Chevron Environmental Management Company
6001 Bollinger Canyon Rd, K2236
P.O. Box 6012
San Ramon, CA 94583-2324
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Dana Thurman
Project Manager

ChevronTexaco

December 14, 2006
(date)

Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Chevron Service Station # 9-1723

Address: 9757 San Leandro Boulevard, Oakland, California

I have reviewed the attached report titled *Closure Request* and dated December 14, 2006.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Cambria Environmental Technology, Inc., upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Dana Thurman
Project Manager

Enclosure: Report

CAMBRIA

December 14, 2006

Mr. Barney Chan
Alameda County Health Care Services Agency (ACHCS)
1131 Harbor Bay Parkway, 2nd Floor
Alameda, California 94502

Re: **Closure Request**
Former Chevron Service Station 9-1723
9757 San Leandro Boulevard
Oakland, California
LOP Site RO412

Dear Mr. Chan:

On behalf of Chevron Environmental Management Company (Chevron), Cambria Environmental Technology, Inc. (Cambria) is submitting this *Closure Request* for the site referenced above. Based on a review of the site background and current conditions, Cambria believes this site meets the San Francisco Bay Regional Water Quality Control Board (RWQCB) definition of a low-risk fuel site, as described in their memorandum *"Interim Guidance on Required Cleanup at Low-Risk Fuel Sites"*, dated December 8, 1995. A summary of the site background, site conditions and the applicability of low-risk fuel site criteria are discussed below.

SITE BACKGROUND

Site Description: The former service station is located at the western corner of San Leandro Boulevard and 98th Avenue in a primarily industrial area with a few retail businesses and private residences (Figure 1). The site is essentially flat, approximately 25 feet above mean sea level, and is located about one-mile east of San Francisco Bay. Site stratigraphy is comprised primarily of alluvial plain and stream channel deposits of low-permeability clayey silt, silt, and sandy silts of low to moderate permeability, with occasional gravel lenses of moderate to high estimated permeability. Figure 2 presents a geologic cross section through the site. Historically, depth to groundwater has ranged from about 5 to 11 feet below grade (fbg). Groundwater generally flows to the west beneath the site. Groundwater monitoring data are presented in Attachment A. San Leandro Creek, which flows into San Leandro Bay, is about one mile south of the site. Significant hydrocarbon levels were first identified in 1987 during a subsurface investigation.

Cambria Environmental Technology, Inc.

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Tel (916) 677-3407
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SITE INVESTIGATION

1978 Station Demolition: In 1978, the Chevron station was demolished and the underground storage tanks (USTs) removed. No detailed records of the demolition and tank excavation activities are available in Chevron's files.

1987 Subsurface Investigation: In April 1987, Beta Associates drilled 11 borings as part of a subsurface investigation in the vicinity of the Chevron site. Of the 11 borings, only one boring, DH-8, was located on the former Chevron site. Soil collected at 10 fbg in DH-8 contained 1,017 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg), 1.063 ppm benzene, and 240 ppm motor oil. Historical soil analytical results are presented in Attachment B.

1988 Subsurface Investigation: In May 1988, Groundwater Technology, Inc. (GTI) conducted a subsurface hydrocarbon investigation, which included a ground-penetrating radar (GPR) survey, and drilling and installing monitoring wells MW-5, MW-6, and MW-8 on the Chevron site. The GPR survey data indicated the presence of remnant utility piping but no USTs on the former Chevron service station site. TPHg concentrations ranged from 5 to 310 ppm in soil samples collected at about 10 fbg from MW-5, MW-6, and MW-8. Prior to regularly scheduled sampling starting in November 1993, groundwater samples were collected twice from these wells: once in June 1988 and once in August 1989. TPHg concentrations were non-detect in MW-5; although, up to 93 parts per billion (ppb) benzene was detected in that well. TPHg has been detected in MW-6 and MW-8 at 1,000 and 77,000 ppb, respectively, and benzene has been detected in these wells at up to 2,300 ppb.

1989 Subsurface Investigation: From August to October 1989, Harding Lawson Associates further investigated the hydrocarbon distribution in the unsaturated soil beneath the former Chevron service station and in the groundwater downgradient of the former station. Of eight borings drilled, borings SB-1 through SB-6 were located in the area surrounding the previously drilled boring DH-8, which contained the highest soil hydrocarbon levels. Up to 470 ppm TPHg was detected in soil samples collected from about 10 fbg in boring SB-1 through SB-6. These samples also contained up to 3.3 ppm benzene. A map showing boring locations and boring logs are included in Attachment C.

1996 Subsurface Investigation: In April 1996, Fluor Daniel GTI conducted a subsurface investigation, which involved advancing 23 soil borings on the former Chevron site. Petroleum hydrocarbons were detected in all boring s except for SB-21. TPHg, benzene, and total oil and grease were detected at concentrations up to 1,800, 99, and 940 milligrams per kilogram (mg/kg), respectively. Grab groundwater samples were collected from three of the borings: SB-11, SB-19, and SB-22. TPHg and benzene were detected in all groundwater samples ranging in concentration from 5,000 to 19,000 micrograms per liter (µg/L), and 170 to 400 µg/L, respectively.

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1997 Soil Vapor Investigation: In October 1997, Cambria conducted a soil vapor investigation, which involved collecting vapor samples from six borings, SV-1 through SV-6. Results of that survey are summarized in Table 1. The highest BTEX concentrations were detected in the area of the former USTs, with concentration of BTEX up to 100,000, 1,500, 4,600, and 2,200 parts per billion by volume (ppbv), respectively.

2001 Risk Management Plan: In January 2001, Gettler-Ryan Inc. submitted a Risk Management Plan that summarized risk at this site, outlined steps for risk management of identified hazards, and included an example of a site health and safety plan. A copy of the text of that report is presented as Attachment D.

2001 Risk Assessment: In November 2001, Delta Environmental Consultants, Inc. submitted a Risk-Based Corrective Action (RBCA) evaluation. The results of the RBCA identified a risk factor for volatilization from soil and groundwater to indoor air of 8.10×10^{-7}, which is below the residential risk factor of 1.00×10^{-6}. According to the RBCA decision making process, no further work is warranted to protect against exposure at this site. A copy of the RBCA summary report is presented as Attachment E.

Hydrocarbon Distribution in Soil

The highest hydrocarbon concentrations detected in soil samples collected during previous investigations were 1,800 mg/kg TPHg and 99 mg/kg benzene. These samples were collected in the vicinity of the former USTs. Generally, the highest hydrocarbon concentrations in soil were detected at approximately 10 fbg. Figure 1 presents TPHg isoconcentration contours at 10 fbg beneath the site based on soil analytical data collected from 1987 to 1996. Except for a small area around boring DH-8, the majority of significant impact was in the vicinity of the former USTs and pump islands, in an area currently adjacent to San Leandro Boulevard. Figure 2 presents a geologic cross section through the site showing the approximate extent of hydrocarbon impact, mainly within lower permeability clay and silty clay soil. Historical soil analytical data are presented as Attachment B. Copies of available boring logs for on-site borings and wells are included in Attachment C.

Hydrocarbon Distribution in Ground Water

Ground water was regularly gauged and analyzed from November 1993 through July 1998. TPHg and benzene have been detected in site wells with overall decreasing concentrations over time. The maximum TPHg and benzene concentrations detected during the July 17, 1998, groundwater monitoring event were 1,400 and 210 ppb, respectively, in well MW-8 (Attachment A).

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Groundwater Concentrations in ppb on July 17, 1998 Compared to ESLs						
Well ID	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)	MTBE (ppb)
MW-5	900	3.6	<2.0	12	2.6	11
MW-6	<50	1.0	<0.5	<0.5	<0.5	<2.5
MW-8	1,400	210	20	24	54	<25
ESLs*	500	46	130	290	100	1,800

* ESLs from Table B: Shallow Soil (≤3m bgs), Groundwater IS NOT a Current or Potential Source of Drinking Water, Screening For Environmental Concerns At Sites With Contaminated Soil and Groundwater, RWQCB, Interim Final dated February 2005.

These TPHg and benzene concentrations exceeded RWQCB ESLs as summarized in the table above, as well as the TPHg concentration in well MW-5; but overall, hydrocarbon concentrations in these wells declined and concentrations in downgradient well MW-6 indicate that significant migration is not taking place.

Hydrocarbon Distribution in Soil Vapor

To assess hydrocarbon concentrations in soil vapor near the former USTs, where the highest concentrations of hydrocarbons in soil and groundwater have been detected, Cambria advanced six soil vapor borings and collected soil vapor samples in October 1997. Boring locations and soil vapor concentrations are presented in Figure 1 and Table 1, respectively.

Benzene was detected in all soil vapor samples collected from borings SV-1 through SV-6. Borings SV-5 and SV-6 were advanced adjacent to borings SV-1 and SV-2. The highest benzene concentration reported was 100,000 ppbv in the soil vapor sample collected 5 ft bgs from SV-5. However, the benzene soil vapor concentration at 5 ft depth from adjacent boring SV-1 was 410 ppbv, and benzene concentration in two samples collected at 3 ft bgs from SV-1 were 96 and 94 ppbv, respectively. So, the high benzene concentration reported in SV-5 appears to be an anomaly, and not representative of the site as a whole. The second highest benzene concentration reported was 3,100 ppbv in SV-2 (SVD-2) at 8 ft bgs. Borings SV-1, SV-2, SV-5, and SV-6 were advanced in the location of the former USTs. Soil vapor benzene concentrations appear to be localized in the vicinity of the former USTs. Benzene concentrations detected in soil vapor samples from borings SV-3 and SV-4 were less than 5 ppbv.

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LOW RISK GROUND WATER CASE CRITERIA

The site appears to meet the RWQCB criteria for a low-risk fuel site. As described by the December 8, 1995 RWQCB memorandum, *Interim Guidance on Required Cleanup at Low-Risk Fuel Sites*, a low-risk groundwater case has the following general characteristics:

- The leak has stopped and ongoing sources, including free product, have been removed or remediated;
- The site has been adequately characterized;
- The dissolved hydrocarbon plume is not migrating;
- No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted; and,
- The site presents no significant risk to human health or the environment.

Each of the low-risk groundwater case characteristics as they relate to the site, are discussed below.

The leak has stopped and ongoing sources, including free product, have been removed or remediated: Results of a ground-penetrating radar survey and subsequent soil boring investigation conducted in 1988 by GTI indicated that USTs were no longer present beneath the site. Free product has not been observed at this site.

The site has been adequately characterized: The lateral and vertical extent of hydrocarbons in soil has been adequately defined by the soil borings drilled around the former tank pit and across the site. To date, three groundwater monitoring wells have been installed and numerous soil borings have been drilled at the site, including six soil borings that were advanced in October 1997 to collect soil vapor samples. Decreasing hydrocarbon concentrations in groundwater from monitoring wells indicate a stable and possible shrinking plume. Concentrations in downgradient well MW-6 are at background levels, suggesting significant downgradient migration is not taking place.

The dissolved hydrocarbon plume is not migrating: As discussed above, hydrocarbon concentrations are decreasing overall in the source area and are generally non-detect in downgradient well MW-6, indicating that the plume is not migrating, and is probably shrinking.

No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted: In May 1996, Flour Daniel GTI conducted a survey of water wells

immediately southwest of the site. Two wells, P2 and P3, were identified within 250 ft downgradient (west) of the site. Well P2 is located about 100 feet west of the former Chevron site and was reported to be completed to a depth of 602 feet and screened from 160 to 225 fbg. As of 1996, this well was operative and on standby service for fire emergencies. Well P3 is located about 230 feet west of the site and, as of 1996, supplied water for industrial purposes. Two other wells were identified during a well survey conducted by GTI in 1988. Well L1 is located more than 500 feet north of the site and is completed to a depth of 950 feet. Well completion records indicate the gravel pack of this well extends from the ground surface to 950 fbg. Well J1 is located more than one-half mile west-northwest of the site and is completed to a depth of 448 ft. Well seal and construction details were not available for well J1. Results of the well surveys are presented as Attachment F.

With the exception of one suspect detection, no hydrocarbons have been detected in an off-site monitoring well MW-9, which is located about 200 feet downgradient (west) of the Chevron site source area (the former USTs). Hydrocarbons have been detected in site perimeter monitoring well MW-6, which is located downgradient of the former UST source area; however, TPHg and benzene concentrations have been mostly non-detect in this well. Based on these data and that the industrial supply wells are screened in deeper water-bearing zones, it is not likely that an off-site water supply well would be impacted by the hydrocarbons beneath the site.

The site presents no significant risk to human health or the environment: As indicated by the Tier 2 RBCA (Attachment E), the risk associated with the site-specific groundwater and soil vapor concentrations is less than the cumulative risk level. Hydrocarbon concentrations in groundwater are declining and the residual risk to human health is not significant. No potential exposure pathways that would adversely impact surface water, wetlands, or other sensitive receptors have been identified in the vicinity of the site. There appears to be little to no risk to human health or the environment.

CONCLUSIONS AND RECOMMENDATIONS

Based on our review of site conditions, we believe this site satisfies the RWQCB criteria for a low-risk fuel site. The attached RBCA analysis indicates that petroleum hydrocarbons beneath the site present no significant current risk to human health or the environment. The hydrocarbon concentrations in groundwater are low and decreasing. No engineered active remedial action appears necessary at the site, and passive bioremediation and attenuation appears to be an acceptable remedial alternative for residual hydrocarbons beneath the site. On behalf of Chevron, Cambria requests No Further Action status for this site.

