Environmental
Science &
Engineering, Inc.
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TO: Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Suite 200
Oakland, CA 94621

DATE: August 16, 1994

ATTN: Ms. Juliet Shin

JOB NUMBER: 6-93-5112

SUBJECT: Second Quarter Ground Water Monitoring Report

WE ARE TRANSMITTING THE FOLLOWING:

Second Quarter Ground Water Monitoring Report for Former Bill Chun Service Center, 2301 Santa Clara Avenue, Alameda, Alameda County, California. Please contact Chris Valcheff or Mike Quillin at (510) 685-4053 if there are any questions regarding this report.

CC: Mr. Wayne Chun
Mr. Steve Marquez, Water Resources Control Board, UST Cleanup Fund
RWQCB - SFB Region, Toxics Cleanup Division
Capt. Steve Mckinley, Alameda Fire Dept.

DIST:
LB
FILE
ORIGINATOR

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

BY Chris H. Valcheff

Christopher H. Valcheff
Staff Geologist

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

SECOND QUARTER 1994
GROUND WATER MONITORING
FORMER BILL CHUN SERVICE STATION
2301 SANTA CLARA AVENUE
ALAMEDA, ALAMEDA COUNTY, CALIFORNIA

(ESE PROJECT #6-93-5112)

PREPARED FOR:

MR. WAYNE CHUN
265 HERON DRIVE
PITTSBURG, CALIFORNIA 94565

AND

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
DEPARTMENT OF ENVIRONMENTAL HEALTH
80 SWAN WAY, ROOM 200
OAKLAND, CALIFORNIA 94621

PREPARED BY:

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

August 16, 1994

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This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of Mr. Wayne Chun as it pertains to the former Bill Chun Service Station, located at 2301 Santa Clara Avenue in Alameda, Alameda County, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made regarding professional advice provided in this report.

REPORT PREPARED BY:

Christopher H. Valcheff
Staff Geologist

8/16/94
DATE

UNDER THE PROFESSIONAL REVIEW AND SUPERVISION OF:

Michael E. Quillin
Senior Hydrogeologist
California Registered Geologist No. 5315

8/16/94
DATE

ESE PROJECT NO. 6-93-5112

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1.0 INTRODUCTION

This report was prepared by Environmental Science & Engineering, Inc. (ESE), and presents the results of Second Quarter 1994 ground water monitoring at the Former Bill Chun Service Station ("site") located at 2301 Santa Clara Avenue in Alameda, Alameda County, California (see Figure 1 - Location Map). Field activities reported herein were conducted by ESE in June 1994. Field activities included measuring static water levels, collecting ground water samples from existing ground water monitoring wells, and analyzing ground water samples for petroleum hydrocarbon content.

1.1 SITE DESCRIPTION

The site is a former service station consisting of a kiosk, a single fuel island with associated canopy, and a separate two-bay repair service building (see Figure 2 - Site Map). An excavation resulting from the July 1992 removal of three underground storage tanks (USTs) remains open. A security fence has been present along the perimeter of the site since January 1993.

The site is relatively flat with an approximate elevation of 30 feet above mean sea level (USGS, 1980). Site physiography and geology were summarized in ESE's March 1993 Preliminary Site Assessment (PSA) report (ESE, 1993a).

1.2 INVESTIGATION BACKGROUND

Site investigation was initiated in July 1992, when Parker Environmental Services (Parker) directed the excavation and removal of three gasoline USTs (two 550-gallon and one 285-gallon) and their associated fuel lines and dispensers. UST removal and excavation was performed by Burnabe & Brinker (B&B). Parker reported that a two-inch hole was observed at the bottom of the 285-gallon UST, for which original contents (type of gasoline) were not specified. Parker collected six soil samples during the UST removal program. One sample of undisturbed soil was collected from beneath each of the former USTs (approximately nine feet below grade), one from beneath the former fuel island, and two from the stockpiled soil generated during UST excavation. Sample locations were reportedly selected by a representative of the Alameda

County Health Care Services Agency, Department of Environmental Health (Alameda County). Those locations were shown in Figure 2 - Site Map of ESE's PSA report (ESE, 1993a).

Parker reported the results of soil sample analysis in an August 4, 1992 letter report to B&B (Parker, 1992). Concentrations of total petroleum hydrocarbons as gasoline (TPHg) up to 16,000 milligrams per kilogram (mg/Kg) or parts per million (ppm) were reported. Concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX) up to 1,400 ppm were reported. The highest concentrations of petroleum hydrocarbons were detected in soil samples collected from beneath the former USTs. ESE was informed by a Parker representative that overexcavation of soil was not performed (Jim Parker, personal communication, 1993).

A soil stockpile with an estimated volume of 50-60 cubic yards was generated during UST removal activities. As part of ESE's PSA, the stockpile was profiled and appropriately disposed. That work was documented in ESE's PSA report (ESE, 1993a).

In January 1993, ESE performed the referenced PSA, which included drilling three soil borings to a depth of approximately 25 feet below ground surface (bgs), sampling soil at five-foot intervals within the borings and having selected samples analyzed for petroleum hydrocarbon content, installing two-inch diameter monitoring wells in the borings (MW-1, MW-2, and MW-3; Figure 2 - Site Map), measuring static water levels in the wells, and collecting ground water samples which were analyzed for petroleum hydrocarbon content. The work was performed in accordance with ESE's Workplan for Preliminary Site Assessment (ESE, 1992), which was approved, with modifications, by Alameda County in a December 30, 1992 letter to Mr. Wayne Chun (Alameda County, 1992).

ESE's PSA concluded that soil in the vicinity of the three borings contained petroleum hydrocarbons, particularly at the approximate vadose zone/saturated zone interface (approximately 10-15 feet bgs). Analytical results for soil samples collected from 10 feet bgs in each boring confirmed that concentrations of petroleum hydrocarbons ranged from 640 to 5,800 ppm. Hydrocarbons detected in soil samples from borings MW-1 and MW-3 were

identified by the analytical laboratory as weathered gasoline. Hydrocarbons in the diesel fuel range were not identified in any of the samples.

Static water levels in monitoring wells MW-1, MW-2, and MW-3, installed in the three borings described above, were approximately nine feet bgs when measured on January 7, 1993. ESE estimated the approximate direction of ground water flow beneath the site as generally westward toward Oak Street (Figure 2). Laboratory analysis of ground water samples collected from the wells at that time indicated TPHg concentrations ranging from 8.5 to 110 milligrams per liter (mg/L) or ppm. In MW-3, the hydrocarbons were identified as weathered gasoline. No diesel was identified in any of the samples. BTEX concentrations in the samples ranged from not detectable above laboratory reporting limits to 20 ppm.

In September 1993, ESE performed an additional site assessment to assess the extent of petroleum hydrocarbons in soil and ground water beneath the site, and to further characterize the shallow site subsurface to allow assessment of remedial options. Additional site assessment activities included installing four new ground water monitoring wells, and collecting soil and ground water samples and analyzing both for petroleum hydrocarbons. The results of this additional assessment are presented along with third quarter 1993 ground water monitoring results in ESE's October 1993 Report titled "Findings and Additional Site Assessment and Third Quarter 1993 Ground Water Monitoring."

