Mr. Wayne Chun

Pittsburg, California

#3838

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Quarterly Ground Water Monitoring Report Former Bill Chun Service Station 2301 Santa Clara Avenue Alameda, California

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December 1997

Document Number 8700-688-100

P. Hudson - Dept ENSR Curtis Martin Sac Office.

ENSR Dan Etheredge - Alameda Office

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748-6735

1420 Harbor Bay Parkway
Suite 160
Alameda, CA 94502
(510) 748-6700
FAX (510) 748-6799
http://www.ensr.com

December 29, 1997
Project No. 8700-688-100

Mr. Wayne Chun
265 Heron Drive
Pittsburg, California 94565

Quarterly Ground Water Monitoring Report
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Dear Mr. Chun:

This report documents results of quarterly groundwater monitoring and sampling conducted on October 14, 1997, at the former Bill Chun Service Station located at 2301 Santa Clara Avenue, Alameda, California (subject property). A site location map is provided as Figure 1, and site maps are provided as Figures 2 and 3.

BACKGROUND

In July 1992, three underground storage tanks (USTs), two 550 gallon and one 285 gallon capacity, were removed from the subject property by Parker Environmental Services. During removal, it was discovered that the 285-gallon gasoline UST had leaked. Analysis of soil samples indicated total petroleum hydrocarbons as gasoline (TPH-g) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) had impacted the subsurface soil.

Several assessment activities were conducted at the subject property to determine the extent of the petroleum-impacted soil and groundwater. These activities consisted of soil and groundwater monitoring and testing and free product recovery. Others installed six monitoring wells at the subject property in 1993: MW-1, MW-2, and MW-3 in January, and MW-4, MW-5, and MW-6 in September. The purpose of these wells was to determine the lateral extent of petroleum-impacted subsurface soil and groundwater. Concentrations of gasoline-range hydrocarbons were detected in soils at depths of 9.5 to 11 feet below ground surface (bgs).

Monitoring wells MW-1, MW-2, and MW-3 were installed with the screened casing depth below the surface of the groundwater. It is suspected that if floating gasoline product is present in the vicinity of monitoring wells MW-1 and MW-2, accurate assessment of it's extent and quantity may not be possible due to the position of the screens.

Fugro West Inc. (Fugro) installed off-site monitoring wells MW-8, MW-9, MW-10, and MW-11 in November 1995 to assess the lateral extent and migration of TPH-g and BTEX in the groundwater.

Quarterly groundwater monitoring and sampling has occurred at the subject property since January 1993. Fugro/ENSR has conducted quarterly monitoring activities from November 1994. Since that time, groundwater flow directions ranged from the northwest to the northeast. Free-phase product and residual

sheens have been detected in monitoring well MW-5 since November, 1993 and in MW-7 since February, 1994.

CURRENT GROUNDWATER MONITORING AND SAMPLING

On October 14, 1997, groundwater monitoring wells MW-1 through MW-11 were monitored for groundwater depth and the presence of free-phase floating product. Groundwater samples were collected from monitoring wells MW-3, MW-4, MW-8, MW-9, MW-10, and MW-11 and submitted to a California state certified laboratory for analysis of TPH-g, BTEX, and methyl tertiary-butyl ether (MTBE). Monitoring wells MW-1, MW-2, MW-5, MW-6, and MW-7 were not sampled because visible product sheen was observed on the groundwater within these monitoring wells.

Quarterly groundwater samples have been analyzed for MTBE since the June 1997 quarterly event. MTBE is found in most gasoline as an octane enhancing and oxygenating compound and has been used since the late 1970s. MTBE is readily water-soluble and degrades at a relatively slower rate than other volatile constituents of gasoline.

Quarterly groundwater samples have been analyzed for volatile organic compounds (VOCs) since May 1996. In a meeting on June 5, 1997 with Alameda County Environmental Health Division (ACHD) ENSR requested that the sampling frequency for VOC analysis be reduced to semi-annual and analysis of VOCs from monitoring wells MW-3 and MW-4 be discontinued. The reduction of sampling frequency for VOCs was based on the consistent detection of 1,2 dichloroethene (1,2 DCE) (ethylene dichloride), a common gasoline additive. ENSR expects that the source of 1,2 DCE is the gasoline present in the soil and groundwater at the subject property. Because the only VOCs detected were gasoline constituents, it was deemed unnecessary and too costly to continue monitoring on a quarterly basis for VOCs. Semi-annual sampling for VOCs was conducted during the recent monitoring event and will take place in April 1997.

Groundwater samples collected since November of 1995 have not contained detectable levels of total petroleum hydrocarbons as diesel (TPH-d); thus, diesel analyses were not performed. Historically, diesel fuel was not dispensed at the former Bill Chun station. It is expected that the previous diesel detection reflected high boiling point range hydrocarbons from the gasoline previously released to the subsurface.

The general flow direction of the water table beneath the subject property is in the northerly direction at a gradient of approximately 0.005 foot per foot (Figure 2). Groundwater elevations have increased an average of 0.13 feet since the last monitoring event in June of 1997.

The results of groundwater elevation data and concentrations of TPH-g, BTEX, and MTBE are summarized in Table 1. Laboratory data reports and chain of custody forms are included in Attachment A. ENSR's Standard Operating Procedures for groundwater monitoring and sampling is provided in Attachment B.

Table 1. Groundwater Elevations and Analytical Results
Former Bill Chun Service Station
October 14, 1997.

Well Number	Groundwater Elevation (feet amsl)	TPH-Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)
MW-1	19.01	--	--	--	--	--	--
MW-2	19.10	--	--	--	--	--	--
MW-3	20.23	2,400	1.8	13	7.8	18	ND
MW-4	19.23	ND	ND	ND	ND	ND	ND
MW-5	19.12	--	--	--	--	--	--
MW-6	18.99	--	--	--	--	--	--
MW-7	19.04	--	--	--	--	--	--
MW-8	19.46	660	29	6.6	10	13	ND
MW-9	18.65	910	480	8.1	2.4	5.0	46
MW-10	19.26	ND	1.2	2.5	ND	1.7	ND
MW-11	18.93	510	4.0	8.7	21	23	ND
MCL	NA	NA	1.0	1,000	680	1,750	NA

NOTES:
amsl = above mean sea level
ppb = parts per billion = micrograms per liter = µg/L
NA = Not Applicable - no MCL has been established for these constituents.
ND = Not Detected
-- = Not Sampled due to the presence of petroleum product sheen.
MCL = Maximum Contaminant Level. Numbers reported for California primary MCLs. Maximum contaminant levels (MCLs) mandated by the state of California Regional Water Quality Control Board. The MCLs are established based on either identified health risks or aesthetics and apply to drinking water.

Following is a comparison of current data with that obtained in the June 1997 monitoring event. Historical data, including those from the June monitoring event, are provided in Table 3 at the end of this report.

- TPH-g and BTEX concentrations in monitoring wells MW-1, MW-5, MW-6, MW-7, MW-8, MW-10, and MW-11, remained generally consistent with those detected in June 1997. (i.e FP/Sheen)
- Free-phase floating product sheen was observed in MW-2 during the current sampling event. Evidence of product sheen was not observed in this well during the June 1997 event. Free-phase floating product sheen was also observed in MW-1, MW-5, MW-6, and MW-7.
- Samples collected from monitoring well MW-9 indicated a decrease in concentrations of TPH-g and BTEX since the June 1997 monitoring event. The benzene concentration decreased from 4,600 micrograms per liter (µg/L or parts per billion, equivalent) in June 1997 to 480 µg/L, while the TPH-g concentration decreased from 8,000 µg/L to 910 µg/L.

- The analysis of groundwater sample collected from monitoring well MW-3 indicates an increase in concentrations of TPH-g from 600 µg/L in June 1997 to 2,400 µg/L.
- MTBE was detected in the sample collected from monitoring well MW-9 at 46 µg/L, a decrease from the June monitoring event concentration of 220 µg/L.
- Chloroform was detected in monitoring well MW-10 at a concentration of 1.5 µg/L. Given the low concentration and distance from the site, the chloroform may have originated from an off-site source. or as a laboratory contaminant.

Significant changes in petroleum hydrocarbon concentrations in groundwater may be due to seasonal groundwater fluctuations and the resulting contact of groundwater to petroleum-impacted soils. Groundwater flow direction and gradient is also a contributing factor.

Although MTBE has not been detected in on-site monitoring wells, the concentration detected in monitoring well MW-9 is expected to have originated from the subject property. MTBE was detected in monitoring wells MW-8 and MW-10 during the June 1997 monitoring event, but was not detected in October. MTBE detected in MW-8 during the June 1997 monitoring event was likely related to groundwater contamination associated with the former Shell Station, located to the south, across Santa Clara Avenue from the subject property. Considering this is the second analysis for MTBE, additional quarterly sampling will be necessary to further evaluate the source and lateral migration of this compound in the shallow groundwater.

