Subsurface Consultants, Inc.

R. William Rudolph, P.E.
President

January 6, 1998
SCI 447.055

STID 469

Mr. George Hill
655 University Avenue, Suite 100
Sacramento, California 95825

Mr. Gordon Linden
150 LaSalle Avenue
Piedmont, California 94611

Groundwater Monitoring
November 1997 Quarterly Event
Connell Oldsmobile Facility
3093 Broadway
Oakland, California

Dear Messrs. Hill & Linden:

This letter records the results of the November 1997 groundwater monitoring event, as well as the September, October, and November 1997 free product recovery events performed by Subsurface Consultants, Inc. (SCI) at the Connell Oldsmobile facility in Oakland, California. The facility is situated at the southwest corner of the intersection of Hawthorne Street and Broadway, as shown on the Site Plan, Plate 1.

BACKGROUND

On December 18, 1989, three underground storage tanks (USTs), which previously contained gasoline, diesel fuel, and waste oil, were removed within a sidewalk area located adjacent to the existing Connell Oldsmobile facility. A fuel dispenser island located within the existing building was also removed at the time. SCI understands that the pipelines connecting the fuel dispenser island with the USTs remained in-place.

Twelve wells have been periodically sampled at the site since 1990 to evaluate impacts to groundwater due to previous UST releases. Groundwater monitoring is performed in accordance with the program outlined in SCI's Corrective Action Plan Work Plan (Work Plan) dated November 6, 1995, and approved by the Alameda County Health Care Services Agency

3736 Mt. Diablo Boulevard • Suite 200 • Lafayette, California 94549 • (510) 299-7960 • FAX (510) 299-7970

171 12th Street • Suite 205 • Oakland, California 94607 • (510) 268-0461 • FAX (510) 268-0137

(ACHCSA) in a letter dated November 29, 1995. On May 30, 1997, ACHCSA modified the groundwater monitoring program to include quarterly sampling of wells MW-1, MW-4, and MW-9 whenever free product is absent in those wells.

Since 1991, free product recovery has been conducted on a monthly basis by hand-bailing product from site wells. In October 1996, to enhance free product recovery efforts, a soil vapor extraction (SVE) system and an internal combustion engine were installed to remove product from MW-6.

MONITORING ACTIVITIES

Groundwater Monitoring

On November 4, 1997, depth-to-water and free product thickness were measured in all wells. Groundwater and free product elevation data are summarized in Table 1. The groundwater flow direction is generally towards the east-southeast at gradients varying from 0.01 to 0.1 foot vertical to 1 foot horizontal. Groundwater table contours are presented on Plate 2. Removal of free product from wells MW-1, MW-4, and MW-6, where appreciable product was measured, is discussed later in this report.

On November 4 and 5, 1997, monitoring wells MW-1, MW-4, MW-6, MW-7, MW-8, MW-9, and MW-13 were purged by removing water with new disposable bailers. As described in the Work Plan, sampling of this group of wells is performed on a semi-annual basis. The wells were purged until measurements of pH, temperature, and conductivity had stabilized. After the wells recharged to within 80 percent of their initial level, they were sampled with new disposable bailers. Purge water was placed in a depression created on top of an existing soil stockpile onsite (see Plate 1) and allowed to evaporate.

Samples were retained in pre-cleaned containers supplied by the analytical laboratory and were placed in ice-filled coolers and remained iced until delivery to the analytical laboratory. Chain-of-custody records accompanied the samples to the laboratory.

Chemical Analyses

Chemical analysis of the samples was performed by Curtis & Tompkins, Ltd., a state-certified chemical testing laboratory in Berkeley, California. A summary of sample preparation and test methods is presented below.

Analysis	Sample Preparation Method	Analysis Method
Total Volatile Hydrocarbons	EPA 5030	EPA 8015 Mod.
Total Extractable Hydrocarbons	EPA 3520	EPA 8015 Mod.
Benzene, Toluene, Ethylbenzene, Xylenes	EPA 5030	EPA 8020
Methyl tertiary butyl ether	EPA 5030	EPA 8020
1,1- and 1,2 Dichloroethane (1,1- and 1,2-DCA)	EPA 5030	EPA 8260
Semivolatile Organic Compounds (MW-1 only)	EPA 3520	EPA 8270
Hydrocarbon Oil & Grease (Gravimetric) (MW-1 only)		SMWW 17:5520BF

Analytical test results are summarized in Table 2. Field sampling forms, analytical test reports, and chain-of-custody documents are attached.

Free Product Removal

SCI currently measures separate-phase product thickness and the depth to water in all wells on a monthly basis. Data from the September 9, October 1, and November 4 monthly measurements are summarized in this report. Field forms for these events are attached. Future reporting on the monthly measurements will continue on a quarterly basis.

Free product is intermittently present in three of the site wells (MW-1, MW-4, and MW-6). Between September and November 1997, the free product thickness in MW-1 ranged from 0.77 to 1.21 feet. In MW-4, the free product thickness ranged from 0.04 to 0.37 feet. At MW-6 where the SVE system is removing free product, no free product was measured during September and October, and 0.18 feet was measured in November.

A summary of free product removed from MW-1, MW-4, MW-6, and MW-9 by hand-bailing is presented in Table 3. A summary of product removed from MW-6 by the SVE is presented on Table 4. A total of approximately 368 gallons of free product have been removed from these wells since December 1991. Approximately 145 gallons of free product have been removed by hand-bailing. Approximately 2 gallons of free product was removed from MW-1 by hand bailing since the last quarterly event in August 1997. Because only 0.04 to 0.37 feet of free product was present in MW-4 during this period, no product could be removed from this well by hand-bailing. Free product removal by SVE continues at well MW-6. As of December 1997, approximately 223 gallons of product have been removed from this well by SVE. Approximately 110 gallons of free product were removed from MW-6 by SVE between September and November 1997.

DISCUSSION OF RESULTS

Free Product

Free product continues to be present in wells MW-1, MW-4, and MW-6. Although the site USTs were removed in 1989, product pipelines apparently remain in place and may be a continuing source of free product. The occurrence of free product is likely related to its redistribution from source areas along preferential flow paths. Free product occurrence appears to be highly dependent on the presence and thickness of permeable sand and gravel layers within the screened intervals of the wells, and the seasonal fluctuations of groundwater levels. The groundwater level appears to affect whether the free product layer is in hydraulic contact with locally more permeable zones where migration is likely to occur. The variations in product thickness in MW-1 and MW-6 appear to coincide with the seasonal fluctuations of the groundwater table.

Dissolved Product Plume

Generally, the concentrations of dissolved hydrocarbons during this event (Table 2) remain similar as in previous events. However, benzene concentrations in wells MW-8 and MW-13 have decreased significantly since earlier this year. Samples from MW-13, the farthest downgradient well, contained 1,2-DCA at 5.5 micrograms per liter (µg/l). This compound has been detected in MW-13 at relatively low concentrations (less than 7 µg/l) since 1995.

Ongoing Monitoring and Recommended Additional Work

Interim product recovery by SVE is ongoing at well MW-6. SCI will continue to record product and water level measurements on a monthly basis. The next monitoring event will be a quarterly event which will occur in February 1998. The next report will be submitted by March 31, 1998.

The distribution of free product beneath the existing building is largely unknown. Because of the continued presence of free product in MW-1, MW-4, and MW-6, and because of the possible presence of an ongoing source of free product in and around the in-place pipelines, SCI recommends an additional subsurface investigation beneath the existing building. SCI has submitted a work plan to ACHCSA (dated December 23, 1997) detailing activities for the additional site investigation. The work plan also summarizes the status of previously pre-approved work and describes the scope of additional recommended tasks needed to prepare the final Corrective Action Plan. SCI is currently preparing a request to the Underground Storage Tank Cleanup Fund for budget pre-approval of several ongoing tasks, as well as for the additional recommended tasks, as described in the work plan.

We trust that this provides the required information. If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

James R. Helge

James R. Helge
Project Environmental Scientist

Samuel C. Won
Civil Engineer 57023 (exp. 6/30/01)
Registered Environmental Assessor 06711 (exp. 6/30/98)

JH:SCW:TJM:ly 447.055\nov97rpt.doc

1 copy submitted

Attachments: Table 1 - Groundwater and Free Product Elevation Data
Table 2 - Summary of Contaminant Concentrations in Groundwater
Table 3 - Free Product Recovery by Hand Bailing
Table 4 - Fee Product Recovery by SVE from MW-6
Plate 1 - Site Plan
Plate 2 - Groundwater Elevation Contours, 11/5/97
Field Forms- September through November 1997
Analytical Test Reports
Chain-of-Custody Documents

cc: ✓Ms. Susan Hugo
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Mr. Jonathan Redding
Fitzgerald, Abbott & Beardsley
1221 Broadway, 12th Floor
Oakland, California 94612

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-1	94.48	10/3/90	26.40	68.08	NM	--
		3/5/91	27.46	67.02	NM	--
		3/18/91	26.88	67.60	NM	--
		4/12/91	25.49	68.99	NM	--
		12/23/91	26.86	67.62	1.15	68.77
		12/26/91	26.08	68.40	0.22	68.63
		1/13/92	26.53	67.95	0.66	68.61
		2/28/92	27.75	66.73	0.42	67.15
		5/18/92	24.75	69.73	NM	--
		6/29/92	25.09	69.39	0.04	69.43
		7/29/92	25.46	69.02	0.15	69.17
		8/28/92	25.56	68.92	0.29	69.21
		10/28/92	26.44	68.04	0.52	68.56
		11/24/92	26.63	67.85	NM	--
		12/22/92	26.37	68.11	NM	--
		4/5/93	23.77	70.71	0.00	--
		7/20/93	24.51	69.97	0.60	70.57
		11/9/93	26.06	68.42	1.17	69.59
		8/30/95	21.73	72.75	0.23	72.98
		9/15/95	21.88	72.61	0.15	72.75
		10/2/95	22.42	72.06	0.42	72.48
		11/3/95	23.10	72.74	0.76	73.50
		11/30/95	23.38	72.54	0.70	73.24
		1/3/96	23.30	72.62	0.78	73.40
		2/2/96	22.96	72.28	0.84	74.12
		3/1/96	21.69	72.79	0.14	72.65
		4/4/96	21.11	73.67	0.00	--
		5/2/96	20.96	73.83	0.00	--
		6/5/96	20.98	73.81	0.04	73.85
		7/9/96	21.64	72.84	0.20	73.04
		8/8/96	22.43	72.05	0.33	72.38
		9/10/96	23.25	71.23	0.60	71.83
		10/1/96	23.58	70.90	0.60	71.50
		11/4/96	24.29	70.19	0.78	70.97
		12/2/96	24.63	69.85	0.88	70.73
		1/3/97	24.08	70.40	0.81	71.21
		2/6/97	22.46	72.02	0.30	72.32
		3/5/97	23.00	71.48	0.00	--
		4/1/97	22.29	72.19	0.20	72.39
		5/8/97	22.79	71.69	0.33	72.02

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-1	94.48	6/6/97	24.33	70.15	1.69	71.84
(cont.)		7/8/97	24.00	70.48	0.96	71.44
		8/7/97	24.58	69.90	1.29	71.19
		9/10/97	**24.93**	**69.55**	**1.21**	**70.76**
		10/1/97	**24.89**	**69.59**	**0.86**	**70.45**
		11/4/97	**25.06**	**69.42**	**0.77**	**70.19**
MW-2	94.81	3/5/91	27.86	66.95	0.00	--
		3/18/91	27.46	67.35	0.00	--
		4/12/91	26.98	67.83	0.00	--
		5/18/92	26.50	68.31	0.00	--
		6/29/92	26.80	68.01	0.00	--
		7/29/92	27.08	67.73	0.00	--
		8/28/92	27.33	67.48	0.00	--
		10/28/92	27.65	67.16	0.00	--
		11/24/92	27.91	66.90	0.00	--
		12/22/92	27.74	67.07	--	--
		4/5/93	25.95	68.86	0.00	--
		7/20/93	25.59	69.22	0.00	--
		11/9/93	26.72	68.09	0.00	--
		8/30/95	25.75	69.06	0.00	--
		10/2/95	25.10	69.71	0.00	--
		11/3/95	25.73	69.02	0.00	--
		11/30/95	25.34	69.41	0.00	--
		1/3/96	25.32	69.43	0.00	--
		2/2/96	25.10	69.65	0.00	--
		3/1/96	24.05	70.76	0.00	--
		4/4/96	23.41	71.49	0.00	--
		5/2/96	23.37	71.53	0.00	--
		6/5/96	23.75	71.11	0.00	--
		7/9/96	23.79	71.02	0.00	--
		8/8/96	24.27	70.54	0.00	--
		9/10/96	24.87	69.94	0.00	--
		10/1/96	25.12	69.69	0.00	--
		11/4/96	25.54	69.27	0.00	--
		12/2/96	25.74	69.07	0.00	--
		1/3/97	25.51	69.30	0.00	--
		2/6/97	24.68	70.13	0.00	--
		3/5/97	24.14	70.67	0.00	--
		4/1/97	24.18	70.63	0.00	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-2 (cont.)	94.81	5/8/97	24.58	70.23	0.00	--
		6/6/97	25.20	69.61	0.00	--
		7/8/97	25.38	69.43	0.00	--
		8/7/97	25.52	69.29	0.00	--
		9/10/97	**25.77**	**69.04**	**0.00**	**--**
		10/1/97	**26.01**	**68.80**	**0.00**	**--**
		11/4/97	**26.23**	**68.58**	**0.00**	**--**
MW-3	90.08	3/6/91	23.17	66.91	NM	--
		3/18/91	22.76	67.32	NM	--
		4/12/91	22.51	67.57	NM	--
		5/12/92	23.17	66.91	NM	--
		6/29/92	22.90	67.18	NM	--
		7/29/92	22.17	67.91	NM	--
		8/28/92	22.28	67.80	NM	--
		10/28/92	22.67	67.41	0.00	--
		11/24/92	23.01	67.07	0.00	--
		12/22/92	22.91	67.17	--	--
		4/5/93	22.11	67.97	0.00	--
		7/20/93	23.93	66.15	0.00	--
		11/9/93	23.14	66.94	0.00	--
		8/29/95	20.61	69.47	0.00	--
		10/2/95	21.18	68.90	0.00	--
		11/3/95	20.74	69.60	0.00	--
		11/30/95	20.68	69.66	0.00	--
		1/3/96	20.58	69.76	0.00	--
		2/2/96	20.43	69.91	0.00	--
		3/1/96	20.24	69.84	0.00	--
		4/4/96	18.50	71.58	0.00	--
		5/2/96	18.43	71.65	0.00	--
		6/5/96	18.51	71.57	0.00	--
		7/9/96	18.97	71.11	0.00	--
		8/8/96	19.51	70.57	0.00	--
		9/10/96	19.86	70.22	0.00	--
		10/1/96	20.04	70.04	0.00	--
		11/4/96	20.25	69.83	0.00	--
		12/2/96	20.40	69.68	0.00	--
		1/3/97	20.33	69.75	0.00	--
		2/6/97	19.98	70.10	0.00	--
		3/5/97	19.80	70.28	0.00	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-3	90.08	4/1/97	19.76	70.32	0.00	--
(cont.)		5/8/97	19.77	70.31	0.00	--
		6/6/97	20.18	69.90	0.00	--
		7/8/97	20.24	69.84	0.00	--
		8/7/97	20.38	69.70	0.00	--
		9/10/97	**20.55**	**69.53**	**0.00**	--
		10/1/97	**20.73**	**69.35**	**0.00**	--
		11/4/97	**20.87**	**69.21**	**0.00**	--
MW-4	88.84	3/5/91	23.79	65.05	NM	--
		3/18/91	22.30	66.54	NM	--
		4/12/91	21.85	66.99	NM	--
		12/23/91	22.63	66.22	0.98	67.19
		12/26/91	22.52	66.32	0.96	67.28
		1/10/92	22.74	66.10	0.99	67.09
		2/28/92	22.00	66.84	0.67	67.51
		3/11/92	21.71	67.13	0.55	67.68
		3/13/92	21.56	67.28	0.49	67.77
		3/17/92	25.46	63.38	0.44	63.82
		3/18/92	21.38	67.47	0.44	67.90
		3/19/92	21.33	67.51	0.48	67.99
		3/23/92	21.29	67.55	0.42	67.97
		3/24/92	21.31	67.53	0.38	67.90
		3/25/92	21.17	67.67	0.36	68.04
		3/26/92	21.08	67.76	0.35	68.11
		3/27/92	20.92	67.92	0.26	68.18
		3/31/92	21.15	67.69	0.44	68.13
		4/1/92	20.90	67.94	0.24	68.18
		4/2/92	20.90	67.94	0.17	68.11
		4/10/92	20.91	67.93	0.33	68.26
		4/13/92	21.04	67.80	0.42	68.22
		4/20/92	20.74	68.10	0.19	68.29
		5/4/92	20.83	68.01	0.33	68.34
		5/18/92	21.33	67.51	0.23	67.74
		5/26/92	20.83	68.01	0.17	68.18
		6/1/92	20.85	67.99	0.19	68.17
		6/29/92	21.38	67.46	0.53	67.99
		7/29/92	21.69	67.15	0.56	67.71
		8/28/92	21.35	67.49	0.63	68.12
		10/28/92	22.48	66.36	0.84	67.20