ESE conducted additional quarterly monitoring activities in December 1993 and March 1994. The results of these activities are summarized in ESE's "Fourth Quarter 1994 Ground Water Monitoring" dated January 6, 1994, and ESE's "First Quarter 1994 Ground Water Monitoring" dated May 26, 1994.

A workplan for additional site assessment was prepared by ESE in April 1994 and submitted to Alameda County. The workplan addressed additional investigation required by Alameda County in an October 7, 1993 letter to Mr. Wayne Chun, site representative. The workplan was approved by Alameda County subject to additional requirements/reminders presented in a May 16, 1994 letter to Mr. Chun. **Implementation of the workplan is pending.**

2.0 GROUND WATER MONITORING

2.1 GROUND WATER ELEVATIONS

On June 6, 1994, ESE measured the static water levels in the seven ground water monitoring wells using an electric interface probe. Measurements were made relative to the surveyed datum for each well. ESE calculated the relative ground water elevations for the purpose of preparing ground water elevation contour maps, from which ESE estimated the general ground water flow direction and gradient.

2.2 GROUND WATER SAMPLING AND ANALYSIS

On June 6, 1994, ESE purged each well and collected ground water samples in accordance with ESE Standard Operating Procedure (SOP) No. 3 for Ground Water Monitoring and Sampling from Monitoring Wells (Appendix A). Purge water was stored in appropriately labeled DOT-rated drums and stored on site pending analysis and recycling. **ESE did not collect ground water samples from wells MW-5 and MW-7 because of the presence of free phase petroleum hydrocarbons (free product) on ground water in those wells.**

Ground water samples were preserved for analysis and transferred under chain of custody documentation to Sequoia Analytical (Sequoia), a State-certified laboratory. Sequoia analyzed each sample for total purgeable petroleum hydrocarbons (TPHg) with BTEX distinction using EPA Method 5030/8015/8020, and for total extractable petroleum hydrocarbons (TEPH) using EPA Method 3510/3520/8015.

As a measure of field quality assurance and quality control (QA/QC), ESE collected a duplicate sample from well MW-1 as a means of evaluating sample homogeneity and to provide a check on ESE's sample collection procedures. The duplicate sample also serves as check on analytical laboratory procedures. In addition, a laboratory-supplied trip blank consisting of deionized water was kept and transported to Sequoia in the same cooler with the ground water samples for the purpose of evaluating ESE's sample handling and transport procedures.

3.0 RESULTS

3.1 GROUND WATER PHYSICAL RESULTS

Historical and current ground water elevation data and free product thicknesses are presented in Table 1 - Historical Ground Water Elevation Data. Ground water elevations for the current monitoring event are contoured on Figure 3 - Ground Water Elevations, June 6, 1994. Ground water elevations for all wells at the site decreased between 0.26 and 1.19 feet since the March 1994 monitoring event. The estimated overall direction of ground water flow was observed to be to the north-northwest with an approximate overall gradient of 0.03 (158 ft/mile) for the June monitoring event. This flow direction is generally consistent with that estimated during the March 1994 monitoring event. The gradient of 0.03 estimated from the June 1994 data is slightly higher than the gradient estimated during the March 1994 monitoring event.

The groundwater elevations measured in wells MW-1, MW-2, MW-6, and MW-7 imply a component of ground water flow to the east in the northeastern portion of the site (Figure 3).

Free product were observed in wells MW-5 and MW-7 during the June monitoring event. Elevation data presented in Figure 3 has been corrected for the presence of free product, using a specific gravity for gasoline of 0.82.

Sample data sheets for each well, showing purge volumes and results of physical sample characterization (pH, temperature, and conductivity) are presented in Appendix B - Sample Data Sheets.

3.2 GROUND WATER CHEMICAL RESULTS

Analytical results for ground water samples collected by ESE since monitoring was initiated in January 1993 are summarized in Table 2 - Historical Analytical Results for Ground Water Samples. Concentrations of petroleum hydrocarbons detected in each well during the June sampling event are presented on Figure 4 - Concentrations of Petroleum Hydrocarbons, June 6, 1994. Laboratory reports and chain of custody documentation for the samples are presented in

Appendix C - Analytical Results and Chain of Custody Documentation for Ground Water Samples.

Results shown in Table 2 and Figure 4 indicate that ground water samples collected from all monitoring wells on site contained petroleum hydrocarbons. **These hydrocarbons were identified by the laboratory as being primarily within the gasoline range, although extractable hydrocarbons (diesel and non-diesel mixtures) were also detected in each sample.** The highest concentrations of all ranges of petroleum hydrocarbons identified were detected in wells located downgradient of the former fuel island and USTs. Free product was found in well MW-5 and MW-7 during the last two monitoring events, and ground water samples were therefore not collected from these wells.

TEPH detected in samples collected from wells MW-1, MW-4, and MW-6, located downgradient of the UST excavation, were identified by Sequoia as a diesel and unidentified hydrocarbon mixture. TEPH detected in samples from each of the remaining wells (MW-2 and MW-3) were described as unidentified hydrocarbons.

Comparison of previous data and current data presented in Table 2 identified a general decrease in TPHg concentrations in wells MW-2, MW-3, MW-4, and MW-6 since the March 1994 monitoring event. The TPHg concentration in samples collected from well MW-1, located downgradient of the tank pit and former fuel islands, approximately doubled between the March 1994 and June 1994 monitoring events. The higher TPHg concentration detected in the ground water sample from well MW-1 in June 1994 is within the range of TPHg concentrations historically observed in this well. Benzene concentrations increased in wells MW-1, MW-2, and MW-6, decreased in well MW-3 and remained below laboratory reporting limits (non-detectable) in well MW-4. Concentrations of toluene decreased in wells MW-1, MW-3, and MW-6 and remained constant in wells MW-2 and MW-4. Concentrations of toluene were non-detectable in the ground water samples collected from wells MW-3 and MW-4. Ethylbenzene and total xylenes concentrations decreased in all wells with the exception of wells MW-3 and MW-4. These wells showed no change in ethylbenzene concentration from the last sampling event. Well

MW-4 showed a decrease in total xylenes concentration for this event, while well MW-3 showed no change in total xylenes concentration.

TEPH concentrations decreased in wells MW-1, MW-2, and MW-6 and increased in wells MW-3 and MW-4. The higher TEPH concentrations detected in wells MW-3 and MW-4 were within the range historically observed at the site.

Free product was found in wells MW-5 and MW-7 and has increased in thickness 0.27 feet and 0.53 feet, respectively, from the previous monitoring event.

3.3 QUALITY CONTROL SAMPLES

The trip blank did not contain detectable concentrations of BTEX constituents, indicating satisfactory sample handling and transport procedures. Analytical results for the duplicate sample collected from MW-1 for QA/QC purposes (Dup; Table 2 and Appendix C) were within an acceptable range of relative percent difference when compared to the results for MW-6.

4.0 CONCLUSIONS

- The general direction of ground water flow beneath the site appears to be to the north-northwest at a gradient of 0.03. This flow direction is expected to be the generally preferred direction of migration for dissolved petroleum hydrocarbons in ground water. The ground water elevation data additionally suggest a component of ground water flow, and consequent petroleum hydrocarbon migration, to the east in the northeastern portion of the site.