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Please call me at (916) 677-3407 (ext. 112) if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

David W. Herzog, P.G.
Senior Project Geologist

Figures: 1 – TPHg Soil Isoconcentration Map
2 – Geologic Cross Section A-A'

Table: 1 – Analytical Data for Soil Vapor Samples

Attachments: A – Groundwater Monitoring Data
B – Historical Soil Analytical Data
C – Harding Lawson Associates 1989 Map, and Boring Logs
D – Gettler-Ryan 2001 Risk Management Plan
E – Delta RBCA Summary Report
F – Flour Daniel GTI Well Survey Results

cc: Mr. Dana Thurman, Chevron Environmental Management Company, P.O. Box 6012, K2236, San Ramon, CA 94583
Cambria File Copy

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10/16/06

EXPLANATION

- MW-1 — Monitoring well location (GTI, May 1988)
- SV-1 — Soil vapor sample location (Cambria October 1997)
- SB-1 — Soil boring location (GTI, April 1996; Beta Associates, April 1987)
- SB-1 — Soil boring location (Harding Lawson Associates, 1989)
- XX.XX — TPHg concentration contour, dashed where inferred
- Well ID / TPHg — Well designation; TPHg concentrations are in milligrams per kilogram (mg/kg)

TPHg Soil Isoconcentration Map
10 fbg

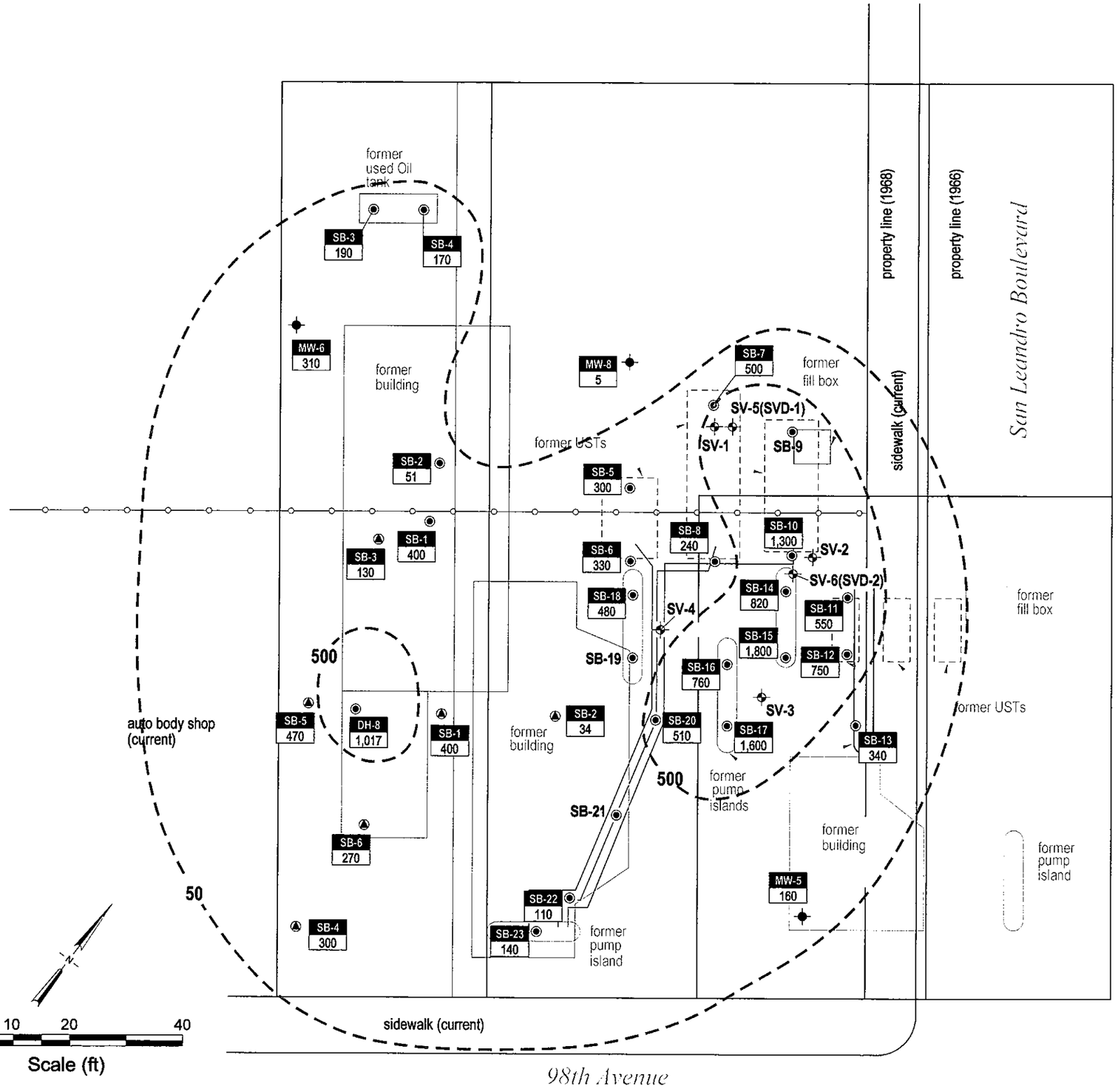

FIGURE
1

Former Chevron Service Station 9-1723
9757 San Leandro Boulevard
Oakland, California

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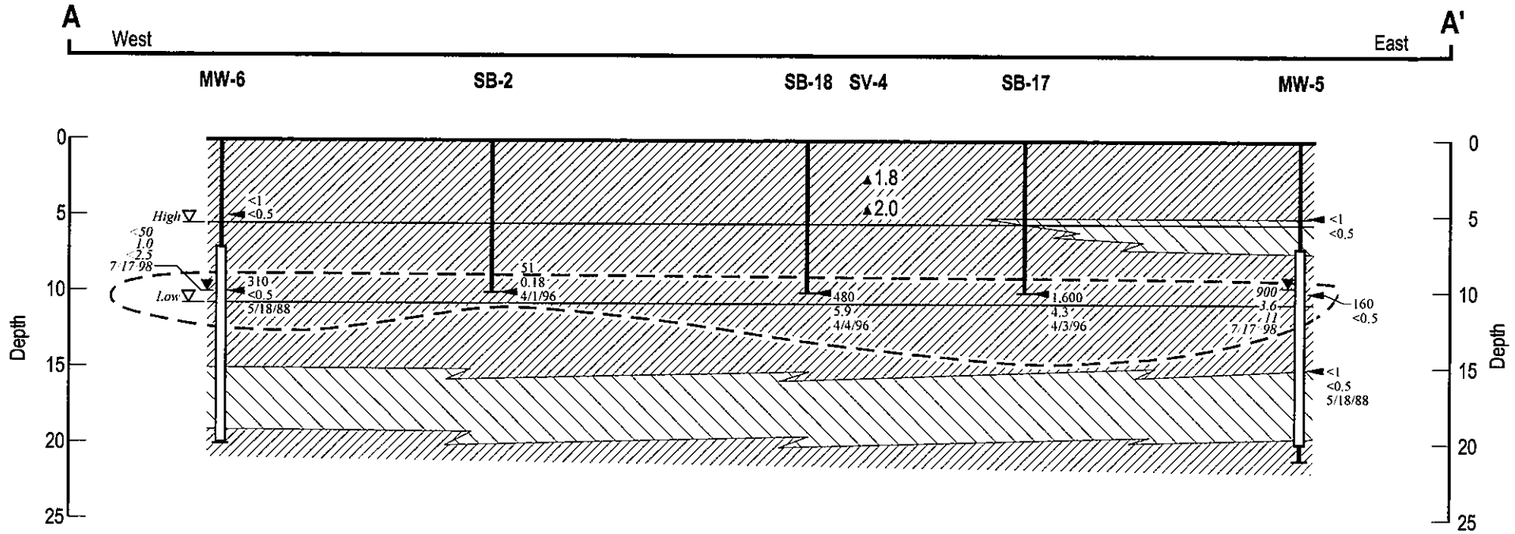
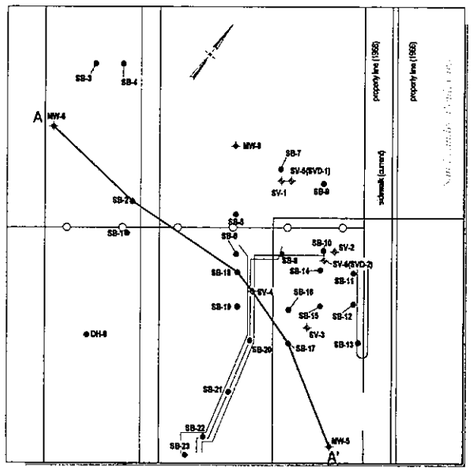
R:\9-1723 OAKLAND\FIGURES\9-1723_3Q06_TPHG-SOIL.DWG

10/19/06





EXPLANATION

= Low Permeability Soils
CL - Clay, Silty Clay

= Moderate Permeability Soils
CL - Sandy Clay

Approximate extent of hydrocarbon impact in soil

Approximate sample location

TPHg
Benzene
Date
Hydrocarbon concentrations in Soil, in parts per million

Well ID — Well Designation
— Top of Casing Elevation

— Groundwater Monitoring Well

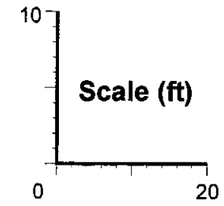
— Well Screen Interval

— Bottom of boring

▲ 1.8 Vapor sample location with benzene concentration in ppbv

▼ Depth of Groundwater

TPHg
Benzene
MTBE
Date
Hydrocarbon concentrations in Groundwater, in parts per billion



FIGURE

2

Geologic Cross Section A-A'

Former Chevron Service Station 9-1723
9757 San Leandro Boulevard
Oakland, California

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R:\9-1723 OAKLAND\FIGURES\9-1723_X-SECTION A-A'.DWG

Table 1. Analytic Data for Soil Vapor Samples- Former Chevron Service Station 9-1723, 9757 San Leandro Boulevard, Oakland, California

Report and Map ID	Chain of Custody and Field ID	Date	Depth (ft)	Benzene	Toluene	Ethylbenzene	m, p -Xylenes	o- Xylene	Comments
				parts per billion by volume					
SV-1-3.0	SV-1-3.0	10/06/97	3.0	96	5.1	6.2	14	5.2	
SV-1-3.0(duplicate)	SV-1-3.0(duplicate)	10/06/97	3.0	94	5.6	6.3	14	5.4	Laboratory Duplicate
SV-1-5.0	SV-1-5.0	10/06/97	5.0	410	4.6	260	25	3.3	
SV-2-3.0	SV-2-3.0	10/06/97	3.0	970	12	190	410	82	
SV-2-5.0	SV-2-5.0	10/06/97	5.0	420	6.0	120	240	46	
SV-2-8.0**	SVD-2-8.0*	10/06/97	8.0	3,100	1,200	2,900	9,200	3,200	
SV-3-3.0	SV-3-3.0	10/06/97	3.0	4.9	5.6	6.4	21	8.2	
SV-3-5.0	SV-3-5.0	10/06/97	5.0	3.6	2.1	2.7	9.0	3.2	
SV-4-3.0	SV-4-3.0	10/06/97	3.0	1.8	4.8	6.0	23	8.4	
SV-4-5.0	SV-4-5.0	10/06/97	5.0	2.0	10	6.0	22	8.2	
SV-5-5.0	SVD-1-5.0*	10/06/97	5.0	100,000	1,500	4,600	1,200	<950	
SV-6-5.0	SVD-2-5.0*	10/06/97	5.0	580	120	490	2,200	980	

Abbreviations / Notes

Benzene, toluene, ethylbenzene, and xylenes by analytical method TO-14

<x = not detected above x parts per billion by volume

Chain of Custody and field sample identifications were changed to more accurately represent the data.

*Incorrectly labeled during field operations

-SVD-2-8.0 corresponds to soil vapor location SV-2 at 8 ft.

-SVD-1-5.0 corresponds to soil vapor location SV-5 at 5 ft.

-SVD-2-5.0- corresponds to soil vapor location SV-6 at 5 ft.

** An additional soil vapor sample was taken at SV-2-8.0 and was not included in table due to sampling equipment failures during field sampling. The analytic results for this sample are inluded on page 8 of Attachment A.

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Attachment A

Groundwater Monitoring Data

Table 2. Summary of Chemical Results from Ground-water Samples

WELL NUMBER	SAMPLING DATE	TPH (GASOLINE) mg/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES, TOTAL ug/l	OTHER DETECTABLE VOLATILE COMPOUNDS 1,1-DCE ug/l	1,1-DCA ug/l	1,1,1-TCA ug/l	1,2-DCA ug/l
MW-1	18-Apr-87	NT	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	61	9.5	93.1	0.5
	03-Jun-88	NT	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	8	40	ND(5)
	08-Aug-89	ND(0.05)	ND(1)	ND(1)	ND(1)	ND(1)	47	9	21	ND(1)
MW-2	18-Apr-87	NT	76.9	121	93.4	477	ND(0.2)	ND(0.5)	ND(0.5)	ND(0.5)
	03-Jun-88	NT	64	18	48	60	ND(5)	ND(5)	ND(5)	ND(5)
	08-Aug-89	1.1	48	9	33	55	ND(1)	ND(1)	ND(1)	ND(1)
MW-4	18-Apr-87	NT	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.2)	ND(0.5)	ND(0.5)	ND(0.5)
	03-Jun-88	NT	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
	08-Aug-89	ND(0.05)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
MW-5	03-Jun-88	NT	93	ND(5)	100	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
	08-Aug-89	ND(0.05)	49	8	15	63	ND(1)	ND(1)	ND(1)	ND(1)
MW-6	03-Jun-88	NT	110	140	35	210	ND(5)	ND(5)	ND(5)	ND(5)
	08-Aug-89	1.0	45	8	15	74	ND(1)	ND(1)	ND(1)	ND(1)
MW-7	03-Jun-88	NT	ND(5)	ND(5)	ND(5)	ND(5)	25	5	18	ND(5)
	08-Aug-89	ND(0.05)	ND(1)	ND(1)	ND(1)	ND(1)	39	8	13	ND(1)
MW-8	03-Jun-88	NT	2300	2000	950	4100	ND(5)	ND(5)	ND(5)	ND(5)
	08-Aug-89	77	1900	820	1000	3600	ND(1)	ND(1)	ND(1)	ND(1)
MW-9	08-Aug-89	ND(0.05)	ND(1)	ND(1)	ND(1)	ND(1)	3	ND(1)	ND(1)	ND(1)
MW-10	08-Aug-89	ND(0.05)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Field Blank	03-Jun-88	NT	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
	08-Aug-89	ND(0.05)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)

NOTES:

mg/l: milligrams per liter (equivalent to parts per million)
ug/l: micrograms per liter (equivalent to parts per billion)
NT: Not Tested
ND: Not detected; Limit of detection indicated in parenthesis
1,1-DCE: 1,1-Dichloroethene
1,1-DCA: 1,1-Dichloroethane
1,1,1-TCA: 1,1,1-Trichloroethane
1,2-DCA: 1,2-Dichloroethane

Volatile Organics in Water by EPA Method 624
Total Petroleum Hydrocarbons (TPH) as Gasoline in Aqueous Solutions by EPA Method 8015 (Modified)
Extraction by EPA Method 5030, Purge and Trap

April 18, 1987 Results from Beta Associates (1987)
June 3, 1988 Results from Groundwater Technology (1988)
August 8, 1989 Results from Curtis & Tompkins, Ltd.