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-4	88.84	11/24/92	22.60	66.24	NM	--
(cont.)		12/22/92	22.47	66.37	NM	--
		4/3/93	20.11	68.73	0.51	69.24
		7/20/93	20.48	68.36	0.52	68.88
		11/9/93	21.71	67.13	0.63	67.76
		8/30/95	19.90	68.94	2.20	71.14
		9/15/95	18.76	70.08	0.57	70.65
		10/2/95	19.17	69.67	0.65	70.32
		11/3/95	19.45	69.39	0.44	69.83
		11/30/95	19.50	69.44	0.32	69.76
		1/3/96	19.31	69.53	0.20	69.73
		2/2/96	18.91	69.93	0.20	70.13
		3/1/96	18.25	70.59	0.19	70.78
		4/4/96	17.53	71.31	0.18	71.47
		5/2/96	17.50	71.34	0.25	71.59
		6/5/96	17.67	71.17	0.39	71.56
		7/9/96	18.29	70.55	0.50	71.05
		8/8/96	18.84	70.00	0.00	--
		9/10/96	19.31	69.53	0.34	69.87
		10/1/96	19.51	69.33	0.29	69.62
		11/4/96	20.13	68.71	0.35	69.06
		12/2/96	20.23	68.61	0.33	68.94
		1/3/97	19.33	69.51	0.10	69.61
		2/6/97	18.13	70.72	0.01	70.73
		3/5/97	18.17	70.67	0.06	70.73
		4/1/97	18.38	70.46	0.05	70.51
		5/8/97	18.63	70.21	0.03	70.24
		6/6/97	18.78	70.06	0.19	70.25
		7/8/97	19.21	69.63	0.02	69.65
		8/7/97	19.50	69.34	0.07	69.41
		9/10/97	**19.86**	**68.98**	**0.04**	**69.02**
		10/1/97	**20.09**	**68.75**	**0.37**	**69.12**
		11/4/97	**20.19**	**68.65**	**0.19**	**68.84**
MW-5	84.84	3/18/91	26.31	58.53	NM	--
		3/12/91	26.41	58.43	NM	--
		5/18/92	26.75	58.09	NM	--
		6/29/92	26.73	58.11	NM	--
		7/29/92	26.66	58.18	NM	--
		8/28/92	26.90	57.94	NM	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-5 (cont.)	84.84	10/28/92	26.39	58.45	0.00	--
		11/24/92	26.83	58.01	0.00	--
		12/22/92	27.33	57.51	--	--
		4/3/93	26.62	58.22	0.00	--
		7/20/93	26.60	58.24	0.00	--
		11/9/93	27.24	57.60	0.00	--
		8/30/95	27.46	57.38	0.00	--
		10/2/95	26.85	57.99	0.00	--
		11/3/95	26.67	58.87	0.00	--
		11/30/95	27.05	58.49	0.00	--
		1/3/96	26.60	59.04	0.00	--
		2/2/96	26.70	59.14	0.00	--
		3/1/96	26.00	58.84	0.00	--
		4/4/96	26.20	58.64	0.00	--
		5/2/96	26.02	58.82	0.00	--
		6/5/96	25.91	58.93	0.00	--
		7/9/96	26.20	58.64	0.00	--
		8/8/96	26.38	58.46	0.00	--
		9/10/96	26.42	58.42	0.00	--
		10/1/96	26.52	58.32	0.00	--
		11/4/96	26.69	58.15	0.00	--
		12/2/96	26.70	58.14	0.00	--
		1/3/97	25.84	59.00	0.00	--
		2/6/97	26.26	58.58	0.00	--
		3/5/97	26.20	58.64	0.00	--
		4/1/97	26.98	57.86	0.00	--
		5/8/97	26.76	58.08	0.00	--
		6/6/97	26.33	58.51	0.00	--
		7/8/97	26.84	58.00	0.00	--
		8/7/97	26.89	57.95	0.00	--
		9/10/97	**26.76**	**58.08**	**0.00**	**--**
		10/1/97	**26.97**	**57.87**	**0.00**	**--**
		11/4/97	**27.04**	**57.80**	**0.00**	**--**
MW-6	85.62	3/18/91	25.82	59.80	NM	--
		4/12/91	27.23	58.39	NM	--
		12/23/91	28.40	57.22	3.21	60.44
		12/26/91	27.25	58.37	1.67	60.04
		1/10/92	27.23	58.39	0.90	59.29
		2/4/92	27.71	57.91	2.04	59.95

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-6	85.62	2/28/92	27.92	57.70	3.00	60.70
(cont.)		3/10/92	27.16	58.46	2.06	60.53
		3/12/92	25.96	59.66	0.52	60.18
		3/13/92	25.70	59.92	0.21	60.13
		3/23/92	26.34	59.28	1.09	60.37
		3/30/92	25.73	59.89	0.35	60.25
		4/10/92	25.29	60.33	0.05	60.38
		4/13/92	25.52	60.10	0.21	60.31
		4/20/92	25.38	60.25	0.10	60.35
		5/4/92	25.40	60.22	NM	--
		5/18/92	25.50	60.12	0.17	60.29
		5/26/92	25.46	60.16	0.13	60.29
		6/1/92	25.46	60.16	0.09	60.26
		6/29/92	25.59	60.03	0.14	60.17
		7/29/92	26.90	58.72	1.71	60.43
		8/28/92	25.09	60.53	2.62	63.15
		10/28/92	25.02	60.60	3.94	64.54
		11/24/92	28.87	56.75	NM	--
		4/3/93	26.96	58.66	2.86	61.52
		7/20/93	26.17	59.45	2.60	62.05
		11/9/93	27.51	58.11	3.06	61.17
		8/30/95	28.00	57.62	7.96	65.58
		9/15/95	28.24	57.38	6.14	63.52
		10/2/95	28.39	57.23	6.13	63.36
		11/3/95	26.91	58.71	3.44	62.15
		11/30/95	27.58	58.04	4.41	62.45
		1/3/96	27.58	58.04	4.37	62.41
		2/2/96	27.96	57.68	5.15	62.83
		3/1/96	27.96	57.68	5.41	63.09
		4/4/96	27.69	57.93	5.69	63.62
		5/2/96	26.83	58.79	4.66	63.45
		6/5/96	27.15	58.47	5.17	63.64
		7/9/96	27.08	58.54	4.86	63.40
		8/8/96	26.71	58.91	4.05	62.96
		9/10/96	26.83	58.79	3.82	62.61
		10/1/96	26.96	58.66	3.77	62.43
MW-6*	86.94	11/4/96	NM	NM	NM	NM
		12/2/96	NM	NM	NM	NM
		1/3/97	NM	NM	NM	NM
		2/6/97	25.08	61.86	0.20	62.06

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-6*	86.94	3/5/97	24.20	62.74	0.00	--
(cont.)		4/1/97	24.04	62.90	0.00	--
		5/8/97	26.54	60.40	1.88	62.28
		6/6/97	25.33	61.61	0.21	61.82
		7/8/97	25.30	61.64	0.07	61.71
		8/7/97	25.52	61.42	0.00	--
		9/10/97	**25.76**	**61.18**	**0.00**	--
		10/1/97	**25.12**	**61.82**	**0.00**	--
		11/4/97	**26.16**	**60.78**	**0.18**	**60.96**
MW-7	85.41	3/18/91	21.63	63.78	NM	--
		4/12/91	22.13	63.28	NM	--
		5/18/92	21.67	63.74	NM	--
		6/29/92	20.75	64.66	NM	--
		7/29/92	21.07	64.34	NM	--
		8/28/92	21.35	64.06	NM	--
		10/28/92	21.81	63.60	0.00	--
		11/24/92	21.52	63.89	0.00	--
		12/22/92	obstructed	--	0.00	--
		4/3/93	20.08	65.33	0.00	--
		7/20/93	19.59	65.82	0.00	--
		11/9/93	20.65	64.76	0.00	--
		8/30/95	18.78	66.63	0.00	--
		10/2/95	18.73	66.68	0.00	--
		11/3/95	19.23	66.18	0.00	--
		11/30/95	19.47	65.94	0.00	--
		1/3/96	18.52	66.89	0.00	--
		2/2/96	17.83	67.58	0.00	--
		3/1/96	17.61	67.80	0.00	--
		4/4/96	17.28	68.13	0.00	--
		5/2/96	17.15	68.26	0.00	--
		6/5/96	17.47	67.94	0.00	--
		7/9/96	18.06	67.35	0.00	--
		8/8/96	18.48	66.93	0.00	--
		9/10/96	18.79	66.62	0.00	--
		10/1/96	18.90	66.51	0.00	--
		11/4/96	18.69	66.72	0.00	--
		12/2/96	18.47	66.94	0.00	--
		1/3/97	17.98	67.43	0.00	--
		2/6/97	17.44	67.97	0.00	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-7 (cont.)	85.41	3/5/97	16.73	68.68	0.00	--
		4/1/97	17.32	68.09	0.00	--
		5/8/97	17.72	67.69	0.00	--
		6/6/97	17.75	67.66	0.00	--
		7/8/97	17.94	67.47	0.00	--
		8/7/97	18.49	66.92	0.00	--
		9/10/97	**18.48**	**66.93**	**0.00**	**--**
		10/1/97	**18.42**	**66.99**	**0.00**	**--**
		11/4/97	**18.86**	**66.55**	**0.00**	**--**
MW-8	85.50	10/28/92	27.70	57.80	0.00	--
		11/24/92	27.62	57.88	0.00	--
		12/22/92	27.40	58.10	--	--
		4/3/93	26.64	58.86	0.00	--
		7/20/93	26.60	58.90	0.00	--
		11/9/93	27.18	58.32	0.00	--
		8/30/95	26.35	59.15	0.00	--
		10/2/95	26.60	58.90	0.00	--
		11/3/95	26.62	58.88	0.00	--
		11/30/95	26.72	58.78	0.00	--
		1/3/96	26.64	58.86	0.00	--
		2/2/96	26.28	59.22	0.00	--
		3/1/96	25.81	59.69	0.00	--
		4/4/96	25.81	59.69	0.00	--
		5/2/96	26.15	60.03	0.00	--
		6/5/96	26.17	60.01	0.00	--
		7/9/96	26.32	59.18	0.00	--
		8/8/96	26.41	59.09	0.00	--
		9/10/96	26.66	58.84	0.00	--
		10/1/96	26.65	58.85	0.00	--
		11/4/96	26.77	58.73	0.00	--
		12/2/96	26.59	58.91	0.00	--
		1/3/97	25.98	59.52	0.00	--
		2/6/97	25.84	59.66	0.00	--
		3/5/97	25.94	59.56	0.00	--
		4/1/97	26.34	59.16	0.00	--
		5/8/97	26.39	59.11	0.00	--
		6/6/97	26.45	59.05	0.00	--
		7/8/97	26.65	58.85	0.00	--
		8/7/97	26.72	58.78	0.00	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-8	85.50	**9/10/97**	**26.89**	**58.61**	**0.00**	--
(cont.)		**10/1/97**	**26.91**	**58.59**	**0.00**	--
		11/4/97	**26.82**	**58.68**	**0.00**	--
MW-9	90.37	10/28/92	23.37	67.00	0.00	--
		11/24/92	23.51	66.86	0.00	--
		12/22/92	23.31	67.06	--	--
		4/3/93	21.14	69.23	0.00	--
		7/20/93	21.54	68.83	0.00	--
		11/9/93	27.53	62.84	0.00	--
		8/30/95	19.59	70.78	0.00	--
		10/2/95	20.05	70.32	0.00	--
		11/3/95	20.40	69.97	0.00	--
		11/30/95	20.65	69.72	0.00	--
		1/3/96	20.73	69.64	0.00	--
		2/2/96	20.19	70.18	0.00	--
		3/1/96	19.53	70.84	0.00	--
		4/4/96	18.74	71.63	0.00	--
		5/2/96	18.63	71.74	0.00	--
		7/9/96	19.15	71.22	0.00	--
		8/8/96	19.89	70.48	0.35	70.83
		9/10/96	20.11	70.26	0.00	--
		10/1/96	20.37	70.00	0.00	--
		11/4/96	20.69	69.68	0.00	--
		12/2/96	21.43	68.94	0.00	--
		1/3/97	20.72	69.65	0.00	--
		2/6/97	19.72	70.65	0.00	--
		3/5/97	19.59	70.78	0.00	--
		4/1/97	19.73	70.64	0.00	--
		5/8/97	19.96	70.41	0.00	--
		6/6/97	20.13	70.24	0.00	--
		7/8/97	20.53	69.84	0.00	--
		8/7/97	20.84	69.53	0.00	--
		9/10/97	**21.15**	**69.22**	**0.00**	--
		10/1/97	**21.42**	**68.95**	**0.00**	--
		11/4/97	**21.55**	**68.82**	**0.00**	--
MW-10	88.60	10/28/92	21.55	67.05	0.00	--
		11/24/92	21.86	66.74	0.00	--
		12/22/92	21.68	66.92	--	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-10 (cont.)	88.60	4/3/93	19.14	69.46	0.00	--
		7/20/93	19.79	68.81	0.00	--
		11/9/93	20.83	67.77	0.00	--
		8/30/95	17.99	70.61	0.00	--
		10/2/95	18.42	70.18	0.00	--
		11/3/95	18.82	69.78	0.00	--
		11/30/95	19.03	69.57	0.00	--
		1/3/96	18.96	69.64	0.00	--
		2/2/96	18.55	70.05	0.00	--
		3/1/96	17.81	70.79	0.00	--
		4/4/96	17.11	71.49	0.00	--
		5/2/96	17.04	71.56	0.00	--
		6/5/96	17.11	71.49	0.00	--
		7/9/96	17.64	70.96	0.00	--
		8/8/96	18.24	70.36	0.00	--
		9/10/96	18.82	69.78	0.00	--
		10/1/96	19.02	69.58	0.00	--
		11/4/96	19.59	69.01	0.00	--
		12/2/96	19.72	68.88	0.00	--
		1/3/97	18.86	69.74	0.00	--
		2/6/97	17.76	70.84	0.00	--
		3/5/97	17.84	70.76	0.00	--
		4/1/97	18.00	70.60	0.00	--
		5/8/97	18.36	70.24	0.00	--
		6/6/97	18.50	70.10	0.00	--
		7/8/97	18.98	69.62	0.00	--
		8/7/97	19.18	69.42	0.00	--
		9/10/97	**19.58**	**69.02**	**0.00**	**--**
		10/1/97	**19.81**	**68.79**	**0.00**	**--**
		11/4/97	**19.95**	**68.65**	**0.00**	**--**
MW-11	102.06	11/24/92	33.65	68.41	0.00	--
		12/22/92	33.37	68.69	--	--
		4/5/93	31.03	71.03	0.00	--
		7/20/93	31.90	70.16	0.00	--
		11/9/93	32.60	69.46	0.00	--
		8/29/95	28.92	73.14		
		10/2/95	29.48	72.58	0.00	--
		11/3/95	29.73	72.33	0.00	--
		11/30/95	30.26	71.80	0.00	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-11 (cont.)	102.06	1/3/96	30.06	72.00	0.00	--
		2/2/96	29.67	72.39	0.00	--
		3/1/96	28.74	73.32	0.00	--
		4/4/96	28.13	73.93	0.00	--
		5/2/96	28.26	74.06	0.00	--
		6/5/96	28.30	74.02	0.00	--
		7/9/96	28.92	73.14	0.00	--
		8/8/96	29.64	72.42	0.00	--
		9/10/96	30.66	71.40	0.00	--
		10/1/96	30.58	71.48	0.00	--
		11/4/96	31.14	70.92	0.00	--
		12/2/96	31.36	70.70	0.00	--
		1/3/97	30.73	71.33	0.00	--
		2/6/97	29.38	72.68	0.00	--
		3/5/97	29.22	72.84	0.00	--
		4/1/97	29.46	72.60	0.00	--
		5/8/97	29.93	72.13	0.00	--
		6/6/97	30.17	71.89	0.00	--
		7/8/97	30.62	71.44	0.00	--
		8/7/97	30.95	71.11	0.00	--
		9/10/97	**31.38**	**70.68**	**0.00**	--
		10/1/97	**31.61**	**70.45**	**0.00**	--
		11/4/97	**31.88**	**70.18**	**0.00**	--
MW-13	84.06	11/24/92	26.05	58.01	0.00	--
		12/22/92	25.08	58.98	--	--
		4/5/93	24.64	59.42	0.00	--
		7/20/93	24.29	59.77	0.00	--
		11/9/93	24.23	59.83	0.00	--
		8/29/95	23.30	60.76	NM	--
		10/2/95	23.78	60.28	0.00	--
		11/3/95	23.73	60.33	0.00	--
		11/30/95	23.80	60.26	0.00	--
		1/3/96	23.95	60.11	0.00	--
		2/2/96	23.70	60.36	0.00	--
		3/1/96	23.36	60.70	0.00	--
		4/4/96	23.27	60.79	0.00	--
		5/2/96	23.35	60.87	0.00	--
		6/5/96	23.07	60.99	0.00	--