- **Ground water samples collected from all monitoring wells at the site during this monitoring program have contained petroleum hydrocarbons.** The highest concentrations of petroleum hydrocarbons, primarily in the gasoline and apparent weathered gasoline ranges, have been detected in ground water samples collected from wells located downgradient of the former USTs and fuel island at the site.

- Although a large proportion of petroleum hydrocarbons in ground water samples appears to be weathered gasoline, **relatively high concentrations of volatile hydrocarbons** (TPHg, benzene, and toluene), **as well as free product in well MW-5 and MW-7, imply that the release is relatively recent.**

- **Free product** observed during the First and Second Quarter 1994 monitoring events in wells MW-5 and MW-7 **implies that the former fuel island,** located directly upgradient from well MW-5, **is a possible source of petroleum hydrocarbons.**

  How do you explain product in MW-5 ??

- **Free product thickness observed in the on-site wells appears to increase concurrent with a decrease in ground water elevation.**

- The increase in TEPH in wells MW-3 and MW-4, located up-gradient of the former fuel islands and USTs, indicates the potential for an off-site source.

- The increase in petroleum hydrocarbon concentrations in wells along the downgradient margin of the site indicates that there is a **high probability of off-site migration of** dissolved (and possibly free phase) petroleum hydrocarbons in ground water.

5.0 REFERENCES

Alameda County Health Care Services Agency, Department of Environmental Health, 1992, Written Communication to Mr. Wayne Chun, December 30, 1992.

Environmental Science & Engineering, Inc. (ESE), 1992, Workplan for Preliminary Site Assessment at Bill Chun Service Station located at 2301 Santa Clara Avenue, Alameda, California; Prepared for Alameda County Health Care Services Agency, Department of Environmental Health, December 16, 1992.

___, 1993a, Report on Preliminary Site Assessment at the Former Bill Chun Texaco Service, 2301 Santa Clara Avenue, Alameda, Alameda County, California: Prepared for Mr. Wayne Chun, March 31, 1993.

___, 1993b, Workplan for Remedial Investigation, Former Bill Chun's Service Station, 2301 Santa Clara Avenue, Alameda, Alameda County, California: Prepared for Alameda County Health Care Services Agency, Department of Environmental Health, August 24, 1993.

Parker Environmental Services (Parker), 1992, Underground Tank Removal Soil Sampling and Analysis Report, Letter Report to Mr. Jim Brinker, Burnabe & Brinker, Oakland, California, August 4, 1992.

___, 1993, Personal Communication with James D. Parker, September 22, 1993

United States Geological Survey (USGS), 1959 (Photorevised 1980), Oakland East Quadrangle, 7.5-Minute Series (Topographic), Scale: 1 = 24,000.

TABLE 1

HISTORICAL GROUND WATER ELEVATION DATA

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

Well	Date	Datum (ft. AMSL)	Depth to Water	Depth to Product	Product Thickness	Corrected Ground Water Elevation (ft. AMSL)
MW-1	06/06/94	28.53	9.55	NP	--	18.98
	03/04/94		9.18	NP	--	19.35
	02/03/94		9.50	NP	--	19.03
	01/06/94		9.67	NP	--	18.86
	12/07/93		9.66	NP	--	18.87
	11/16/93		9.89	NP	--	18.64
	09/07/93		9.63	NP	--	18.90
	01/07/93		8.87	NP	--	19.66*
MW-2	06/06/94	28.51	9.40	NP	--	19.11
	03/04/94		9.02	NP	--	19.49
	02/03/94		9.37	NP	--	19.14
	01/06/94		9.54	NP	--	18.97
	12/07/93		9.54	NP	--	18.97
	11/16/93		9.73	NP	--	18.78
	09/07/93		9.52	NP	--	18.99
	01/07/93		8.78	NP	--	19.73*
MW-3	06/06/94	28.82	9.50	NP	--	19.32
	03/04/94		9.11	NP	--	19.71
	02/03/94		9.45	NP	--	19.37
	01/06/94		9.62	NP	--	19.20
	12/07/93		9.60	NP	--	19.22
	11/16/93		9.82	NP	--	19.00
	09/07/93		9.62	NP	--	19.20
	01/07/93		8.86	NP	--	19.96*
MW-4	06/06/94	28.57	9.31	NP	--	19.26
	03/04/94		9.05	NP	--	19.52
	02/03/94		9.31	NP	--	19.26
	01/06/94		9.44	NP	--	19.13
	12/07/93		9.42	NP	--	19.15
	11/16/93		9.60	NP	--	18.97
	09/07/93		9.39	NP	--	19.18

TABLE 1 (cont...)

HISTORICAL GROUND WATER ELEVATION DATA

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

Well	Date	Datum (ft. AMSL)	Depth to Water	Depth to Product	Product Thickness	Corrected Ground Water Elevation (ft. AMSL)
MW-5	06/06/94	28.37	9.72	9.14	0.58	18.17
	03/04/94		8.99	8.96	0.03	19.36
	02/03/94		9.51	9.19	0.32	18.60
	01/06/94		9.85	9.27	0.58	19.00
	12/07/93		9.88	9.27	0.61	18.99
	11/16/93		9.99	9.45	0.54	18.82
	09/07/93		9.31	NP	--	19.06
MW-6	06/06/94	28.41	9.46	NP	--	18.95
	03/04/94		9.18	NP	--	19.23
	02/03/94		9.47	NP	--	18.94
	01/06/94		9.60	NP	--	18.81
	12/07/93		9.58	NP	--	18.83
	11/16/93		9.74	NP	--	18.67
	09/07/93		9.53	NP	--	18.88
MW-7	06/06/94	28.56	9.67	9.37	0.30	18.64
	03/04/94		9.04	9.01	0.03	19.53
	02/03/94		9.56	9.39	0.17	18.86
	01/06/94		9.59	NP	--	18.97
	12/07/93		9.58	NP	--	18.98
	11/16/93		9.86	NP	--	18.70
	09/07/93		9.61	NP	--	18.95

NOTES:

ft. AMSL = Feet Above Mean Sea Level
NP = No free product observed
* = Elevation corrected to reflect standardization of survey data