Table 3. Water-Level Elevations

WELL NUMBER	MW-1	MW-2	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
Top of Casing Elevation	18.05	18.42	18.74	18.96	18.71	18.05	18.97	17.66	18.36
DATE	DEPTH TO WATER (FEET) FROM TOP OF CASING								
20-Apr-87	10.28	10.38	NA	10.84	NA	NA	NA	NA	NA
22-Jul-88	10.48	10.71	11.43	10.86	11.00	10.39	11.04	NM	NM
04-Aug-89	10.41	NM	NM	10.63	10.91	NM	10.95	NM	NM
08-Aug-89	10.40	10.56	11.19	10.77	10.89	10.27	10.98	10.11	10.53
DATE	GROUND-WATER ELEVATION (FEET) ABOVE MEAN SEA LEVEL								
20-Apr-87	7.77	8.04	NA	8.12	NA	NA	NA	NA	NA
22-Jul-88	7.57	7.71	7.31	8.10	7.71	7.66	7.93	NM	NM
04-Aug-89	7.64	NM	NM	8.33	7.80	NM	8.02	NM	NM
08-Aug-89	7.65	7.86	7.55	8.19	7.82	7.78	7.99	7.55	7.83

NOTES:

NA: Not Applicable, Monitoring Well Not Yet Installed

NM: Not Measured

Table 4
GROUNDWATER SAMPLE ANALYTICAL RESULTS
BTEX AND PETROLEUM HYDROCARBONS

APRIL 1-4, 1996

CHEVRON SERVICE STATION #9-1723
9757 SAN LEANDRO BOULEVARD, OAKLAND, CALIFORNIA

SAMPLE NUMBER	DATE	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	TPH-G (ug/L)
SB-11	04-04-96	210	97	180	400	5,100
SB-19	04-03-96	170	30	21	34	2,300 a
SB-22	04-02-96	400	ND<0.50	110	77	19,000 b

EXPLANATION
TPH-G = Total petroleum hydrocarbons-as-gasoline
ug/L = micrograms per liter, equivalent to parts per billion (ppb)
ND = Not detected at or above the minimum detection limit shown
a = Gasoline and unidentified hydrocarbons <C7
b = Gasoline and unidentified hydrocarbons >C8

0080WTA.WK4

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	Lead	MTBE
MW-5											
11/02/93	21.84	11.15	10.69	--	790	43	3.4	22	12	<400	--
02/10/94	21.84	13.10	8.74	--	1400	52	3.0	50	40	--	--
05/12/94	21.84	12.40	9.44	--	1800	87	6.2	77	66	--	--
08/26/94	21.84	--	--	--	--	--	--	--	--	--	--
11/11/94	21.84	13.50	8.34	--	380	18	<1.0	18	11	--	--
02/01/95	21.84	14.32	7.52	--	570	36	0.59	21	11	--	--
05/18/95	21.84	12.87	8.97	--	590	29	1.0	16	9.8	--	--
08/02/95	21.84	11.98	9.86	--	210	9.2	<0.5	4.0	1.2	--	--
11/01/95	21.84	11.58	10.26	--	210	5.6	<0.5	1.9	<0.5	--	<2.5
01/31/96	21.84	14.72	7.12	--	1200	50	<5.0	19	29	--	<25
05/16/96	21.84	14.22	7.62	--	440	14	<0.5	17	8.6	--	11
08/01/96	21.84	11.86	9.98	--	58	1.4	<0.5	<0.5	<0.5	--	2.5
12/17/96	21.84	13.13	8.71	--	300	9.7	<0.5	11	6.3	--	6.9
02/20/97	21.84	12.81	9.03	--	350	6.7	<0.5	4.3	1.9	--	5.0
05/02/97	21.84	12.50	9.34	--	270	4.8	<0.5	3.5	1.3	--	7.3
07/23/97	21.84	11.70	10.14	--	290	3.4	<0.5	<0.5	<0.5	--	3.1
11/04/97	21.84	11.69	10.15	--	180	3.8	<0.5	1.5	<0.5	--	8.6
02/04/98	21.84	16.54	5.30	--	140	4.3	<0.5	8.5	<0.5	--	<2.5
05/01/98	21.84	12.77	9.07	--	1200	19	<1.0	9.7	1.7	--	25
07/17/98	21.84	12.19	9.65	--	900	3.6	<2.0	12	2.6	--	11

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	Lead	MTBE
MW-6											
11/02/93	21.71	10.93	10.78	--	300	19	1.8	2.5	5.0	<400	--
02/10/94	21.71	12.86	8.85	--	200	10	0.9	2.0	4.0	--	--
05/12/94	21.71	12.08	9.63	--	210	10	1.1	1.2	3.1	--	--
08/26/94	21.71	10.82	10.89	--	310	16	1.4	2.3	7.1	--	--
11/11/94	21.71	13.25	8.46	--	<50	1.3	<0.5	<0.5	1.0	--	--
02/01/95	21.71	14.02	7.69	--	<50	1.9	<0.5	<0.5	0.51	--	--
05/18/95	21.71	12.43	9.28	--	<50	8.2	<0.5	<0.5	<0.5	--	--
08/02/95	21.71	11.64	10.07	--	<50	2.3	<0.5	<0.5	<0.5	--	--
11/01/95	21.71	11.31	10.40	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
01/31/96	21.71	13.63	8.08	--	<50	0.98	<0.5	<0.5	<0.5	--	<2.5
05/16/96	21.71	13.91	7.80	--	<50	1.6	<0.5	<0.5	<0.5	--	<2.5
08/01/96	21.71	11.56	10.15	--	<50	0.82	<0.5	<0.5	<0.5	--	<2.5
12/17/96	21.71	13.26	8.45	--	63	2.6	<0.5	<0.5	<0.5	--	<2.5
02/20/97	21.71	--	--	Inaccessible	--	--	--	--	--	--	--
05/02/97	21.71	--	--	Inaccessible	--	--	--	--	--	--	--
05/29/97	21.71	11.72	9.99	--	120	1.8	<0.5	<0.5	<0.5	--	2.6
07/23/97	21.71	11.31	10.40	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
11/04/97	21.71	11.38	10.33	--	63	1.2	<0.5	<0.5	<0.5	--	<2.5
02/04/98	21.71	16.19	5.52	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
05/01/98	21.71	12.40	9.31	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
07/17/98	21.71	11.84	9.87	--	<50	1.0	<0.5	<0.5	<0.5	--	<2.5

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	Lead	MTBE
MW-7											
11/02/93	20.95	10.88	10.07	--	--	--	--	--	--	--	--
02/10/94	20.95	--	--	--	--	--	--	--	--	--	--
05/12/94	20.95	--	--	--	--	--	--	--	--	--	--
08/26/94	20.95	--	--	--	--	--	--	--	--	--	--
NO LONGER MONITORED OR SAMPLED											
MW-8											
11/02/93	21.84	11.02	10.82	--	15,000	2000	440	420	1400	<400	--
02/10/94	21.84	12.97	8.87	--	6500	1200	380	250	7900	--	--
05/12/94	21.84	12.19	9.65	--	30,000	1400	2900	800	3800	--	--
08/26/94	21.84	10.90	10.94	--	17,000	720	200	330	930	--	--
11/11/94	21.84	13.38	8.46	--	6800	250	170	190	650	--	--
02/01/95	21.84	14.36	7.48	--	330	68	2.8	2.7	4.3	--	--
05/18/95	21.84	12.54	9.30	--	540	120	12	11	23	--	--
08/02/95	21.84	11.73	10.11	--	1100	150	9.7	20	40	--	--
11/01/95	21.84	11.36	10.48	--	1700	120	15	16	39	--	<5.0
01/31/96	21.84	14.64	7.20	--	57	5.3	<0.5	<0.5	<0.5	--	<2.5
05/16/96	21.84	13.99	7.85	--	2100	260	43	56	130	--	64
08/01/96	21.84	11.59	10.25	--	1100	45	0.92	8.9	25	--	7.4
12/17/96	21.84	12.95	8.89	--	2000	280	30	51	88	--	22
02/20/97	21.84	--	--	Inaccessible	--	--	--	--	--	--	--
05/02/97	21.84	--	--	Inaccessible	--	--	--	--	--	--	--
05/29/97	21.84	11.79	10.05	--	3400	280	31	53	120	--	<50
07/23/97	21.84	11.48	10.36	--	760	20	2.2	2.6	5.0	--	9.7
11/04/97	21.84	11.49	10.35	--	1100	150	13	22	39	--	49
02/04/98	21.84	16.29	5.55	--	270	6.8	<0.5	3.3	<0.5	--	<2.5
05/01/98	21.84	12.62	9.22	--	190	5.3	<0.5	<0.5	0.75	--	2.8
07/17/98	21.84	11.89	9.95	--	1400	210	20	24	54	--	<25

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Attachment B

Historical Soil Analytical Data

Table 1
SOIL SAMPLE ANALYTICAL RESULTS
BTEX AND PETROLEUM HYDROCARBONS

APRIL 1-4, 1996

CHEVRON SERVICE STATION #9-1723
9757 SAN LEANDRO BOULEVARD, OAKLAND, CALIFORNIA

SAMPLE NUMBER BORING	DEPTH (feet BGS)	DATE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)	TPH-G (mg/kg)	TOTAL OIL AND GREASE (mg/kg)
SB-1	5	04/02/96	--	--	--	--	--	--
	10	"	1.4	0.44	8.9	28	400	78
	15	"	--	--	--	--	--	--
SB-2	5	04/01/96	--	--	--	--	--	--
	10	"	0.18	0.12	0.79	0.59	51	24
SB-3	5	04/01/96	--	--	--	--	--	--
	10	"	0.54	0.66	2.3	3.3	190	35
	15	"	--	--	--	--	--	--
SB-4	5	04/01/96	--	--	--	--	--	--
	10	"	0.59	0.52	0.14	1.1	170 a	940
	15	"	0.091	0.036	0.029	0.23	20 a	--
SB-5	5	04/01/96	--	--	--	--	--	--
	10	"	2.4	1.4	10	4.2	300	--
	15	"	--	--	--	--	--	--
SB-6	5	04/04/96	--	--	--	--	--	--
	10	"	0.57	ND<0.0050	0.42	2.3	330 a	--
	15	"	--	--	--	--	--	--
SB-7	5	04/01/96	2.2	0.58	7.7	7.9	880	--
	10	"	1.3	1.6	7.0	27	500	--
	15	"	--	--	--	--	--	--
SB-8	5	04/04/96	1.6	ND<0.0050	ND<0.0050	0.79	110 a	--
	10	"	4.6	1.1	0.76	2.1	240 a	--
	15	"	0.0054	ND<0.0050	ND<0.0050	0.042	2.1 b	--
SB-9	5	04/01/96	0.60	0.16	0.14	0.82	67	--
	10	"	--	--	--	--	--	--
	15	"	3.8	7.4	17	69	610	--
SB-10	5	04/04/96	3.7	8.9	9.9	53	450	--
	10	"	99	40	150	210	1,300	--
	15	"	0.010	0.0051	ND<0.0050	0.016	ND<1.0	--
SB-11	5	04/04/96	0.012	0.040	0.019	0.056	7.5 a	--
	10	"	1.5	ND<0.0050	9.7	3.2	550	--
	15	"	--	--	--	--	--	--
SB-12	5	04/03/96	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<1.0	--
	10	"	1.1	4.1	19	85	750	--
	15	"	--	--	--	--	--	--
SB-13	5	04/03/96	--	--	--	--	--	--
	10	"	1.6	0.81	7.4	24	340	--
SB-14	5	04/04/96	0.066	0.050	0.097	0.067	17 a	--
	10	"	5.0	28	16	82	820	--
SB-15	5	04/03/96	0.011	0.0060	ND<0.0050	0.15	2.1 a	--
	10	"	17	68	53	260	1,800	--
SB-16	5	04/03/96	0.15	ND<0.0050	0.0069	0.026	1.9	--
	10	"	6.2	1.8	28	76	760	--
SB-17	5	04/03/96	--	--	--	--	--	--
	10	"	4.3	15	38	150	1,600	--
SB-18	5	04/04/96	--	--	--	--	--	--
	10	"	5.9	4.5	2.0	5.4	480	--
SB-19	5	04/03/96	--	--	--	--	--	--
	10	"	2.3	ND<0.0050	1.1	1.5	[illegible]	--
SB-20	5	04/03/96	--	--	--	--		
	10	"	3.8	1.5	17	39	510	--
SB-21	5	04/02/96	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	ND<1.0	--
SB-22	5	04/02/96	0.027	0.0091	0.020	0.015	3.1 a	--
	10	"	0.72	0.47	4.7	0.39	110	--
SB-23	5	04/02/96	--	--	--	--	--	--
	10	"	3.4	0.29	0.86	4.6	140	--

EXPLANATION
BGS = Below ground surface
TPH-G = Total petroleum hydrocarbons-as-gasoline
mg/kg = milligrams per kilogram, equivalent to parts per million (ppm)
ND = Not detected at or above the minimum detection limit shown
a = Gasoline and unidentified hydrocarbons >C8
b = Unidentified hydrocarbons >C8

0080STA1.WK4

FLUOR DANIEL GTI

Table 5. Summary of Chemical Results from Soil Samples

WELL NUMBER	SAMPLING DATE	DEPTH (FEET)	TPH (GASOLINE) mg/kg	BENZENE ug/kg	TOLUENE ug/kg	BENZENE ug/kg	TOTAL ug/kg
SB-1	03-Aug-89	6-6.5	ND(10)	ND(5)	30	ND(5)	ND(5)
	03-Aug-89	10-10.5	400	1900	1400	4100	11000
SB-2	03-Aug-89	6-6.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
	03-Aug-89	9-9.5	34	140	200	270	430
	03-Aug-89	15.5-16	140	670	790	1300	4900
SB-3	03-Aug-89	6-6.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
	03-Aug-89	9-9.5	130	900	ND(100)	1500	3400
	03-Aug-89	15-15.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
SB-4	03-Aug-89	5-5.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
	03-Aug-89	10-10.5	300	3300	420	8200	12000
	03-Aug-89	15-15.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
SB-5	03-Aug-89	5-5.5	ND(10)	47	ND(5)	ND(5)	ND(5)
	03-Aug-89	10-10.5	470	1900	580	7200	22000
	03-Aug-89	15-15.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
SB-6	05-Oct-89	5-5.5	ND(10)	18	23	8.0	27
	05-Oct-89	10-10.5	270	2000	900	1600	3800
	05-Oct-89	15-15.5	ND(10)	33	34	5.5	26
MW-9	04-Aug-89	6-6.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
	04-Aug-89	12-12.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
MW-10	04-Aug-89	6-6.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)
	04-Aug-89	12-12.5	ND(10)	ND(5)	ND(5)	ND(5)	ND(5)

NOTES:

mg/kg: milligrams per kilogram (equivalent to parts per million)
ug/kg: micrograms per kilogram (equivalent to parts per billion)
ND: Not detected; Limit of detection indicated in parenthesis

Total Petroleum Hydrocarbons (TPH) by EPA Method 8015
Benzene, Toluene, Ethyl Benzene, Total Xylenes by EPA Method 8020
Extraction by EPA Method 5030, Purge and Trap

Analyses performed by Curtis & Tompkins, Ltd.