TABLE 1
GROUNDWATER AND FREE PRODUCT ELEVATION DATA
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	TOC Elevation (feet)	Date	Groundwater Depth (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Product Elevation (feet)
MW-13	84.06	7/9/96	23.31	60.75	0.00	--
(cont.)		8/8/96	23.44	60.62	0.00	--
		9/10/96	23.66	60.40	0.00	--
		10/1/96	23.80	60.26	0.00	--
		11/4/96	24.04	60.02	0.00	--
		12/2/96	24.00	60.06	0.00	--
		1/3/97	23.30	60.76	0.00	--
		2/6/97	23.24	60.82	0.00	--
		3/5/97	23.24	60.82	0.00	--
		4/1/97	23.37	60.69	0.00	--
		5/8/97	23.46	60.60	0.00	--
		6/6/97	23.57	60.49	0.00	--
		7/8/97	23.80	60.26	0.00	--
		8/7/97	23.92	60.14	0.00	--
		9/10/97	**24.07**	**59.99**	**0.00**	**--**
		10/1/97	**24.18**	**59.88**	**0.00**	**--**
		11/4/97	**24.27**	**59.79**	**0.00**	**--**

Reference datum: arbitrary benchmark established by Levine Fricke.
TOC = Top of casing
Groundwater depths are measured below TOC.
NM = Not measured
* New TOC from connection to remediation system.

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER
FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-1	10/1/90	620,000	<500	33,000	50,000	7,900	41,000	2,900	ND	--	--	--
SA	10/1/92	490,000	--	51,000	59,000	5,000	27,000	1,300	--	--	--	--
	11/1/92	320,000	4,600	35,000	43,000	4,200	22,000	1,600	ND	--	--	--
	4/1/93	270,000	25,000	50,000	58,000	4,600	25,000	1,800	ND	--	--	--
	7/1/93	FP	--	--	--	--	--	--	--	--	--	--
	11/1/93	FP	--	--	--	--	--	--	--	--	--	--
	8/1/95	FP	--	--	--	--	--	--	--	10	--	--
	12/1/95	FP	--	--	--	--	--	--	--	--	**	--
	5/1/96	340,000	32,000	57,000	73,000	7,200	38,000	1,200	--	<5	**	--
	11/5/96	270,000	--	43,000	56,000	4,500	34,000	--	--	9.8	--	--
	5/9/97	240,000	28,000[1,2]	36,000	45,000	3,300	17,900	930	--	20	***	--
	11/5/97	240,000	28000 [1,2]	42,000	48,000	3,600	18,800	1,200	--	ND	****	<1,000
MW-2	3/1/91	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
A	11/1/92	<50	<50	<0.5	1.1	<0.5	1.5	<1	ND	--	--	--
	4/1/93	<50	870	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	7/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/93	<50	240	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	8/1/95	<50	150*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
	5/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	5/8/97	<50	<50	<0.5	0.7	<0.5	<0.5	<1	--	--	--	--

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER
FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-3	3/1/91	<50	<50	<50	0.6	<0.5	<0.5	<1	ND	--	--	--
	11/1/92	50	160	<0.5	0.9	<0.5	2	<1	ND	--	--	--
	4/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	7/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	8/1/95	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
A	5/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	5/8/97	<50	<50	<0.5	0.7	<0.5	<0.5	<1	--	--	--	--
MW-4	3/1/91	150,000	<500	20,000	38,000	2,800	14,000	610	ND	--	--	--
SP	10/1/92	230,000	--	15,000	32,000	2,500	14,000	430	--	--	--	--
	11/1/92	210,000	1,600	14,000	31,000	2,500	14,000	500	ND	--	--	--
	4/1/93	FP	--	--	--	--	--	--	--	--	--	--
	7/1/93	FP	--	--	--	--	--	--	--	--	--	--
	11/1/93	FP	--	--	--	--	--	--	--	--	--	--
	8/1/95	FP	--	--	--	--	--	--	--	--	--	--
	12/1/95	FP	--	--	--	--	--	--	--	--	--	--
	5/1/96	140,000	9,200	24,000	50,000	3,000	15,100	420	ND	--	--	--
	11/4/96	160,000	4,700 [1,2]	16,000	38,000	2,700	14,000	380	ND	--	--	--
	5/8/97	170,000	5,100 [1,2]	16,000	37,000	2,400	15,900	290	--	--	--	--
	11/5/97	190,000	3,700 [1,2]	15,000	31,000	2,200	14,600	290	--	--	--	<400

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-5	3/1/91	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/92	<50	50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	4/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	7/1/93	<50	190	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/93	<50	170	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	8/1/95	<50	180*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
	5/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	5/8/97	<50	<50	<0.5	0.5	<0.5	<0.5	<1	--	--	--	--
MW-6	3/1/91	80,000	<50	12,000	13,000	1,100	5,400	1,400	Dibromochloromethane (160)	--	--	--
	10/1/92	19,000	--	3,200	1,400	200	560	840	--	--	--	--
	12/1/92	FP	--	--	--	--	--	--	--	--	--	--
	4/1/93	FP	--	--	--	--	--	--	--	--	--	--
	7/1/93	FP	--	--	--	--	--	--	--	--	--	--
	11/1/93	FP	--	--	--	--	--	--	--	--	--	--
	8/1/95	FP	--	--	--	--	--	--	--	--	--	--
	5/1/96	130,000	9,000	37,000	50,000	3,200	14,200	2,400	ND	--	--	--
	5/9/97	1,700,000	53,000[1,2]	14,000	27,000	4,000	28,200	1,200	--	--	--	--
	11/5/97	160,000	65,000[1,2]	13,000	19,000	1,900	14,300	790	--	--	--	<200
MW-7	3/1/91	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/92	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER
FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-7	4/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
(cont.)	7/1/93	<50	150	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/93	<50	200	<0.5	1	<0.5	1.7	<1	ND	--	--	--
	8/1/95	<50	170*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
	12/1/95	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	5/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	8/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	<2.0
	11/4/96	<50	<50	<1	<1	<1	<1	<1	ND	--	--	--
	2/6/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	<2.0
	5/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
	8/7/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	<2.0
	11/5/97	<50	<50	<0.5	<0.5	<0.5	<0.5	1	--	--	--	<2.0
MW-8	10/1/92	70	--	20	1	1	3	210	--	--	--	--
	11/1/92	<50	170	<0.5	<0.5	<0.5	<0.5	200	ND	--	--	--
	4/1/93	490	100	15	45	5.1	73	210	ND	--	--	--
	7/1/93	180	90	2.5	3	<0.5	1.9	350	ND	--	--	--
	11/1/93	310	170	23	<0.5	<0.5	<0.5	240	ND	--	--	--
	8/1/95	660	240*	360	6.8	13	2.8	130	--	--	--	--
	12/1/95	250	<50	46	0.9	4.9	<0.5	94	ND	--	--	--
	5/1/96	69	94	110	<0.5	<0.5	1.5	100	ND	--	--	--
	8/1/96	120	250 [1,2]	11	<0.5	<0.5	<0.5	93	ND	--	--	<2.0

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER
FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-8	11/5/96	110	<50	20	<1	1	<1	98	ND	--	--	--
(cont.)	2/6/97	67 [1,2]	130	51	<0.5	0.56	<0.5	81	ND	--	--	<2.0
	5/9/97	110 [1,2]	120 [1,2]	59	<0.5	<0.5	<0.5	76	--	--	--	--
	8/7/97	<50	150 [2]	12 [3]	<0.5	<0.5	<0.5	79	ND	--	--	<2.0
	11/5/97	<50	110 [1,2]	9.4	<0.5	<0.5	<0.5	84	--	--	--	<2.0
MW-9	11/1/92	19,000	320	180	590	23	2000	340	Chloroform (15)	--	--	--
	4/1/93	2,300	920	48	4	0.6	13	600	Chloroform (2)	--	--	--
	7/1/93	2,300	450	170	8.1	15	<0.5	1100	ND	--	--	--
	11/1/93	4,400	450	69	7.3	21	9.7	900	ND	--	--	--
	8/1/95	3,200	680	3,900	49	80	22.8	960	--	--	--	--
	5/1/96	<1300	710	2,600	<13	200	<13	550	ND	--	--	--
	11/5/96	1,800	420	280	<5	65	<5	770	ND	--	--	--
	5/9/97	1,100	490 [1,2]	160	<0.5	42	<0.5	690	--	--	--	--
	8/8/97	570 [1,2]	480 [2]	<0.5	<0.5	<0.5	0.78 [3]	680	ND	--	--	<2.0
	11/5/97	490 [1]	370 [1,2]	<0.5	<0.5	6	<0.5	500	--	--	--	<2.0
MW-10	10/1/92	28,000	--	2,700	3,800	210	1,300	150	--	--	--	--
	11/1/92	130,000	1,300	9,700	19,000	1,400	8,400	370	ND	--	--	--
	4/1/93	63,000	5,000	6,300	14,000	1,100	7,500	70	ND	--	--	--
	7/1/93	140,000	20,000	16,000	31,000	2,200	13,000	700	ND	--	--	--
	8/1/95	92,000	5,900	13,000	24,000	1,800	9,100	300	--	--	--	--

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-10	5/1/96	81,000	5,600	17,000	29,000	2,100	8,500	320	ND	--	--	--
(cont.)	5/9/97	63,000	2,500 [1,2]	7,400	13,000	940	4,100	150	--	--	--	--
MW-11	11/1/92	<50	220	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	12/1/92	<50	140	<0.1	<0.1	<0.1	<0.1	--	--	--	--	--
	12/1/92	<50	120	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
	4/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	7/1/93	160	150	<0.5	1.8	<0.5	<0.5	<1	ND	--	--	--
	11/1/93	80	60	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	8/1/95	<50	240*	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
	5/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	5/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	--	--	--	--
MW-13	11/1/92	<50	3,600	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	12/1/92	<50	210	<0.1	<0.1	<0.1	<0.1	--	--	--	--	--
	12/1/92	<50	100	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
	4/1/93	<50	<50	<0.5	0.9	<0.5	<0.5	<1	ND	--	--	--
	7/1/93	<50	<50	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	11/1/93	<50	160	<0.5	<0.5	<0.5	<0.5	<1	ND	--	--	--
	8/1/95	<50	<50	49	<0.5	<0.5	<0.5	3.6	--	--	--	--
	12/1/95	<50	<50	<0.5	<0.5	<0.5	<0.5	4.1	ND	--	--	--
	5/1/96	<50	<50	<0.5	<0.5	<0.5	<0.5	4	ND	--	--	--

TABLE 2
SUMMARY OF CONTAMINANT CONCENTRATIONS IN GROUNDWATER
FROM MONITORING WELLS
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Event Date	TVH µg/l	TEH µg/l	B µg/l	T µg/l	E µg/l	X µg/l	1,2-DCA µg/l	Other Purgeable Halocarbons+ µg/l	Oil & Grease mg/l	Semi-volatile Compounds µg/l	MTBE µg/l
MW-13	8/1/96	<50	<50	32	<0.5	<0.5	<0.5	6.4	ND	--	--	<2.0
(cont.)	11/5/96	<50	<50	<1	<1	<1	<1	5.7	ND	--	--	--
	2/6/97	<50	<50	<0.5	<0.5	<0.5	<0.5	3.5	ND	--	--	<2.0
	5/8/97	<50	<50	81	<0.5	<0.5	<0.5	5.5	--	--	--	--
	8/8/97	<50	<50	<0.5	<0.5	<0.5	<0.5	6.8	ND	--	--	<2.0
	11/5/97	<50	<50	<0.5	<0.5	<0.5	<0.5	5.5	--	--	--	<2.0

NOTES:

µg/l = micrograms per liter = parts per billion = ppb
TVH = Total Volatile Hydrocarbons
TEH = Total Extractable Hydrocarbons
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
1,2-DCA = 1,2-Dichloroethane
<0.5 = Chemical not present at a concentration in excess of detection limit shown
* = Suspect laboratory contamination contributing to test result.
** = 2,4-dichlorophenol (1,700 µg/l), naphthalene (1,200 µg/l), 2-methylnapthalene (630 µg/l), bis (2-ethylhexyl) phthalate (240 µg/l) detected during August 1995 event, naphthalene (640 µg/l), 2-methylnapthalene (250 µg/l) during the May 1996 event
*** = Phenol (93 µg/l), Benzoic acid (570 µg/l), Naphthalene (650 µg/l), 2-Methylnaphthalene (280 µg/l) during May 1997 event.
**** = Naphthalene (1500 µg/l), 2-Methylnaphthalene (720 µg/l) during the November 1997 event.
[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

ND = None detected, chemicals not present at concentrations above detection limits reported on laboratory test reports
MW-1 was initially referred to as Sample 5
-- = Test not requested
FP = Free product encountered in well
+ = Includes 1,1-dichloroethane

TABLE 3
FREE PRODUCT RECOVERY BY HAND-BAILING
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Removal Date	Product Removed by Hand-Bailing (gallons)	Cumulative Product Removed by Hand-Bailing (gallons)
MW-1	12/23/91	2.00	2.00
	12/26/91	0.50	2.50
	1/13/92	1.00	3.50
	2/28/92	2.00	5.50
	11/9/93	0.50	6.00
	11/3/95	0.25	6.75
	11/30/95	0.25	7.00
	1/3/96	0.53	7.53
	2/2/96	0.75	8.28
	3/1/96	0.10	8.38
	4/4/96	0.00	8.38
	5/2/96	0.00	8.38
	6/5/96	0.10	8.48
	7/9/96	0.10	8.58
	8/8/96	0.05	8.63
	9/10/96	0.10	8.73
	10/1/96	0.25	8.98
	11/4/96	0.13	9.11
	12/2/96	0.26	9.37
	1/3/97	0.39	9.76
	2/6/97	0.01	9.77
	3/5/97	0.00	9.77
	4/1/97	0.01	9.78
	5/8/97	0.02	9.80
	6/6/97	0.26	10.06
	7/8/97	0.20	10.26
	8/7/97	1.00	11.26
	9/10/97	**1.50**	**12.76**
	10/1/97	**0.26**	**13.02**
	11/4/97	**0.26**	**13.28**
MW-4	12/23/91	2.50	2.50
	12/26/91	6.00	8.50
	1/10/92	5.00	13.50
	2/28/92	4.00	17.50
	3/11/92	3.50	21.00
	3/13/92	3.50	24.50
	3/17/92	2.25	26.75