TABLE 2

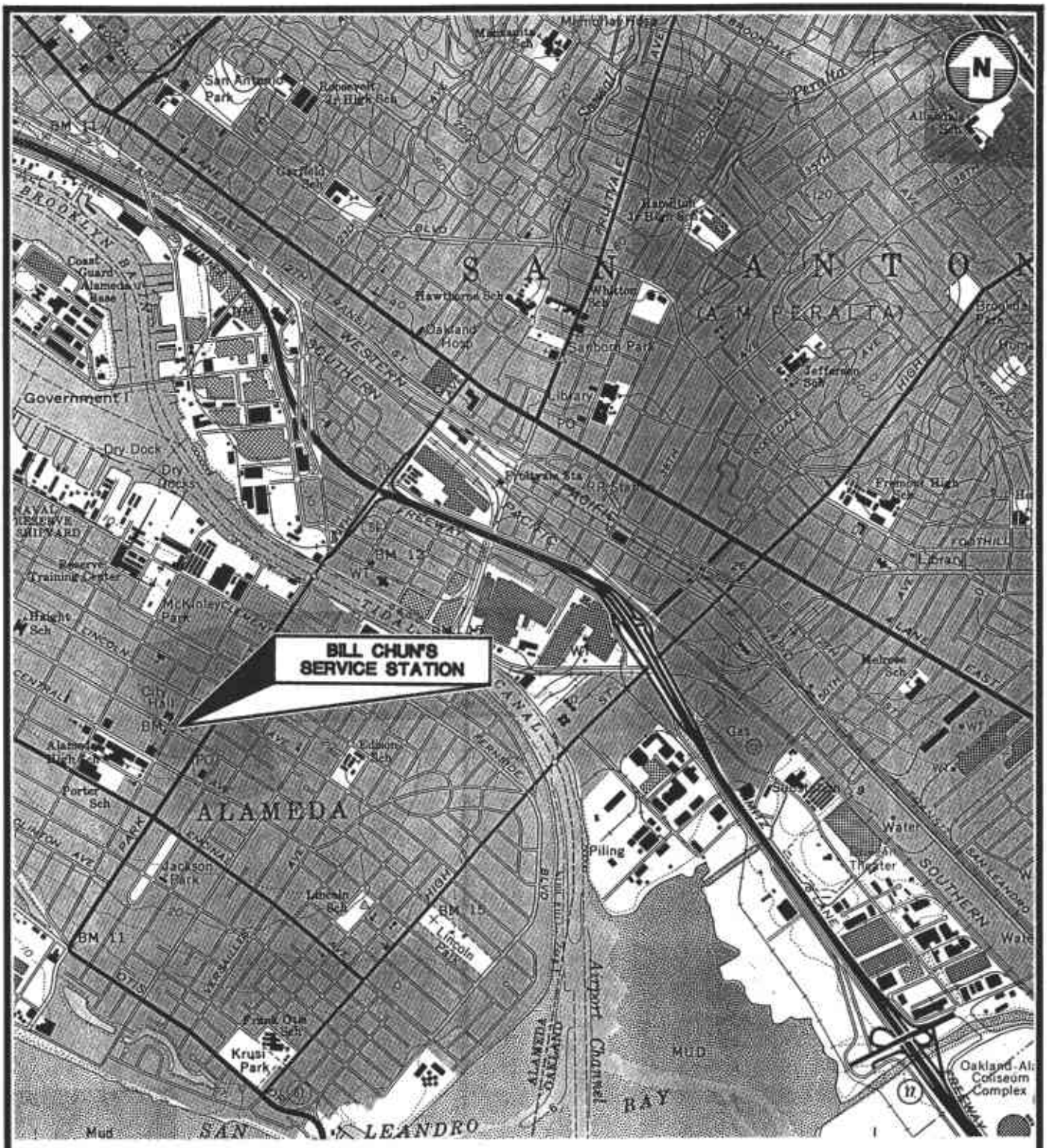
HISTORICAL ANALYTICAL RESULTS FOR GROUND WATER SAMPLES

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

Well	Date	TPH-g (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	TEPH (µg/L)
MW-1	06/06/94	12,000	6,300	230	ND <0.5	ND <0.5	710 (4)
	03/04/94	6,600	4,400	870	150	590	920 (4)
	12/07/93	17,000	10,000	3,000	610	2,000	1,800 (1)
	09/07/93	28,000	11,000	2,100	380	1,200	1,000 (2)
	01/07/93	110,000	14,000	17,000	2,500	8,800	ND<3,000
MW-2	06/06/94	100,000	27,000	22,000	2,300	10,000	9,600 (5)
	03/04/94	130,000	22,000	22,000	3,500	16,000	18,000 (4)
	12/07/93	86,000	28,000	17,000	35,000	16,000	8,200 (2)
	09/07/93	140,000	46,000	28,000	3,300	15,000	8,200 (2)
	01/07/93	85,000	20,000	8,500	1,500	4,300	ND<3,000
MW-3	06/06/94	1,900	3.9	ND <0.5	9.0	27	1,600 (5)
	03/04/94	2,300	22	46	9.0	27	1,300 (5)
	12/07/93	3,000	17	43	13	28	520 (2)
	09/07/93	2,800	19	46	7.7	23	2,500 (1)
	01/07/93	8,500 (3)	170	70	ND<30	ND<30	ND<3,000
MW-4	06/06/94	68	ND <0.5	ND <0.5	ND <0.5	ND <0.5	68 (4)
	03/04/94	110	ND<0.5	ND<0.5	ND<0.5	0.63	56 (5)
	12/07/93	610	6.6	ND<0.5	0.61	2.5	460 (2)
	09/07/93	440	2.7	1.2	1	1.9	330 (2)
MW-5	06/06/94	NS	NS	NS	NS	NS	NS
	03/04/94	NS	NS	NS	NS	NS	NS
	12/07/93	NS	NS	NS	NS	NS	NS
	09/07/93	37,000	2,700	1,700	870	4,600	1,700 (2)
MW-6	06/06/94	12,000	5,400	350	ND<0.5	1,200	1,600 (4)
	03/04/94	21,000	4,600	1,000	460	1,800	1,800 (4)
	12/07/93	17,000	4,300	1,200	600	2,700	2,400 (2)
	09/07/93	10,000	1,300	540	370	1,600	1,400 (2)
MW-7	06/06/94	NS	NS	NS	NS	NS	NS
	03/04/94	NS	NS	NS	NS	NS	NS
	12/07/93	95,000	28,000	24,000	1,600	8,700	2,200 (1)
	09/07/93	24,000	6,800	4,800	490	2,300	1,300 (1)
DUP MW-1	06/06/94	8,400	5,200	150	ND<0.5	89	680

NOTES:

TPH-g = Total Petroleum Hydrocarbons as Gasoline
µg/L = Micrograms per liter or parts per billion (ppb)
TEPH = Total Extractable Petroleum Hydrocarbons
NS = Not Sampled - Free Product present
ND = Not Detected
< = Less than listed quantitation limit
(1) = Quantitated as a non-diesel mixture (<C16)
(2) = Quantitated as a diesel and non-diesel mixture (<C16)
(3) = Quantitated as weathered gasoline
(4) = Quantitated as diesel and unidentified hydrocarbons (<C14)
(5) = Quantitated as unidentified hydrocarbons (<C14)



SCALE 1:24,000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

ADAPTED FROM U.S.G.S. OAKLAND EAST 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAP, 1959, PHOTOREVISED 1980.

ESE A CILCORP Company Environmental Science & Engineering, Inc. 4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DATE 8/93 REVISED CAD FILE 51121001	LOCATION MAP BILL CHUN'S SERVICE STATION 2301 SANTA CLARA AVENUE ALAMEDA, CALIFORNIA	FIGURE NO. 1 PROJ. NO. 6-93-5112

OAK STREET

SANTA CLARA AVENUE

SIDEWALK

SIDEWALK

MW-4

MW-5

MW-6

MW-1

MW-2

MW-3

MW-7

CANOPY SUPPORT

CANOPY

FORMER FUEL ISLAND

LIMIT OF EXISTING EXCAVATION

KIOSK

STORM DRAIN

REPAIR SERVICE BUILDING

EXISTING STRUCTURE

LEGEND

EXISTING MONITORING WELL LOCATION

PROPERTY BOUNDARY

SCALE

0 10 FEET

ESE A DILCORP Company

Environmental Science & Engineering, Inc.