Table 1. Summary of Previous Chemical Results from Soil Samples

WELL NUMBER	SAMPLING DATE	DEPTH (FEET)	TPH (GASOLINE) mg/kg	BENZENE ug/kg	TOLUENE ug/kg	ETHYL BENZENE ug/kg	XYLENES, TOTAL ug/kg	DIESEL mg/kg	MOTOR OIL mg/kg
Source: Groundwater Technology, Inc., 1988									
MW-5	18-May-88	5	ND(1)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	NT	NT
	18-May-88	10	160	ND(0.5)	ND(0.5)	3000	7000	NT	NT
	18-May-88	15	ND(1)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	NT	NT
MW-6	18-May-88	5	ND(1)	ND(0.5)	ND(5)	ND(5)	ND(5)	NT	NT
	18-May-88	10	310	ND(0.5)	2000	4000	18000	NT	NT
MW-7	18-May-88	5	ND(1)	ND(0.5)	ND(5)	ND(5)	ND(5)	NT	NT
	18-May-88	10	ND(1)	ND(0.5)	ND(5)	ND(5)	ND(5)	NT	NT
MW-8	19-May-88	5	2	ND(0.5)	ND(5)	ND(5)	ND(5)	NT	NT
	19-May-88	10	5	ND(0.5)	ND(5)	ND(5)	ND(5)	NT	NT
Source: Beta Associates, 1987									
MW-1	18-Apr-87	3	NT	ND(10)	ND(10)	ND(10)	ND(20)	NT	NT
MW-2	18-Apr-87	3	NT	ND(10)	ND(10)	ND(10)	ND(20)	NT	NT
DH-3	18-Apr-87	2.5	NT	ND(10)	ND(10)	ND(10)	ND(20)	NT	NT
MW-4	18-Apr-87	10.5	NT	ND(10)	ND(10)	NT	ND(10)	ND	ND
DH-5	18-Apr-87	5	NT	ND(10)	ND(10)	ND(10)	ND(20)	NT	NT
DH-6	18-Apr-87	10.5	NT	ND(10)	ND(10)	NT	ND(10)	ND	ND
DH-7	18-Apr-87	3.5	ND(1)	ND(10)	ND(10)	NT	ND(10)	NT	NT
DH-8	18-Apr-87	10	1017	1063	9997	NT	108092	ND(1)	240
DH-9	18-Apr-87	1	NT	ND(10)	ND(10)	ND(10)	ND(20)	NT	NT
DH-10	18-Apr-87	1	NT	NT	NT	NT	NT	NT	NT
DH-11	18-Apr-87	1	NT	ND(10)	ND(10)	NT	ND(10)	NT	380

NOTES:

mg/kg: milligrams per kilogram (equivalent to parts per million)
ug/kg: micrograms per kilogram (equivalent to parts per billion)
ND: Not detected; Limit of detection indicated in parenthesis
NT: Not Tested

Total Petroleum Hydrocarbons (TPH) by EPA Method 8015
Benzene, Toluene, Ethyl Benzene, Total Xylenes by EPA Method 8020
Extraction by EPA Method 5030, Purge and Trap

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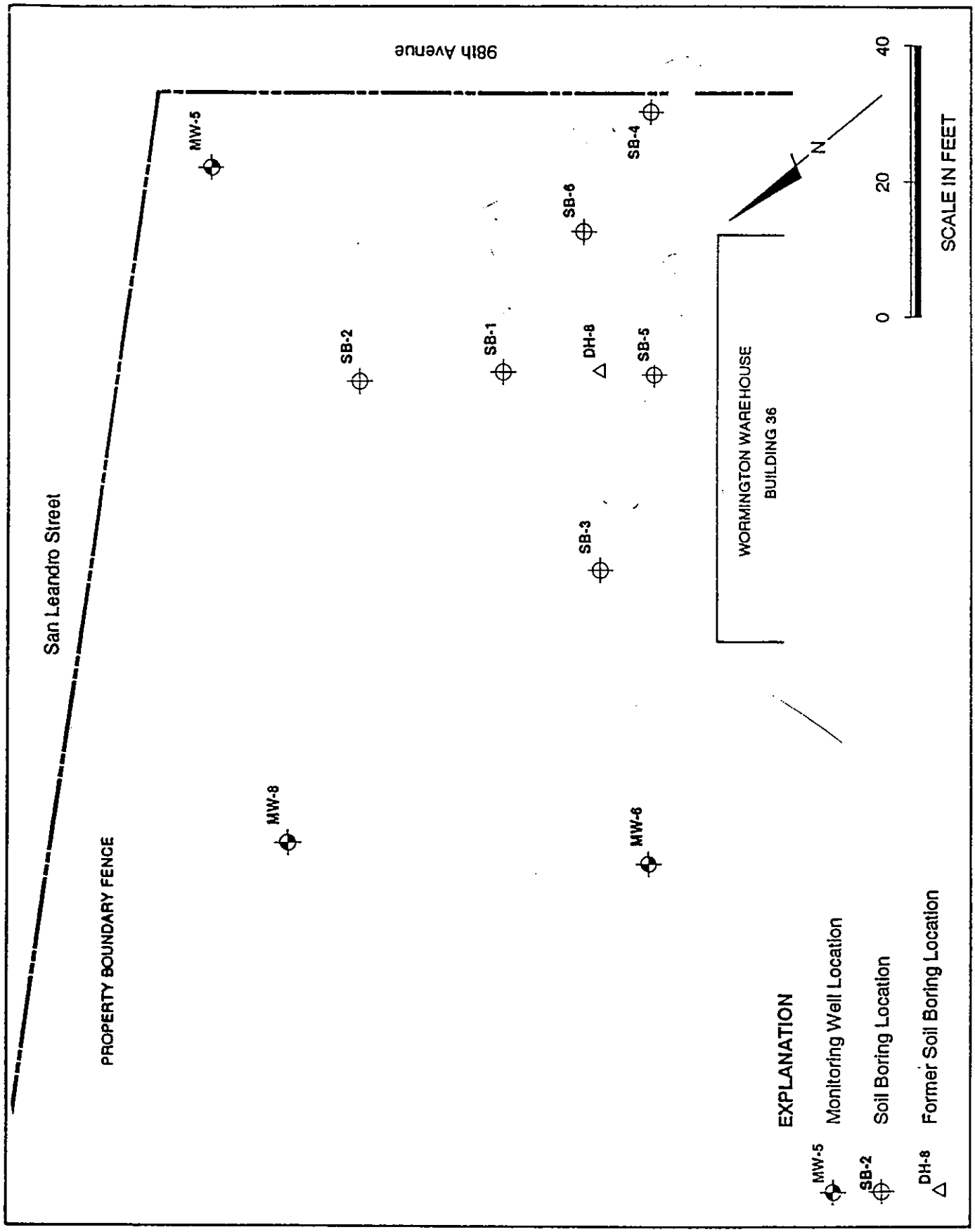
Attachment C

Harding Lawson Associates 1989 Map,
and Boring Logs

15178



Harding Lawson Associates
Engineering and
Environmental Services

Soil Boring Locations
Gerber Products Company
Oakland, California

PLATE
2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459,001.02	JDS	11/89	

15920

Equipment 6" Hollow Stem Auger

Elevation 19.2 ft Date 8/3/89

Blows/Ft	OVA (ppm)	Depth (ft)	Sample	
		0		4" asphalt BROWN AND BLACK MOTTLED SANDY CLAY (CL) soft, moist
21	20			becoming black, stiff, moist
32	30	5		DARK GRAY SAND (SP) medium dense, moist, medium-grained, slight hydrocarbon odor
32	700	10		DARK GRAY CLAY (CL) stiff, moist, slight white staining, strong hydrocarbon odor bottom of boring at 10.0 ft
		15		

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SB-1
Gerber Products Company
Oakland, California

PLATE A-1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459,001.02	JPS	11/89	

15921

Equipment 6" Hollow Stem Auger

Elevation 19.2 ft Date 8/3/89

Blows/Ft	OVA (ppm)	Depth (ft)	Sample	
		0		4" asphalt SANDY GRAVEL SUB-BASE (Fill) loose, dry BLACK SILTY CLAY (CL) medium stiff, moist
20				color change to dark gray and brown mottled, stiff, moist
		5		
30	1			GRAY CLAYEY SAND (SC) stiff, moist, fine- to medium-grained sand
25	200			GRAY AND BROWN MOTTLED SILTY CLAY (CL) very stiff, moist, strong hydrocarbon odor
		10		becoming wet
		15		
22	650			strong hydrocarbon odor
12				
		20		BROWN AND GRAY MOTTLED CLAYEY SILT (ML) soft, wet bottom of boring at 19.5 ft

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring S8-2
Gerber Products Company
Oakland, California

PLATE
A-2

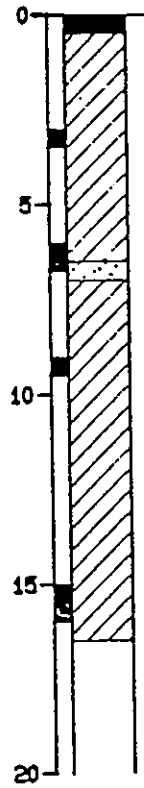
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459.001.02	JDS	11/89	

15922

Equipment 6" Hollow Stem Auger

Elevation 19.2 ft Date 8/3/89

Blows/Ft	OVA (ppm)	Depth (ft)	Sample
		0	
19	400		
		5	
35	20		
		10	
26	650		
		15	
36	1		
		20	



4" asphalt

BROWN AND GRAY GRAVELLY SANDY CLAY (CL)

becoming black silty clay, stiff, moist, minor 1/4" diameter gravel

GRAY SAND (SP) loose, moist, predominantly fine-grained

GRAY SANDY CLAY (CL) stiff, moist, predominantly fine-grained sand

becoming gray and brown mottled silty clay

bottom of boring at 16.5 ft

PLATE

A-3

Harding Lawson Associates
Engineering and Environmental Services

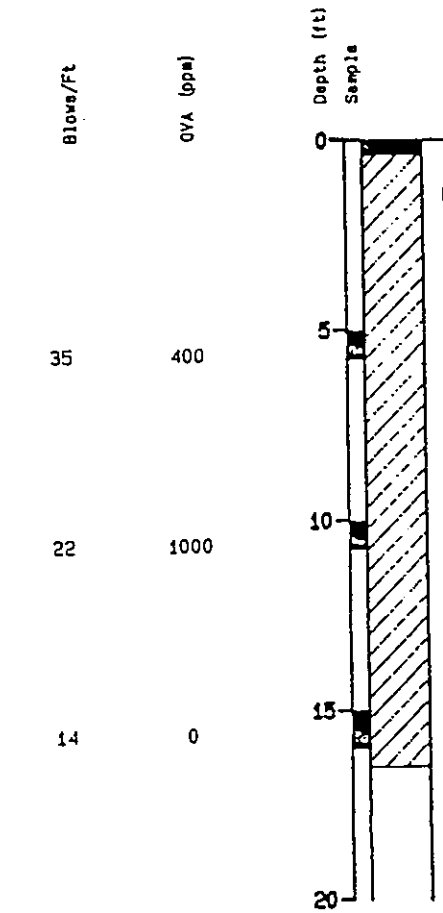
Log of Boring SB-3
Gerber Products Company
Oakland, California

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459.001.02	JDS	11/89	

15923

Equipment 6" Hollow Stem Auger

Elevation 19.2 ft Date 8/3/89



PLATE

A-4

Harding Lawson Associates
Engineering and Environmental Services

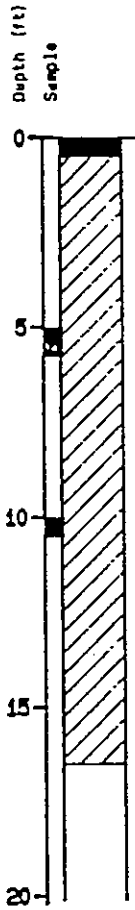
Log of Boring SB-4
Gerber Products Company
Oakland, California

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459.001.02	JPS	11/89	

15924

Equipment: 6" Hollow Stem Auger

Elevation 19.2 ft Date 8/3/89



Blows/Ft	OVA (ppm)	
		4" asphalt BLACK SANDY CLAY (CL) loose, moist
30	200	color change to gray, 20% fine- to medium-grained sand
22	400	becoming wet, 10% fine-grained sand, strong hydrocarbon odor
20	0	medium stiff, wet, no hydrocarbon odor
		bottom of boring at 16.5 ft

PLATE

A-5

Harding Lawson Associates
Engineering and Environmental Services

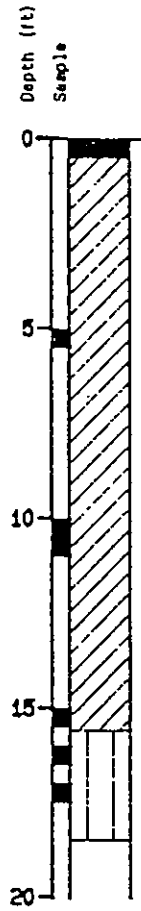
Log of Boring SB-5
Gerber Products Company
Oakland, California

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459.001.02	JPS	11/89	

15925

Equipment 6" Hollow Stem Auger

Elevation 19.2 ft Date 10/5/89



Blows/Ft	OVA (ppm)	
		4" asphalt
		BROWN SANDY CLAY (CL) loose to firm, moist, fine- to medium-grained sand
30	2	decrease in sand color change to dark brown, medium stiff to stiff, moist, trace silt
	110	becoming wet
16	300	color change to gray green and brown mottled, medium stiff, wet to saturated, strong hydrocarbon odor
12	15	
13	0	BROWN CLAYEY SILT (ML) stiff, wet, no hydrocarbon odor
	0	bottom of boring at 18.5 ft

Harding Lawson Associates
Engineering and Environmental Services

Log of Boring SB-6
Gerber Products Company
Oakland, California

PLATE
A-6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
	19459.001.02	JDS	11/89	

EXPLORATION DRILL HOLE LOG

HOLE No. DH-8

PROJECT GERBER PRODUCTS | DATE 04/18/87 | LOGGED BY DLS

DRILL RIG CME 55 | HOLE DIA. 8" | SAMPLER Modified California

GROUNDWATER DEPTH INITIAL | FINAL | HOLE ELEV. __

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN.(tsf)	TORVANE(tsf)		LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN(%)	UNCONFINED SHEAR STRENGTH(psf)
2" concrete.													
CLAY/GRAVEL, orange, damp, stiff, medium dense, sandy.	CL/GC	1											
		2											
		3											
		4	X	10									
			X										
		5											
		6	X	15									
			X										
green clay - smells like gas.		7											
		8											
CLAY, brown-gray, mottled, damp, stiff, silty - gas odor.		9											
		10											
		11	X	14									
			X										
Bottom of Drillhole @ 10.5'. No Ground Water Encountered.		12											
		13											
		14											
		15											
		16											
		17											
		18											
		19											
		20											

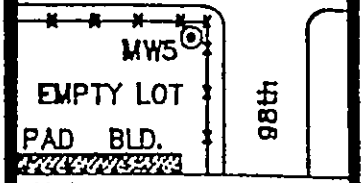
GROUNDWATER TECHNOLOGY, INC.

Monitoring Well 5

Drilling Log

Project GERBER/OAKLAND Owner GERBER PRODUCTS
Location OAKLAND, CALIFORNIA Project Number 203-799-5049
Date Drilled 5/18/88 Total Depth of Hole 20 FT Diameter 7.5 IN
Surface Elevation Water Level Initial 9 FT 24-hour
Screen: Dia. 2 IN Length 13 FT Slot Size 0.020 IN
Casing: Dia. 2 IN Length 7 FT Type PVC
Drilling Company KYLHAUG Drilling Method HOLLOW STEM AUGER
Driller CHRIS PRUNER Log by BRUCE EPPLER
Geologist / Engineer License No.

Sketch Map



Notes:

Depth (ft)	Well Construction	PID (ppm)	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0				CL	4 inches of asphalt over 6 inches base course Dark brown–black clay (Medium stiff, moist, no product odor, organic rich)
2					
4					
6		0	A 8 9 17	SC	Dark brown clay with minor fine grained sands (Stiff, no product odor)
8		3		CL	(Grades blue–grey) ▼ Encountered water 5/18/88 (1020 hours)
10		0	B 5 4 5	CL	Blue–grey mottled clay (Wet, product odor, stiff)
12					
14					
16		180	C 3 3 6	SC	Blue–grey sandy clay (Wet, stiff, no product odor)
18					(Grades tan–brown silty clay)
20		0	D 8 50	CL	Tan–brown silty clay (No product odor, wet, medium stiff) End of boring, installed monitoring well (1045 hours)
22					
24					

8/88 REV. 0

GROUNDWATER TECHNOLOGY, INC.