TABLE 3
FREE PRODUCT RECOVERY BY HAND-BAILING
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Removal Date	Product Removed by Hand-Bailing (gallons)	Cumulative Product Removed by Hand-Bailing (gallons)
MW-4 (cont.)	3/18/92	2.50	29.25
	3/19/92	1.50	30.75
	3/23/92	4.00	34.75
	3/24/92	1.50	36.25
	3/25/92	1.00	37.25
	3/26/92	1.00	38.25
	3/27/92	0.50	38.75
	3/31/92	0.50	39.25
	4/1/92	0.25	39.50
	4/2/92	0.13	39.63
	4/6/92	0.13	39.76
	4/10/92	0.25	40.01
	4/13/92	0.25	40.26
	4/20/92	0.13	40.39
	5/4/92	0.13	40.52
	5/18/92	0.13	40.65
	5/26/92	0.13	40.78
	6/1/92	0.06	40.84
	6/29/92	0.25	41.09
	7/29/92	1.11	42.20
	8/28/92	1.68	43.88
	4/3/93	0.13	44.01
	11/9/93	0.03	44.04
	8/30/95	1.75	45.79
	10/2/95	0.50	46.29
	11/3/95	0.25	46.54
	11/30/95	0.25	46.79
	1/3/96	0.05	46.84
	2/2/96	0.10	46.94
	3/1/96	0.20	47.14
	4/4/96	0.20	47.34
	5/2/96	0.20	47.54
	6/5/96	0.15	47.59
	7/9/96	0.16	47.75
	8/8/96	0.00	47.75
	9/10/96	0.05	47.80
	10/1/96	0.05	47.85
	11/4/96	0.02	47.87

TABLE 3
FREE PRODUCT RECOVERY BY HAND-BAILING
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Removal Date	Product Removed by Hand-Bailing (gallons)	Cumulative Product Removed by Hand-Bailing (gallons)
MW-4	12/2/96	0.02	47.89
(cont.)	1/3/97	0.02	47.91
	2/6/97	0.01	47.92
	3/5/97	0.00	47.92
	4/1/97	0.00	47.92
	5/8/97	0.00	47.92
	6/6/97	0.00	47.92
	7/8/97	0.00	47.92
	8/7/97	0.00	47.92
	9/10/97	**0.00**	**47.92**
	10/1/97	**0.00**	**47.92**
	11/4/97	**0.00**	**47.92**
MW-6	12/23/91	7.50	7.50
	12/26/91	2.00	9.50
	1/10/92	1.00	10.50
	2/4/92	2.00	12.50
	2/28/92	3.00	15.50
	3/10/92	2.75	18.25
	3/12/92	2.00	20.25
	3/23/92	1.00	21.25
	3/30/92	0.50	21.75
	4/10/92	0.25	22.00
	4/13/92	0.13	22.13
	4/20/92	0.13	22.26
	5/4/92	0.13	22.39
	5/8/92	0.06	22.45
	5/26/92	0.13	22.58
	6/1/92	0.06	22.64
	6/29/92	0.19	22.83
	7/29/92	0.60	23.43
	8/28/92	2.40	25.83
	12/2/92	(obstruction in well)	--
	4/3/93	1.75	27.58
	11/9/93	0.83	28.41
	8/30/95	4.50	32.91
	10/2/95	4.0	36.91
	11/3/95	3.00	39.91

TABLE 3
FREE PRODUCT RECOVERY BY HAND-BAILING
3093 BROADWAY
OAKLAND, CALIFORNIA

Well	Removal Date	Product Removed by Hand-Bailing (gallons)	Cumulative Product Removed by Hand-Bailing (gallons)
MW-6	11/30/95	2.50	42.41
(cont.)	1/3/96	2.50	44.91
	2/2/95	5.00	49.90
	3/1/96	4.00	53.90
	4/4/96	5.00	58.90
	5/2/96	4.50	63.40
	6/5/96	4.00	67.40
	7/9/96	4.50	71.90
	8/8/96	4.00	75.90
	9/10/96	3.50	79.40
	10/1/96	4.00	83.40
	11/4/96	NM*	83.40
	12/2/96	NM*	83.40
	1/3/97	NM*	83.40
	2/6/97	NM*	83.40
	3/5/97	NM*	83.40
	4/1/97	NM*	83.40
	5/8/97	0.40	83.80
	6/6/97	0.03	83.83
	7/8/97	0.00	83.83
	8/7/97	0.00	83.83
	9/10/97	**0.00**	**83.83**
	10/1/97	**0.00**	**83.83**
	11/4/97	**0.02**	**83.85**
MW-9	8/8/96	0.10	0.10
	9/10/96	0.00	0.10
	10/1/96	0.00	0.10
	11/4/96	0.00	0.10
	12/2/96	0.00	0.10
	1/3/97	0.00	0.10
	2/6/97	0.00	0.10
	3/5/97	0.00	0.10
	4/1/97	0.00	0.10
	5/8/97	0.00	0.10
	6/6/97	0.00	0.10
	7/8/97	0.00	0.10
	8/7/97	0.00	0.10

TABLE 3
FREE PRODUCT RECOVERY BY HAND-BAILING
3093 BROADWAY
OAKLAND, CALIFORNIA

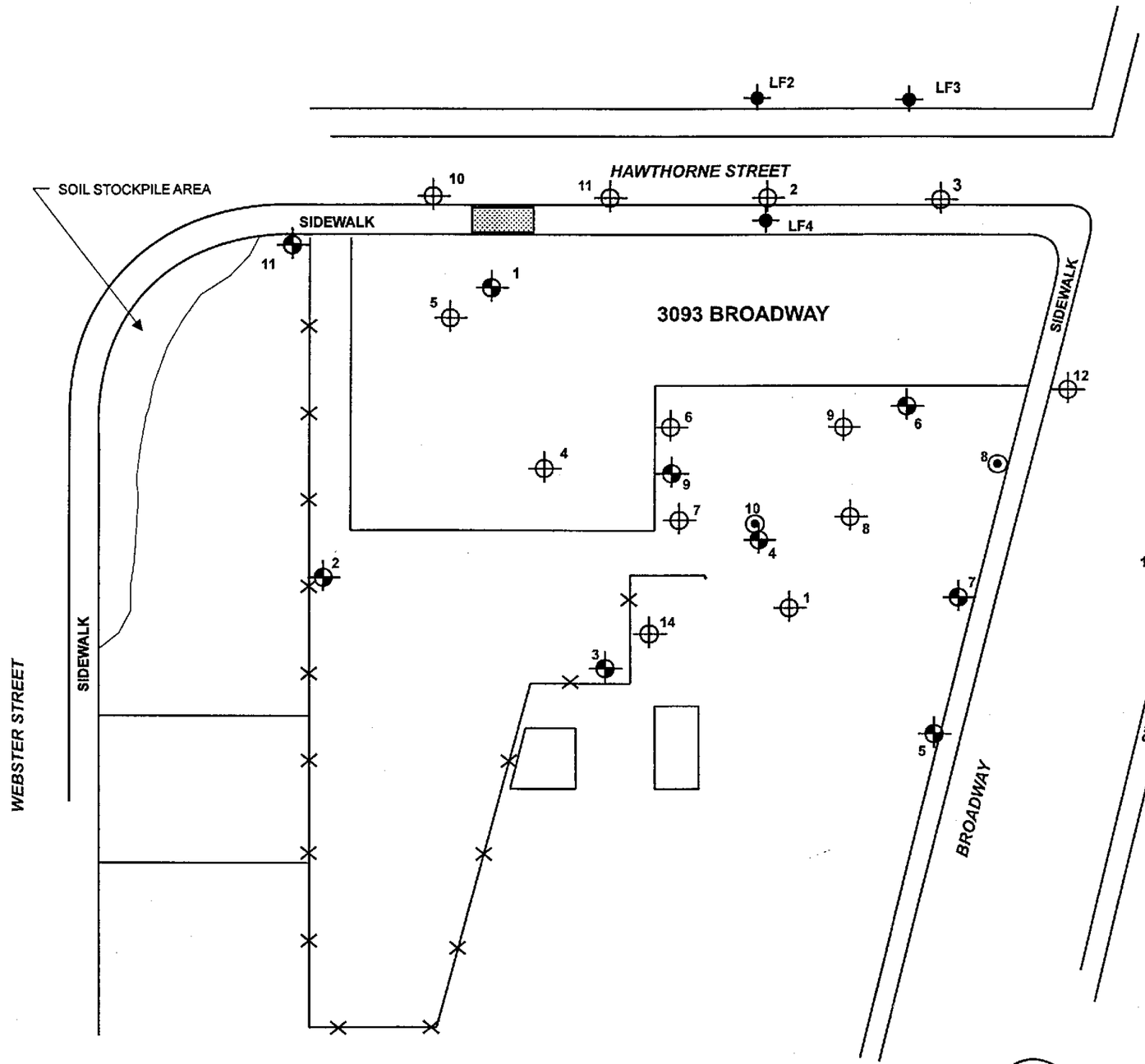
Well	Removal Date	Product Removed by Hand-Bailing (gallons)	Cumulative Product Removed by Hand-Bailing (gallons)
MW-9 (cont.)	9/10/97	0.00	0.10
	10/1/97	0.00	0.10
	11/4/97	0.00	0.10
	Total Product (gallons) removed by bailing		**145.15**
	Total Product (gallons) removed by Soil Vapor Extraction (see Table 4)		**223.00**
	Cumulative Total of Product (gallons) Removed		**368.15**

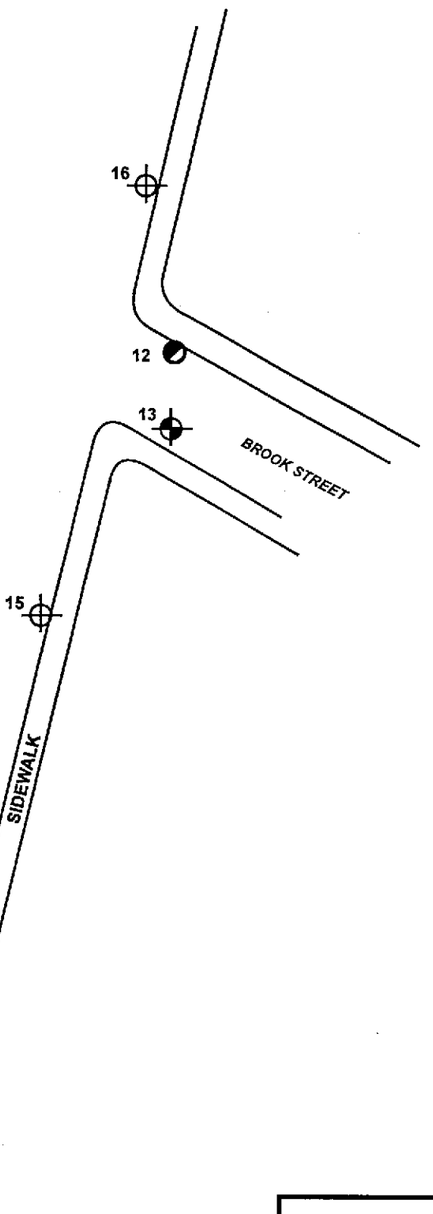
* NM - Not measured.

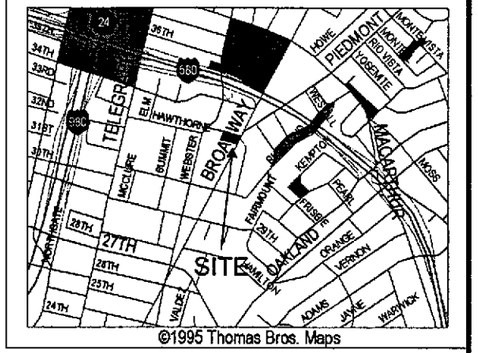
TABLE 4
FREE PRODUCT REMOVED BY SVE FROM MW-6
3093 BROADWAY
OAKLAND, CALIFORNIA

VAPOR SAMPLING DATE	FREE PRODUCT REMOVED FOR PERIOD (gallons)*	CUMULATIVE FREE PRODUCT REMOVED (gallons)
10/29/96	0.1	0.1
11/4/96	2.8	2.9
11/5/96	3.5	6.4
11/14/96	19.7	26.1
11/25/96	38.4	64.5
12/18/96	20.8	85.3
12/30/96	0.5	85.8
2/4/97	0.0	85.8
2/12/97	7.8	93.6
3/11/97	4.7	98.3
4/21/97	2.1	100.4
5/28/97	2.3	102.7
7/23/97	6.5	109.2
8/7/97	3.4	112.6
9/15/97	14.3	126.9
10/30/97	25.5	152.4
11/1/97	0.0	152.4
12/9/97	70.6	223.0

* Free Product Removed during each period is estimated by (1) monthly sampling and analyses of the vapor stream and (2) performing mass balance calculations based on chemical data and vapor flow rate through the SVE system. Free product calculations assume that the vapor flow rate and hydrocarbon concentrations measured during each sampling event remain constant for that period.







VICINITY MAP

EXPLANATION

- SCI TEST BORING
- SCI MONITORING WELL
- EXTRACTION WELL
- LEVINE FRICKE MONITORING WELL
- CONE PENETRATION TEST (CPT)
- FENCE
- RETAINING WALL
- FORMER TANK LOCATION

APPROXIMATE SCALE (feet)
0 60 120

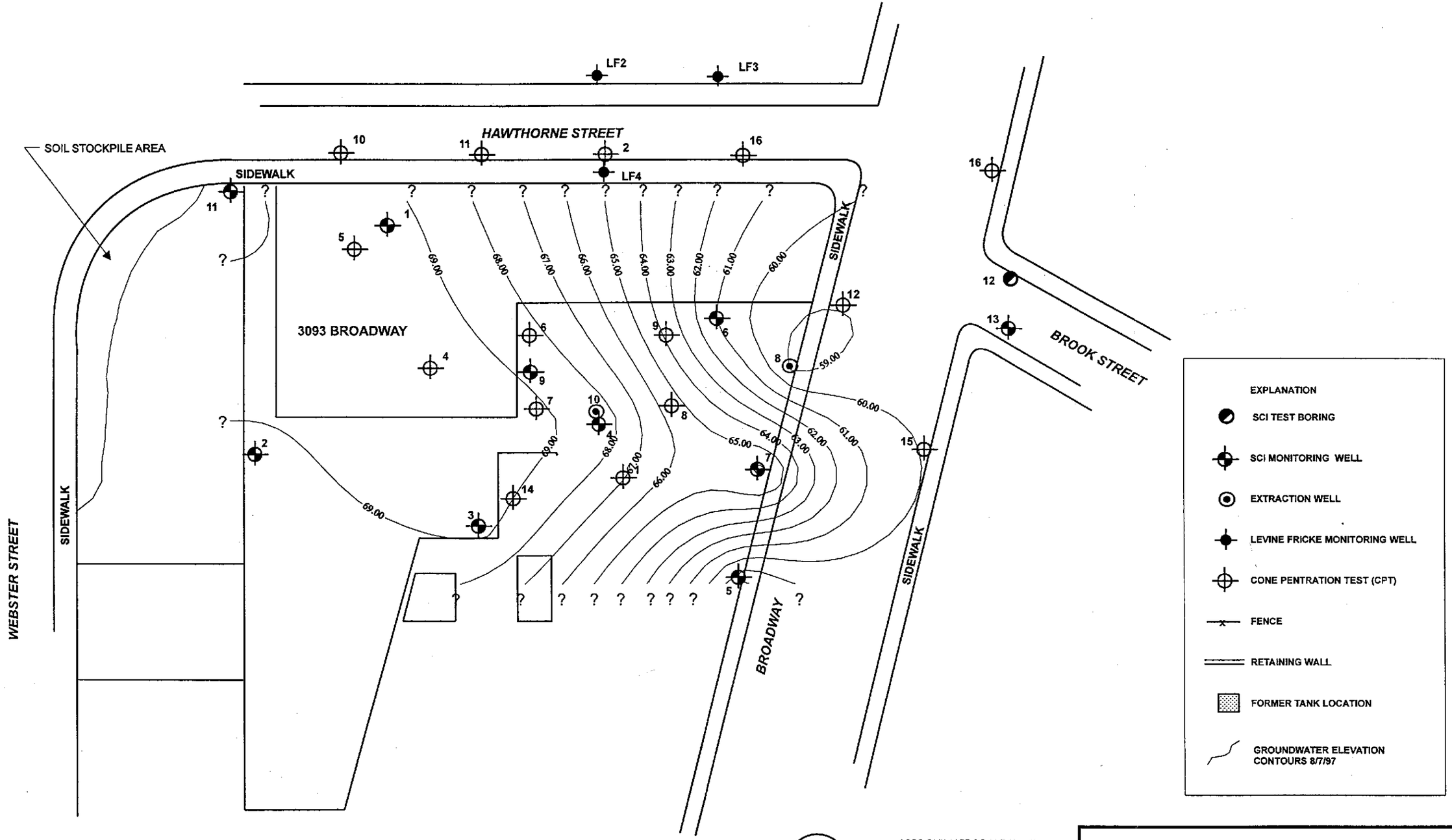
SITE PLAN

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.055	8/5/97	

PLATE 1



GROUNDWATER ELEVATION CONTOURS NOVEMBER 1997

SCI Subsurface Consultants, Inc.
Geotechnical & Environmental Engineers

CONNELL OLDSMOBILE - OAKLAND, CA

JOB NUMBER	DATE	APPROVED
447.055	12/15/97	

PLATE 2

GROUNDWATER DEPTHS

Project Name: Connell Olds

Job No.: 447.055

Measured by: DWA

Well	Date	Time	Groundwater Depth (feet)	Comments
MW-1	9/10/97	0930	24' 11 1/8"	Top of Product = 23' 8 9/16" Product thickness = 1' 2 9/16" " Bailed = 1 1/2 gals. 1.5 g
MW-2	↓	1000	25.77	
MW-3		0810	20.55	
MW-4		0900	19' 10 5/16"	Top of Product = 19' 9 7/8" Product thickness = 7/16" faint ring in bailer " Bailed = insignificant
MW-5		0845	26.76	(under pressure) new lock
MW-6		0920	25.76	no product
MW-7		0830	18.48	
MW-8		0825	26.89	
MW-9		0815	21.15	
MW-10		0820	19.58	
MW-11		0805	31.38	
MW-13	↓	0800	24.07	new lock
				* system off