REMARKS

This report has been prepared solely for the use of Mr. Wayne Chun. Any reliance on this report by third parties shall be at the parties' sole risk.

We appreciate the opportunity to provide environmental consulting services to Mr. Wayne Chun. If there are any questions or comments regarding this report, or if we can assist you in any other matter, please contact us at (510) 748-6700.

Sincerely,

ENSR Consulting, Engineering and Remediation,

Pansy Gee
Staff Scientist

Peter B. Hudson, R.G.
Project Manager

cc: Barney Chan, Alameda County Division of Environmental Health

Attachments

TABLES

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TABLE 2
Monitoring Well - MW-1
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-1	01/07/93	28.53	8.87	--	0.00	19.66
	09/07/93		9.63	--	0.00	18.90
	11/16/93		9.89	--	0.00	18.64
	12/07/93		9.66	--	0.00	18.87
	01/06/94		9.67	--	0.00	18.86
	02/03/94		9.50	--	0.00	19.03
	03/04/94		9.18	--	0.00	19.35
	06/06/94		9.55	--	0.00	18.98
	11/09/94		8.83	--	0.00	19.70
	12/20/94		9.00	--	0.00	19.53
	03/29/95		8.44	--	0.00	20.09
	05/24/95		9.01	--	0.00	19.52
	08/30/95		9.52	--	0.00	19.01
	11/29/95	28.49 (2)	9.96	--	0.00	18.53
	05/01/96		9.19	--	0.00	19.30
	08/05/96		9.63	--	0.00	18.86
	12/10/96		9.31	--	0.00	19.18
	03/05/97		9.01	--	0.00	19.48
	06/25/97		9.61	--	0.00	18.88
	10/14/97		**9.48**	**--**	**sheen**	**19.01**

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TABLE 2
Monitoring Well - MW-2
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-2	01/07/93	28.51	8.78	--	0.00	19.73
	09/07/93		9.52	--	0.00	18.99
	11/16/93		9.73	--	0.00	18.78
	12/07/93		9.54	--	0.00	18.97
	01/06/94		9.54	--	0.00	18.97
	02/03/94		9.37	--	0.00	19.14
	03/04/94		9.02	--	0.00	19.49
	06/06/94		9.40	--	0.00	19.11
	11/09/94		NM(1)	NM	NM	NM
	12/20/94		NM(1)	NM	NM	NM
	03/29/95		8.26	--	0.00	20.25
	05/24/95		8.89	--	0.00	19.62
	08/30/95		9.41	--	0.00	19.10
	11/29/96	28.47 (2)	9.96	--	0.00	18.53
	05/01/96		9.19	--	0.00	19.30
	08/05/96		9.49	--	0.00	18.98
	12/10/96		9.13	--	0.00	19.34
	03/05/97		8.90	--	0.00	19.57
	06/25/97		9.49	--	0.00	18.98
	10/14/97		**9.37**	**--**	**sheen**	**19.10**

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TABLE 2
Monitoring Well - MW-3
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-3	01/07/93	28.82	8.86	--	0.00	19.96
	09/07/93		9.62	--	0.00	19.20
	11/16/93		9.82	--	0.00	19.00
	12/07/93		9.60	--	0.00	19.22
	01/06/94		9.62	--	0.00	19.20
	02/03/94		9.45	--	0.00	19.37
	03/04/94		9.11	--	0.00	19.71
	06/06/94		9.50	--	0.00	19.32
	11/09/94		8.82	--	0.00	20.00
	12/20/94		9.00	--	0.00	19.82
	03/29/95		8.45	--	0.00	20.37
	05/24/95		8.99	--	0.00	19.83
	08/30/95		9.54	--	0.00	19.28
	11/29/95	28.78 (2)	9.90	--	0.00	18.88
	05/01/96		9.25	--	0.00	19.53
	08/05/96		9.61	--	0.00	19.17
	12/10/96		9.27	--	0.00	19.51
	03/05/97		9.09	--	0.00	19.69
	06/25/97		9.62	--	0.00	19.16
	10/14/97		**9.55**	**--**	**0.00**	**20.23**

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TABLE 2
Monitoring Well - MW-4
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-4	09/07/93	28.57	9.39	--	0.00	19.18
	11/16/93		9.60	--	0.00	18.97
	12/07/93		9.42	--	0.00	19.15
	01/06/94		9.44	--	0.00	19.13
	02/03/94		9.31	--	0.00	19.26
	03/04/94		9.05	--	0.00	19.52
	06/06/94		9.31	--	0.00	19.26
	11/09/94		8.68	--	0.00	19.89
	12/20/94		8.97	--	0.00	19.60
	03/29/95		8.46	--	0.00	20.11
	05/24/95		8.86	--	0.00	19.71
	08/30/95		9.41	--	0.00	19.16
	11/29/95	28.53 (2)	9.72	--	0.00	18.81
	05/01/96		9.17	--	0.00	19.36
	08/05/96		9.44	--	0.00	19.09
	12/10/96		9.18	--	0.00	19.35
	03/05/97		8.99	--	0.00	19.54
	06/25/97		9.43	--	0.00	19.10
	10/14/97		**9.30**	**--**	**0.00**	**19.23**

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TABLE 2
Monitoring Well - MW-5
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-5	09/07/93	28.37	9.31	0.00	--	19.06
	11/16/93		9.99	9.45	0.54	18.81
	12/07/93		9.88	9.27	0.61	18.98
	01/06/94		9.85	9.27	0.58	18.98
	02/03/94		9.51	9.19	0.32	19.12
	03/04/94		8.99	8.96	0.03	19.40
	06/06/94		9.72	9.14	0.58	19.11
	11/09/94		8.58	8.56	0.02	19.81
	12/20/94		8.77	8.76	0.01	19.61
	03/29/95		8.31	--	0.00	20.06
	05/24/95		8.77	8.76	0.01	19.61
	08/30/95		9.50	9.19	0.31	19.12
	11/29/95	28.33 (2)	9.84	9.60	0.24	18.68
	05/01/96		8.87	8.86	0.01	19.47
	08/05/96		9.37	9.36	0.01	18.97
	12/10/96		8.15	8.14	0.01	19.39
	03/05/97		8.75	--	0.00	19.58
	06/25/97		9.34	--	0.00	18.99
	10/14/97		**9.21**	**--**	**sheen**	**19.12**

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TABLE 2
Monitoring Well - MW-6
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-6	09/07/93	28.41	9.53	--	0.00	18.88
	11/16/93		9.74	--	0.00	18.67
	12/07/93		9.58	--	0.00	18.83
	01/06/94		9.60	--	0.00	18.81
	02/03/94		9.47	--	0.00	18.94
	03/04/94		9.18	--	0.00	19.23
	06/06/94		9.46	--	0.00	18.95
	11/09/94		8.72	--	0.00	19.69
	12/20/94		9.00	--	0.00	19.41
	03/29/95		8.44	--	0.00	19.97
	05/24/95		8.94	--	0.00	19.47
	08/30/95		9.43	--	0.00	18.98
	11/29/95	28.36 (2)	9.83	--	0.00	18.53
	05/01/96		9.00	--	0.00	19.36
	08/05/96		9.55	--	0.00	18.81
	12/10/96		9.18	--	0.00	19.18
	03/05/97		8.97	--	0.00	19.39
	06/25/97		9.53	--	0.00	18.83
	10/14/97		**9.37**	**--**	**sheen**	**18.99**

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TABLE 2
Monitoring Well - MW-7
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-7	09/07/93	28.56	9.61	--	0.00	18.95
	11/16/93		9.86	--	0.00	18.70
	12/07/93		9.58	--	0.00	18.98
	01/06/94		9.59	--	0.00	18.97
	02/03/94		9.56	9.39	0.17	19.14
	03/04/94		9.04	9.01	0.03	19.54
	06/06/94		9.67	9.37	0.30	19.13
	11/09/94		8.57	8.52	0.05	20.03
	12/20/94		9.08	8.67	0.41	19.81
	03/29/95		8.51	7.96	0.55	20.49
	05/24/95		8.98	8.81	0.17	19.72
	08/30/95		9.71	9.40	0.31	19.10
	11/29/95	28.44 (2)	9.86	9.84	0.02	18.60
	05/01/96		8.94	8.85	0.09	19.57
	08/05/96		9.48	9.45	0.03	19.03
	12/10/96		8.96	8.95	0.01	19.49
	03/05/97		8.77	--	0.00	19.67
	06/25/97		9.47	--	0.00	18.97
	10/14/97		**8.71**	**--**	**sheen**	**19.04**

