ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

March 4, 1999
StID # 838

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

Chevron Products c/o
Mr. Phil Briggs
P.O. Box 6004
San Ramon, CA 94583

Mr. David Gross
78-704 Putting Green Dr.
Palm Desert CA 92211-1513

Ms. Majorie Salin c/o
Ms. Pamela Perry Esq.
1363 Lincoln Ave., Suite 4
San Rafael, CA 94901

Linda and Lora Morn c/o
Mr. John Morn
69 La Espiral
Orinda, CA 94563

RE: Fuel Leak Site Case Closure, Former Chevron Station No. 9-4340
2681 Fruitvale Ave., Oakland CA 94601

Dear Ladies and Gentlemen:

This letter transmits the enclosed underground storage tank (UST) case closure letter in accordance with the Health and Safety Code, Chapter 6.75 (Article 4, Section 25299.37 h). The State Water Resources Control Board adopted this letter on February 20, 1997. As of March 1, 1997, the Alameda County Health Services, Local Oversight Program (LOP) is required to use this case closure letter. We are also enclosing the case closure summary. These documents confirm the completion of the investigation and cleanup of the reported release at the subject site.

Site Investigation and Cleanup Summary:

Please be advised that the following conditions exist at the site:

- 8800 parts per billion (ppb) Total Petroleum Hydrocarbons (TPH)as gasoline, 35 ppb methyl t-butyl ether (MTBE),17, 29, 25 and 22 ppb benzene, toluene, ethylbenzene and xylenes, respectively remain in groundwater at the site.
- 170 parts per million (ppm) Total Petroleum Hydrocarbons (TPH)as gasoline and 2.1, 3.2, 17 ppm benzene, toluene and xylenes, respectively, remain in soil at the site.

Please contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

enclosures: Case Closure Letter, Case Closure Summary

c: √ B. Chan, files (letter only)
Mr. L. Griffin, City of Oakland Fire Dept., OES, 505 14th St., 7th Floor, Oakland, CA 94612

TrLt2681Fruitvale

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

March 4, 1999
StID # 838

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

REMEDIAL ACTION COMPLETION CERTIFICATION

Chevron Products c/o
Mr. Phil Briggs
P.O. Box 6004
San Ramon, CA 94583

Mr. David Gross
78-704 Putting Green Dr.
Palm Desert CA 92211-1513

Ms. Majorie Salin c/o
Ms. Pamela Perry Esq.
1363 Lincoln Ave., Suite 4
San Rafael, CA 94901

Linda and Lora Morn c/o
Mr. John Morn
69 La Espiral
Orinda, CA 94563

RE: Former Chevron Service Station #9-4340, 2681 Fruitvale Ave.,Oakland 94601

Dear Messrs. Briggs, Gross, Morn and Ms. Perry:

This letter confirms the completion of site investigation and remedial action for the (1) one 1000 gallon waste oil and the (3) three gasoline underground tanks at the above referenced location. Thank you for your cooperation throughout this investigation. Your willingness and promptness in responding to our inquiries concerning the former underground tank is greatly appreciated.

Based upon the available information and with provision that the information provided to this agency was accurate and representative of site conditions, no further action related to the underground tank releases is required.

This notice is issued pursuant to a regulation contained in Title 23, Division 3, Chapter 16, Section 2721 (e) of the California Code of Regulations. You may contact Barney Chan at (510) 567-6765 if you have any questions regarding this matter.

Sincerely,

Mee Ling Tung
Director, Environmental Health

c: B. Chan, Hazardous Materials Division-files
Chuck Headlee, RWQCB
Mr. Dave Deaner, SWRCB Cleanup Fund
Mr. Leroy Griffin, City of Oakland OES, 505 14th St., Suite 702, Oakland CA 94612

RACC2681Fruitvale

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

November 3, 1998
StID # 838

Chevron Products c/o
Mr. Phil Briggs
P.O. Box 6004
San Ramon, CA 94583

Mr. David Gross
78-704 Putting Green Dr.
Palm Desert CA 92211-1513

Ms. Majorie Salin c/o
Ms. Pamela Perry Esq.
1363 Lincoln Ave., Suite 4
San Rafael, CA 94901

Linda and Lora Morn c/o
Mr. John Morn
69 La Espiral
Orinda, CA 94563

Re: Closure of Monitoring Wells at 2681 Fruitvale Ave., CA 94601

Dear Messrs. Briggs, Gross,Morn and Ms. Perry:

This letter is to inform you that in regards to the subsurface investigation of the petroleum release from the former underground storage tanks, our office has received Regional Water Quality Control Board concurrence for site closure of the above referenced site. Prior to issuing a closure letter, our office requires the proper closure of the remaining fifteen (15) monitoring wells at the above site (this excludes MW13 and two wells installed in 1982 but never found).