Monitoring Well 6

Drilling Log

Project GERBER/OAKLAND Owner GERBER PRODUCTS
Location OAKLAND, CALIFORNIA Project Number 203-799-5049
Date Drilled 5/18/88 Total Depth of Hole 20 FT Diameter 7.5 IN
Surface Elevation ____ Water Level Initial 9 FT 24-hour ____
Screen: Dia. 2 IN Length 7 FT Slot Size 0.020 IN
Casing: Dia. 2 IN Length 13 FT Type PVC
Drilling Company KVILHAUG Drilling Method HOLLOW STEM AUGER
Driller CHRIS PRUNER Log by BRUCE EPPLER
Geologist / Engineer ____ License No. ____

Sketch Map
SAN LEANDRO
EMPTY LOT
MW6
98th
Notes:

Depth (ft)	Well Construction	PID	Sample	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					4 inches of asphalt over 6 inches base course
2				CL	Dark brown-black clay (Moist, very stiff, no product odor)
4					
6		0	A 3,7,9	CL	Dark brown clay (Moist, stiff, no product odor)
8					(Grades blue-grey clay 7 feet)
10		300	B 5,6,9	CL	▼ Encountered water 5/18/88 (1140 hours) (Grades brown) Brown-grey mottled silty clay (Strong product odor, wet, medium stiff)
12					
14					
16			C 7,7,9	SC	Tan-grey mottled silty sandy clay with minor gravel (No product odor, wet, stiff) (Grades tan)
18					
20			D 3,7,5	CL	Tan silty clay (Wet, medium stiff, no product odor) End of boring, installed monitoring well
22					
24					

8/88 REV. 0

GROUNDWATER TECHNOLOGY, INC.

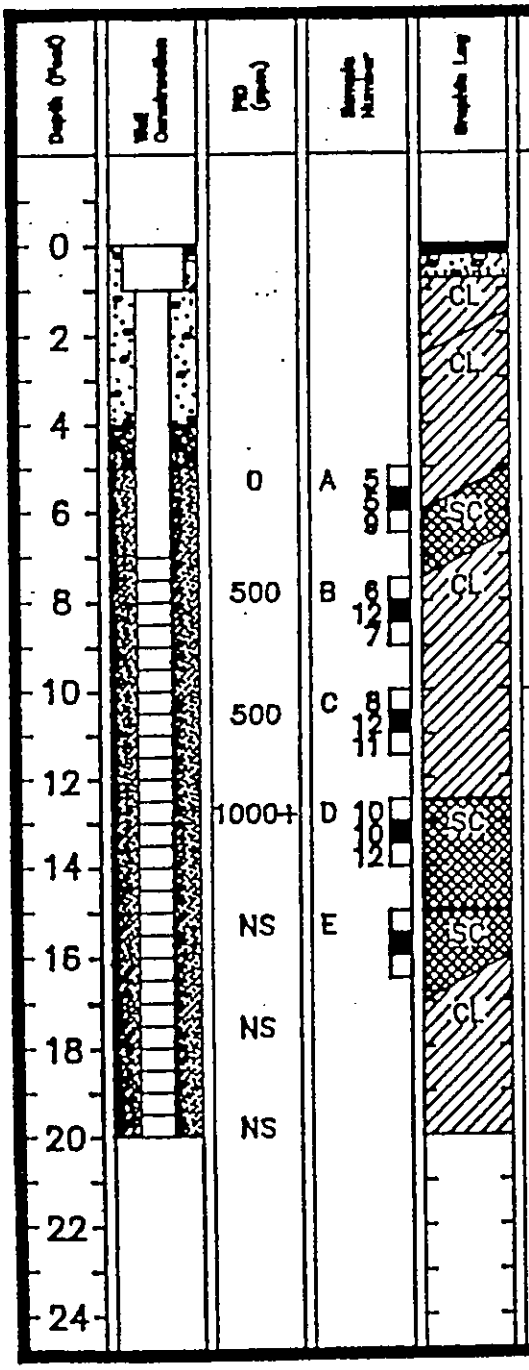
Monitoring Well 8

Drilling Log

Project GERBER/OAKLAND Owner GERBER PRODUCTS
Location OAKLAND, CALIFORNIA Project Number 203-799-5049
Date Drilled 5/19/88 Total Depth of Hole 20 FT Diameter 7.5 IN
Surface Elevation Water Level Initial 9 FT 24-hour
Screen: Dia. 2 IN Length 13 FT Slot Size 0.020 IN
Casing: Dia. 2 IN Length 7 FT Type PVC
Drilling Company KVILHAUG Drilling Method HSA
Driller CHRIS PRUNER Log by BRUCE EPPLER
Geologist / Engineer License No.

Sketch Map

Notes:



Description/Soil Classification
(Color, Texture, Structures)

4 inches of asphalt over 8 inches base course

Tan silty clay
(Moist, no product odor)
(Grades dark brown-black clay)

(Grades sandy gravelly)

7' color change to blue-grey
(Grades tan-grey mottled silty clay)
(Moist, strong product odor, very stiff)

▼ Encountered water 5/19/88 (1039 hours)
(Grades with strong product odor)

Tan-grey mottled sandy gravelly clay
(Very strong product odor, wet, medium dense)

Tan-grey mottled silty fine sandy clay
(Wet rootlets)
(Grades clayey)

End of boring, installed monitoring well (1100 hours)

6/88 REV. 0

CAMBRIA

Attachment D

Gettler-Ryan 2001 Risk Management Plan

1.0 INTRODUCTION

A corrective action evaluation was done for the site of the Former Chevron Service Station #9-1723 located at 9757 San Leandro Street, Oakland, California. The evaluation was completed on behalf of Chevron Products Company by Chevron Research and Technology Company (CRTC), presented in a document titled *Risk-Based Corrective Action (RBCA) Summary Report, Tier 2 RBCA Evaluation,* and by Cambria Environmental Technology, Inc., presented in a document titled *Tier 2 RBCA Analysis and Closure Request.* Copies of theses documents are included in Appendix A.

This document provides the Risk Management Plan (RMP) for the site as well as an example health and safety plan. In Section 2, the compounds of concern (COCs), risk, and sources of risk are summarized. In Section 3, risk management measures are developed. The RBCA evaluation that serves as a basis for this work is given in Appendix A, and figures showing the site location and relevant site features are provided in Appendix B. Appendix C contains the example health and safety plan.

2.0 RISK SUMMARY

2.1 Data

Data considered in preparing this RMP were summarized by Delta Environmental Consultants, Inc./Network Associate Gettler-Ryan Inc. (GR) from CRTC's document titled *RBCA Summary Report, Tier 2 RBCA Site Evaluation* and Cambria Environmental Technology, Inc.'s *Tier 2 RBCA Analysis and Closure Request.* Figures showing the hydrocarbon-affected areas are provided in Appendix B. Observations regarding the data are listed below.

- The highest hydrocarbon concentrations detected in soil samples were 1,800 parts per million (ppm) of TPHg and 99 ppm of benzene. These samples were collected in the vicinity of the former underground storage tanks (USTs), which have been removed. The vertical and lateral extent of hydrocarbons in unsaturated soil has been well defined by the soil borings drilled around the former UST pit and across the site. Therefore, hydrocarbon impact to soil has been adequately delineated.

- Impacted soil remains in the unsaturated soil (0 to 5 feet bgs) in the vicinity of the USTs and dispenser islands. TPHg concentrations up to 880 ppm and benzene concentrations up to 47 ppm have been detected in soil samples collected at approximately 5 feet bgs. While natural processes have undoubtedly reduced these concentrations, some level of hydrocarbons likely remain in these areas.

- Soil vapor samples were collected from six vapor borings in 1997. Benzene was detected in all soil vapor samples collected from borings SV-1 through SV-6. Borings SV-5 and SV-6 were advanced adjacent to borings SV-1 and SV-2. The highest benzene concentration reported was 100,000 parts per billion by volume (ppbv) in the soil vapor sample collected at five feet below ground surface (bgs) from boring SV-5. However, the benzene soil vapor concentration at 5 feet bgs from adjacent boring SV-1 was 410 ppbv, and the benzene concentrations in two samples collected at 3 feet bgs from boring SV-1 were 96 an94 ppbv. Therefore, the sample collected from boring SV-5 appears to be anomalous. Borings S-1, SV-2, SV-5 and SV-6 were advanced in the locations of the former USTs.

- Groundwater has been gauged and analyzed quarterly since November 1993. Total Petroleum Hydrocarbons as gasoline (TPHg) and benzene have been detected in site wells in steadily decreasing concentrations over this time, indicating a stable and decreasing plume.

- In May 1996, Fluor Daniel GTI conducted a survey of water wells immediately southwest of the site. Two wells, P2 and P3, were identified within 250 feet downgradient (west) of the site. Both were identified as being used for industrial purposes. With the exception of one suspect detection, no hydrocarbons have been detected in off-site monitoring wells MW-9 since its installation in November 1993. Well MW-9 is located about 200 feet downgradient of the source area (former USTs) in the vicinity of well P-2.

- Hydrocarbons have been detected in off-site monitoring well MW-2 and site perimeter monitoring well MW-6, which is also located downgradient of the site. However, TPHg and benzene concentrations have been less than 400 and 20 ppb, respectively. Based on these data and the deep screen interval of the industrial supply well, it is not likely that an off-site water supply well would have been impacted by the hydrocarbons beneath the site. While hydrocarbons have generally detected at low concentrations in wells MW-2, MW-5, MW-6, MW-8 and MW-9, the trend has been a decreasing one.

2.2 Risk Summary

Risks at the site were evaluated by Chevron using Groundwater Services, Inc.'s RBCA Spreadsheet (version 1.0), based on American Society for Testing and Materials (ASTM) Standard E1739 for Risk-Based Corrective Action at Petroleum Release Sites (Appendix C). Risks identified by this evaluation are summarized:

- The RBCA evaluation performed by CRTC indicate that BTEX compounds in groundwater beneath the site do not pose a significant risk to occupants of an on-site building.

- Historical BTEX concentrations in soil exceeded the SSTL calculated by CRTC's analysis. However, soil vapor data collected at the site in October 1997 by Cambria indicated that benzene volatilization from groundwater to indoor air, intrusion of benzene to soil vapor to outdoor air, and intrusion of benzene in soil vapor to indoor air indicated that site-specific source concentrations are less than the SSTL.

- Based on information available in March 1997, CRTC's analysis indicated no complete human or ecological exposure pathways.

Possible scenarios associated with public health and safety concerns include:

- Construction workers engaged in subsurface piping at the site could be exposed to hydrocarbon-impacted soil or groundwater if excavations intersect the water table;
- Construction dewatering could take place at or near the site. Untreated groundwater could be inadvertently discharged to the street;
- A groundwater extraction well could be installed for the purpose of providing an irrigation supply. Residents at the site could be exposed to untreated groundwater, or the irrigation well could act as a conduit to a deeper groundwater supplies;
- Impacted soil excavated from the site as a result of construction activities could be used as fill for landscaping. Workers and residents could be exposed to the soil and/or vapor from soil containing impacted groundwater;
- If construction excavations are deep enough to intersect either impacted unsaturated soil or the water table, atmospheric conditions, such as pressure and temperature, could create a situation where vapor phase hydrocarbons accumulate at the bottom of a trench or excavation. Workers might then be exposed to vapor phase hydrocarbons, or the mixture of air and vapor phase hydrocarbons could reach the lower explosive limit, and an ignition source could cause a fire or explosion.

Several factors suggest that the scenarios listed above have a low probability of taking place; nevertheless, the least probable event must be considered in the effort to protect public health and safety.

3.0 RISK MANAGEMENT

In the previous section, data were reviewed, risks were summarized, and possible public health and safety scenarios were identified. Risk management concerns controlling the identified risks, to the extent that all possible risks were identified. Although petroleum hydrocarbon impact at the site is characterized according to specific source areas, there is a chance that records identifying the locations of source areas may be lost or misplaced. As such, risk management measures should apply to the entire site. Below, risk management measures are recommended along with justification for each measure.

1. The appropriate agency (ACEHS, City of Oakland Emergency Services, or the City of Oakland Permit Tracking System) shall be notified before any general construction takes place at the site where soil and/or groundwater might be handled. This measure will assure that aspects of any construction project for the site are reviewed in light of the fact that residual hydrocarbons have been left in-place at the site.

2. The appropriate agency shall be consulted for approval regarding uses or disposal of soils from the site. This measure is meant to place controls on the use or disposal of soils from the site that may contain petroleum hydrocarbons.

3. The appropriate agency shall be consulted for approval regarding construction dewatering at the site. The purpose of this measure is to assure extracted groundwater is handled properly given the potential that it may be impacted with petroleum hydrocarbons.

4. Groundwater from beneath the site shall not be used for any purpose unless approved by the appropriate agency. This measure will assure that any proposed uses are reviewed by the appropriate regulating authority.

5. Wells shall not be installed at the site unless approved by the appropriate agency. The purpose of this measure is to mitigate the possibility that vertical conduits to deeper groundwater sources are introduced at the site.

6. If the site is redeveloped, the appropriate agency will be notified if contamination is encountered. If redevelopment includes construction of residential property, the future owners or residents will be notified of the contamination encountered.

7. If necessary, dust control measure shall be used during grading or excavation activities at the site. A contingency plan for such measures shall be included in site development plans reviewed by the appropriate agency.

8. The atmosphere in trenches and/or excavations at the site deeper than 2 feet below grade surface shall be monitored using a flame ionization or photo-ionization detector before manual work in the trenches and/or excavation begins. This activity shall happen each day work is to take place in trenches and/or excavations. Monitoring shall occur once in the morning and once in the afternoon, and records shall be kept. Conditions under which work shall stop and mitigation measure take place shall be considered in the site health and safety plan (see Appendix C for example). This measure is meant to protect workers from inhalation risk.

9. The atmosphere in trenches and/or excavations at the site deeper than 2 feet below grade surface shall be monitored for an explosive atmosphere each day work is to take place in trenches and/or excavations. Monitoring shall occur in the morning prior to beginning work and at other times when conditions might be conducive to the formation of explosive atmospheres (e.g. hot afternoons on sunny days). Monitoring records shall be kept. Mitigation measures shall take place (e.g.; ventilate trenches and/or excavation) if it is noted that an explosive atmosphere exists. A contingency plan for such measures shall be included in site development plans reviewed by the appropriate agency. The purpose of this measure is to mitigate the potential for fire/explosion.

10. Records for the site, including investigative reports and the attached RBCA analyses, shall be kept on file with the appropriate agency. Proper documentation can help all parties control potential risks associated with the site.

4.0 LIMITATIONS

Evaluations of the geological conditions at the site that serve as a basis for this RMP are inherently limited due to the limited number of observation points. There may be variations in subsurface conditions in areas away from the sample points. There are no representations, warranties, or guarantees that the points selected for sampling are representative of the entire site. The recommendations provided herein reflect the sample conditions at specific locations at a specific point in time. No other interpretations, representations, warranties, guarantees, express or implied, are included or intended in this RMP. Additional work, including further subsurface investigation, might reduce the inherent uncertainties associated with this RMP.