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TABLE 2
Monitoring Well - MW-10
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-10	11/29/95	27.32 (2)	8.73	--	0.00	18.59
	05/01/96		NM (3)	NM	NM	NM
	08/05/96		8.50	--	0.00	18.82
	12/10/96		8.17	-	0.00	19.15
	03/05/97		8.06	--	0.00	19.26
	06/25/97		8.51	--	0.00	18.81
	10/14/97		**8.06**	**--**	**0.00**	**19.26**

Table Notes on Following Page

TABLE 2
Monitoring Well - MW-11
GROUNDWATER ELEVATION DATA
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Monitoring Well Identification	Monitoring Date	Top of Casing Elevation (ft. above MSL)	Depth to Water (feet)	Depth to Free Product (feet)	Free Product Thickness (feet)	Corrected Groundwater Elevation (ft. above MSL)
MW-11	11/29/95	28.56 (2)	10.16	--	0.00	18.40
	05/01/96		9.12	--	0.00	1944
	08/05/96		9.62	--	0.00	18.94
	12/10/96		9.18	--	0.00	19.38
	03/05/97		8.93	--	0.00	19.63
	06/25/97		9.65	--	0.00	18.91
	10/14/97		**9.63**	**--**	**0.00**	**18.93**

Table Notes on Following Page

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NOTES:

(1) MW-2 could not be located; well box was temporarily buried during tank excavation activities

(2) Top of casing reference elevations of all well were resurveyed on Nov. 29, 1995, following installation of MW-8, MW-9, and MW-11. Elevations relative to a found "cut-cross" in the top of the depressed curb at the mid return of the northwest corner of the intersection of Santa Clara Avenue and oak Street. Benchmark elevation taken as 28.455 feet above MSL

(3) MW-10 inaccessible due to parked car

MSL = Mean Sea Level
NM = Not Measured
Ground water elevations (GWE) are corrected for free product thickness (FPT) using the following equation: Corrected GWE = Top of Casing Elevation - (Measured Depth to Water - (0.8 x FPT))
Data prior to 11/09/94 from Environmental Science and Engineering, Inc.

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TABLE 3
GROUNDWATER ANALYTICAL RESULTS
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Well Number	Date Sampled	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Xylene (Total) (µg/L)	TPH as Diesel (µg/L)	HVOCs (µg/L)	MTBE (µg/L)
MW-1	01/07/93	110,000	14,000	17,000	2,500	8,800	ND (3,000)	1,2-DCE-470	NA
	09/07/93	28,000	11,000	2,100	380	1,200	1,000 (2)	NA	NA
	12/07/93	17,000	10,000	3,000	610	2,000	1,800 (1)	NA	NA
	03/04/94	6,600	4,400	870	150	590	920 (4)	NA	NA
	06/06/94	12,000	6,300	230	ND (0.5)	ND (0.5)	710 (4)	NA	NA
	11/09/94	28,000	9,500	3,000	810	2,300	250	NA	NA
	12/20/94	5,600	3,000	92	86	76	ND (50)	NA	NA
	03/29/95	24,000	5,800	3,100	390	1,300	ND (50)	NA	NA
	05/24/95	2,500	800	280	31	130	ND (50)	NA	NA
	08/30/95	48,000	14,000	3,500	620	1,600	800	NA	NA
	11/29/95	120,000	42,000	22,000	2,300	9,900	ND (1000)	NA	NA
	05/01/96	49,800	11,800	5,720	121	3,160	ND (50)	1,2-DCE-5.6	NA
	08/05/96	54,600	17,400	7,440	1,130	3,880	ND (50)	1,2-DCE-50.7	NA
	12/10/96	27,500	7,680	2,020	720	720	ND (50)	ND	NA
	03/06/97	86,900	18,900	7,730	1,470	3,320	ND (50)	ND	NA
	06/25/97	NSFP	NSFP	NSFP	NSFP	NSFP	NA	NSFP	NSFP
	10/14/97	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NA**	**NSFP**	**NSFP**
MW-2	01/07/93	85,000	20,000	8,500	1,500	4,300	ND (3,000)	1,2-DCE-550	NA
	09/07/93	140,000	46,000	28,000	3,300	15,000	8,200 (2)	NA	NA
	12/07/93	86,000	28,000	17,000	35,000	16,000	8,200 (2)	NA	NA
	03/04/94	130,000	22,000	22,000	3,500	16,000	18,000 (4)	NA	NA
	06/06/94	100,000	27,000	22,000	2,300	10,000	9,600 (5)	NA	NA
	11/09/94	NSL	NSL	NSL	NSL	NSL	NSL	NA	NA
	12/20/94	NSL	NSL	NSL	NSL	NSL	NSL	NA	NA
	03/29/95	240,000	56,000	30,000	3,100	7,000	3,800	NA	NA
	05/24/95	330,000	54,000	51,000	4,700	22,000	28,000	NA	NA
	08/30/95	200,000	48,000	52,000	3,900	16,000	8,000	NA	NA
	11/29/95	170,000	42,000	40,000	3,400	17,000	ND (1000)	NA	NA
	05/01/96	481,000	59,000	69,000	27,200	89,600	ND (50)	1,2-DCE-61.8	NA
	08/05/96	193,000	41,800	56,000	3,590	18,000	ND (50)	1,2-DCE-83.2	NA
	12/10/96	166,000	26,400	38,600	3,180	14,700	ND (50)	ND	NA
	03/06/97	316,000	36,600	55,900	4,160	16,100	ND (50)	ND	NA
	06/25/97	160,000	37,000	63,000	3,500	19,000	NA	ND	ND
	10/14/97	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NA**	**NSFP**	**NSFP**
MW-3	01/07/93	8,500 (3)	170	70	ND (30)	ND (30)	ND (3,000)	NA	NA
	09/07/93	2,800	19	46	7.7	23	2,500 (1)	NA	NA
	12/07/93	3,000	17	43	13	28	520 (2)	NA	NA
	03/04/94	2,300	22	46	9.0	27	1,300 (5)	NA	NA
	06/06/94	1,900	3.9	ND (0.5)	9.0	27	1,600 (5)	NA	NA
	11/09/94	2,800	2.6	17	17	32	ND (50)	NA	NA
	12/20/94	2,700	10	62	24	59	ND (50)	NA	NA
	03/29/95	1,200	230	230	13	37	500	NA	NA
	05/24/95	5,700	ND (5)	73	20	57	ND (50)	NA	NA
	08/30/95	3,100	ND (1.0)	29	13	28	ND (50)	NA	NA
	11/29/95	13,000	39	59	7	33	ND (80)	NA	NA
	05/01/96	3,020	ND (1.0)	39.9	9.86	30.8	ND (50)	ND	NA
	08/05/96	2,340	4.1	5.3	4.9	25.3	ND (50)	ND	NA
	12/10/96	694,000	920	5,980	1,060	2,960	ND (50)	ND	NA
	03/06/97	9,060	136	244	34	126	ND (50)	ND	NA
	06/25/97	600	ND	1.1	ND	3.0	NA	ND	ND
	10/14/97	**2400**	**1.8**	**13**	**7.8**	**18**	**NA**	**ND (0.5)**	**ND (5)**