Please contact Alameda County Public Works for the specific requirements for well closure. Their contact is Mr. Andreas Godfrey, who can be reached at (510) 670-5575.

Please contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Wicl2681Fruitvale

RB# 01-0350

CALIFORNIA REGIONAL WATER

SEP 2 8 1998

QUALITY CONTROL BOARD

GP

CASE CLOSURE SUMMARY
Leaking Underground Fuel Storage Tank Program

I. AGENCY INFORMATION Date: August 10, 1998

Agency name: **Alameda County-HazMat** Address: **1131 Harbor Bay Parkway Rm 250, Alameda CA 94502**

City/State/Zip: **Alameda** Phone: **(510) 567-6700**

Responsible staff person: Barney Chan Title: **Hazardous Materials Spec.**

II. CASE INFORMATION

Site facility name: Former Chevron Station No. 9-4340

Site facility address: 2681 Fruitvale Ave., Oakland CA 94601

RB LUSTIS Case No: **N/A** Local Case No./LOP Case No.: 838

ULR filing date: 7/1/88 from Leak Book SWEEPS No: **N/A**

Responsible Parties:	Addresses:	Phone Numbers:
1. Mr. P. Briggs c/o Chevron Products	P.O. Box 6004 San Ramon, CA 94583	510-842-9136
2. Mr. David Gross	78-704 Putting Green Dr. Palm Desert CA 92211-1513	
3. Ms. Majorie Salin c/o Ms. Pamela Perry Esq.	1363 Lincoln Ave. Suite 4 San Rafael, CA 94901	
4. Linda and Lora Morn c/o Mr. John Morn	69 La Espiral Orinda, CA 94563	

Tank No:	Size in gal.:	Contents:	Closed in-place or removed?:	Date:
1-3	10,000 gal	gasoline	removed	2/23/88
4	1,000 gal	waste oil	removed	2/23/88

III RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: unknown

Site characterization complete? Yes

Leaking Underground Fuel Storage Program

Date approved by oversight agency: NA

Monitoring Wells installed? Yes Number: 21

Proper screened interval? Yes, based upon depth to first encountered gw

Highest GW depth: 9.3'bgs Lowest depth: 17.0' bgs

Flow direction: west-southwest

Most sensitive current use: adjacent properties are residential but no water wells were found

Are drinking water wells affected? No Aquifer name: NA

Is surface water affected? No Nearest affected SW name: NA

Off-site beneficial use impacts (addresses/locations): None identified

Report(s) on file? **Yes** Where is report(s)? Alameda County
1131 Harbor Bay Parkway,
Room 250, Alameda CA 94502-6577

Treatment and Disposal of Affected Material:

Material	Amount (include units)	Action (Treatment of Disposal w/destination)	Date
Tanks	3-10,000 1-1,000	Disposed @ Erickson, Richmond	2/23/88
Soil	28cy	Disposed @ Chemical Waste Mgmt Kettleman City	3/9/88
	130 cy	Aerated & reused as backfill	3/88

Leaking Underground Fuel Storage Tank Program

Maximum Documented Contaminant Concentrations - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)	
	1Before	After2	3Before	After 4
TPH (Gas)	1600	170	50,000	8800
TPH (Diesel)	* 13	ND		
Benzene	8.1	2.1	1900	17
Toluene	52	3.2	ND	29
Ethylbenzene	19	NA	800	25
Xylenes	97	17	2300	22
Oil and Grease	*1500	ND		ND
VOC's (8240)	*ND			
MTBE				35

Comments (Depth of Remediation, etc.):
*** Sample WOOP from waste oil tank removal**
1 soil sample CF
2 confirmation soil samples after overexcavation
3 highest onsite MW result, MW-5 (8/16/89)
4 MW5/MW10 6/29/97 monitoring result

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? Undetermined

Does corrective action protect public health for current land use? YES

Site management requirements: site should be included in the City of Oakland Permit Tracking System. A site health and safety plan will be required for any subsurface work.

Should corrective action be reviewed if land use changes? Yes

Monitoring wells Decommisioned: Yes

Number Decommisioned: 3 Number Retained: 18, this includes MW13 which now belongs to the City of Oakland and 2 wells installed in 1982 but never found

List enforcement actions taken: none

List enforcement actions rescinded: None

Leaking Underground Fuel Storage Tank Program

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Barney M. Chan Title: Hazardous Materials Specialist

Signature: Barney M. Chan Date: 9/15/98

Reviewed by

Name: Tom Peacock Title: Manager

Signature: Tom Peacock Date: 9-14-98

Name: Eva Chu Title: Hazardous Materials Specialist

Signature: Eva Chu Date: 8/13/98

VI. RWQCB NOTIFICATION

Date Submitted to RB: RB Response: David Headlee

RWQCB Staff Name: C. Headlee Title: EG Date: 9/28/98

VII. ADDITIONAL COMMENTS, DATA, ETC.

See attached site summary.