GROUNDWATER DEPTHS

Project Name: Connell Olds

Job No.: 447.055

Measured by: DWA

Well	Date	Time	Groundwater Depth (feet)	Comments
MW-1	10/1/97	1150	24' 10 5/8"	Top of product = 24' 1/4" Product thickness = 10 3/8" Bailed = 1 liter = 0.26 gal.
MW-2	↓	1045	26.01	
MW-3		1050	20.73	
MW-4		1105	20' 1 1/8"	Top of Product = 20' 3/4" Product thickness = 3/8" fount ring/globs in bailer Bailed = none
MW-5		1120	26.97	
MW-6		1140	25.12	no product
MW-7		1115	18.42	
MW-8		1135	26.91	
MW-9		1055	21.42	
MW-10		1100	19.81	
MW-11		1040	31.61	
MW-13	↓	1030	24.18	
				* System Running

GROUNDWATER DEPTHS

Project Name: Connell Olds

Job No.: 447.055

Measured by: DWA

Well	Date	Time	Groundwater Depth (feet)	Comments
MW-1	11/4/97	1130	25' 3/4"	Top of Product = 24' 3½" Product thickness = 9/4" Bailed = 1 liter
MW-2		0850	26.23	
MW-3		0855	20.87	
MW-4		1215	20' 2 5/16"	Top of Product = 20' 2" product thickness = 5/16" Bailed = none
MW-5		0905	27.04	
MW-6		1100	26' 2"	Top of Product = ~~25~~ 11 7/8" Product thickness = 2 1/8" Bailed = 1 YDA
MW-7		0900	18.86	
MW-8		1045	26.82	
MW-9		1330	21.55	
MW-10		1325	19.95	
MW-11		0840	31.88	
MW-13		0745	24.27	

WELL SAMPLING FORM

Project Name: Connell Olds — Well Number: MW-1

Job No.: 447.055 — Well Casing Diameter: 2 inches

Sampled By: DWA — Date: 11/5/97

TOC Elevation: _____ — Weather: Sunny

Depth to Casing Bottom (below TOC) 35.00 feet

Depth to Groundwater Before Purging (below TOC) 25.06 feet

Feet of Water in Well 9.94 feet

Depth to Groundwater When 80% Recovered 27.05 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.6 gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product 9¼" thick -

Purge Method disposable bailer

FIELD MEASUREMENTS

moderate recharge

Gallons Removed	Time	pH	Temp (°C / °F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1		6.13	21.0	1025		semi-clear/strong odor/sheen
2		6.08	21.0	1225		
3		6.12	20.5	1250		
4		6.04	20.5	1250		
5		6.05	20.5	1250		

Total Gallons Purged 5 gallons

Depth to Groundwater Before Sampling (below TOC) 27.00' feet

Sampling Method disposable bailer

Containers Used 7 (40 ml) — 3 (liter) — _____ (pint) — _____

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-4
Job No.: 447.055
Well Casing Diameter: 2 inches
Sampled By: DWA
Date: 11/4/97
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 24.50 feet
Depth to Groundwater Before Purging (below TOC) 20.20 feet
Feet of Water in Well 4.30 feet
Depth to Groundwater When 80% Recovered 21.06 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) .7 gallons
Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other
Free Product 5/16" thick – no visible layer in bailer (a few globs of product)
Purge Method disposable bailer

FIELD MEASUREMENTS

fast recharge

Gallons Removed	Time	pH	Temp (°C) °F	Conductivity (micromhos/cm)	Salinity S%	Comments
1		6.41	24.5	575		clear/strong odor/sheen
3		6.42	24.0	575		↓
5		6.44	24.5	575		decreasing odor
7						

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 20.26 feet
Sampling Method disposable bailer
Containers Used 7 (40 ml) 1 (liter) (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-6
Job No.: 447.055
Well Casing Diameter: 2 inches
Sampled By: DWA
Date: 11/4/97
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 34.50 feet
Depth to Groundwater Before Purging (below TOC) 26' 2" (26.17) feet
Feet of Water in Well 8.33 feet
Depth to Groundwater When 80% Recovered 27.84 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.4 gallons
Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other
Free Product 2⅛" thick - ¼" thick layer visible in bailer
Purge Method disposable

FIELD MEASUREMENTS

immediate recharge

Gallons Removed	Time	pH	Temp (°C) °F	Conductivity (micromhos/cm)	Salinity S%	Comments
1		6.10	24.0	1000		murky / strong odor
2		6.09	24.0	1000		decreasing odor
3		6.05	24.5	1000		
4		6.03	25.0	1000		
5		6.07	25.0	1000		

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 26.17 feet
Sampling Method disposable bailer
Containers Used 7 (40 ml) 1 (liter) (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-7
Job No.: 447.055
Well Casing Diameter: 2 inches
Sampled By: DWA
Date: 11/4/97
TOC Elevation: _____
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 30.00 feet
Depth to Groundwater Before Purging (below TOC) 20.87 feet
Feet of Water in Well 9.13 feet
Depth to Groundwater When 80% Recovered 22.70 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.5 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

fast recharge

Gallons Removed	Time	pH	Temp (°C / °F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1		6.32	22.0	750		clear/no odor
2		6.35	21.5	550		murky
3		6.31	21.5	675		
4		6.28	21.5	775		
5		6.34	21.5	825		

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 22.15 feet
Sampling Method disposable bailer
Containers Used 7 (40 ml) 1 (liter) _____ (pint) _____

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: Connell ddS
Well Number: MW-8
Job No.: 447.055
Well Casing Diameter: 6 inches
Sampled By: DWA
Date: 11/5/97
TOC Elevation: _____
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 39.50 feet
Depth to Groundwater Before Purging (below TOC) 26.82 feet
Feet of Water in Well 12.68 feet
Depth to Groundwater When 80% Recovered 29.36 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) ~~27.0~~ 18.6 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

moderate recharge

FIELD MEASUREMENTS

Gallons Removed	Time	pH	Temp (°C) °F)	Conductivity (micromhos/cm)	Salinity S%	Comments
20		6.21	20.5	900		semi-clear/no odor
30		6.20	21.0	900		
40		6.21	21.5	950		
50		6.24	22.0	975		
60		6.27	22.0	975		

Total Gallons Purged 60 gallons
Depth to Groundwater Before Sampling (below TOC) 29.30 feet
Sampling Method disposable bailer
Containers Used 7 (40 ml) 1 (liter) _____ (pint) _____

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: Connell dds
Well Number: MW-9
Job No.: 447.055
Well Casing Diameter: 2 inches
Sampled By: DWA
Date: 11/4/97
TOC Elevation:
Weather: sunny

Depth to Casing Bottom (below TOC) 30.50 feet
Depth to Groundwater Before Purging (below TOC) 21.55 feet
Feet of Water in Well 8.95 feet
Depth to Groundwater When 80% Recovered 23.34 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.5 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product
Purge Method disposable bailer

FIELD MEASUREMENTS

slow recharge

Gallons Removed	Time	pH	Temp (°C / °F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1		5.89	24.0	875		clear/strong odor & sheen
2		5.87	23.5	925		
3		6.17	23.5	900		Dry @ 3 gals. / murky
11/5 4		6.20	20.0	800		clear/strong odor
5		6.04	20.0	825		Semi-clear/decreasing odor

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 23.34 feet
Sampling Method disposable bailer
Containers Used 7 (40 ml) 1 (liter) (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: Connell Olds
Well Number: MW-13
Job No.: 447.055
Well Casing Diameter: 2 inches
Sampled By: DWA
Date: 11/4/97
TOC Elevation: _____
Weather: cloudy

Depth to Casing Bottom (below TOC) 40.00 feet
Depth to Groundwater Before Purging (below TOC) 24.27 feet
Feet of Water in Well 15.73 feet
Depth to Groundwater When 80% Recovered 27.42 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.6 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

moderate recharge

Gallons Removed	Time	pH	Temp (°C / °F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2		6.90	19.5	675		clear/no odor
4		6.65	19.5	650		"
6		6.43	19.5	650		semi-clear/no odor
8		6.40	19.0	675		murky

Total Gallons Purged 8 gallons
Depth to Groundwater Before Sampling (below TOC) 27.40 feet
Sampling Method disposable bailer
Containers Used 7 (40 ml) 1 (liter) _____ (pint) _____

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

ANALYTICAL REPORT

Prepared for:

Subsurface Consultants
3736 Mt. Diablo Blvd.
Suite 200
Lafayette, CA 94549

Date: 14-NOV-97
Lab Job Number: 131275
Project ID: 447.055
Location: Connell Olds

Reviewed by: Tracy Bair

Reviewed by:

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: TVH
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131275-001	MW-1	37434	11/05/97	11/10/97	11/10/97	
131275-002	MW-4	37411	11/04/97	11/08/97	11/08/97	
131275-003	MW-6	37434	11/04/97	11/10/97	11/10/97	
131275-004	MW-7	37411	11/04/97	11/07/97	11/07/97	

Matrix: Water

Analyte Diln Fac:	Units	131275-001 125	131275-002 50	131275-003 100	131275-004 1
Gasoline C7-C12	ug/L	240000	190000	160000	<50
Surrogate					
Bromofluorobenzene	%REC	124	126	121	103

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131275-001	MW-1	37538	11/05/97	11/14/97	11/14/97	
131275-002	MW-4	37492	11/04/97	11/12/97	11/12/97	
131275-003	MW-6	37434	11/04/97	11/10/97	11/10/97	
131275-004	MW-7	37411	11/04/97	11/07/97	11/07/97	

Matrix: Water

Analyte	Units	131275-001	131275-002	131275-003	131275-004
Diln Fac:		500	200	100	1
MTBE	ug/L	<1000	<400	<200	<2
Benzene	ug/L	42000	15000	13000	<0.5
Toluene	ug/L	48000	31000	19000	<0.5
Ethylbenzene	ug/L	3600	2200	1900	<0.5
m,p-Xylenes	ug/L	13000	9900	10000	<0.5
o-Xylene	ug/L	5800	4700	4300	<0.5
Surrogate					
Trifluorotoluene	%REC	92	83	82	79
Bromofluorobenzene	%REC	89	90	91	86

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: TVH
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131275-005	MW-8	37411	11/05/97	11/07/97	11/07/97	
131275-006	MW-9	37411	11/05/97	11/07/97	11/07/97	
131275-007	MW-13	37411	11/04/97	11/07/97	11/07/97	

Matrix: Water

Analyte	Units	131275-005	131275-006	131275-007
Diln Fac:		1	1	1
Gasoline C7-C12	ug/L	<50	490 Y	<50
Surrogate				
Bromofluorobenzene	%REC	106	116	106

Y: Sample exhibits fuel pattern which does not resemble standard

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131275-005	MW-8	37411	11/05/97	11/07/97	11/07/97	
131275-006	MW-9	37411	11/05/97	11/07/97	11/07/97	
131275-007	MW-13	37411	11/04/97	11/07/97	11/07/97	

Matrix: Water

Analyte Diln Fac:	Units	131275-005 1	131275-006 1	131275-007 1
MTBE	ug/L	<2	<2	<2
Benzene	ug/L	9.4	<0.5	<0.5
Toluene	ug/L	<0.5	<0.5	<0.5
Ethylbenzene	ug/L	<0.5	6	<0.5
m,p-Xylenes	ug/L	<0.5	<0.5	<0.5
o-Xylene	ug/L	<0.5	<0.5	<0.5
Surrogate				
Trifluorotoluene	%REC	81	94	80
Bromofluorobenzene	%REC	89	97	90

TVH-Total Volatile Hydrocarbons

Client:	Subsurface Consultants	Analysis Method:	TVH
Project#:	447.055	Prep Method:	EPA 5030
Location:	Connell Olds		

METHOD BLANK

Matrix:	Water	Prep Date:	11/07/97
Batch#:	37411	Analysis Date:	11/07/97
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC58332

Analyte	Result
Gasoline C7-C12	<50

Surrogate	%Rec	Recovery Limits
Bromofluorobenzene	96	65-135

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 37411
Units: ug/L
Diln Fac: 1

Prep Date: 11/07/97
Analysis Date: 11/07/97

MB Lab ID: QC58332

Analyte	Result
MTBE	<2.0
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	76	58-130
Bromofluorobenzene	80	62-131

TVH-Total Volatile Hydrocarbons

Client:	Subsurface Consultants	Analysis Method:	TVH
Project#:	447.055	Prep Method:	EPA 5030
Location:	Connell Olds		

METHOD BLANK

Matrix:	Water	Prep Date:	11/10/97
Batch#:	37434	Analysis Date:	11/10/97
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC58417

Analyte	Result
Gasoline C7-C12	<50

Surrogate	%Rec	Recovery Limits
Bromofluorobenzene	102	65-135

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 37434
Units: ug/L
Diln Fac: 1

Prep Date: 11/10/97
Analysis Date: 11/10/97

MB Lab ID: QC58417

Analyte	Result
MTBE	<2.0
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	80	58-130
Bromofluorobenzene	86	62-131

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

METHOD BLANK

Matrix: Water
Batch#: 37492
Units: ug/L
Diln Fac: 1

Prep Date: 11/12/97
Analysis Date: 11/12/97

MB Lab ID: QC58609

Analyte	Result
MTBE	<2.0
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
m,p-Xylenes	<0.5
o-Xylene	<0.5

Surrogate	%Rec	Recovery Limits
Trifluorotoluene	78	58-130
Bromofluorobenzene	86	62-131

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: TVH
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 37411
Units: ug/L
Diln Fac: 1

Prep Date: 11/07/97
Analysis Date: 11/07/97

LCS Lab ID: QC58330

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	2177	2000	109	75-125

Surrogate	%Rec	Limits
Bromofluorobenzene	124	65-135

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 37411
Units: ug/L
Diln Fac: 1

Prep Date: 11/07/97
Analysis Date: 11/07/97

LCS Lab ID: QC58331

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	18.18	20	91	65-135
Benzene	17.9	20	90	80-120
Toluene	17.73	20	89	80-120
Ethylbenzene	18.89	20	94	80-120
m,p-Xylenes	35.7	40	89	80-120
o-Xylene	18.55	20	93	80-120

Surrogate	%Rec	Limits
Trifluorotoluene	79	58-130
Bromofluorobenzene	88	62-131

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 6 outside limits

TVH-Total Volatile Hydrocarbons

Client:	Subsurface Consultants	Analysis Method:	TVH
Project#:	447.055	Prep Method:	EPA 5030
Location:	Connell Olds		

LABORATORY CONTROL SAMPLE

Matrix:	Water	Prep Date:	11/09/97
Batch#:	37434	Analysis Date:	11/09/97
Units:	ug/L		
Diln Fac:	1		

LCS Lab ID: QC58415

Analyte	Result	Spike Added	%Rec #	Limits
Gasoline C7-C12	2270	2000	113	75-125

Surrogate	%Rec	Limits
Bromofluorobenzene	124	65-135

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 1 outside limits

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 37434
Units: ug/Kg
Diln Fac: 1

Prep Date: 11/09/97
Analysis Date: 11/09/97

LCS Lab ID: QC58416

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	19.14	20	96	65-135
Benzene	18.17	20	91	80-120
Toluene	17.88	20	89	80-120
Ethylbenzene	19.11	20	96	80-120
m,p-Xylenes	36.07	40	90	80-120
o-Xylene	18.67	20	93	80-120