SITE HEALTH AND SAFETY PLAN

Former Chevron Service Station #9-1723
9757 San Leandro Avenue
Oakland, California

Prepared for:

_____
_____
_____

Date: _____

1.0 INTRODUCTION

A. Overview

The contractor is providing this site safety plan in order to address various health and safety issues regarding work at the site and to disseminate information about the contractor's health and safety goals, procedures, and policies.

B. Scope of Work

This Site Health and Safety Plan was created for field work being performed at the Former Chevron Service Station #9-1723, 9757 San Leandro Avenue, Oakland, California. The scope of the investigation includes: (1) soil excavation, (2) soil, groundwater, and concrete disposal, and (3) excavation backfill and surfacing.

Subcontractors will be utilized to perform the work associated soil excavation; soil, groundwater, and concrete disposal; and excavation backfilling. Entry into site excavations by site personnel will be expressly prohibited.

C. Site Description

The subject property is located on the southern corner of the intersection of Central and Park Avenues in Alameda, California. A multi-story hotel and office building currently occupy the site.

A. Inhalation Hazards

Contaminants that have been documented to occur in groundwater at the site include gasoline. Site specific hazard indentification with regards to the inhalation of these contaminanants are discussed below.

Gasoline

Gasoline is a clear liquid with a characteristic odor. Inhalation or absorption of gasoline can cause irritation of the eyes, skin, and mucous membranes, dermatitis, headache, fatigue, slurred speech, confusion, and convulsions.

The California Occupational Safety and Health Administration (Cal-OSHA) Permissible Exposure Limit (PEL) (the maximum permitted 8-hour time-weighted average concentration of an airborne contaminant) for gasoline is 300 parts per million (ppm). The Short Term Exposure Limit (STEL) (the maximum permitted 15 minute time weighted exposure) for gasoline is 500 ppm.

Benzene

Benzene is a colorless to light-yellow liquid with an aromatic odor. Inhalation or absorption of benzene can cause irritation of the eyes, skin, nose and respiratory system. Prolonged exposure can cause giddiness, headache, nausea, staggered gait, and fatigue.

The Cal-OSHA PEL for benzene is 1 ppm; the STEL for benzene is 5 ppm.

Toluene

Toluene is a colorless liquid with a sweet, pungent odor. Inhalation or absorption of toluene can cause irritation to the eyes and nose, fatigue, weakness, dizziness, headache, dermatitis, liver, and kidney damage.

The Cal-OSHA PEL for toluene is 100 ppm; the STEL for toluene is 150 ppm. The ceiling limit (The maximum concentration of an airborne contaminant to which an employee may be exposed at any time) for toluene is 500 ppm.

Ethylbenzene

Ethylbenzene is a colorless liquid with an aromatic odor. Inhalation or absorption of ethylbenzene can cause irritation to the eyes, skin, mucous membranes, headache, dermatitis, narcosis, and coma.

The Cal-OSHA PEL for ethylbenzene is 100 ppm; the STEL for ethylbenzene is 125 ppm.

4.0 RISK ASSESSMENT SUMMARY

It is anticipated that there will be no significant or major potential source of exposures due to the scope of work to be performed on this project. An analyses of site specific hazards with respect to chemical and physical hazards are discussed below.

In general, the principal routes of exposure on any site include inhalation, absorption, dermal contact, and ingestion. With respect to the scope of work to be performed, the potential routes of exposure include inhalation, absorption, and dermal contact. General safe work practices should adequately address the potential for exposure via absorption or dermal contact.

The potential for exposure due to inhalation would probably originate from airborne vapors, gas, or dusts. Due to the nature of this project, it is necessary to perform excavation activities at the site. Dust suppression measures may be required if it is deemed that airborne materials pose a hazard. These measures will include slowing the pace of work to minimize agitation of possible airborne materials and water saturation to minimize airborne materials.

With respect to direct contact, personal protective equipment such as gloves, eye protection, and skin protection will provide protection from potential exposure. Further, the amount of direct contact with potential contaminants, other than airborne dusts, will be limited.

Should respiratory irritation occur, appropriate air-purifying respiratory protective devices will be worn, with organic vapor cartridges and dust pre-filters, or with high efficiency organic vapor/HEPA stack-type cartridge. Typically, the cartridge will require replacement daily. Should direct contact occur in excess of what is anticipated through sample preservation procedures, appropriate protective clothing will be worn.

Physical hazards on-site have been identified as hazards associated with soil and groundwater sampling, soil excavation, and soil disposal activities; fire and explosion due to the presence of petroleum hydrocarbons; and general safety hazards

6.0 PERSONAL PROTECTIVE EQUIPMENT

A. Introduction

It is important that personal protective equipment and safety requirements be appropriate to protect against the potential hazards at the site. Protective equipment will be selected based on the contaminant type(s), concentration(s), and route of entry. In situations where the type of materials and possibilities of contact are unknown or the hazards are not clearly identifiable, a more subjective determination must be made of the personal protective equipment.

A minimum of modified Level D Safety equipment and clothing will be required for all workers and visitors on the site. All personnel must be prepared to step up to higher levels of protective equipment as conditions warrant.

B. Levels of Protection

The basic required work uniform for the site is modified Level D protection which will include :

- hard hat
- steel toed boots
- safety glasses
- polyvinyl gloves for handling soil or liquid samples
- neoprene over gloves for handling augers or other contaminated items

If Level C protection is deemed necessary by the Site Safety Officer based on field conditions, the protective equipment will include:

- modified Level D equipment including gloves and polycoated Tyvek coveralls
- respiratory protection which may include half face respirator with organic vapor cartridges depending on respiratory action levels listed above

The necessity for Level A or Level B protection is not expected to be encountered on this site. If site conditions indicate that Level C protection is inadequate, all site activities are to be ceased pending further review by the Company Safety Officer and the Contractor Senior Management.

8.0 DECONTAMINATION PROCEDURES

As part of the system to prevent or reduce the physical transfer of contaminants by people and/or equipment from on-site, procedures will be instituted for decontaminating anything leaving the Exclusion Area and Contamination Reduction Areas. These procedures include the decontamination of personnel, protective equipment, monitoring equipment, clean-up equipment, etc. In cases where the Contamination Reduction Zone is not directly adjacent to the Exclusion Area, gross decontamination will occur in the Exclusion Area, followed by more detailed cleaning in the Contaminant Reduction Area. This gross decontamination will be performed to the extent necessary to keep contaminants from spreading to other "clean" areas of the site. In general, decontamination at the site consists of rinsing equipment, personnel, etc., with copious amounts of water and washing with detergent water solutions. The spent solution, brushes, sponges, containers, stands, etc., used in the decontamination process must be properly disposed.

- Field operations personnel shall be cautioned to inform each other of non-visual effects of the presence of toxics, such as: headaches, dizziness, or nausea.

- On-site personnel shall be aware of symptoms related to heat and cold stress.

11.0 EMERGENCY PROCEDURES

A. Site Emergency Warnings

Several warning systems may be utilized depending on the work site conditions or emergency involved:

1. Verbal Communications

2. Vehicle Horns

Verbal instructions between crew members are typically adequate to communicate steps that are required in emergency situations. In cases where parts of the crew are distant from the center of activity, vehicle horns may be necessary to indicate site emergencies. This type of communication needs to be followed by verbal instructions on necessary emergency actions.

In cases where a field worker is alone, verbal communication with the company safety officer should be established upon arrival to and exit from the site. The field worker should also present any other field personnel with the Contractor's telephone number and address. Location of the nearest telephone should be within reasonable distance of the field worker. The Contractor will provide the field worker with a field phone if the nearest telephone is not readily available.

B. Emergency Equipment

The following equipment comprises the basic elements for emergency preparedness. All or some of these items will be available at the work site:

1. Fire extinguishers - dry chemical

2. First aid kits

C. General Emergency Procedures

In case of an emergency or hazardous situation, the person that observes this condition shall immediately sound the alarm.

1. Upon hearing an alarm, all non-emergency communications will cease and the person giving the alarm will proceed to give the Project Safety Officer all pertinent information.

2. Power equipment will be shut down and operators will stand by for instruction.

3. Injured personnel will be transported outside of the Exclusion Zone (if possible).

4 The Contractor's office will be notified immediately.

5. In case of a fire, explosion, or hazard alarm, personnel will immediately proceed to assigned pre-arranged safe locations.

EMERGENCY CONTACT LISTING

Nature of Emergency	Phone Number
Ambulance	911
Fire	911
Police	911
Poison Control Center	(900) 662-9886
Office of Emergency Services	(510) 646-5908
Chemical Spills	(800) 852-7550
Hospital	(510) 522-3700
The Contractor	( ) ___-____

13.0 MEDICAL SURVEILLANCE

The Contractor personnel and sub-contractors engaged in project operations shall be participants in the Medical Surveillance program, and must be cleared by the examining physician(s) to wear protection devices and protective clothing for working with hazardous materials. The applicable requirements under CCR, Title 8, General Industry Safety Orders, Sections 5192 and 29 CFR 1910 will be observed.

A. Examination Requirements

All Contractor personnel on-site shall have successfully completed a pre-placement or periodic medical examination in accordance with established Contractor policies and procedures, and consistent with the provisions of the OSHA standards. This examination shall include a complete medical and occupational history, physical examination, and selected biological sampling. Laboratory studies include a complete blood count (CBC), urinalysis, chemistry panel (SMAC), pulmonary function (FEV and FVC), chest X-ray, audiometry, and vision screening.

CAMBRIA

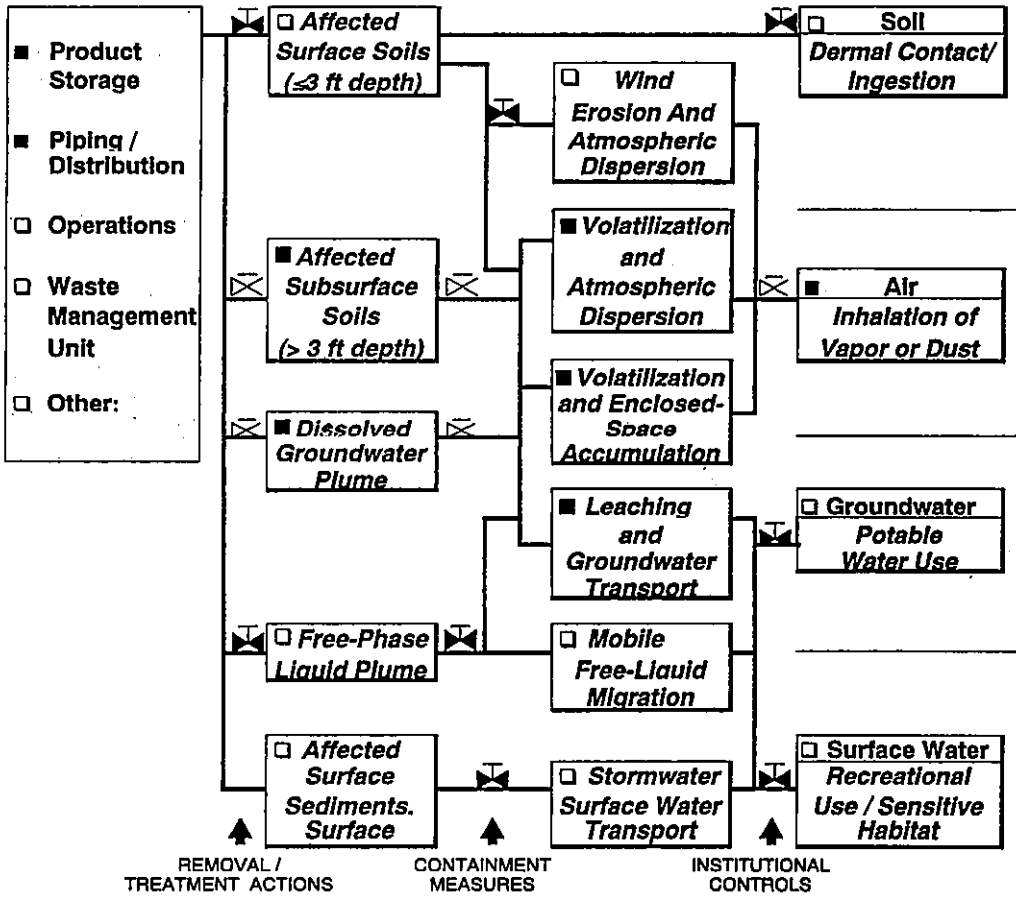
Attachment E

Delta RBCA Summary Report

Site Name: Former Chevron Service Station No. 9-1723 — Date Completed: September 5, 2001
Site Location: 9757 San Leandro Street, Oakland, CA — Completed By: Jed A. Douglas

EXPOSURE CONTROL FLOWCHART

Instructions: *Identify remedial measures to be implemented to prevent exposure, as follows:* • *Step 1 – Baseline Exposure: Identify applicable sources, transport mechanisms, and receptors as shown on Worksheet 4.2 (■ = applicable to site).* • *Step 2 – Remedial Measures: Fill in shut-off valves (⋈) to indicate removal / treatment action, containment measure, or institutional controls to be used to "shut off" exposure pathway.* • *Step 3 – Remedial Technology Options: For each complete pathway, identify category of corrective measure to be applied and list possible technology options in space provided (see options list in RBCA Guidance Manual).*



Exposed Receptors

On-Site:	□ Residential	□ Non-Resid.	□ N/A	
	□ Sensitive	□ Recreation		
	Habitat			
Off-Site:	□ Residential	□ Non-Resid.	□ N/A	
	□ Sensitive	□ Recreation		
	Habitat			

□ Complete Pathway: ○ Current ● Potential
⋈ Action Required: □Yes ■ No
If yes, list technology options for ⋈
A HEALTH BAND SAFETY PLAN SHOULD BE PREPARED FOR SOIL REMOVAL > 4 FEET

Exposed Persons

On-Site:	□Residential	■ Non-Resid.	□ N/A
Off-Site:	□Residential	□ Non-Resid.	■ N/A

■ Complete Pathway: ○ Current ● Potential
⋈ Action Required: □Yes ■ No
If yes, list technology options for ⋈

Groundwater Users

On-Site:	□Residential	■ Non-Resid.	□ N/A
Off-Site:	□Residential	□ Non-Resid.	□ N/A

□ Complete Pathway: ○ Current ○ Potential
⋈ Action Required: □Yes ■ No
If yes, list technology options for ⋈

Surface Water Users

On-Site:	□ Residential	□ Non-Resid.	□ N/A
	□ Sensitive	□ Recreation	
	Habitat		
Off-Site:	□ Residential	□ Non-Resid.	□ N/A
	□ Sensitive	□ Recreation	
	Habitat		

□ Complete Pathway: ○ Current ○ Potential
⋈ Action Required: □Yes □ No
If yes, list technology options for ⋈

(■ OR ● OR ⋈ TO SELECT)