Site summary for 2681 Fruitvale Ave., Oakland CA 94601
StID # 838

This site is a L-shaped lot located on the corner of E. 27th St. and Fruitvale Ave. and was formerly a Chevron gasoline station. Adjacent to this site consists of mixed residential and commercial buildings. The immediate down-gradient properties are residential, single family and apartments. The homeowners in this area are quite sensitive to the perceived environmental injustice shown to Oakland residents.

On **January 1982,** five monitoring wells were installed by IT Enviroscience. See **Figure A for the locations of these wells and their accompanying boring logs.** Groundwater was encountered at approximately 12'bgs in sandy silty clay. Apparently at this time, only field screen monitoring of the well headspace was done. Attached is **Table A with the results of the 1/27/82 and 2/4/82 "monitoring" events of these wells.** A sheen was noted in well B-3 during the first event, but no sheen was observed during the second event.

On **February 23, 1988,** three 10,000 gallon fiberglass gasoline and one 1,000 gallon fiberglass waste oil tank were removed from the site under the oversight of Mr. A. Levi of ACEH. The three fuel tanks were located in the same pit to the east of the waste oil tank. Soil samples were taken at the ends of each tank at a depth of approximately 12-14' bgs. In addition, pit floor soil samples were taken between the middle of the fuel tanks. Up to 1600 ppm TPHg, 8.1, 52, 19, and 97 ppm BTEX, respectively, was exhibited in the samples from the gasoline tanks. Up to 1500 ppm total oil and grease and 13 ppm TPHd was exhibited in the waste oil soil samples. No BTEX or HVOCs were detected in the waste oil soil samples. Based upon the initial results of the soil samples, on March 2, 1988, additional over-excavation and sampling occurred. The fuel tank pit was over-excavated to a depth of 16-18' bgs and the waste oil tank excavated to a depth of 15' bgs. In general, over-excavation was successful and soil contamination in the fuel tank pit was reduced to 170 ppm TPHg and 2.1, 3.2, 17 ppm BTX , respectively. The waste oil tank sample after over-excavation was ND for TPHd and total oil and grease. See **Diagrams 1&2 and Table 1.**

On **February 15, 1989** Ensco Environmental Services came to the site to abandon the existing five groundwater monitoring wells, however, two of the wells (B-1 and B-4) could not be located, therefore, only three wells were abandoned. A trench was dug in an unsuccessful attempt to locate these two wells. The following day, monitoring wells MW-1R and MW-2R were installed in the area of the former station building and in the area of the former underground tanks, respectively. The wells were advanced to approximately 20' and screened the bottom 10'. Although no TPHg or BTEX was observed in the soil borings from these wells, TPHg and BTEX was exhibited in the groundwater samples. See **Figure 2, Table 2 and the boring logs for MW-1R and MW-2R.**

From **May 23-26, 1989** six exploratory borings were advanced at the site and converted into 4 inch monitoring wells. These wells were identified MW-3 through MW-8. They ranged in depth from 21.5 to 26 feet. Groundwater was encountered at approximately 14.5 –18' bgs and stabilized at approximately 13-16' bgs. Soil samples were taken at five feet intervals from the soil borings. The only boring to exhibit contamination was the 15.5' sample from MW-5. This

sample exhibited 36 ppm TPHg, and ND, 0.2,0.3, 0.6 ppm BTEX, respectively. The highest contaminated groundwater sample was from MW-5 (34 mg/l TPHg and 3.6 mg/l B), however, MW-5 was located in the southwest corner of the site further downgradient from known potential source areas. See **Figure 1, Tables 3 and 4 and copies of the boring logs for MW-3 through MW-8.**

In **August of 1989**, Ensco performed an off-site shallow groundwater investigation. Four borings (#1 through #4) were advanced downgradient of this site. Three were located on the south side of Davis St. while the fourth was located even further downgradient on Blossom St. The results of this investigation indicated that groundwater contamination had migrated offsite in a westerly direction. Up to 69 ppm total petroleum hydrocarbons as gasoline (TPHg) and 7.9, 30, ND, 3.4 ppm BTEX, respectively, was found in a grab groundwater sample#1. The other borings further did not detect any TPHg or BTEX. There has been some question as to the validity of this result which lead to further groundwater characterization near boring 1. See **Figure 3 and Table 5.**

In **June 1990**, Chevron requested that their consultant, Chempro, design and install a groundwater remediation system. In addition, Chempro was requested to install two additional monitoring wells (MW-9 and MW-10) to be used in evaluating an aquifer pump test. Chempro proposed a groundwater pump and treat system with treatment of the groundwater through a carbon extraction unit and discharge to the sanitary or storm sewer.