Surrogate	%Rec	Limits
Trifluorotoluene	80	58-130
Bromofluorobenzene	89	62-131

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 6 outside limits

BTXE

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8020A
Prep Method: EPA 5030

LABORATORY CONTROL SAMPLE

Matrix: Water
Batch#: 37492
Units: ug/L
Diln Fac: 1

Prep Date: 11/12/97
Analysis Date: 11/12/97

LCS Lab ID: QC58608

Analyte	Result	Spike Added	%Rec #	Limits
MTBE	18.07	20	90	65-135
Benzene	17.73	20	89	80-120
Toluene	17.59	20	88	80-120
Ethylbenzene	18.67	20	93	80-120
m,p-Xylenes	35.75	40	89	80-120
o-Xylene	18.49	20	92	80-120

Surrogate	%Rec	Limits
Trifluorotoluene	79	58-130
Bromofluorobenzene	88	62-131

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
Spike Recovery: 0 out of 6 outside limits

TVH-Total Volatile Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: TVH
Prep Method: EPA 5030

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID: MW-7
Lab ID: 131275-004
Matrix: Water
Batch#: 37411
Units: ug/L
Diln Fac: 1

Sample Date: 11/04/97
Received Date: 11/05/97
Prep Date: 11/07/97
Analysis Date: 11/07/97

MS Lab ID: QC58333

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C7-C12	2000	<50	2165	108	75-125

Surrogate	%Rec	Limits
Bromofluorobenzene	125	65-135

MSD Lab ID: QC58334

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C7-C12	2000	2218	111	75-125	2	35

Surrogate	%Rec	Limits
Bromofluorobenzene	123	65-135

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

TVH-Total Volatile Hydrocarbons

Client:	Subsurface Consultants	Analysis Method:	TVH
Project#:	447.055	Prep Method:	EPA 5030
Location:	Connell Olds		

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

Field ID:	ZZZZZZ	Sample Date:	11/04/97
Lab ID:	131266-001	Received Date:	11/04/97
Matrix:	Water	Prep Date:	11/10/97
Batch#:	37434	Analysis Date:	11/10/97
Units:	ug/L		
Diln Fac:	1		

MS Lab ID: QC58418

Analyte	Spike Added	Sample	MS	%Rec #	Limits
Gasoline C7-C12	2000	<50	2150	107	75-125

Surrogate	%Rec	Limits
Bromofluorobenzene	127	65-135

MSD Lab ID: QC58419

Analyte	Spike Added	MSD	%Rec #	Limits	RPD #	Limit
Gasoline C7-C12	2000	2226	111	75-125	3	35

Surrogate	%Rec	Limits
Bromofluorobenzene	130	65-135

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

LABORATORY NUMBER: 131275
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.055
LOCATION: CONNELL OLDS

DATE SAMPLED: 11/05/97
DATE RECEIVED: 11/05/97
DATE ANALYZED: 11/11/97
DATE REPORTED: 11/14/97
BATCH NO: 37439

EPA 8240

LAB ID	CLIENT ID	1,1-DCA (ug/L)	1,2-DCA (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERIES 1	2	3
131275-001	MW-1	ND	1,200	200	100%	89%	101%
131275-002	MW-4	ND	290	130	101%	88%	102%
131275-003	MW-6	ND	790	130	100%	89%	101%
METHOD BLANK	N/A	ND	ND	1.0	99%	91%	99%

	Limits
1=Toluene-d8	87-125
2=Bromofluorobenzene	79-122
3= 1,2-Dichloroethane-d4	68-126

ND = Not detected at or above reporting limit.

LABORATORY NUMBER: 131275
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.055
LOCATION: CONNELL OLDS

DATE SAMPLED: 11/04-05/97
DATE RECEIVED: 11/05/97
DATE ANALYZED: 11/07/97
DATE REPORTED: 11/14/97
BATCH NO: 37379

EPA 8240

LAB ID	CLIENT ID	1,1-DCA (ug/L)	1,2-DCA (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERIES 1	2	3
131275-004	MW-7	ND	1.1	1.0	99%	116%	106%
131275-005	MW-8	ND	84	1.0	99%	116%	106%
METHOD BLANK	N/A	ND	ND	1.0	99%	116%	102%

	Limits
1=Toluene-d8	87-125
2=Bromofluorobenzene	79-122
3= 1,2-Dichloroethane-d4	68-126

ND = Not detected at or above reporting limit.

LABORATORY NUMBER: 131275
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 447.055
LOCATION: CONNELL OLDS

DATE SAMPLED: 11/04/97
DATE RECEIVED: 11/05/97
DATE ANALYZED: 11/07/97
DATE REPORTED: 11/14/97
BATCH NO: 37407

EPA 8240

LAB ID	CLIENT ID	1,1-DCA (ug/L)	1,2-DCA (ug/L)	REPORTING LIMIT (ug/L)	SURROGATE RECOVERIES 1	2	3
131275-006	MW-9	ND	500	5.0	102%	91%	97%
131275-007	MW-13	ND	5.5	1.0	101%	92%	97%
METHOD BLANK	N/A	ND	ND	1.0	102%	92%	97%

	Limits
1=Toluene-d8	87-125
2=Bromofluorobenzene	79-122
3= 1,2-Dichloroethane-d4	68-126

ND = Not detected at or above reporting limit.

Halogenated Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8260
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 37379
Units: ug/L
Diln Fac: 1

Prep Date: 11/06/97
Analysis Date: 11/06/97

BS Lab ID: QC58203

Analyte	Spike Added	BS	%Rec #	Limits
1,1-Dichloroethene	50	53.68	107	73-141
Trichloroethene	50	51.9	104	84-113
Chlorobenzene	50	52.45	105	87-117

Surrogate	%Rec	Limits
Toluene-d8	101	92-107
Bromofluorobenzene	101	80-121
1,2-Dichloroethane-d4	102	87-121

BSD Lab ID: QC58204

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
1,1-Dichloroethene	50	53.25	107	73-141	0	14
Trichloroethene	50	49.42	99	84-113	5	14
Chlorobenzene	50	51.57	103	87-117	2	13

Surrogate	%Rec	Limits
Toluene-d8	102	92-107
Bromofluorobenzene	104	80-121
1,2-Dichloroethane-d4	102	87-121

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 3 outside limits
Spike Recovery: 0 out of 6 outside limits

Halogenated Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8260
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 37407
Units: ug/L
Diln Fac: 1

Prep Date: 11/07/97
Analysis Date: 11/07/97

BS Lab ID: QC58354

Analyte	Spike Added	BS	%Rec	#	Limits
1,1-Dichloroethene	50	48.15	96		73-141
Trichloroethene	50	48.6	97		84-113
Chlorobenzene	50	49.94	100		87-117

Surrogate	%Rec	Limits
Toluene-d8	102	92-107
Bromofluorobenzene	91	80-121
1,2-Dichloroethane-d4	95	87-121

BSD Lab ID: QC58355

Analyte	Spike Added	BSD	%Rec	#	Limits	RPD	#	Limit
1,1-Dichloroethene	50	51.01	102		73-141	6		14
Trichloroethene	50	51.6	103		84-113	6		14
Chlorobenzene	50	52.74	105		87-117	6		13

Surrogate	%Rec	Limits
Toluene-d8	102	92-107
Bromofluorobenzene	90	80-121
1,2-Dichloroethane-d4	95	87-121

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 3 outside limits
Spike Recovery: 0 out of 6 outside limits

Halogenated Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8260
Prep Method: EPA 5030

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 37439
Units: ug/L
Diln Fac: 1

Prep Date: 11/10/97
Analysis Date: 11/10/97

BS Lab ID: QC58429

Analyte	Spike Added	BS	%Rec #	Limits
1,1-Dichloroethene	50	45.49	91	73-141
Trichloroethene	50	48.71	97	84-113
Chlorobenzene	50	51.55	103	87-117

Surrogate	%Rec	Limits
Toluene-d8	99	92-107
Bromofluorobenzene	91	80-121
1,2-Dichloroethane-d4	95	87-121

BSD Lab ID: QC58430

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
1,1-Dichloroethene	50	44.45	89	73-141	2	14
Trichloroethene	50	48.23	96	84-113	1	14
Chlorobenzene	50	51.36	103	87-117	0	13

Surrogate	%Rec	Limits
Toluene-d8	99	92-107
Bromofluorobenzene	91	80-121
1,2-Dichloroethane-d4	96	87-121

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 3 outside limits
Spike Recovery: 0 out of 6 outside limits

Curtis & Tompkins, Ltd.

Client: Subsurface Consultants

Laboratory Login Number: 131275

Project Name: Connell Olds
Project Number: 447.055

Report Date: 14 November 97

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **METHOD: SMWW 17:5520BF**

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
131275-001	MW-1	Water	05-NOV-97	05-NOV-97	06-NOV-97	ND	mg/L	5	SDG	37417

ND = Not Detected at or above Reporting Limit (RL).

Curtis & Tompkins, Ltd.

Q C B a t c h R e p o r t

Client: Subsurface Consultants
Project Name: Connell Olds
Project Number: 447.055

Laboratory Login Number: 131275
Report Date: 14 November 97

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) **QC Batch Number: 37417**

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
MB	ND	5	mg/L	SMWW 17:5520BF	06-NOV-97

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	96%	SMWW 17:5520BF	06-NOV-97
BSD	95%	SMWW 17:5520BF	06-NOV-97

		Control Limits
Average Spike Recovery	95%	80% - 120%
Relative Percent Difference	.6%	< 20%

Semivolatile Organics by GC/MS

Client:	Subsurface Consultants	Analysis Method:	EPA 8270B
Project#:	447.055	Prep Method:	EPA 3520
Location:	Connell Olds		
Field ID:	MW-1	Sampled:	11/05/97
Lab ID:	131275-001	Received:	11/05/97
Matrix:	Water	Extracted:	11/06/97
Batch#:	37401	Analyzed:	11/12/97
Units:	ug/L		
Diln Fac:	20		

Analyte	Result	Reporting Limit
Phenol	ND	190
2-Chlorophenol	ND	190
Benzyl alcohol	ND	190
2-Methylphenol	ND	190
3,4-Methylphenol	ND	190
2-Nitrophenol	ND	940
2,4-Dimethylphenol	ND	190
Benzoic acid	ND	940
2,4-Dichlorophenol	ND	190
4-Chloro-3-methylphenol	ND	190
2,4,6-Trichlorophenol	ND	190
2,4,5-Trichlorophenol	ND	940
2,4-Dinitrophenol	ND	940
4-Nitrophenol	ND	940
4,6-Dinitro-2-methylphenol	ND	940
Pentachlorophenol	ND	190
N-Nitrosodimethylamine	ND	190
Aniline	ND	190
bis(2-Chloroethyl)ether	ND	190
1,3-Dichlorobenzene	ND	190
1,4-Dichlorobenzene	ND	190
1,2-Dichlorobenzene	ND	190
bis(2-Chloroisopropyl) ether	ND	190
N-Nitroso-di-n-propylamine	ND	190
Hexachloroethane	ND	190
Nitrobenzene	ND	190
Isophorone	ND	190
bis(2-Chloroethoxy)methane	ND	190
1,2,4-Trichlorobenzene	ND	190
Naphthalene	1500	190
4-Chloroaniline	ND	190
Hexachlorobutadiene	ND	190
2-Methylnaphthalene	720	190
Hexachlorocyclopentadiene	ND	940
2-Chloronaphthalene	ND	190
2-Nitroaniline	ND	940
Dimethylphthalate	ND	190
Acenaphthylene	ND	190

Semivolatile Organics by GC/MS

Field ID:	MW-1	Sampled:	11/05/97
Lab ID:	131275-001	Received:	11/05/97
Matrix:	Water	Extracted:	11/06/97
Batch#:	37401	Analyzed:	11/12/97
Units:	ug/L		
Diln Fac:	20		

Analyte	Result	Reporting Limit
2,6-Dinitrotoluene	ND	190
3-Nitroaniline	ND	940
Acenaphthene	ND	190
Dibenzofuran	ND	190
2,4-Dinitrotoluene	ND	190
Diethylphthalate	ND	190
4-Chlorophenyl-phenylether	ND	190
Fluorene	ND	190
4-Nitroaniline	ND	940
N-Nitrosodiphenylamine	ND	190
Azobenzene	ND	190
4-Bromophenyl-phenylether	ND	190
Hexachlorobenzene	ND	190
Phenanthrene	ND	190
Anthracene	ND	190
Di-n-butylphthalate	ND	190
Fluoranthene	ND	190
Pyrene	ND	190
Butylbenzylphthalate	ND	190
3,3'-Dichlorobenzidine	ND	940
Benzo(a)anthracene	ND	190
Chrysene	ND	190
bis(2-Ethylhexyl)phthalate	ND	190
Di-n-octylphthalate	ND	190
Benzo(b,k)fluoranthene	ND	190
Benzo(a)pyrene	ND	190
Indeno(1,2,3-cd)pyrene	ND	190
Dibenz(a,h)anthracene	ND	190
Benzo(g,h,i)perylene	ND	190

Surrogate	%Recovery	Recovery Limits
2-Fluorophenol	DO*	21-110
Phenol-d5	DO*	10-110
2,4,6-Tribromophenol	DO*	10-123
Nitrobenzene-d5	DO*	35-114
2-Fluorobiphenyl	DO*	43-116
Terphenyl-d14	DO*	33-141

* Values outside of QC limits
DO: Surrogate diluted out

EPA 8270 Semi-Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270B
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 37401
Units: ug/L
Diln Fac: 1

Prep Date: 11/06/97
Analysis Date: 11/12/97

MB Lab ID: QC58288

Analyte	Result	Reporting Limit
Phenol	ND	10
2-Chlorophenol	ND	10
Benzyl alcohol	ND	10
2-Methylphenol	ND	10
3,4-Methylphenol	ND	10
2-Nitrophenol	ND	50
2,4-Dimethylphenol	ND	10
Benzoic acid	ND	50
2,4-Dichlorophenol	ND	10
4-Chloro-3-methylphenol	ND	10
2,4,6-Trichlorophenol	ND	10
2,4,5-Trichlorophenol	ND	50
2,4-Dinitrophenol	ND	50
4-Nitrophenol	ND	50
4,6-Dinitro-2-methylphenol	ND	50
Pentachlorophenol	ND	10
N-Nitrosodimethylamine	ND	10
Aniline	ND	10
bis(2-Chloroethyl)ether	ND	10
1,3-Dichlorobenzene	ND	10
1,4-Dichlorobenzene	ND	10
1,2-Dichlorobenzene	ND	10
bis(2-Chloroisopropyl) ether	ND	10
N-Nitroso-di-n-propylamine	ND	10
Hexachloroethane	ND	10
Nitrobenzene	ND	10
Isophorone	ND	10
bis(2-Chloroethoxy)methane	ND	10
1,2,4-Trichlorobenzene	ND	10
Naphthalene	ND	10
4-Chloroaniline	ND	10
Hexachlorobutadiene	ND	10
2-Methylnaphthalene	ND	10
Hexachlorocyclopentadiene	ND	50
2-Chloronaphthalene	ND	10
2-Nitroaniline	ND	50
Dimethylphthalate	ND	10
Acenaphthylene	ND	10
2,6-Dinitrotoluene	ND	10
3-Nitroaniline	ND	50

EPA 8270 Semi-Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270B
Prep Method: EPA 3520

METHOD BLANK

Matrix: Water
Batch#: 37401
Units: ug/L
Diln Fac: 1

Prep Date: 11/06/97
Analysis Date: 11/12/97

MB Lab ID: QC58288

Analyte	Result	Reporting Limit
Acenaphthene	ND	10
Dibenzofuran	ND	10
2,4-Dinitrotoluene	ND	10
Diethylphthalate	ND	10
4-Chlorophenyl-phenylether	ND	10
Fluorene	ND	10
4-Nitroaniline	ND	50
N-Nitrosodiphenylamine	ND	10
Azobenzene	ND	10
4-Bromophenyl-phenylether	ND	10
Hexachlorobenzene	ND	10
Phenanthrene	ND	10
Anthracene	ND	10
Di-n-butylphthalate	ND	10
Fluoranthene	ND	10
Pyrene	ND	10
Butylbenzylphthalate	ND	10
3,3'-Dichlorobenzidine	ND	50
Benzo(a)anthracene	ND	10
Chrysene	ND	10
bis(2-Ethylhexyl)phthalate	ND	10
Di-n-octylphthalate	ND	10
Benzo(b,k)fluoranthene	ND	10
Benzo(a)pyrene	ND	10
Indeno(1,2,3-cd)pyrene	ND	10
Dibenz(a,h)anthracene	ND	10
Benzo(g,h,i)perylene	ND	10

Surrogate	%Rec	Recovery Limits
2-Fluorophenol	82	21-110
Phenol-d5	83	10-110
2,4,6-Tribromophenol	62	10-123
Nitrobenzene-d5	74	35-114
2-Fluorobiphenyl	74	43-116
Terphenyl-d14	92	33-141

Lab #: 131275 BATCH QC REPORT Curtis & Tompkins, Ltd.