ENSR

TABLE 3
GROUNDWATER ANALYTICAL RESULTS
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Well Number	Date Sampled	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Xylene (Total) (µg/L)	TPH as Diesel (µg/L)	HVOCs (µg/L)	MTBE (µg/L)
MW-4	09/07/93	440	2.7	1.2	1	1.9	330 (2)	NA	NA
	12/07/93	610	6.6	0.5	0.61	2.5	460 (2)	NA	NA
	03/04/94	110	ND (0.5)	ND (0.5)	ND (0.5)	0.63	56 (5)	NA	NA
	06/06/94	68	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	68 (4)	NA	NA
	11/09/94	90	0.7	1.1	0.5	2.1	ND(50)	NA	NA
	12/20/94	130	2.2	33	4.8	27	ND (50)	NA	NA
	03/29/95	ND (50)	ND (0.5)	0.5	ND (0.5)	ND (0.5)	ND (50)	NA	NA
	05/24/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	NA	NA
	08/30/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	NA	NA
	11/29/95	100	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	NA	NA
	05/01/96	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	ND	NA
	08/05/96	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	ND	NA
	12/10/96	65	ND (0.5)	ND (0.5)	ND (0.5)	0.6	ND (50)	ND	NA
	03/06/97	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND	NA
	06/25/97	200	ND (0.5)	ND (0.5)	0.5	ND (0.5)	NA	ND	ND
	10/14/97	**ND (50)**	**ND (0.5)**	**ND (0.5)**	**ND (0.5)**	**ND (0.5)**	**NA**	**ND (0.5)**	**ND (5)**
MW-5	09/07/93	37,000	2,700	1,700	870	4,600	1,700 (2)	NA	NA
	12/07/93	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	03/04/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	06/06/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	11/09/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	12/20/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	03/29/95	54,000	6,800	3,600	1,500	7,600	7,500	NA	NA
	05/24/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	08/30/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	11/29/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	05/01/96	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	08/05/96	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	12/10/96	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	03/06/97	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	06/25/97	NSFP	NSFP	NSFP	NSFP	NSFP	NA	NSFP	NSFP
	10/14/97	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NA**	**NSFP**	**NSFP**
MW-6	09/07/93	10,000	1,300	540	370	1,600	1,400 (2)	NA	NA
	12/07/93	17,000	4,300	1,200	600	2,700	2,400 (2)	NA	NA
	03/04/94	21,000	4,600	1,000	460	1,800	1,800 (4)	NA	NA
	06/06/94	12,000	5,400	350	ND (0.5)	1,200	1,600 (4)	NA	NA
	11/09/94	29,000	4,600	1,600	820	3,600	7,500	NA	NA
	12/20/94	66,000	5,800	2,200	1,100	4,600	1,100	NA	NA
	03/29/95	25,000	8,000	780	450	1,300	1,300	NA	NA
	05/24/95	56,000	1,600	1,300	1,200	7,200	40,000	NA	NA
	08/30/95	68,000	16,000	3,400	1,900	6,800	4,900	NA	NA
	11/29/95	57,000	15,000	2,900	2,500	10,000	ND (900)	NA	NA
	05/01/96	39,500	7,400	2,540	1,270	4,470	ND (50)	1,2-DCE-73	NA
	08/05/96	71,200	22,600	4,000	2,100	7,030	ND (50)	1,2-DCE-157	NA
	12/10/96	49,200	10,900	2,180	1,880	6,720	ND (50)	1,2-DCE-210	NA
	03/06/97	65,300	10,300	2,500	1,940	5,770	ND (50)	ND	NA
	06/25/97	NSFP	NSFP	NSFP	NSFP	NSFP	NA	NSFP	NSFP
	10/14/97	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NA**	**NSFP**	**NSFP**

Notes on page T3-4.

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TABLE 3
GROUNDWATER ANALYTICAL RESULTS
Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

Well Number	Date Sampled	TPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl Benzene (µg/L)	Xylene (Total) (µg/L)	TPH as Diesel (µg/L)	HVOCs (µg/L)	MTBE (µg/L)
MW-7	09/07/93	24,000	6,000	4,800	490	2,300	1,300	NA	NA
	12/07/93	95,000	28,000	24,000	1,600	8,700	2,200	NA	NA
	03/04/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	06/06/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	11/09/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	12/20/94	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	03/29/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	05/24/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	08/30/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	11/29/95	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	05/01/96	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	08/05/96	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	12/10/96	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	03/05/97	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP	NSFP
	06/25/97	NSFP	NSFP	NSFP	NSFP	NSFP	NA	NSFP	NSFP
	10/14/97	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NSFP**	**NA**	**NA**	**NSFP**
MW-8	11/29/95	7,400	260	40	140	190	ND (80)	NA	NA
	05/01/96	270	1.02	ND	1.10	1.87	ND (50)	ND	NA
	08/05/96	1,100	22.6	3.4	11.2	12.7	ND (50)	TCB-2.5	NA
	12/10/96	442	17.2	2.7	5.9	5.6	ND (50)	ND	NA
	03/05/97	765	33.2	7.2	9.3	11.1	525	ND	NA
	06/25/97	700	36	5.1	8.0	8.0	NA	NA	10
	10/14/97	**660**	**29**	**6.6**	**10**	**13**	**NA**	**ND (0.5)**	**ND (5)**
MW-9	11/29/95	1,500	590	2	3	20	ND (50)	1,2-DCE-46	NA
	05/01/96	230	142	0.78	ND	1.17	ND (50)	ND	NA
	08/05/96	1,80	3.1	0.5	0.5	2.3	ND (50)	ND	NA
	12/10/96	157,000	13.6	320	135	500	ND (50)	1,2-DCE-5.0	NA
	03/05/97	2,710	940	4.6	20.2	12.4	ND (50)	1,2-DCE-19.2	NA
	06/25/97	8,000	4,600	190	100	30	NA	NA	220
	10/14/97	**910**	**480**	**8.1**	**2.4**	**5.0**	**NA**	**ND (0.5)**	**46**
MW-10	11/29/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2)	ND (950)	NA	NA
	05/01/96	NSR	NSR	NSR	NSR	NSR	NSR	NSR	NA
	08/05/96	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	Chloroform	NA
	12/10/96	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	1,2-DCE-10.1	NA
	03/05/97	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	ND	NA
	06/25/97	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NS	ND
	10/14/97	**ND (50)**	**1.2**	**2.5**	**ND (0.5)**	**1.7**	**NA**	**Chloroform-**	**ND (5)**
MW-11	11/29/95	3,200	14	31	15	570	ND (50)	NA	NA
	05/01/96	79	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	107	ND	NA
	08/05/96	6,660	5,040	ND (0.5)	51.6	ND (0.5)	ND (50)	1,2-DCE-16.0	NA
	12/10/96	68,000	800	260	200	1,160	ND (50)	ND	NA
	03/05/97	340	4.2	0.6	3.1	5.3	ND (50)	ND	NA
	06/25/97	300	3.5	0.9	2.7	5.0	NA	NS	ND
	10/14/97	**510**	**4.0**	**8.7**	**21**	**23**	**NA**	**ND (0.5)**	**ND (5)**

Notes on following page.

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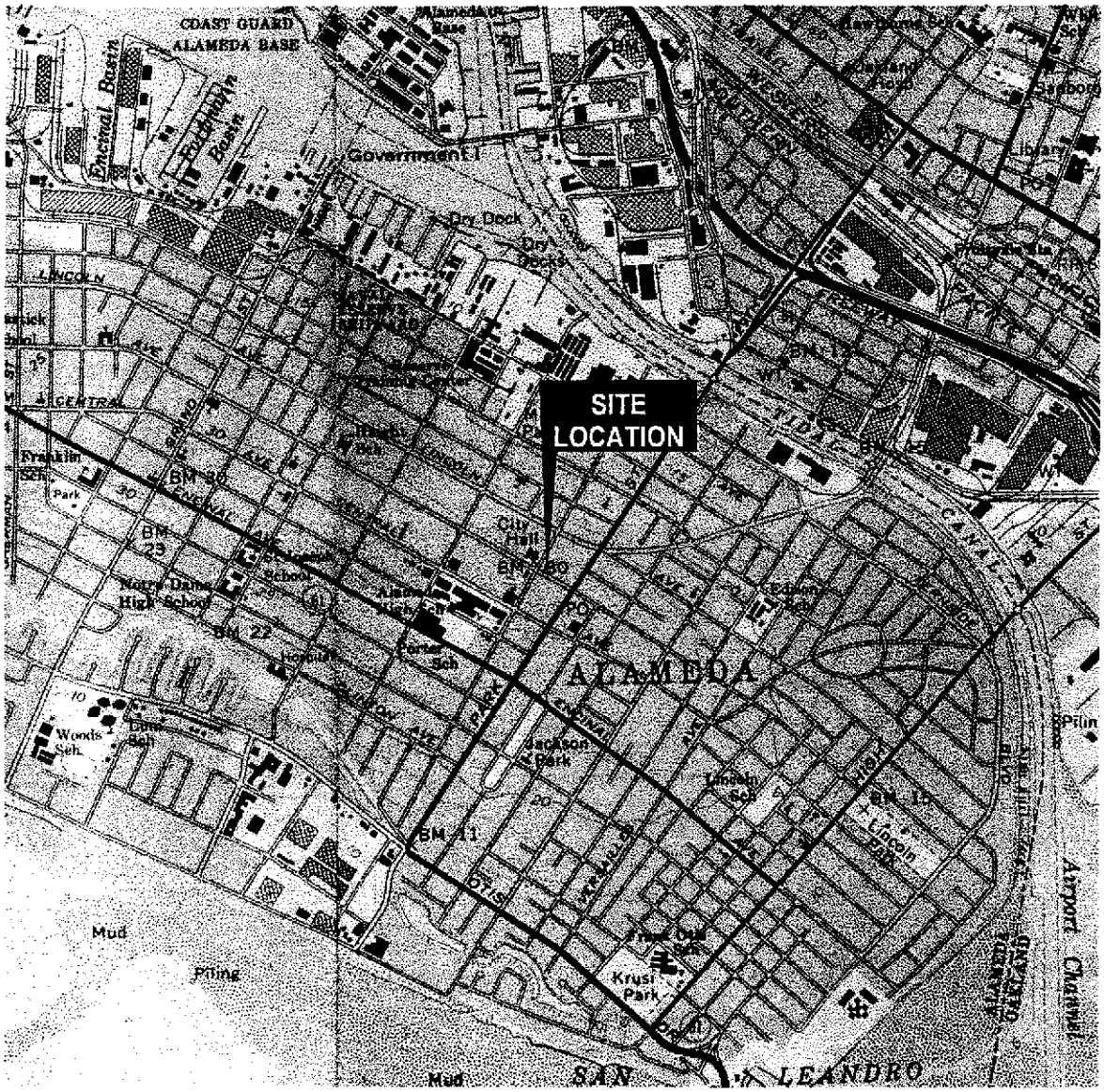
NOTES:

1,2-DCE	=	1,2-Dichloroethane	(1)	=	Results typical of a non-diesel mixture (<C16)
TCB		1,1,2,2-Tetrachlorobenzene	(2)	=	Results typical of a diesel and non-diesel mixture (<C16)
TPH-g	=	Total Petroleum Hydrocarbons as gasoline	(3)	=	Results typical of weathered gasoline
TPH-d	=	Total Petroleum Hydrocarbons as diesel	(4)	=	Results typical of diesel and unidentified hydrocarbons <C14)
MTBE	=	Methyl tertiarybutyl ether reported in µg/L	(5)	=	Results typical of unidentified hydrocarbons (<C14)
µg/L	=	micrograms per liter or parts per billion (ppb)			
ND	=	Not Detected (detection limit in parentheses)			
NSFP	=	Not Sampled - Free Product present			
NSL	=	Not Samples - well could not be located			
NSR	=	Not Sampled - well could not be reached			
NA	=	Not Analyzed			

FIGURES



USGS 7.5 MINUTE
OAKLAND EAST & WEST,
CALIFORNIA QUADRANGLE

NORTH

0 1000 2000

FEET

ENSR

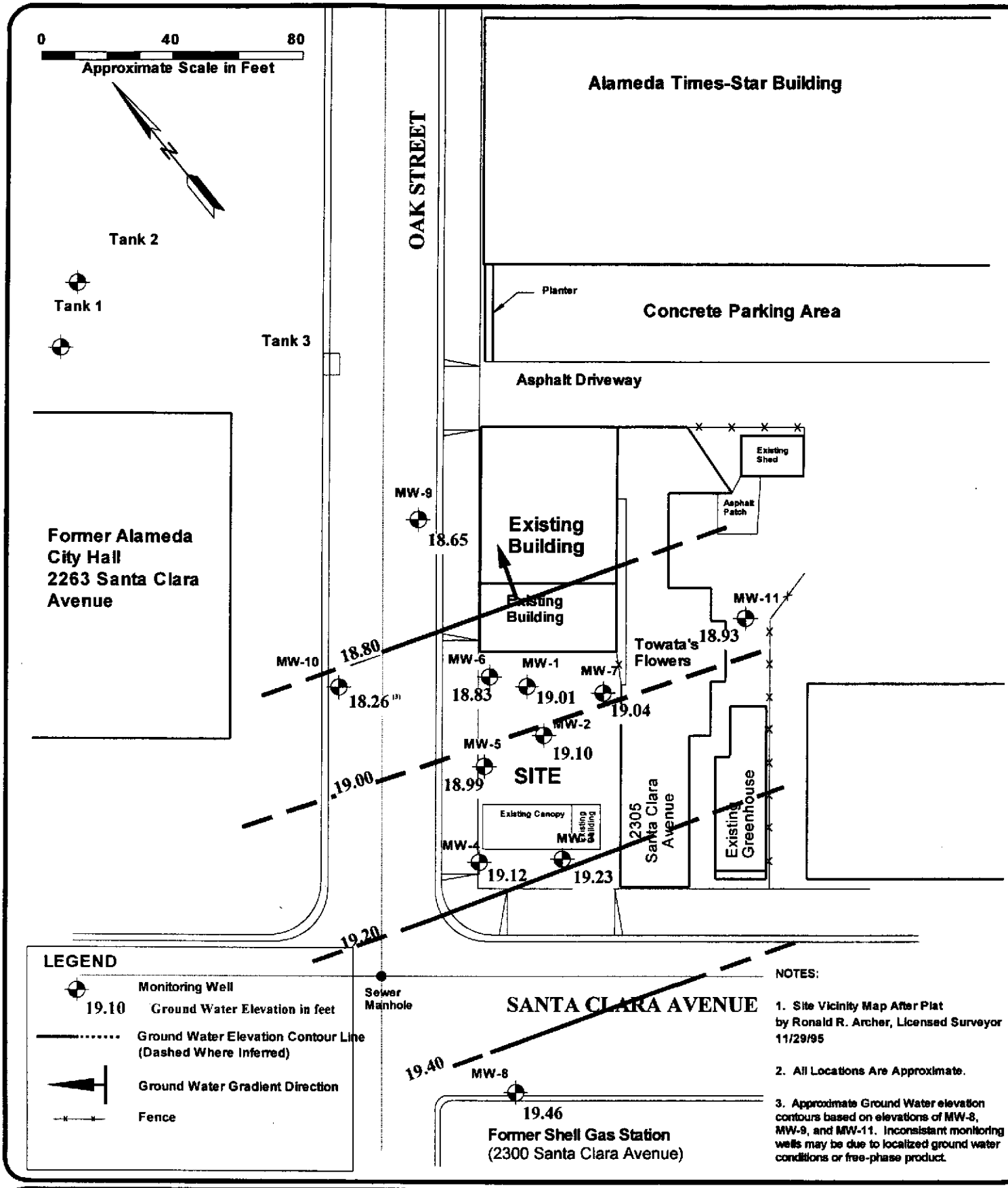
DRAWN BY: S. Hale	REVISED BY:
DATE: November 13, 1997	DATE:

SITE LOCATION MAP

Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

FIGURE
1

PROJECT NUMBER
8700-688



ENSR

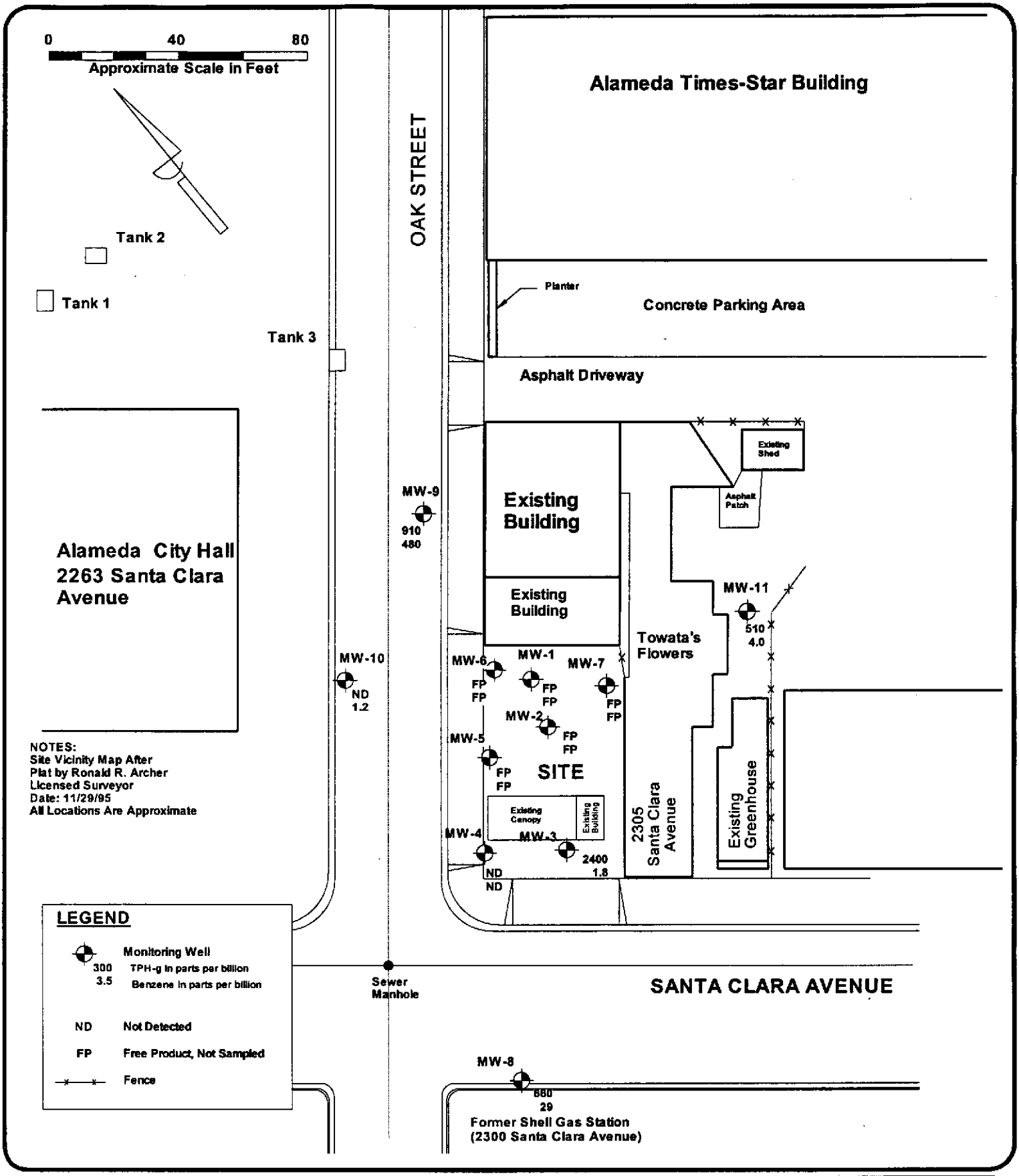
DRAWN BY: J. Paradis
REVISED BY: S. Hale
DATE: October 31, 1996
DATE: December 15, 1997