4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

DATE 8/93

REVISED 9/93 MEQ

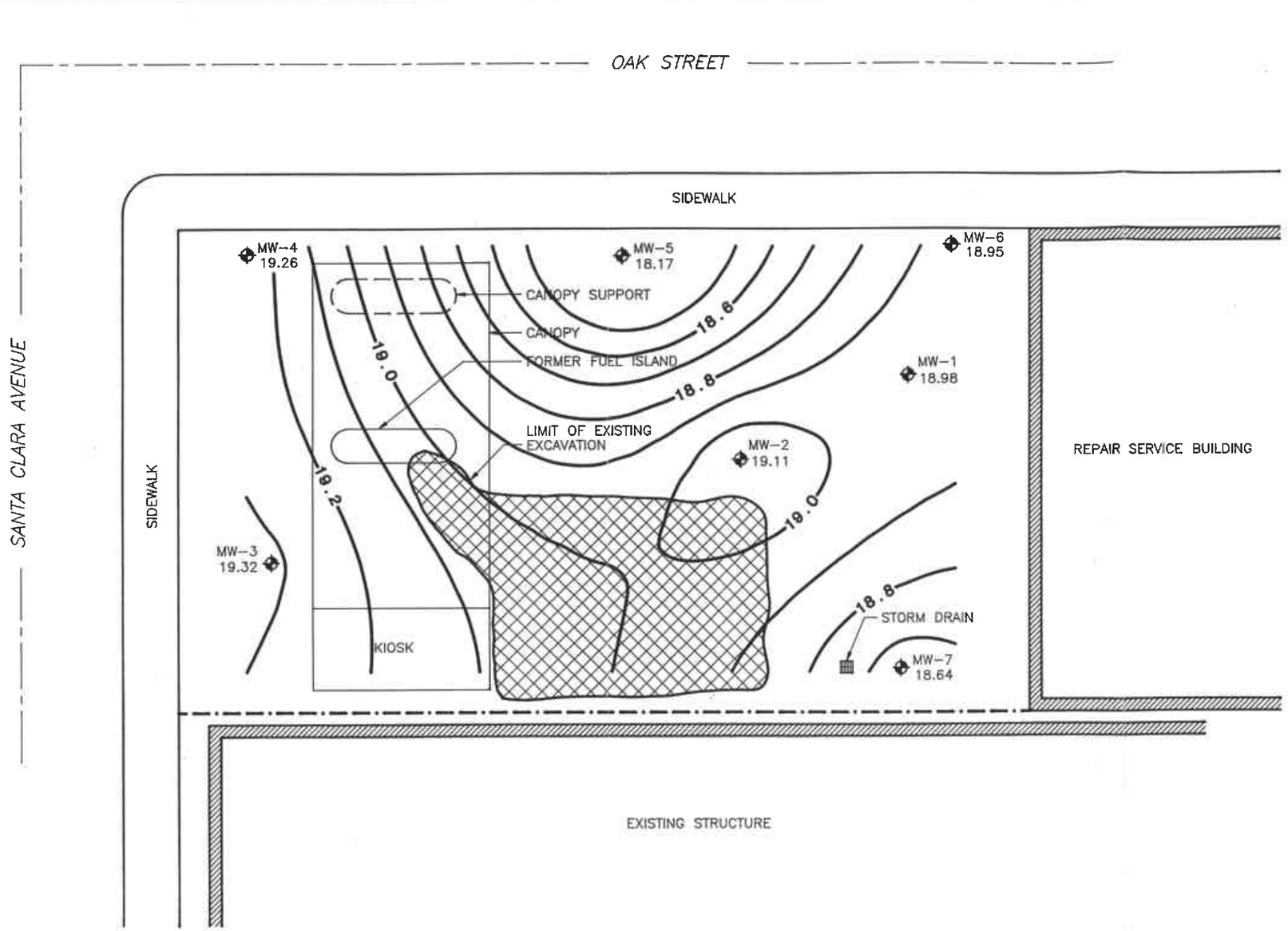
CAD FILE 51121002

SITE MAP

BILL CHUN'S SERVICE STATION
2301 SANTA CLARA AVENUE
ALAMEDA, CALIFORNIA

FIGURE NO. 2

PROJ. NO. 6-93-5112



LEGEND

- EXISTING MONITORING WELL LOCATION
- PROPERTY BOUNDARY
- 19.32 GROUND WATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL)
- 19.2 GROUND WATER ELEVATION CONTOUR IN FEET ABOVE MSL
- APPROXIMATE DIRECTION OF GROUND WATER FLOW

SCALE
0 10 FEET

CONTOUR INTERVAL = 0.1 FEET

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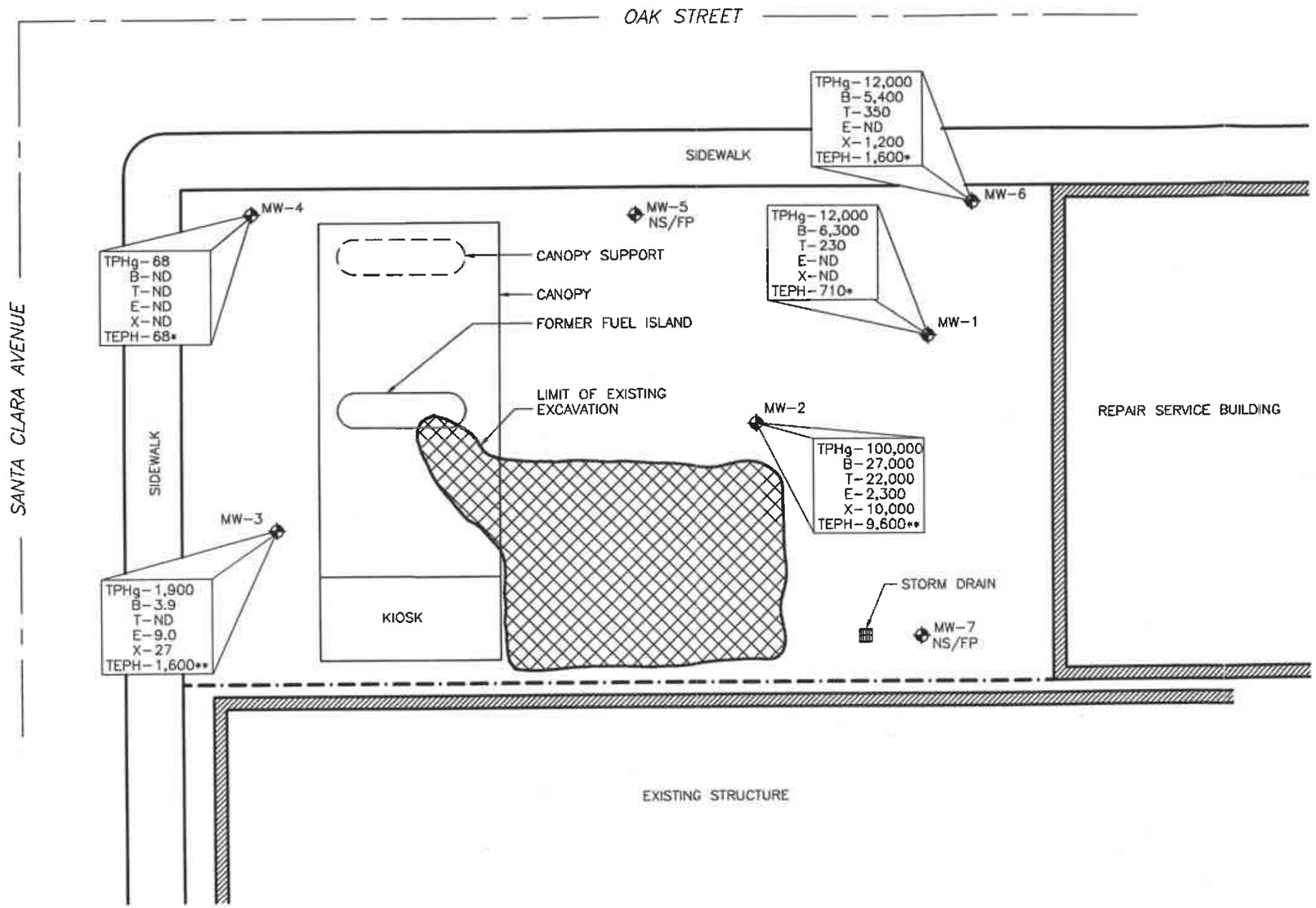
Environmental Science & Engineering, Inc.
4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