EPA 8270 Semi-Volatile Organics

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8270B
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 37401
Units: ug/L
Diln Fac: 1

Prep Date: 11/06/97
Analysis Date: 11/12/97

BS Lab ID: QC58289

Analyte	Spike Added	BS	%Rec #	Limits
Phenol	100	76.36	76	12-110
2-Chlorophenol	100	75.52	76	27-123
4-Chloro-3-methylphenol	100	70.82	71	23-97
4-Nitrophenol	100	42.16	42	10-80
Pentachlorophenol	100	23.1	23	9-103
1,4-Dichlorobenzene	50	33	66	36-97
N-Nitroso-di-n-propylamine	50	31.82	64	41-116
1,2,4-Trichlorobenzene	50	30.53	61	39-98
Acenaphthene	50	38.33	77	46-118
2,4-Dinitrotoluene	50	33.77	68	24-96
Pyrene	50	43.66	87	26-127

Surrogate	%Rec	Limits
2-Fluorophenol	79	21-110
Phenol-d5	85	10-110
2,4,6-Tribromophenol	70	10-123
Nitrobenzene-d5	75	35-114
2-Fluorobiphenyl	77	43-116
Terphenyl-d14	98	33-141

BSD Lab ID: QC58290

Analyte	Spike Added	BSD	%Rec #	Limits	RPD #	Limit
Phenol	100	79.23	79	12-110	4	42
2-Chlorophenol	100	77.51	78	27-123	3	40
4-Chloro-3-methylphenol	100	70.53	71	23-97	0	42
4-Nitrophenol	100	40.61	41	10-80	4	50
Pentachlorophenol	100	31.94	32	9-103	32	50
1,4-Dichlorobenzene	50	33.11	66	36-97	0	28
N-Nitroso-di-n-propylamine	50	30.75	62	41-116	3	38
1,2,4-Trichlorobenzene	50	30.97	62	39-98	1	28
Acenaphthene	50	38.55	77	46-118	1	31
2,4-Dinitrotoluene	50	32.85	66	24-96	3	38
Pyrene	50	45.16	90	26-127	3	31

Surrogate	%Rec	Limits
2-Fluorophenol	85	21-110
Phenol-d5	89	10-110
2,4,6-Tribromophenol	68	10-123
Nitrobenzene-d5	79	35-114
2-Fluorobiphenyl	80	43-116
Terphenyl-d14	101	33-141

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131275-001	MW-1	37403	11/05/97	11/06/97	11/10/97	
131275-002	MW-4	37403	11/04/97	11/06/97	11/08/97	
131275-003	MW-6	37403	11/04/97	11/06/97	11/10/97	
131275-004	MW-7	37403	11/04/97	11/06/97	11/08/97	

Matrix: Water

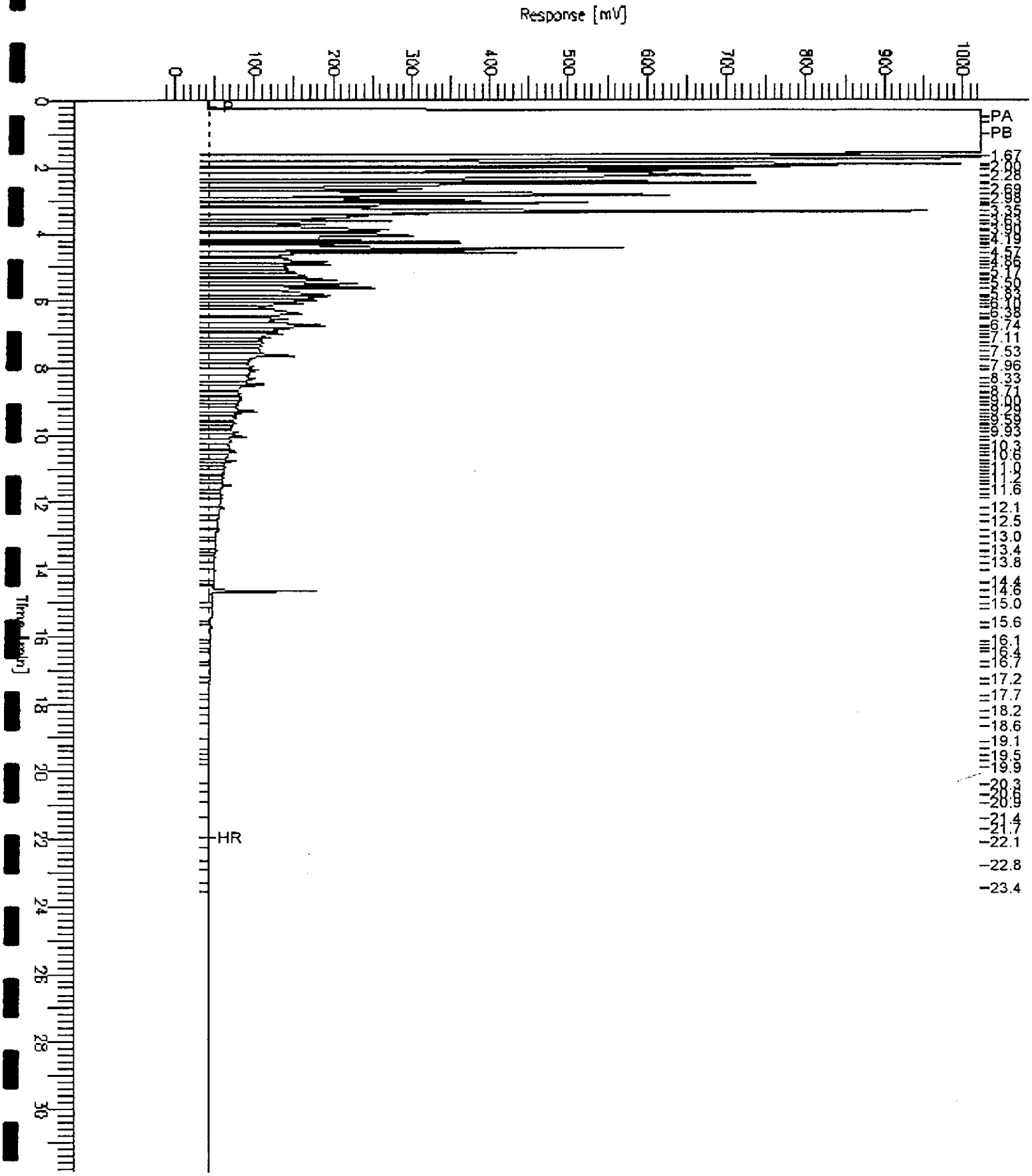
Analyte Diln Fac:	Units	131275-001 5	131275-002 1	131275-003 20	131275-004 1
Diesel C12-C22	ug/L	28000 YL	3700 YL	65000 YL	<50
Surrogate					
Hexacosane	%REC	92	75	DO	73

DO: Surrogate diluted out
Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

GC15 Channel B TEH

mple Name : 131275-001,37403
leName : G:\GC15\CHB\314B011.RAW
ethod : B286TEH.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -11 mV

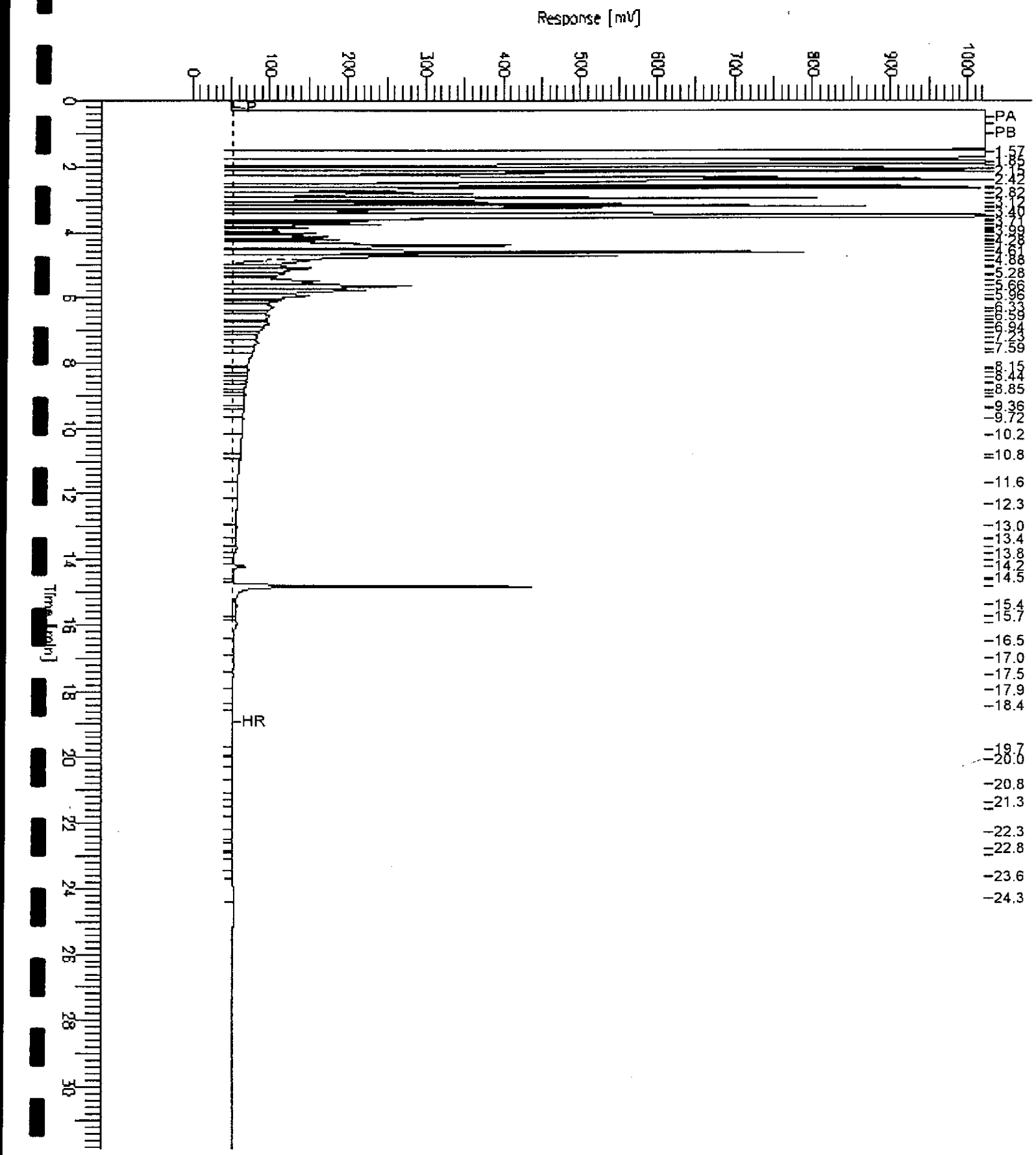
Sample #: 37403 Page 1 of 1
Date : 11/11/97 08:59 AM
Time of Injection: 11/10/97 07:19 PM
Low Point : -11.02 mV High Point : 1024.00 mV
Plot Scale: 1035.0 mV



GC15 Channel B TEH

mple Name : 131275-002,37403
leName : G:\GC15\CHB\311B021.RAW
ethod : B286TEH.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -2 mV

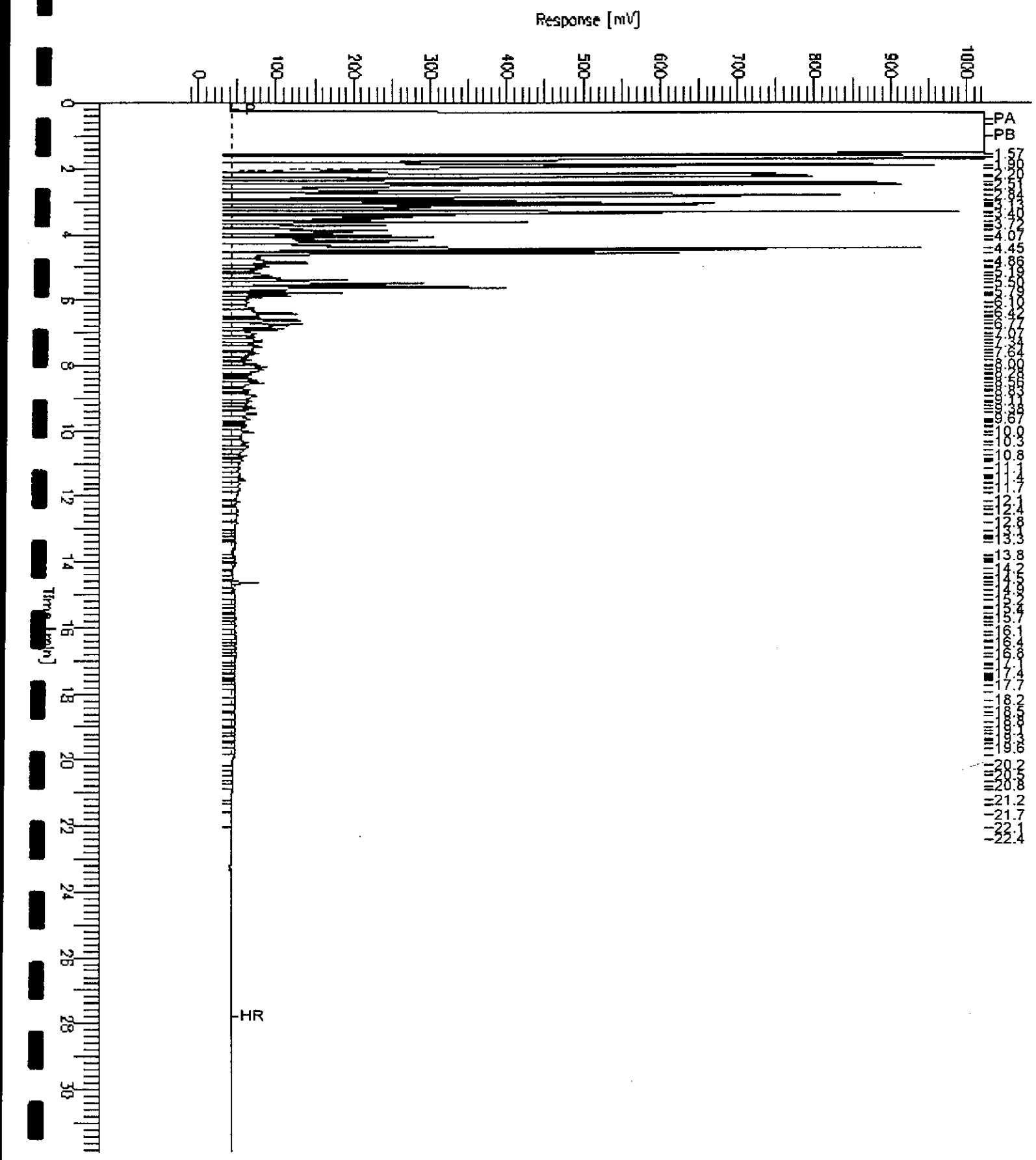
Sample #: 37403 Page 1 of 1
Date : 11/10/97 09:06 AM
Time of Injection: 11/8/97 02:47 AM
Low Point : -1.94 mV High Point : 1024.00 mV
Plot Scale: 1025.9 mV



GC15 Channel B TEH

mple Name : 131275-003,37403
leName : G:\GC15\CHB\314B012.RAW
ethod : B286TEH.MTH
Start Time : 0.00 min End Time : 31.90 min
Scale Factor: 0.0 Plot Offset: -12 mV

Sample #: 37403 Page 1 of 1
Date : 11/11/97 09:01 AM
Time of Injection: 11/10/97 08:02 PM
Low Point : -11.62 mV High Point : 1024.00 mV
Plot Scale: 1035.6 mV



TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8015M
Prep Method: EPA 3520

Sample #	Client ID	Batch #	Sampled	Extracted	Analyzed	Moisture
131275-005	MW-8	37403	11/05/97	11/06/97	11/08/97	
131275-006	MW-9	37403	11/05/97	11/06/97	11/08/97	
131275-007	MW-13	37403	11/04/97	11/06/97	11/08/97	