POTENTIOMETRIC SURFACE MAP
OCTOBER 14, 1997

Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

FIGURE
2

PROJECT NUMBER:
8700-688



ENSR

DRAWN BY: J. Paradis | REVISED BY: S. Hale

DATE: October 31, 1996 | DATE: November 12, 1997

DISTRIBUTION MAP OF TPH-g AND BENZENE IN GROUND WATER October 14, 1997

Former Bill Chun Service Station
2301 Santa Clara Avenue
Alameda, California

FIGURE
3

PROJECT NUMBER
8700-688

ATTACHMENT A

LABORATORY REPORTS

GROUNDWATER SAMPLE ANALYSIS
OCTOBER 14, 1997

SUPERIOR ANALYTICAL LABORATORY
MARTINEZ, CALIFORNIA

Superior Analytical Laboratory

ENSR
1420 Harbor Bay Parkway # 160
Alameda, CA 94502

Date: October 23, 1997

Attn: Peter B. Hudson

Laboratory Number : 23342

Project Number/Name : CHUN 8700
Facility/Site : ALAMEDA,CA

Dear Peter B. Hudson:

Attached is Superior Analytical Laboratory report for the samples received on October 14, 1997. This report has been reviewed and approved for release. Reproduction of this report is permitted only in its entirety. Following the cover letter is the Case Narrative detailing sample receipt and analysis. Also enclosed is a copy of the original Chain-of-Custody record confirming receipt of samples.

Please note that any unused portion of the sample will be discarded after November 13, 1997, unless you have requested otherwise.

We appreciate the opportunity to be of service to you. If you have any questions, please contact our Laboratory at (510) 313-0850.

Sincerely,

Afsaneh Salimpour
Project Manager

Sanjay Panda
QA/QC Manager

Superior Analytical Laboratory

CASE NARRATIVE

ENSR
Project Number/Name: CHUN 8700 688
Laboratory Number: 23342

Sample Receipt

Six water samples were received by Superior Analytical Laboratory on October 14, 1997.

Cooler temperature was 2.1°C

No abnormalities were noted with sample recieving.

Sample Analysis

The samples were analyzed for methods 8010, 8015M and 8020.

GBTXEMTBE :

P - There is a greater than 25% difference for detected concentration between the two GC columns.

Superior
Analytical Laboratory

ENSR
Attn: Peter B. Hudson

Project CHUN 8700 688
Reported on October 22, 1997

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Chronology

Laboratory Number 23342

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-3	10/14/97	10/14/97	10/15/97	10/15/97	DJ152.37	01
MW-4	10/14/97	10/14/97	10/15/97	10/15/97	DJ152.37	02
MW-8	10/14/97	10/14/97	10/15/97	10/15/97	DJ152.37	03
MW-9	10/14/97	10/14/97	10/15/97	10/15/97	DJ152.37	04
MW-10	10/14/97	10/14/97	10/15/97	10/15/97	DJ152.37	05
MW-11	10/14/97	10/14/97	10/15/97	10/15/97	DJ152.37	06

QC Samples

QC Batch #	QC Sample ID	TypeRef.	Matrix	Extract.	Analyzed
DJ152.37-05	Method Blank	MB	Water	10/15/97	10/15/97
DJ152.37-02	Laboratory Spike	LS	Water	10/15/97	10/15/97
DJ152.37-03	1225 MID-1010	MS 23332-07	Water	10/15/97	10/15/97
DJ152.37-04	1225 MID-1010	MSD 23332-07	Water	10/15/97	10/15/97

ENSR
Attn: Peter B. Hudson

Project CHUN 8700 688
Reported on October 22, 1997

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
23342-01	MW-3	Water	1.0	-
23342-02	MW-4	Water	1.0	-
23342-03	MW-8	Water	1.0	-
23342-04	MW-9	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	23342-01 Conc. ug/L	RL	23342-02 Conc. ug/L	RL	23342-03 Conc. ug/L	RL	23342-04 Conc. ug/L	RL
Gasoline Range	2400	50	ND	50	660	50	910	50
Benzene	1.8	0.5	ND	0.5	29	0.5	480	2.5
Toluene	13P	0.5	ND	0.5	6.6P	0.5	8.1	0.5
Ethyl Benzene	7.8P	0.5	ND	0.5	10	0.5	2.4	0.5
Total Xylenes	18	0.5	ND	0.5	13	0.5	5.0	0.5
Methyl-t-butyl-ether	ND	5	ND	5	ND	5	46	5
>> Surrogate Recoveries (%) <<								
Trifluorotoluene (SS)	114		99		105		108	

ENSR
Attn: Peter B. Hudson

Project CHUN 8700 688
Reported on October 22, 1997

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
23342-05	MW-10	Water	1.0	-
23342-06	MW-11	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	23342-05 Conc. ug/L	RL	23342-06 Conc. ug/L	RL
Gasoline Range	ND	50	510	50
Benzene	1.2	0.5	4.0P	0.5
Toluene	2.5	0.5	8.7	0.5
Ethyl Benzene	ND	0.5	21	0.5
Total Xylenes	1.7	0.5	23	0.5
Methyl-t-butyl-ether	ND	5	ND	5
>> Surrogate Recoveries (%) <<				
Trifluorotoluene (SS)	101		111	

Superior
Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 23342
Method Blank(s)

	DJ152.37-05 Conc. ug/L	 RL
Gasoline Range	ND	50
Benzene	ND	0.5
Toluene	ND	0.5
Ethyl Benzene	ND	0.5
Total Xylenes	ND	0.5
Methyl-t-butyl-ether	ND	5
>> Surrogate Recoveries (%) <<		
Trifluorotoluene (SS)	104	

Superior Analytical Laboratory

Gasoline Range Petroleum Hydrocarbons and BTXE
by EPA SW-846 5030/8015M/8020
Gasoline Range quantitated as all compounds from C6-C10

Quality Assurance and Control Data

Laboratory Number: 23342

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Water Matrix (ug/L) DJ152.37 02 / - Laboratory Control Spikes						
Gasoline Range		2000	2000	100	65-135	
Benzene		20	21	105	65-135	
Toluene		20	22	110	65-135	
Ethyl Benzene		20	22	110	65-135	
Total Xylenes		60	66	110	65-135	
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				106	50-150	
For Water Matrix (ug/L) DJ152.37 03 / 04 - Sample Spiked: 23332 - 07						
Gasoline Range	ND	2000	2000/2000	100/100	65-135	0
Benzene	ND	20	21/21	105/105	65-135	0
Toluene	ND	20	21/21	105/105	65-135	0
Ethyl Benzene	ND	20	21/21	105/105	65-135	0
Total Xylenes	ND	60	62/63	103/105	65-135	2
>> Surrogate Recoveries (%) <<						
Trifluorotoluene (SS)				101/98	50-150	

P - There is a greater than 25% difference for detected concentration between the two GC columns.