DATE 9/93
REVISED 6/94 MEQ
CAD FILE 51121003

GROUND WATER ELEVATIONS
JUNE 6, 1994

BILL CHUN'S SERVICE STATION
2301 SANTA CLARA AVENUE
ALAMEDA, CALIFORNIA

FIGURE NO. 3
PROJ. NO. 6-93-5112



LEGEND

- EXISTING MONITORING WELL LOCATION
- PROPERTY BOUNDARY

TPHg	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (ppb)
B	BENZENE (ppb)
T	TOLUENE (ppb)
E	ETHYLBENZENE (ppb)
X	XYLENES (ppb)
TEPH	TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS (ppb)
NS/FP	NOT SAMPLED/FREE PRODUCT PRESENT
*	QUANTITATED BY SEQUOIA AS A DIESEL AND UNIDENTIFIED HYDROCARBON MIXTURE (<C14)
**	QUANTITATED BY SEQUOIA AS UNIDENTIFIED HYDROCARBONS (<C14)
ND	NOT DETECTED

SCALE
0 10 FEET

Environmental Science & Engineering, Inc.
4090 NELSON AVENUE, SUITE J
CONCORD, CA 94520

DATE 5/94
REVISED 6/29/94
CAD FILE 51121009

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUND WATER JUNE 6, 1994

BILL CHUN'S SERVICE STATION
2301 SANTA CLARA AVENUE
ALAMEDA, CALIFORNIA

FIGURE NO. 4
PROJ. NO. 6-93-5112

APPENDIX A

ESE STANDARD OPERATING PROCEDURE NO. 3 FOR GROUND WATER MONITORING AND SAMPLING FROM MONITORING WELLS

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURE NO. 3
FOR GROUND-WATER MONITORING AND SAMPLING FROM MONITORING WELLS

Environmental Science & Engineering, Inc. (ESE) typically performs ground-water monitoring at project sites on a quarterly basis. As part of the monitoring program an ESE staff member will first gauge the depth to water and free product (if present) in each well, then collect ground-water samples from each well. Depth to water measurements are taken by lowering an electric fiberglass tape measure into the well and recording the occurrence of water in feet below a fixed datum set on the top of the well-casing. If free-phase liquid hydrocarbons (free product) are known or suspected to be present in the well, then an electric oil/water interface probe is used to determine the depth to the occurrence of ground-water and the free product in feet below the fixed datum on the top of the well-casing. Depth to water and depth to product measurements are measured and recorded within an accuracy of 0.005-foot. The electric tape and the electric oil/water interface probe are washed with an Alconox® detergent and tap water solution then rinsed with tap water between uses in different wells.

Ground-water samples are collected from a well subsequent to purging a minimum of three to four well-casing volumes of ground water from the well, if the well bails dry prior to the removal of the required minimum volume, then the samples are collected upon the recovery of the ground water in that well to 80% of its initial static level. Ground water is typically purged from monitoring wells using either a hand-operated positive displacement pump, constructed of polyvinylchloride (PVC); a new (precleaned), disposable polyethylene bailer; or, a variable-flow submersible pump, constructed of stainless steel and Teflon®. The hand pumps and the submersible pumps are cleaned between each use with an Alconox® detergent and tap water solution followed by a tap water rinse. During the well purging process the conductivity, pH and temperature of the ground water are monitored by the ESE staff member. Ground-water samples are collected from the well subsequent to the stabilization of the of the conductivity, pH and temperature of the purge water, and the removal of four well-casing volumes of ground-water (unless the well bails dry). The parameters are deemed to have stabilized when two consecutive measurements are within 10% of each other, for each respective parameter. The temperature, pH, conductivity and purge volume measurements, and observations of water clarity and sediment content will be documented by the ESE staff member on ESE Ground-Water Sampling Data Forms.

Ground-water samples are collected by lowering a new (precleaned), disposable polyethylene bailer into the well using new, disposable nylon cord. The filled bailer is retrieved, emptied, then filled again. The ground water from this bailer is decanted into appropriate laboratory supplied glassware and/or plastic containers (if sample preservatives are required, they are added to the empty containers at the laboratory prior to the sampling event). The containers are filled carefully so that no headspace is present to avoid volatilization of the sample. The filled sample containers are then labeled and placed in a cooler with ice for transport under chain of custody documentation to the designated analytical laboratory. The ESE staff member will document the time and method of sample collection, and the type of sample containers and preservatives (if any) used. These facts will appear on the ESE Ground-Water Sampling Data Forms. ESE will collect a duplicate ground-water sample from one well for every ten wells sampled at each site. The duplicate will be a blind sample (its well designation will be unknown to the laboratory). The duplicate sample is for Quality Assurance and Quality Control (QA/QC) purposes, and provides a check on ESE sampling procedures and laboratory sample handling procedures. When VOCs are included in the laboratory analyses, ESE will include a trip blank, if required, in the cooler with the ground-water samples for analysis for the identical VOCs. The trip blank is supplied by the laboratory and consists of deionized water. The trip blank is for QA/QC purposes and provides a check on both ESE and laboratory sample handling and storage procedures. Since disposable bailers are used for sample collection, and are not reused, no equipment blank (rinsate) samples are collected.