Matrix: Water

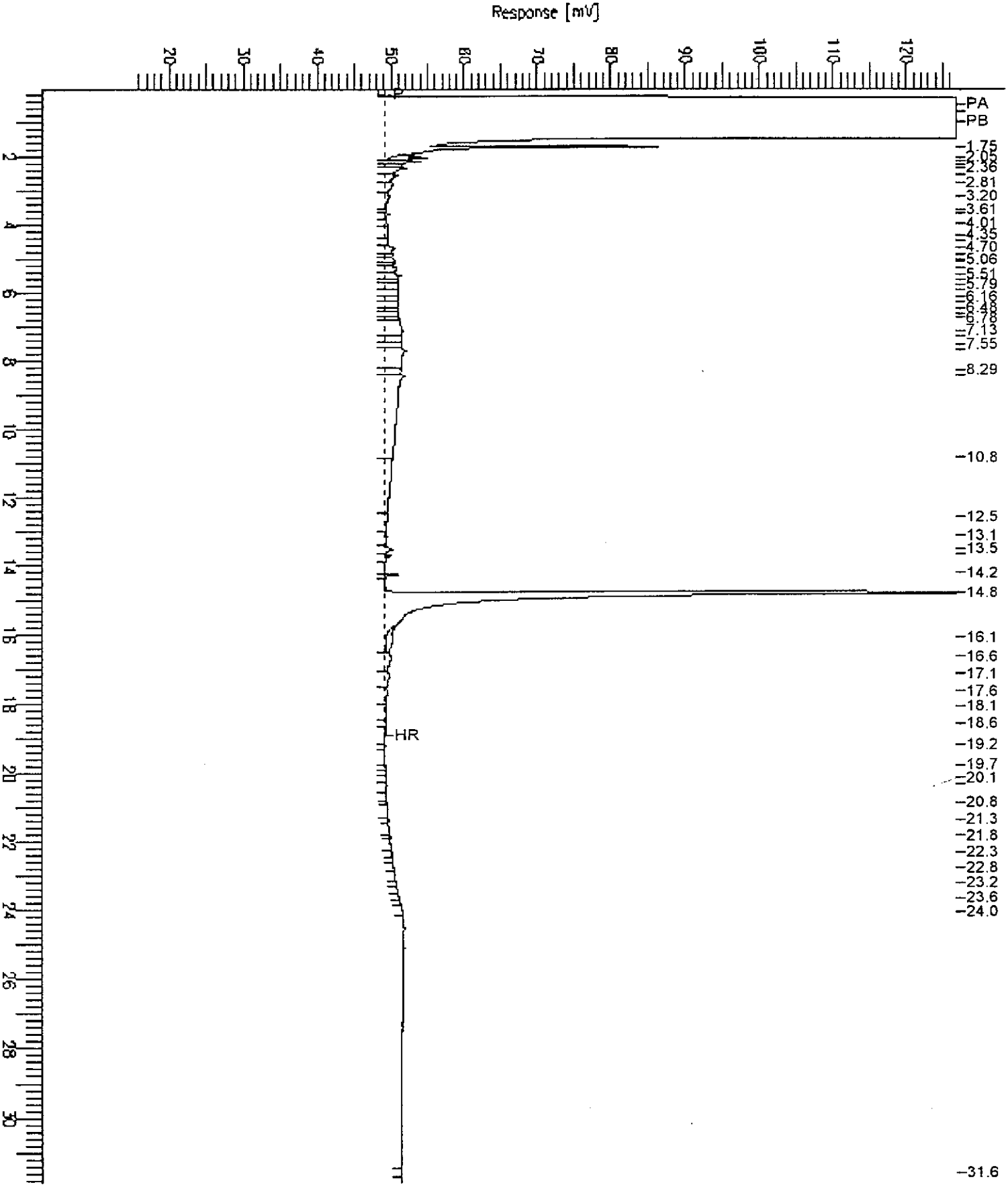
Analyte	Units	131275-005	131275-006	131275-007
Diln Fac:		1	1	1
Diesel C12-C22	ug/L	110 YL	370 YL	<50
Surrogate				
Hexacosane	%REC	72	72	67

Y: Sample exhibits fuel pattern which does not resemble standard
L: Lighter hydrocarbons than indicated standard

GC15 Channel B TEH

mple Name : 131275-005,37403
leName : G:\GC15\CHB\311B024.RAW
Method : B286TEH.MTH
Start Time : 0.07 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 15 mV

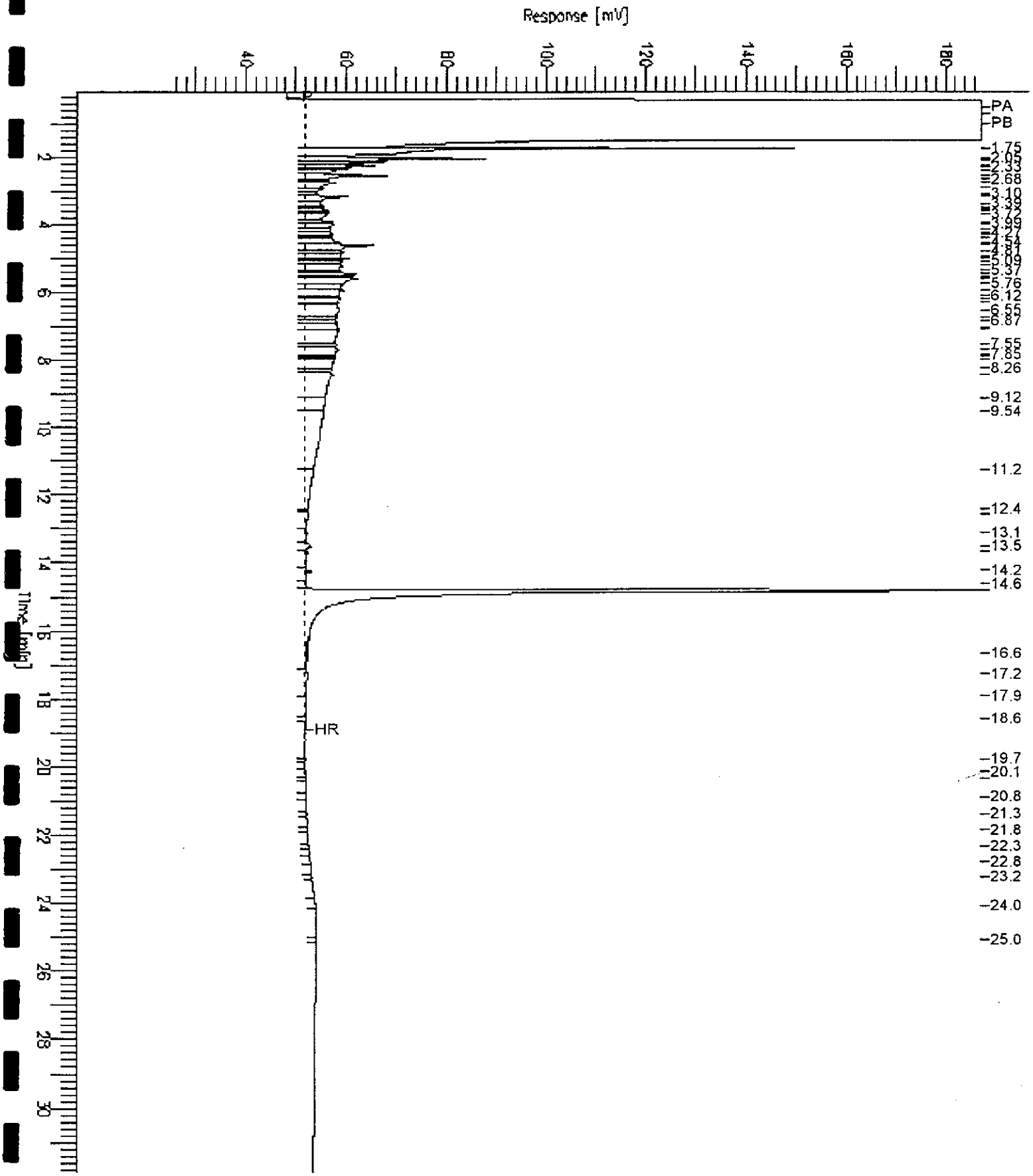
Sample #: 37403 Page 1 of 1
Date : 11/10/97 09:08 AM
Time of Injection: 11/8/97 04:56 AM
Low Point : 15.41 mV High Point : 126.91 mV
Plot Scale: 111.5 mV



GC15 Channel B TEH

mple Name : 131275-006,37403
leName : G:\GC15\CHB\311B025.RAW
ethod : B286TEH.MTH
Start Time : 0.07 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 25 mV

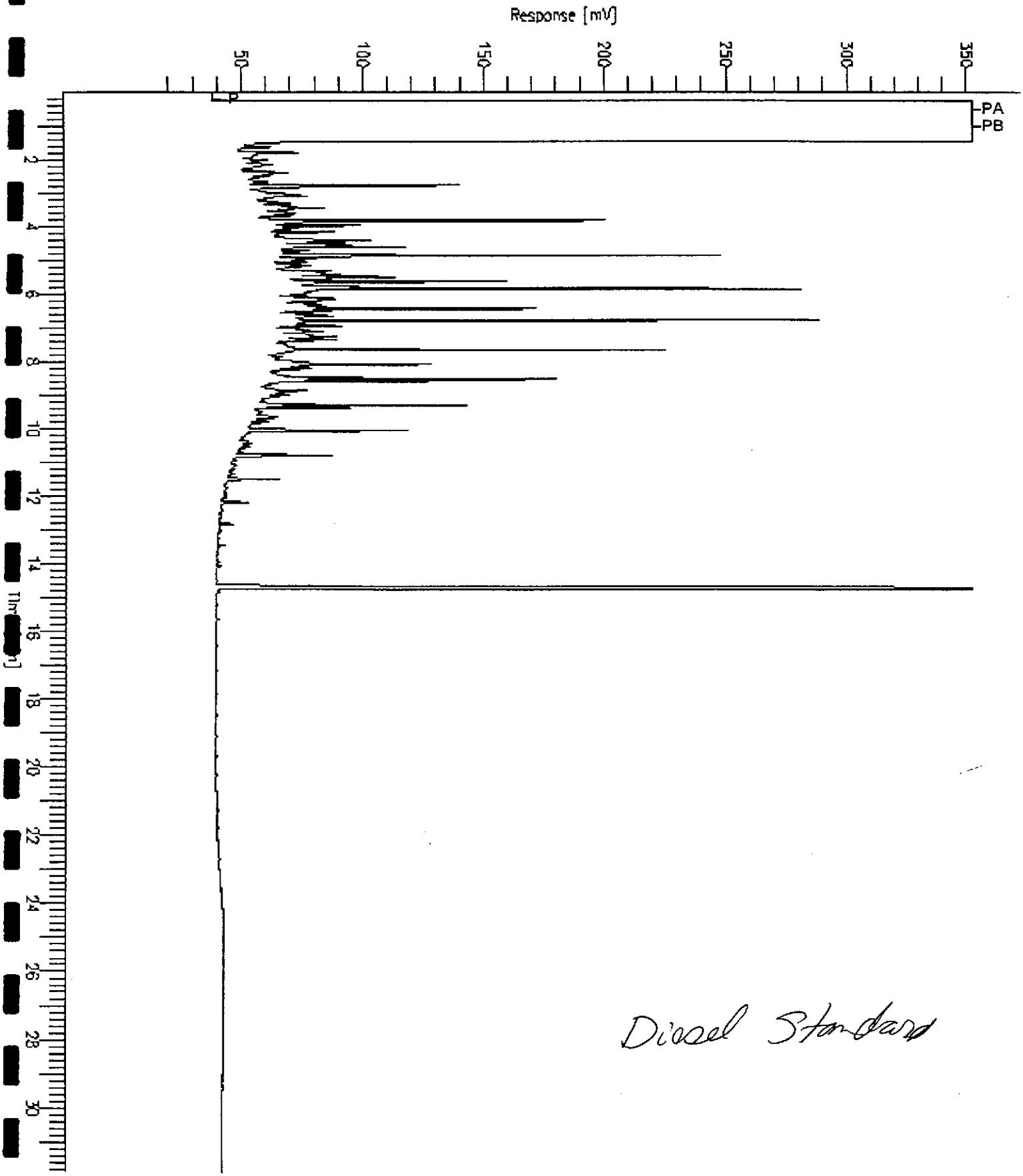
Sample #: 37403 Page 1 of 1
Date : 11/10/97 09:10 AM
Time of Injection: 11/8/97 05:39 AM
Low Point : 24.70 mV High Point : 187.30 mV
Plot Scale: 162.6 mV



GC15 Channel B TEH

Sample Name : CCV,97WS4926,DS
FileName : G:\GC15\CHB\314B019.RAW
Method : B286TEH.MTH
Start Time : 0.01 min End Time : 31.91 min
Scale Factor: 0.0 Plot Offset: 15 mV

Sample #: 500MG/L Page 1 of 1
Date : 11/11/97 09:18 AM
Time of Injection: 11/11/97 01:04 AM
Low Point : 14.64 mV High Point : 352.56 mV
Plot Scale: 337.9 mV



Diesel Standard

TEH-Tot Ext Hydrocarbons

Client:	Subsurface Consultants	Analysis Method:	EPA 8015M
Project#:	447.055	Prep Method:	EPA 3520
Location:	Connell Olds		

METHOD BLANK

Matrix:	Water	Prep Date:	11/06/97
Batch#:	37403	Analysis Date:	11/07/97
Units:	ug/L		
Diln Fac:	1		

MB Lab ID: QC58294

Analyte	Result
Diesel C12-C22	<50

Surrogate	%Rec	Recovery Limits
Hexacosane	91	60-140

TEH-Tot Ext Hydrocarbons

Client: Subsurface Consultants
Project#: 447.055
Location: Connell Olds

Analysis Method: EPA 8015M
Prep Method: EPA 3520

BLANK SPIKE/BLANK SPIKE DUPLICATE

Matrix: Water
Batch#: 37403
Units: ug/L
Diln Fac: 1

Prep Date: 11/06/97
Analysis Date: 11/07/97

BS Lab ID: QC58295

Analyte	Spike Added	BS	%Rec	#	Limits
Diesel C12-C22	2475	1781	72		60-140

Surrogate	%Rec	Limits
Hexacosane	90	60-140

BSD Lab ID: QC58296

Analyte	Spike Added	BSD	%Rec	#	Limits	RPD	#	Limit
Diesel C12-C22	2475	1692	68		60-140	5		35

Surrogate	%Rec	Limits
Hexacosane	87	60-140

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits
RPD: 0 out of 1 outside limits
Spike Recovery: 0 out of 2 outside limits

CHAIN OF CUSTODY FORM

13127

PAGE ____ OF ____

PROJECT NAME: Connell Olds
JOB NUMBER: 447.055
PROJECT CONTACT: Samuel Won
SAMPLED BY: Dennis Alexander
LAB: Curtis & Tompkins
TURNAROUND: Normal
REQUESTED BY: Samuel Won

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX: WATER	SOIL	WASTE	AIR	CONTAINERS: VOA	LITER	PINT	TUBE	METHOD PRESERVED: HCL	H_2SO_4	HNO_3	ICE	NONE	SAMPLING DATE: MONTH	DAY	YEAR	TIME	NOTES	ANALYSIS REQUESTED: TVH	BTXE	MTBE	TEH	O&G	SVOCs	DCA
-1	MW-1	X				7	3			X			X		11	05	97	1330	*	X	X	X	X			X
-2	MW-4	X				7	1			X			X		11	04	97	1300	*	X	X	X	X			X
-3	MW-6	X				7	1			X			X		11	04	97	1200	*	X	X		X			X
-4	MW-7	X				7	1			X			X		11	04	97	1030		X	X		X			X
-5	MW-8	X				7	1			X			X		11	05	97	1030		X	X		X			X
-6	MW-9	X				7	1			X			X		11	05	97	1100		X	X	X	X			X
-7	MW-13	X				7	1			X			X		11	04	97	0830		X	X		X			X

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
Dennis Alexander	11/5/97 1:40 p.m.	J. GUERRERO	11-5-97 1:40 pm
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME

COMMENTS & NOTES: * Samples came from wells with product in them. Possible high concentrations!

Subsurface Consultants, Inc.
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
(510) 268-0461 • FAX: 510-268-0137