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

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ENSR
Attn: Peter B. Hudson

Project CHUN 8700 688
Reported on October 23, 1997

Halogenated Volatile Organics by EPA SW-846 Methods 5030/8010

Chronology

Laboratory Number 23342

Sample ID	Sampled	Received	Extract.	Analyzed	QC Batch	LAB #
MW-3	10/14/97	10/14/97	10/16/97	10/16/97	DJ161.07	01
MW-4	10/14/97	10/14/97	10/16/97	10/16/97	DJ161.07	02
MW-8	10/14/97	10/14/97	10/16/97	10/16/97	DJ161.07	03
MW-9	10/14/97	10/14/97	10/16/97	10/16/97	DJ161.07	04
MW-10	10/14/97	10/14/97	10/22/97	10/22/97	DJ221.07	05
MW-11	10/14/97	10/14/97	10/16/97	10/16/97	DJ161.07	06

QC Samples

QC Batch #	QC Sample ID	Type	Ref.	Matrix	Extract.	Analyzed
DJ161.07-01	Method Blank	MB		Water	10/16/97	10/16/97
DJ161.07-02	Laboratory Spike	LS		Water	10/16/97	10/16/97
DJ161.07-03	Laboratory Spike Duplicate	LSD		Water	10/16/97	10/16/97
DJ161.07-04	MW-4	MS	23342-02	Water	10/16/97	10/16/97
DJ161.07-05	MW-4	MSD	23342-02	Water	10/16/97	10/16/97
DJ221.07-01	Method Blank	MB		Water	10/22/97	10/22/97
DJ221.07-02	Laboratory Spike	LS		Water	10/22/97	10/22/97
DJ221.07-04	MW-10	MS	23342-05	Water	10/23/97	10/23/97
DJ221.07-05	MW-10	MSD	23342-05	Water	10/23/97	10/23/97

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Project CHUN 8700 688
Reported on October 23, 1997

Halogenated Volatile Organics by EPA SW-846 Methods 5030/8010

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
23342-01	MW-3	Water	1.0	-
23342-02	MW-4	Water	1.0	-
23342-03	MW-8	Water	1.0	-
23342-04	MW-9	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	23342-01 Conc. ug/L	RL	23342-02 Conc. ug/L	RL	23342-03 Conc. ug/L	RL	23342-04 Conc. ug/L	RL
Chloromethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Vinyl Chloride	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Bromomethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Chloroethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Trichlorofluoromethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,1-Dichloroethene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Dichloromethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
t-1,2-Dichloroethene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,1-Dichloroethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
c-1,2-Dichloroethene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Chloroform	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,1,1-Trichloroethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Carbon tetrachloride	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,2-Dichloroethane EDB	ND	0.5	ND	0.5	ND	0.5	7.4	0.5
Trichloroethene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
c-1,3-Dichloropropene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,2-Dichloropropane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
t-1,3-Dichloropropene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Bromodichloromethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,1,2-Trichloroethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Tetrachloroethene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Dibromochloromethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Chlorobenzene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
Bromoform	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,3-Dichlorobenzene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,2-Dichlorobenzene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
1,4-Dichlorobenzene	ND	0.5	ND	0.5	ND	0.5	ND	0.5
>> Surrogate Recoveries (%) <<								
Bromochloromethane	85		86		89		90	
4-Bromofluorobenzene	87		89		88		91	

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Project CHUN 8700 688
Reported on October 23, 1997

Halogenated Volatile Organics by EPA SW-846 Methods 5030/8010

LAB ID	Sample ID	Matrix	Dil.Factor	Moisture
23342-05	MW-10	Water	1.0	-
23342-06	MW-11	Water	1.0	-

R E S U L T S O F A N A L Y S I S

Compound	23342-05 Conc. ug/L	RL	23342-06 Conc. ug/L	RL
Chloromethane	ND	0.5	ND	0.5
Vinyl Chloride	ND	0.5	ND	0.5
Bromomethane	ND	0.5	ND	0.5
Chloroethane	ND	0.5	ND	0.5
Trichlorofluoromethane	ND	0.5	ND	0.5
1,1-Dichloroethene	ND	0.5	ND	0.5
Dichloromethane	ND	0.5	ND	0.5
t-1,2-Dichloroethene	ND	0.5	ND	0.5
1,1-Dichloroethane	ND	0.5	ND	0.5
c-1,2-Dichloroethene	ND	0.5	ND	0.5
Chloroform	1.5	0.5	ND	0.5
1,1,1-Trichloroethane	ND	0.5	ND	0.5
Carbon tetrachloride	ND	0.5	ND	0.5
1,2-Dichloroethane	ND	0.5	ND	0.5
Trichloroethene	ND	0.5	ND	0.5
c-1,3-Dichloropropene	ND	0.5	ND	0.5
1,2-Dichloropropane	ND	0.5	ND	0.5
t-1,3-Dichloropropene	ND	0.5	ND	0.5
Bromodichloromethane	ND	0.5	ND	0.5
1,1,2-Trichloroethane	ND	0.5	ND	0.5
Tetrachloroethene	ND	0.5	ND	0.5
Dibromochloromethane	ND	0.5	ND	0.5
Chlorobenzene	ND	0.5	ND	0.5
Bromoform	ND	0.5	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5	ND	0.5
1,3-Dichlorobenzene	ND	0.5	ND	0.5
1,2-Dichlorobenzene	ND	0.5	ND	0.5
1,4-Dichlorobenzene	ND	0.5	ND	0.5
>> Surrogate Recoveries (%) <<				
Bromochloromethane	96		86	
4-Bromofluorobenzene	97		86	

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Halogenated Volatile Organics by EPA SW-846 Methods 5030/8010

Quality Assurance and Control Data

Laboratory Number: 23342
Method Blank(s)

	DJ161.07-01 Conc. ug/L	RL	DJ221.07-01 Conc. ug/L	RL
Chloromethane	ND	0.5	ND	0.5
Vinyl Chloride	ND	0.5	ND	0.5
Bromomethane	ND	0.5	ND	0.5
Chloroethane	ND	0.5	ND	0.5
Trichlorofluoromethane	ND	0.5	ND	0.5
1,1-Dichloroethene	ND	0.5	ND	0.5
Dichloromethane	ND	0.5	ND	0.5
t-1,2-Dichloroethene	ND	0.5	ND	0.5
1,1-Dichloroethane	ND	0.5	ND	0.5
c-1,2-Dichloroethene	ND	0.5	ND	0.5
Chloroform	ND	0.5	ND	0.5
1,1,1-Trichloroethane	ND	0.5	ND	0.5
Carbon tetrachloride	ND	0.5	ND	0.5
1,2-Dichloroethane	ND	0.5	ND	0.5
Trichloroethene	ND	0.5	ND	0.5
c-1,3-Dichloropropene	ND	0.5	ND	0.5
1,2-Dichloropropane	ND	0.5	ND	0.5
t-1,3-Dichloropropene	ND	0.5	ND	0.5
Bromodichloromethane	ND	0.5	ND	0.5
1,1,2-Trichloroethane	ND	0.5	ND	0.5
Tetrachloroethene	ND	0.5	ND	0.5
Dibromochloromethane	ND	0.5	ND	0.5
Chlorobenzene	ND	0.5	ND	0.5
Bromoform	ND	0.5	ND	0.5
1,1,2,2-Tetrachloroethane	ND	0.5	ND	0.5
1,3-Dichlorobenzene	ND	0.5	ND	0.5
1,2-Dichlorobenzene	ND	0.5	ND	0.5
1,4-Dichlorobenzene	ND	0.5	ND	0.5
>> Surrogate Recoveries (%) <<				
Bromochloromethane	96		100	
4-Bromofluorobenzene	95		98	

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Halogenated Volatile Organics by EPA SW-846 Methods 5030/8010

Quality Assurance and Control Data

Laboratory Number: 23342

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
For Water Matrix (ug/L)						
DJ161.07 02 / 03 - Laboratory Control Spikes						
1,1-Dichloroethene		20	20/18	100/90	70-130	11
Trichloroethene		20	19/20	95/100	60-130	5
Chlorobenzene		20	21/21	105/105	75-130	0
>> Surrogate Recoveries (%) <<						
Bromochloromethane				97/98	70-120	
4-Bromofluorobenzene				98/99	60-125	
For Water Matrix (ug/L)						
DJ221.07 02 / - Laboratory Control Spikes						
1,1-Dichloroethene		20	19	95	70-130	
Trichloroethene		20	19	95	60-130	
Chlorobenzene		20	23	115	75-130	
>> Surrogate Recoveries (%) <<						
Bromochloromethane				111	70-120	
4-Bromofluorobenzene				120	60-125	
For Water Matrix (ug/L)						
DJ161.07 04 / 05 - Sample Spiked: 23342 - 02						
1,1-Dichloroethene	ND	20	20/19	100/95	70-130	5
Trichloroethene	ND	20	19/19	95/95	60-130	0
Chlorobenzene	ND	20	21/22	105/110	75-130	5
>> Surrogate Recoveries (%) <<						
Bromochloromethane				95/101	70-120	
4-Bromofluorobenzene				99/105	60-125	
For Water Matrix (ug/L)						
DJ221.07 04 / 05 - Sample Spiked: 23342 - 05						
1,1-Dichloroethene	ND	20	17/16	85/80	70-130	6