APPENDIX B

SAMPLE DATA SHEETS

Environmental Science & Engineering, Inc.
A CRLCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: Bill Chun Svc. Center
PROJECT NO.: 6-93-5112
DATE: June 6, 1994

SAMPLE LOCATION I.D.: MW-1
SAMPLER: Chris Valcheff
PROJECT MANAGER: Mike Quillin

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

Ground Water X
Surface Water ____
Treat. Influent ____
Treat. Effluent ____
Other ____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 9.55 (ft.)
DEPTH OF WELL: 19.40 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 9.85 (ft.)
WELL CASING VOLUME: 1.61 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 4.82 (gal)
ACTUAL VOLUME PURGED: 5.08 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1:12	0	12.5	X1000	71.9°		
	2	12.83	0.91	69.8°		
	4	12.61	0.87	68.7°		
	5		0.85			

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE Hydac UNIT# 9308 A DATE: 6-6-94 TIME: 0700 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other- Disp. Bailer
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-1	1321	6-6-94	SEQUOIA	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: ____

SAMPLER: Chris Valcheff PROJECT MANAGER

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Environmental Science & Engineering, Inc.
A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: Bill Chun Svc. Center
PROJECT NO.: 6-93-5112
DATE: June 6, 1994

SAMPLE LOCATION I.D.: MW-2
SAMPLER: Chris Valcheff
PROJECT MANAGER: Mike Quillin

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

Ground Water X
Surface Water ____
Treat. Influent ____
Treat. Effluent ____
Other ____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: - (ft.)
DEPTH TO WATER: 9.40 (ft.)
DEPTH OF WELL: 20.91 (ft.)

PRODUCT THICKNESS: - (ft.)
WATER COLUMN: 11.51 (ft.)
WELL CASING VOLUME: 1.88 (gal)

MINIMUM PURGE VOLUME (3 or ~~4~~ WCV): 5.64 (gal)
ACTUAL VOLUME PURGED: ____ (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
			X1000			
1350	0	9.75	1.10	70.0		Grey
13:58	2	9.55	1.07	68.7°		odor
	4	9.95	1.02	68.4°		

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 93088 DATE: 6-6-94 TIME: 0700 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump ___Other
___Bailer (Teflon/PVC/SS) ___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS) ___Dedicated
X Bailer (Disposable) ___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-2	1405	6-6-94	SEQUOIA	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: ____

SAMPLER: Chris H. Valcheff PROJECT MANAGER

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Environmental Science & Engineering, Inc.
A CRCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: Bill Chun Svc. Center
PROJECT NO.: 6-93-5112
DATE: June 6, 1994

SAMPLE LOCATION I.D.: MW-3
SAMPLER: Chris Valcheff
PROJECT MANAGER: Mike Quillin

CASING DIAMETER

2" X
4"
Other

SAMPLE TYPE

Ground Water X
Surface Water
Treat. Influent
Treat. Effluent
Other

WELL VOLUMES PER UNIT

Well Casing I.D. (Inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 9.50 (ft.)
DEPTH OF WELL: 20.79 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 11.29 (ft.)
WELL CASING VOLUME: 1.84 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 5.53 (gal)
ACTUAL VOLUME PURGED: (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1426	0	7.29	0.62 x1000	67.3	—	Black/Brown
1430	2	7.14	0.58	67.4		
	4	7.19	0.60	69.1°		

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE Hydac UNIT# 9308A DATE: 6-6-94 TIME: 0700 BY: CHV
TURBIDITY: TYPE UNIT# DATE: TIME: BY:

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other - Disp. Bailer
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-3	1440	6-6-94	Sequoia	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS:

SAMPLER: Chris Valcheff

PROJECT MANAGER

4080 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Environmental Science & Engineering, Inc.

A CILCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: Bill Chun Svc. Center
PROJECT NO.: 6-93-5112
DATE: June 6, 1994

SAMPLE LOCATION I.D.: MW-4
SAMPLER: Chris Valcheff
PROJECT MANAGER: Mike Quillin

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

Ground Water X
Surface Water ____
Treat. Influent ____
Treat. Effluent ____
Other ____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 9.31 (ft.)
DEPTH OF WELL: 22.24 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 12.93 (ft.)
WELL CASING VOLUME: 2.11 (gal)

MINIMUM PURGE VOLUME (3 or ~~4~~ WCV): 6.33 (gal)
ACTUAL VOLUME PURGED: 6.5 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
			X1000			
1410	0	7.76	0.56	66.4°	—	Brown/silty
1415	2	7.79	0.52	68.4	—	"
1419	4	7.79	0.54	68.4	—	"
1422	6	7.76	0.56	68.4	—	"

INSTRUMENT CALIBRATION

pH/COND./TEMP.: TYPE HYDAC UNIT# 9308A DATE: 6-6-94 TIME: 0700 BY: CHV
TURBIDITY: TYPE ____ UNIT# ____ DATE: ____ TIME: ____ BY: ____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
___Other
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-4	1425	6-6-94	Sequoia	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: ____

SAMPLER: Chris W. Valcheff PROJECT MANAGER ____

4090 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

Environmental Science & Engineering, Inc.

A CRLCORP Company

SAMPLE COLLECTION LOG

PROJECT NAME: BILL CHUN SVC. CENTER
PROJECT NO.: 6-93-5112
DATE: JUNE 6, 1994

SAMPLE LOCATION I.D.: MW-6
SAMPLER: CHRIS VALCHEFF
PROJECT MANAGER: MIKE QUILLIN

CASING DIAMETER

2" X
4" ____
Other ____

SAMPLE TYPE

Ground Water X
Surface Water ____
Treat. Influent ____
Treat. Effluent ____
Other ____

WELL VOLUMES PER UNIT

Well Casing I.D. (inches)	Gal/Ft.
2.0	0.1632
4.0	0.6528
6.0	1.4690

DEPTH TO PRODUCT: — (ft.)
DEPTH TO WATER: 9.46 (ft.)
DEPTH OF WELL: 22.65 (ft.)

PRODUCT THICKNESS: — (ft.)
WATER COLUMN: 13.19 (ft.)
WELL CASING VOLUME: 2.15 (gal)

MINIMUM PURGE VOLUME (3 or 4 WCV): 6.46 (gal)
ACTUAL VOLUME PURGED: 6.50 (gal)

TIME	Volume (GAL)	pH (Units)	E.C. (x1000 Micromhos)	Temperature (F°)	Turbid. (NTU)	Other
1331	0	11.55	0.86	69.8	—	BLANK/SILICA STONE ABOVE
1335	2.0	11.26	0.89	68.2	—	"
1339	4.0	11.20	0.81	67.8	—	"
1342	6.0	11.22	0.83	67.6	—	"

INSTRUMENT CALIBRATION

pH/COND./TEMP.:	TYPE HYDAC	UNIT# 9308A	DATE: 6-6-94	TIME: 0700	BY: CHV
TURBIDITY:	TYPE ____	UNIT# ____	DATE: ____	TIME: ____	BY: ____