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.3

Site Name: Former Chevron 9-1723
Site Location: 9757 San Leandro Blvd., Oakland

Completed By: J. Douglas
Date Completed: 10/11/2001

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	9.2E-10	1.0E-6	1.2E-9	N/A	☐	1.3E-5	1.0E+0	2.5E-5	N/A	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	6.3E-7	1.0E-6	8.1E-7	N/A	☐	8.6E-3	1.0E+0	1.7E-2	N/A	☐
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	6.3E-7	1.0E-6	8.1E-7	N/A	☐	8.6E-3	1.0E+0	1.7E-2	N/A	☐

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Former Chevron 9-1723 Job Identification: DG91723B.3C01 Software: GSI RBCA Spreadsheet
Site Location: 9757 San Leandro Blvd., Oakl Date Completed: 10/11/01 Version: 1.0.1
Completed By: J. Douglas

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	TRUE	FALSE	
GW.v	Volatilization from Groundwater	TRUE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	TRUE
Groundwater Pathways:				
GW.I	Groundwater Ingestion	FALSE	FALSE	
S.I	Leaching to Groundwater from all Soils	FALSE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		TRUE		TRUE
S	Inhalation receptor (cm)		TRUE		TRUE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	1	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	***1.7E+06***	
W	Length of affect. soil parallel to wind (cm)	***1.5E+03***	
W.gw	Length of affect. soil parallel to groundwater (cm)	***1.2E+03***	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)		
Pe	Particulate areal emission rate (g/cm^2/s)		

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	***4.6E+02***
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw.tr	Groundwater seepage velocity (cm/yr)	6.6E+03
Ks	Saturated hydraulic conductivity(cm/s)	
grad	Groundwater gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***2.6E+01***		
hv	Vadose zone thickness (cm)	***2.5E+02***		
rho	Soil density (g/cm^3)	1.7		
foc	Fraction of organic carbon in vadose zone	***0.001***		
phi	Soil porosity in vadose zone	***0.38***		
Lgw	Depth to groundwater (cm)	***2.8E+02***		
Ls	Depth to top of affected subsurface soil (cm)	***1.5E+02***		
Lsubs	Thickness of affected subsurface soils (cm)	***1.3E+02***		
pH	Soil/groundwater pH	***6.8***		
		capillary	vadose	foundation
phi.w	Volumetric water content	***0.35***	0.34	0.12
phi.a	Volumetric air content	***0.01***	***0.02***	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	***0.001***	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Oakland Completed By: J. Douglas Date Completed: 10/11/2001

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ☒ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS: VAPOR AND DUST INHALATION Constituents of Concern	Exposure Concentration 1) Source Medium Surface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day)		5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	
Benzene	0.0E+0								
Benzene-CAL	0.0E+0								
Ethylbenzene	0.0E+0								
Methyl t-Butyl Ether	0.0E+0								
Toluene	0.0E+0								
Xylene (mixed isomers)	0.0E+0								

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Oakland Completed By: J. Douglas Date Completed: 10/11/2001

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: VAPOR INHALATION Constituents of Concern	Exposure Concentration 1) Source Medium Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor On-Site Residential		3) Exposure Medium Outdoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential	
Benzene	3.0E-2	4.0E+5		7.4E-8		1.2E-1		8.7E-9	
Benzene-CAL	3.0E-2	4.0E+5		7.4E-8		1.2E-1		8.7E-9	
Ethylbenzene	2.0E-2	6.1E+5		3.3E-8		2.7E-1		9.0E-9	
Methyl t-Butyl Ether	2.6E-2	1.3E+5		2.0E-7		2.7E-1		5.5E-8	
Toluene	1.8E-2	6.4E+5		2.8E-8		2.7E-1		7.8E-9	
Xylene (mixed isomers)	4.7E-2	9.2E+5		5.1E-8		2.7E-1		1.4E-8	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequency (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposue area (cm^2/day)

Site Name: Former Chevron 9-1723 | Site Location: 9757 San Leandro Blvd., Oakl | Completed By: J. Douglas | Date Completed: 10/11/2001 | *3 OF 9*

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4): On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) *(Sum intake values from surface, subsurface & groundwater routes.)*: On-Site Residential	
Benzene	1.4E-2	3.1E+6		4.5E-9		1.2E-1		5.3E-10		9.2E-9	
Benzene-CAL	1.4E-2	3.1E+6		4.5E-9		1.2E-1		5.3E-10		9.2E-9	
Ethylbenzene	5.3E-3	3.8E+6		1.4E-9		2.7E-1		3.8E-10		9.4E-9	
Methyl t-Butyl Ether	8.1E-3	4.1E+5		2.0E-8		2.7E-1		5.4E-9		6.0E-8	
Toluene	1.2E-3	3.5E+6		3.4E-10		2.7E-1		9.4E-11		7.9E-9	
Xylene (mixed isomers)	2.6E-3	3.9E+6		6.8E-10		2.7E-1		1.9E-10		1.4E-8	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Former Chevron 9-1723 | Site Location: 9757 San Leandro Blvd., Oakland | Completed By: J. Douglas | Date Completed: 10/11/2001 | *1 OF 4*

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	CARCINOGENIC RISK: (4) Individual COC Risk (2) x (3) On-Site Residential		TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	TOXIC EFFECTS: (7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene	A	9.2E-9		2.9E-2	2.7E-10		2.1E-8		1.7E-3	1.3E-5	
Benzene-CAL	A	9.2E-9		1.0E-1	9.2E-10		2.1E-8		1.7E-3	1.3E-5	
Ethylbenzene	D						9.4E-9		2.9E-1	3.3E-8	
Methyl t-Butyl Ether							6.0E-8		8.6E-1	7.0E-8	
Toluene	D						7.9E-9		1.1E-1	6.9E-8	
Xylene (mixed isomers)	D						1.4E-8		2.0E+0	7.1E-9	

Total Pathway Carcinogenic Risk = 1.2E-9 | 0.0E+0

Total Pathway Hazard Index = 2.5E-5 | 0.0E+0

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Oakland Completed By: J. Douglas Date Completed: 10/11/2001

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration 1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4): On-Site Residential	
Benzene	3.0E-2	4.5E+2		6.7E-5		8.8E-2		5.9E-6	
Benzene-CAL	3.0E-2	4.5E+2		6.7E-5		8.8E-2		5.9E-6	
Ethylbenzene	2.0E-2	6.4E+2		3.1E-5		2.1E-1		6.4E-6	
Methyl t-Butyl Ether	2.6E-2	6.4E+2		4.0E-5		2.1E-1		8.2E-6	
Toluene	1.8E-2	6.9E+2		2.6E-5		2.1E-1		5.4E-6	
Xylene (mixed isomers)	4.7E-2	9.9E+2		4.8E-5		2.1E-1		9.8E-6	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequency (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: Former Chevron 9-1723 | Site Location: 9757 San Leandro Blvd., Oakl | Completed By: J. Douglas | Date Completed: 10/11/2001 | 5 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration: 1) Source Medium — Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) — Receptor: On-Site Residential		3) Exposure Medium — Indoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4): On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from subsurface & groundwater routes.): On-Site Residential	
Benzene	1.4E-2	3.2E+3		4.4E-6		8.8E-2		3.9E-7		6.3E-6	
Benzene-CAL	1.4E-2	3.2E+3		4.4E-6		8.8E-2		3.9E-7		6.3E-6	
Ethylbenzene	5.3E-3	3.8E+3		1.4E-6		2.1E-1		2.9E-7		6.7E-6	
Methyl t-Butyl Ether	8.1E-3	3.2E+3		2.5E-6		2.1E-1		5.2E-7		8.7E-6	
Toluene	1.2E-3	3.6E+3		3.4E-7		2.1E-1		6.9E-8		5.5E-6	
Xylene (mixed isomers)	2.6E-3	3.9E+3		6.7E-7		2.1E-1		1.4E-7		1.0E-5	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Former Chevron 9-1723 | Site Location: 9757 San Leandro Blvd., Oakland | Completed By: J. Douglas | Date Completed: 10/11/2001 | *2 OF 4*

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS			
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene	A	6.3E-6		2.9E-2	1.8E-7		1.5E-5		1.7E-3	8.6E-3	
Benzene-CAL	A	6.3E-6		1.0E-1	6.3E-7		1.5E-5		1.7E-3	8.6E-3	
Ethylbenzene	D						6.7E-6		2.9E-1	2.3E-5	
Methyl t-Butyl Ether							8.7E-6		8.6E-1	1.0E-5	
Toluene	D						5.5E-6		1.1E-1	4.8E-5	
Xylene (mixed isomers)	D						1.0E-5		2.0E+0	5.0E-6	
		Total Pathway Carcinogenic Risk =			8.1E-7	0.0E+0	***Total Pathway Hazard Index =***			1.7E-2	0.0E+0

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Oakland Completed By: J. Douglas Date Completed: 10/11/2001

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ☑ (CHECKED IF PATHWAY IS ACTIVE)

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION

Constituents of Concern	Exposure Concentration 1) Source Medium: Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor		3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2)		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (L/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) x (4)	
Benzene	3.0E-2								
Benzene-CAL	3.0E-2								
Ethylbenzene	2.0E-2								
Methyl t-Butyl Ether	2.6E-2								
Toluene	1.8E-2								
Xylene (mixed isomers)	4.7E-2								

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body Weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (L/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Oakland Completed By: J. Douglas Date Completed: 10/11/2001 *9 OF 9*

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ☑ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (dim) Receptor		3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2)		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (L/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) x (4)		MAX. PATHWAY INTAKE (mg/kg-day) *(Maximum intake of active pathways soil leaching & groundwater routes.)*	
Benzene	1.4E-2										
Benzene-CAL	1.4E-2										
Ethylbenzene	5.3E-3										
Methyl t-Butyl Ether	8.1E-3										
Toluene	1.2E-3										
Xylene (mixed isomers)	2.6E-3										

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (L/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: Former Chevron 9-1723 | Site Location: 9757 San Leandro Blvd., Oakland | Completed By: J. Douglas | Date Completed: 10/11/2001 | *4 OF 4*

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ☑ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK (2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3)		TOXIC EFFECTS (5) Total Toxicant Intake Rate (mg/kg/day)		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6)	
Benzene	A			2.9E-2							
Benzene-CAL	A			1.0E-1							
Ethylbenzene	D								1.0E-1		
Methyl t-Butyl Ether									5.0E-3		
Toluene	D								2.0E-1		
Xylene (mixed isomers)	D								2.0E+0		
Total Pathway Carcinogenic Risk =					0.0E+0	0.0E+0	***Total Pathway Hazard Index =***			0.0E+0	0.0E+0

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration in Groundwater value (mg/L)	note	in Surface Soil value (mg/kg)	note	in Subsurface Soil value (mg/kg)	note
Benzene	1.4E-2	UCL			3.0E-2	UCL
Benzene-CAL	1.4E-2	UCL			3.0E-2	UCL
Ethylbenzene	5.3E-3	UCL			2.0E-2	UCL
Methyl t-Butyl Ether	8.1E-3	UCL			2.6E-2	UCL
Toluene	1.2E-3	UCL			1.8E-2	UCL
Xylene (mixed isomers)	2.6E-3	UCL			4.7E-2	UCL

Site Name: Former Chevron 9-1723
Site Location: 9757 San Leandro Blvd., Oakland

Completed By: J. Douglas
Date Completed: 10/11/2001

RBCA SITE ASSESSMENT | Input Screen 6.3

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene	
Benzene-CAL	
Ethylbenzene	
Methyl t-Butyl Ether	
Toluene	
Xylene (mixed isomers)	

Site Name: Former Chevron 9-1723 Completed By: J. Douglas
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RBCA SITE ASSESSMENT	Input Screen 9.4

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

CONSTITUENT	Dilution Attenuation Factor (DAF) in Groundwater	
	Residential Receptor	Comm./Ind. Receptor
Benzene	1.0E+0	1.0E+0
Benzene-CAL	1.0E+0	1.0E+0
Ethylbenzene	1.0E+0	1.0E+0
Methyl t-Butyl Ether	1.0E+0	1.0E+0
Toluene	1.0E+0	1.0E+0
Xylene (mixed isomers)	1.0E+0	1.0E+0

Site Name: Former Chevron 9-1723
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Date Completed: 10/11/2001

RBCA SITE ASSESSMENT | Input Screen 9.1

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene	720
Benzene-CAL	
Ethylbenzene	228
Methyl t-Butyl Ether	
Toluene	28
Xylene (mixed isomers)	360

Site Name: Former Chevron 9-1723 Completed By: J. Douglas
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RBCA SITE ASSESSMENT

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m^3)
Benzene		
Benzene-CAL		
Ethylbenzene		
Methyl t-Butyl Ether		
Toluene		
Xylene (mixed isomers)		

Site Name: Former Chevron 9-1723
Site Location: 9757 San Leandro Blvd., Oakland

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CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3) mol	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A			
71-43-2	Benzene-CAL	O	78.1		9.30E-02		1.10E-05		1.58		5.29E-03	2.20E-01		9.52E+01		1.75E+03				
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5			
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A			
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29			
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5			

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Completed By: J. Douglas Date Completed: 10/11/2001

Software version: 1.0.1

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Reference Dose (mg/kg/day) Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Slope Factors 1/(mg/kg/day) Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-2	Benzene	-		1.70E-03	R	2.90E-02	A	2.90E-02	A	A	TRUE
71-43-2	Benzene-CAL			1.70E-03		1.00E-01		1.00E-01		A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-		-		D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		-			FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-		-		D	FALSE

Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blv Completed By: J. Douglas Date Completed: 10/11/2001

Software version: 1.0.1

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
71-43-2	Benzene-CAL	5.00E-03		3.20E+00		1	0.5	0.002		0.005		720	720	
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