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Halogenated Volatile Organics by EPA SW-846 Methods 5030/8010

Quality Assurance and Control Data

Laboratory Number: 23342

Compound	Sample conc.	SPK Level	SPK Result	Recovery %	Limits %	RPD %
Trichloroethene	ND	20	17/17	85/85	60-130	0
Chlorobenzene	ND	20	20/18	100/90	75-130	11
>> Surrogate Recoveries (%) <<						
Bromochloromethane				99/88	70-120	
4-Bromofluorobenzene				109/90	60-125	

Definitions:
ND = Not Detected
RL = Reporting Limit
NA = Not Analysed
RPD = Relative Percent Difference
ug/L = parts per billion (ppb)
mg/L = parts per million (ppm)
ug/kg = parts per billion (ppb)
mg/kg = parts per million (ppm)

M901376

ENSR CHAIN OF CUSTODY RECORD

23342

Page 1 of 1

Client/Project Name:	Project Location:
CHUN 8700688	ALAMEDA CA
Project Number:	**Field Logbook No.:**
Sampler: (Print Name) /Affiliation: P. HUDSON	**Chain of Custody Tape No.:**
Signature: P. GEE	**Send Results/Report to:** PETER HUDSON 1420

Analysis Requested: TPH+Gas + BTEX (EPA 8020) / MTBE / EPA 8010 HAL. VOL. ORGANICS

Field Sample No./ Identification	Date	Time	Grab	Comp	Sample Container (Size/Matl)	Sample Type (Liquid, Sludge, Etc.)	Preservative	Field Filtered	TPH+Gas + BTEX (EPA 8020)	MTBE	EPA 8010 HAL. VOL. ORGANICS				Lab I.D.	Remarks
MW 3	10/14 1997				40ml VOA (6)	WATER	HCL	—	X	X	X					WATCH FOR AIR BUBBLES
MW 4	10/14 1997				40 ml VOA (6)	WATER	HCL	—	X	X	X					FROM CARBONATION ?)
MW 8	10/14 1997				40 ml VOA (6)	WATER	HCL	—	X	X	X					MW3, MW 4 MW #9
MW 9	10/14 1997				40 ml VOA (6)	WATER	HCL	—	X	X	X					MAY BE HOT—
MW 10	10/14 1997				40 ml VOA (6)	WATER	HCL	—	X	X	X					
MW 11	10/14 1997				40ml VOA (6)	WATER	HCL	—	X	X	X					

Please Initial — EJ
Samples Stored in ice. — YES — t=2.1
Appropriate containers — YES
Samples preserved — YES
VOA's without headspace — YES
Comments:

Relinquished by: (Print Name)	Date:	Received by: (Print Name)	Date:
PETER HUDSON	10/14/97	Elizabeth Travous	10/14/97
Signature:	Time: 4:56pm	Signature:	Time: 4:56
Relinquished by: (Print Name) Elizabeth Travous	Date: 10/14/97	Received by: (Print Name)	Date:
Signature:	Time: 7:00pm	Signature:	Time:
Relinquished by: (Print Name)	Date:	Received by: (Print Name) Polly Farrow	Date: 10/14/97
Signature:	Time:	Signature:	Time:

Analytical Laboratory (Destination):

Serial No. 23374

ATTACHMENT B

STANDARD OPERATING PROCEDURES
GROUNDWATER MONITORING AND SAMPLING

ENSR

SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES
SOP-4

Sample identification and chain-of-custody procedures ensure sample integrity, and document sample possession from the time of collection to its ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any name(s) of on-site personnel and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to its arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample-control officer at the laboratory will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

If these conditions are met, the samples will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, client's name, and any other relevant information will also be recorded.

LABORATORY ANALYTICAL QUALITY ASSURANCE AND CONTROL
SOP-5

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias. Additional components of the laboratory Quality Assurance/Quality Control program include:

1. Participation in state and federal laboratory accreditation/certification programs;
2. Participation in both U.S. EPA Performance Evaluation studies (WS and WP studies) and inter-laboratory performance evaluation programs;
3. Standard operating procedures describing routine and periodic instrument maintenance;
4. "Out-of-Control"/Corrective Action documentation procedures; and,
5. Multi-level review of raw data and client reports.

GROUNDWATER PURGING AND SAMPLING
SOP-7

Prior to water sampling, each well is purged by evacuating a minimum of three wetted well-casing volumes of groundwater. When required, purging will continue until either the discharge water temperature, conductivity, or pH stabilize to within 10% of previously measured values; and a maximum of ten wetted casing volumes of groundwater have been recovered, or the well is bailed dry. When practical, the groundwater sample should be collected when the water level in the well recovers to at least 80 percent of its static level. Field measurements, observations and procedures are noted.

The sampling equipment consists of a clean bailer, or stainless steel bladder pump with a "Teflon" bladder. If the sampling system is dedicated to the well, then the bailer is usually "Teflon," but the bladder pump may be PVC with a polypropylene bladder. Sample container type, preservation, and volume depends on the intended analyses.

The groundwater sample is decanted into each VOA vial in such a manner that there is no meniscus at the top of the vial. A cap is quickly secured to the top of the vial. The vial is then inverted and gently tapped to see if air bubbles are present. If none are present, the vial is labeled and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. Label information should include a unique sample identification number, job identification number, date, time, and the sampler's initials.

For quality control purposes, a duplicate water sample may be collected from a well. When required, a trip blank is prepared at the laboratory and placed in the transport cooler. It is labeled similar to the well samples, remains in the cooler during transport, and is analyzed by the laboratory along with the groundwater samples. In addition, a field blank may be prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been either steam cleaned or properly washed, prior to use in the next well, and is analyzed along with the other samples. The field blank analysis demonstrates the effectiveness of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all well development and water sampling equipment not dedicated to a well is either steam cleaned or properly washed between use. As a second precautionary measure, wells are sampled in order of lowest to highest concentrations as established by available previous analytical data.

In the event the water samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator.

MEASURING LIQUID LEVELS USING A WATER LEVEL INDICATOR OR INTERFACE PROBE
SOP-12

Field equipment used for liquid-level gauging typically includes the measuring probe (water level or interface) and a clean product bailer(s). The field kit also includes cleaning supplies (buckets, TSP, spray bottles, and deionized water) to be used in cleaning the equipment between wells.

Prior to measurement, the probe tip is lowered into the well until it touches bottom. Using the previously established top-of-casing or top-of-box (i.e., wellhead vault) point, the probe cord (or halyard) is marked and a measuring tape (graduated in hundredths of a foot) is used to determine the distance between the probe end and the marking on the cord. This measurement is then recorded on the liquid-level data sheet as the "Measured Total Depth" of the well.

When necessary in using the interface probe to measure liquid levels, the probe is first electrically grounded to either the metal stove pipe or another metal object nearby. When no ground is available, reproducible measurements can be obtained by clipping the ground lead to the handle of the interface probe case.

The probe tip is then lowered into the well and submerged in the groundwater. An oscillating (beeping) tone indicates the probe is in water. The probe is slowly raised until either the oscillating tone ceases or becomes a steady tone. In either case, this is the depth-to-water (DTW) indicator and the DTW measurement is made accordingly. The steady tone indicates floating hydrocarbons. In this case, the probe is slowly raised until the steady tone ceases. This is the depth-to-product (DTP) indicator and the measurement of DTP is recorded. A corrected depth to groundwater to account for floating hydrocarbons can be calculated by using the following formula:

CDTW = DTW - (SP.G x LHT).
CDTW = Corrected depth to groundwater.
DTW = Measured depth to groundwater.
SP.G = Specific gravity: unweathered gasoline = 0.75; diesel = 0.80
LHT = Measured liquid hydrocarbon thickness.

The corresponding groundwater elevation is the difference between a previously determined well reference elevation and either the depth to groundwater or the corrected depth to groundwater.

The process of lowering and raising the probe must be repeated several times to ensure accurate measurements. The DTW and DTP measurements are recorded on the liquid-level data sheet. When floating product is indicated by the probe's response, a product bailer is lowered partially through the product-water interface to confirm the product on the water surface, and as further indication of product thickness, particularly in cases where the product layer is quite thin. Either this measurement or the difference between DTW and DTP is recorded on the data sheet as "product thickness."

In order to avoid cross-contamination of wells during the liquid-level measurement process, wells are measured in the order of "clean" to "dirty" (where such information is available). In addition, all measurement equipment is cleaned with TSP or similar solution and thoroughly rinsed with deionized water before use, between measurements in respective wells, and at the completion of the day's activities.