PURGE METHOD

___Displacement Pump
___Bailer (Teflon/PVC/SS)
X Other - Disp. Bailer
___Submersible Pump

SAMPLE METHOD

___Bailer (Teflon/PVC/SS)
X Bailer (Disposable)
___Dedicated
___Other

SAMPLES COLLECTED

	ID	TIME	DATE	LAB	ANALYSES
SAMPLE	MW-6	1345	6-6-94	SEQUOIA	
DUPLICATE					
SPLIT					
FIELD BLANK					

COMMENTS: ____

SAMPLER: Chris H. Valchef
PROJECT MANAGER

4080 Nelson Avenue, Suite J Concord, CA 94520 Phone (510) 685-4053 Fax (510) 685-5323

APPENDIX C

ANALYTICALRESULTS AND CHAIN OF CUSTODY DOCUMENTATION FOR GROUND WATERSAMPLES

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.	Client Project ID:	#6-93-5112/Bill Chun Svc. Center	Sampled: Jun 6, 1994
4090 Nelson Ave., Ste J	Sample Matrix:	Water	Received: Jun 6, 1994
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Reported: Jun 20, 1994
Attention: Mike Quillin	First Sample #:	406-0241	

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 406-0241 MW-1	Sample I.D. 406-0242 MW-2	Sample I.D. 406-0243 MW-3	Sample I.D. 406-0244 MW-4	Sample I.D. 406-0245 MW-6	Sample I.D. 406-0246 DUP
Purgeable Hydrocarbons	50	12,000	100,000	1,900	68	12,000	8,400
Benzene	0.5	6,300	27,000	3.9	N.D.	5,400	5,200
Toluene	0.5	230	22,000	N.D.	N.D.	350	150
Ethyl Benzene	0.5	N.D.	2,300	9.0	N.D.	N.D.	N.D.
Total Xylenes	0.5	N.D.	10,000	27	N.D.	1,200	89
Chromatogram Pattern:		Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	200	400	5.0	1.0	100	100
Date Analyzed:	6/15/94	6/15/94	6/16/94	6/15/94	6/15/94	6/15/94
Instrument Identification:	HP-5	HP-5	HP-2	HP-4	HP-2	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	104	97	106	73	94	95

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.	Client Project ID:	#6-93-5112/Bill Chun Svc. Center	Sampled: Jun 6, 1994
4090 Nelson Ave., Ste J	Sample Matrix:	Water	Received: Jun 6, 1994
Concord, CA 94520	Analysis Method:	EPA 5030/8020	Reported: Jun 20, 1994
Attention: Mike Quillin	First Sample #:	406-0247	

BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 406-0247 Trip
Benzene	0.5	N.D.
Toluene	0.5	N.D.
Ethyl Benzene	0.5	N.D.
Total Xylenes	0.5	N.D.

Quality Control Data

Report Limit Multiplication Factor:	1.0
Date Analyzed:	6/14/94
Instrument Identification:	HP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	99

Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.	Client Project ID:	#6-93-5112/Bill Chun Svc. Center	Sampled: Jun 6, 1994
4090 Nelson Ave., Ste J	Sample Matrix:	Water	Received: Jun 6, 1994
Concord, CA 94520	Analysis Method:	EPA 3510/3520/8015	Reported: Jun 20, 1994
Attention: Mike Quillin	First Sample #:	406-0241	

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 406-0241 MW-1	Sample I.D. 406-0242 MW-2	Sample I.D. 406-0243 MW-3	Sample I.D. 406-0244 MW-4	Sample I.D. 406-0245 MW-6	Sample I.D. 406-0246 DUP
Extractable Hydrocarbons	50	710	9,600	1,600	68	1,600	680
Chromatogram Pattern:		Diesel and Unidentified Hydrocarbons <C14	Unidentified Hydrocarbons <C16	Unidentified Hydrocarbons <C16	Diesel and Unidentified Hydrocarbons <C14	Diesel and Unidentified Hydrocarbons <C14	Diesel and Unidentified Hydrocarbons <C14

Quality Control Data

Report Limit Multiplication Factor:	1.0	10	1.0	1.0	1.0	1.0
Date Extracted:	6/8/94	6/8/94	6/8/94	6/8/94	6/8/94	6/8/94
Date Analyzed:	6/14/94	6/15/94	6/14/94	6/14/94	6/14/94	6/14/94
Instrument Identification:	HP-3B	HP-3B	HP-3B	HP-3B	HP-3B	HP-3B

Extractable Hydrocarbons are quantitated against a fresh diesel standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Environmental Science & Engineering, Inc.
4090 Nelson Ave., Ste J
Concord, CA 94520
Attention: Mike Quillin

Client Project ID: #6-93-5112/Bill Chun Svc. Center
Matrix: Liquid
QC Sample Group: 4060241-47
Reported: Jun 21, 1994

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes	Diesel
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	EPA 8015 Mod.
Analyst:	J. Fontecha	J. Fontecha	J. Fontecha	J. Fontecha	K. Wimer
MS/MSD Batch#:	4060595	4060595	4060595	4060595	BLK060894
Date Prepared:	6/16/94	6/16/94	6/16/94	6/16/94	6/8/94
Date Analyzed:	6/16/94	6/16/94	6/16/94	6/16/94	6/14/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3B
Conc. Spiked:	20 µg/L	20 µg/L	20 µg/L	60 µg/L	300 µg/L
Matrix Spike % Recovery:	95	95	95	96	85
Matrix Spike Duplicate % Recovery:	98	95	95	97	82
Relative % Difference:	3.1	0.0	0.0	1.0	2.8
LCS Batch#:	1LCS061694	1LCS061694	1LCS061694	1LCS061694	BLK060894
Date Prepared:	6/16/94	6/16/94	6/16/94	6/16/94	6/8/94
Date Analyzed:	6/16/94	6/16/94	6/16/94	6/16/94	6/14/94
Instrument I.D.#:	HP-2	HP-2	HP-2	HP-2	HP-3B
LCS % Recovery:	102	100	100	102	85
% Recovery Control Limits:	71-133	72-128	72-130	71-120	28-122

SEQUOIA ANALYTICAL, #1271

Karen L. Enstrom
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

DATE 6-6-94 PAGE 1 OF 1

CHAIN OF CUSTODY RECORD

PROJECT NAME Bill Chan Svc. Center

ADDRESS 2301 Santa Clara Ave. Alameda, CA

PROJECT NO. 6-93-5112

SAMPLED BY Chris Valcheff

LAB NAME Sequoia

ESE Environmental Science & Engineering, Inc.
A CILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
Phone (510) 685-4053
Fax (510) 685-5323

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: TPH-G	BTEX	TPH-D					MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
MW-1	6-6-94	1321	Alameda	X	X	X			4060241		H_2O	4	3 VOAs/WHCl 1 Amber 1 Liter
MW-2		1405		X	X	X			4060242			4	
MW-3		1440		X	X	X			4060243			4	
MW-4		1425		X	X	X			4060244			1	
MW-6		1345		X	X	X			4060245			4	
DUP		1321		X	X	X			4060246			4	
TRIP					X				4060247			1	1 VOA w/HCl

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. Chris Valcheff	Melissa Creevere	6/6/94	4:20pm
2.			
3.			
4.			
5.			

25 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Mike Quilici

SPECIAL SHIPMENT REQUIREMENTS: Cold Transport

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):

Standard T.A.T.

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	X
CONFORMS TO RECORD	X