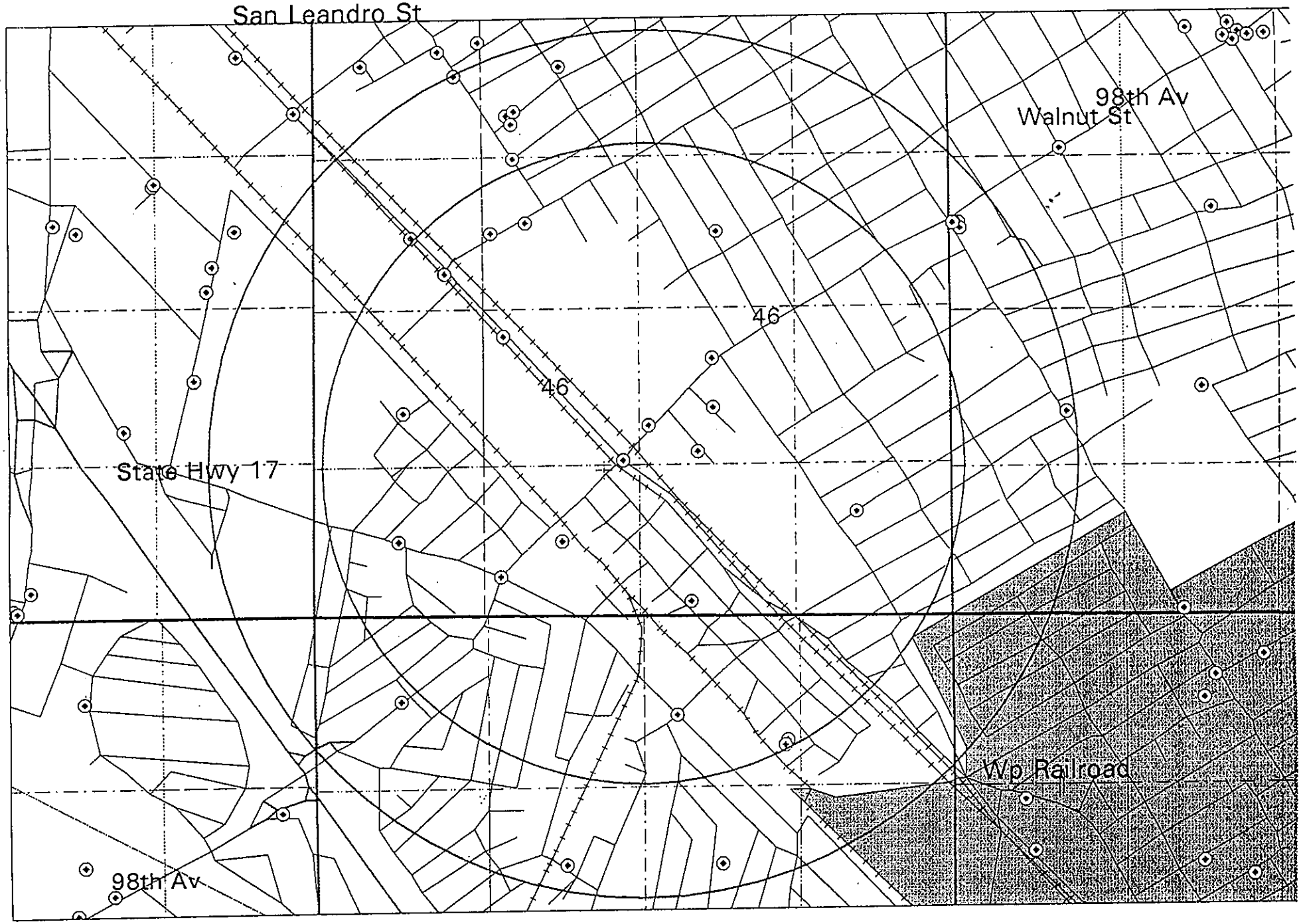
Site Name: Former Chevron 9-1723 Site Location: 9757 San Leandro Blvd., Oakland Completed By: J. Douglas Date Completed: 10/11/2001

Software version: 1.0.1

CAMBRIA

Attachment F

Flour Daniel GTI Well Survey Results


San Leandro St
98th Av
Walnut St
46
46
State Hwy 17
Wp Railroad
98th Av

WELL #	CITY	ADDRESS	OWNER	PHONE	USE	DR.DATE	DIAM	TOT.DEPTH	DTW	ST.ELEV	WA.ELEV	YIELD	LOG	WQ	WL	DATAORGN	MARGIN
2S/3W 22C 2	OAK	910 89 AV.	BARRETT'S METAL FNSH.	0	MON	01/89	2	19	13	0	0	0	G	0	0	L	Yes
2S/3W 22C 3	OAK	910 89 AV.	BARRETT'S METAL FNSH.	0	MON	01/89	2	20	13	0	0	0	G	0	0	L	Yes
2S/3W 22E	OAK	9201 San Leandro Street	Paco Pumps PBMW3	0	BOR	11/92	0	20	0	0	0	0	D	0	0	D	
2S/3W 22E 8	OAK	9201 San Leandro Street	Paco Pumps 9MW1	0	MON	11/92	4	21	10	0	0	0	D	0	0	D	
2S/3W 22E 9	OAK	9201 San Leandro Street	Paco Pumps 9MW2	0	MON	11/92	4	21	10	0	0	0	D	0	0	D	
2S/3W 22E10	OAK	9201 San Leandro Street	Paco Pumps 9MW3	0	MON	11/92	4	21	11	0	0	0	D	0	0	D	
2S/3W 22E11	OAK	9201 San Leandro Street	Paco Pumps 9MW4	0	MON	11/92	4	21	9	0	0	0	D	0	0	D	
2S/3W 22F 2	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	06/88	2	24	13	0	0	0	D	1	0	L	
2S/3W 22F 2	OAK	888 92ND AVE	PUGET SOUND PIPE	0			0	0	0	0	0	0				A	
2S/3W 22F 3	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	06/88	2	25	13	0	0	0	D	1	0	L	
2S/3W 22F 4	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	06/88	2	25	13	0	0	0	D	1	0	L	
2S/3W 22F 5	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	06/88	2	25	13	0	0	0	D	1	0	L	
2S/3W 22F 6	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	6/88	2	25	13	0	0	0	D	0	0	L	
2S/3W 22F 7	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	6/88	2	24	13	0	0	0	D	0	0	L	
2S/3W 22F 8	OAK	888 92ND AVE	PUGET SOUND PIPE	0	MON	6/88	2	25	13	0	0	0	D	0	0	L	
2S/3W 22F 9	OAK	845 92nd Avenue	Paco Pumps 8MW1	0	MON	11/92	4	20	9	0	0	0	D	0	0	D	
2S/3W 22F10	OAK	845 92nd Avenue	Paco Pumps 8MW2	0	MON	11/92	4	21	11	0	0	0	D	0	0	D	
2S/3W 22F11	OAK	845 92nd Avenue	Paco Pumps 9MW1	0	MON	11/92	4	21	10	0	0	0	D	0	0	D	
2S/3W 22F12	OAK	845 92nd Avenue	Paco Pumps 9MW2	0	MON	11/92	4	21	11	0	0	0	D	0	0	D	
2S/3W 22F13	OAK	845 92nd Avenue	Paco Pumps 9MW3	0	MON	11/92	4	21	11	0	0	0	D	0	0	D	
2S/3W 22F14	OAK	845 92nd Avenue	Paco Pumps 9MW4	0	MON	11/92	4	21	9	0	0	0	D	0	0	D	
2S/3W 22G 2	OAK	ELMHURST ST	EBMUD	0	CAT	6/81	0	65	0	0	0	0	D	0	0	L	
2S/3W 22J 1	OAK	9957 MEDFORD AV	AMERICAN HOME FOODS	0	IND	/46	14	950	0	0	0	1100	?	0	0	L	
2S/3W 22K	OAK	1025 98th Ave.	Pioneer Packing	0	BOR	8/92	0	10	10	0	0	0	G	0	0	D	
2S/3W 22K 1	OAK	9838 Gould St	David Barretta MW-1	0	MON	11/91	2	25	13	105	92	0	G	1	1	D	
2S/3W 22K 2	OAK	9838 Gould St	David Barretta MW-2	0	MON	11/91	2	25	13	106	93	0	G	1	1	D	
2S/3W 22K 3	OAK	9838 Gould St	David Barretta MW-3	0	MON	11/91	2	30	0	105	92	0	G	1	1	D	
2S/3W 22K 4	OAK	1025 98th Ave.	Pioneer Packing MW-1	0	MON	8/92	2	19	10	0	0	0	G	0	0	D	
2S/3W 22L	OAK	921 98th Ave.	Fleischmann's Yeast	0	MON	12/90	4	25	13	0	0	0	G	1	0	D	
2S/3W 22L 1	OAK	888 92ND AVE	PARKER-HANNIFIN	0	IND	9/54	14	950	0	0	0	1250	D	0	0	L	
2S/3W 22L 2	OAK	921 98TH AV	STANDARD BRANDS INC	6332209	IND	7/32	14	953	62	21	-41	940	D	0	0	L	
2S/3W 22L 3	OAK	921 98TH AV	STANDARD BRANDS INC	0	IND	11/67	14	957	0	0	0	1000	D	0	0	L	
2S/3W 22L 4	OAK	921 98th Ave.	Fleischmann's Yeast	0	MON	11/90	2	30	12	0	0	0	G	0	0	D	
2S/3W 22L 5	OAK	921 98th Ave	Fleischmann's Yeast	0	MON	8/90	3	28	20	41	21	0	G	0	0	D	
2S/3W 22L 6	OAK	921 98th Ave	Fleischmann's Yeast	0	MON	9/90	2	26	15	0	0	0	G	0	0	D	
2S/3W 22L 7	OAK	921 98th Ave	Fleischmann's Yeast	0	MON	9/90	2	25	15	0	0	0	G	0	0	D	
2S/3W 22M 1	OAK	711 LOUISIANA	S.G. MASTERS	0	IRR	?	6	0	5	0	0	0	?	0	1	L	
2S/3W 22N	OAK	Edes Ave & Rossmoor	Edes Ave Senior Housing	0	IRR	4/90	6	282	35	0	0	50	D	0	0	D	
2S/3W 22P	OAK	98th & Edes	City of Oak. Construction	0	BOR*	2/90	2	0	0	99	0	0	G	0	0	D	
2S/3W 22P 2	OAK	801 98TH AV	GERBERS PRODUCTS CO.	5691100	IND	4/48	14	602	52	22	-30	1150	D	Y	0	L	
2S/3W 22P 3	OAK	801 98TH AV	GERBERS PRODUCTS	0	IND+	?	10	0	0	22	0	0	?	0	+	L	
2S/3W 22P 4	OAK	9401 SAN LEANDRO STREET	KALMAN COMPANIES	0	MON	4/87	2	22	10	0	0	0	D	0	0	L	
2S/3W 22P 5	OAK	9401 SAN LEANDRO STREET	KALMAN COMPANIES	0	MON	4/87	2	23	10	0	0	0	D	0	0	L	
2S/3W 22P 6	OAK	9401 SAN LEANDRO STREET	KALMAN COMPANIES	0	MON	4/87	2	22	11	0	0	0	D	0	0	L	
2S/3W 22P 8	OAK	98th & Edes	City of Oak. Construction	0	MON	2/90	2	23	11	99	88	0	G	0	0	D	
2S/3W 22P 9	OAK	98th & Edes	City of Oak. Construction	0	MON	2/90	2	29	13	100	88	0	G	0	0	D	
2S/3W 22P07	OAK	9401 SANLEANDRO ST.	GERBER PRODUCTS CO.	0	MON	05/88	2	20	9	0	0	0	G	0	0	L	
2S/3W 22P10	OAK	98th & Edes -	City of Oak. Construction	0	MON	2/90	2	23	14	101	87	0	G	0	0	D	
2S/3W 22P11	OAK	98th & Edes	City of Oak. Construction	0	MON	2/90	2	22	8	100	92	0	G	0	0	D	
2S/3W 22P12	OAK	98th & Edes	City of Oak. Construction	0	MON	2/90	2	23	15	101	8	0	G	0	0	D	
2S/3W 22P13	OAK	98th Av./San Leandro St.	City of Oakland	0	MON	10/89	2	24	11	0	0	0	G	0	0	D	
2S/3W 22P14	OAK	98th Av./San Leandro St.	City of Oakland	0	MON	10/89	2	22	10	0	0	0	G	0	0	D	
2S/3W 22P15	OAK	98th Av./San Leandro St	City of Oakland	0	MON	10/89	2	22	15	0	0	0	G	0	0	D	
2S/3W 22P16	OAK	98th Av./San Leandro St.	City of Oakland	0	MON	10/89	2	26	0	0	0	0	G	0	0	D	
2S/3W 22P17	OAK	98th Av./San Leandro St.	City of Oakland	0	MON	10/89	2	41	11	0	0	0	G	0	0	D	
2S/3W 22P18	OAK	98th Av.\San Leandro St.	City of Oakland	0	MON	11/89	2	19	0	0	0	0	G	0	0	D	
2S/3W 22P19	OAK	1901 San Leandro St.	Gerber Products	0	MON	11/90	2	59	43	0	0	0	D	0	0	D	
2S/3W 22P20	OAK	1901 San Leandro St.	Gerber Products	0	MON	8/89	4	21	10	40	30	0	G	0	0	D	
2S/3W 22P21	OAK	98th Ave & San Leandro St	City Attorney, Oakland	0	MON	8/90	2	35	24	0	0	0	G	0	0	D	
2S/3W 22Q 1	OAK	9957 MEDFORD AV	MEDEZES BROS	6388750	IND	7/56	14	598	115	0	0	1200	D	0	0	L	
2S/3W 22Q 2	OAK	98TH&SAN LEANDRO ST	FLEISCHMAN YEAST	0	IND	?	0	944	0	0	0	940	D	0	0	L	
2S/3W 22Q 3	OAK	10222 Pearmain	Melrose Metal Fab MW-1	0	MON	6/91	2	25	16	0	0	0	G	1	0	D	

WELL #	CITY	ADDRESS	OWNER	PHONE	USE	DR.DATE	DIAM	TOT.DEPTH	DTW	ST.ELEV	WA.ELEV	YIELD	LOG	WQ	WL	DATAORGN	MARGIN
2S/3W 22R 1	OAK	103RD AVE	PG&E	0	CAT	3/73	0	120	0	0	0	0	D	0	0	L	
2S/3W 23M 1	OAK	9957 MEDFORD AV	AMERICAN HOME FOOD	0	?	?	0	0	0	0	0	0	?	0	0	L	
2S/3W 27B	OAK	105th Avenue & Edes	Reynolds & Brown	0	BOR*	4/89	0	20	19	0	0	0	G	0	0	D	
2S/3W 27B	OAK	750 107th Ave	Hard Chrome Engrg SB-1	0	BOR*	8/91	0	20	0	0	0	0	G	0	0	D	
2S/3W 27B 8	OAK	750 107th Ave.	Hardchrome Eng. Inc. MW-1	0	MON	6/92	2	28	18	33	15	0	G	0	0	D	
2S/3W 27B 9	OAK	750 107th Ave.	Hardchrome Eng. Inc. MW-2	0	MON	6/92	2	24	18	33	15	0	G	0	0	D	
2S/3W 27B10	OAK	750 107th Ave.	Hardchrome Eng. Inc. MW-3	0	MON	6/92	2	24	18	33	15	0	G	0	0	D	
2S/3W 27B11	OAK	750 107th Ave.	Hard Chrome Engr. SB-2	0	BOR	8/91	2	25	0	0	0	0	G	0	0	D	
2S/3W 27B12	OAK	750 107th Ave.	Hard Chrome Engr. SB-3	0	BOR	8/91	2	28	0	0	0	0	G	0	0	D	
2S/3W 27B13	OAK	750 107th Ave.	Hard Chrome Engr. SB-4	0	BOR	8/91	2	25	0	0	0	0	G	0	0	D	
2S/3W 27B14	OAK	750 107th Ave.	Hard Chrome Engr. SB-5	0	BOR	8/91	2	25	0	0	0	0	G	0	0	D	
2S/3W 27D 2	SLE	324 JONES AVE	EDWARD PENS	0	IRR	/56	0	2	0	0	0	0	?	0	0	L	Yes
2S/3W 27F 1	OAK	1160 105TH AVE	IBUE	0	IRR	3/56	12	220	12	21	9	0	D	0	0	L	Yes
2S/3W 27F 2	SLE	358 105TH AVE	G. KINDLE	0	IRR	8/45	0	120	0	0	0	0	D	0	0	L	Yes
2S/3W 27F 3	OAK	ETMO & HUNTER ST	PG&E	0	CAT	2/76	0	120	0	0	0	0	D	0	0	L	Yes
2S/3W 27G 1	OAK	460 - 105TH AV	OBIE'S NURSERY	0	IRR	10/57	10	236	20	0	0	0	D	0	0	L	Yes