On **July 26, 1990** monitoring wells MW-9 and MW-10 were installed near monitoring wells MW-1R and MW-5 respectively. No soil samples were taken from these wells since they were located near existing wells. It was never quite clear the motive for the installation of these wells since monitoring wells already existed near these. Perhaps, since the groundwater pump test was done using MW-1R, it was necessary to have a well nearby to check the influence of the pumping. In addition, MW-10 was located near MW-5, which consistently exhibited the highest TPHg and BTEX concentrations. The results of the pumping test indicated a radius of influence of 25 feet at a pump rate of 2 gallons per minute. Therefore, it appeared that this methodology would be amenable at this site.

On **October 8 and 9, 1991**, four off-site monitoring wells were installed down-gradient of the site to determine the limits of the hydrocarbon plume. These wells, MW-11 through MW-14, were located along Davis St. immediately down-gradient of the site. MW-14 was located on Blossom St. over 250 feet down-gradient of the site. Assuming the historical southwest gradient, MW-12 was located approximately 50' down-gradient of MW-5 and MW-10. The borings from these wells were field screened and only those samples exhibiting fuel contamination were analyzed in the laboratory. The only soil samples analyzed were from MW-13 located on the east side of Fruitvale Ave. Because of the absence of soil contamination in the other wells and the presence of elevated TPHg and BTEX in MW-13 it was suspected that the former Texaco station up-gradient of MW-13 could be an additional source of contamination. This was later shown to be the case and the City of Oakland now assumes the responsibility for MW-13 and the contamination found in this well. See **Figure 4, Table 6 and the boring logs for MW-11 through MW-14.**

Quarterly groundwater monitoring continued at this site. On November 9, 1992 Chevron provided a feasibility study offering several remediation approaches for the site. Containment/passive bioremediation was compared to active pump and treating of groundwater. Chevron proposed the establishment of compliance points via the Alternate Points of Compliance (APC) approach with continual groundwater monitoring. In addition, evidence was given to show that the contamination being found in MW-13 was likely from the former Texaco station located across Fruitvale Ave. (2662 Fruitvale Ave.)

Concern arose from the prior results from the October 1989 Ensco investigation which reported 69 ppm TPHg and 7.9 ppm benzene in a grab groundwater sample #1. Another concern was the one time elevated TPHg and BTEX concentration in MW-12, the well just up-gradient of the location of sample #1 referenced above. The initial sampling of MW-12 exhibited 9200 ppb TPHg while the subsequent readings were ND. Meanwhile, Texaco was requested to provide information regarding the removal of the underground tanks on the neighboring property because of the high concentration of contaminants found in MW-13. A site inspection of the former Texaco site discovered a number of grouted borings indicative of a prior subsurface investigation. Texaco provided information showing that four underground tanks were removed by Texaco in 1978. In 1984, the property was sold to the City of Oakland, the current responsible party.

To resolve these issues, Chevron proposed to install two additional monitoring wells. MW-15 would be located near the location of former sample #1 and MW-16 would be located between the Chevron site and MW-13. The logic was that if the contamination being found in MW-13 was from the Chevron site, it would appear in MW-16. These two wells were installed on 6/21/93 and 7/15/93 and sampled on 8/13/93. Low levels of TPHg and BTEX were found in MW-15 (190, 0.7,1,1,2 ppb, TPHg and BTEX respectively) and ND for all analytes in MW-16. The soil samples from these two wells taken at 5' and 10' were ND for TPHg and BTEX. See **Figure 5, Table 7 and the boring logs for MW-15 and MW-16**.

Given these results, Chevron requested to discontinue monitoring MW-13 and to apply for Alternative Points of Compliance (APC) for the site. Chevron stated that:

- The underlying soils are fine grained sediments which are low yielding
- Adequate source removal has occurred
- Alternative or best available technologies were inappropriate or not cost effective and
- An acceptable management plan was proposed for dealing with the residual groundwater contamination. A modified monitoring plan was proposed eliminating unnecessary wells and while keeping those needed to verify a stable groundwater condition.

Our office accepted the implementation of APC with the provision that:

- The concentration in the monitoring wells show a decline indicative of natural biodegradation
- A plan for re-sampling and verification would be put into effect if concentration trends changed and

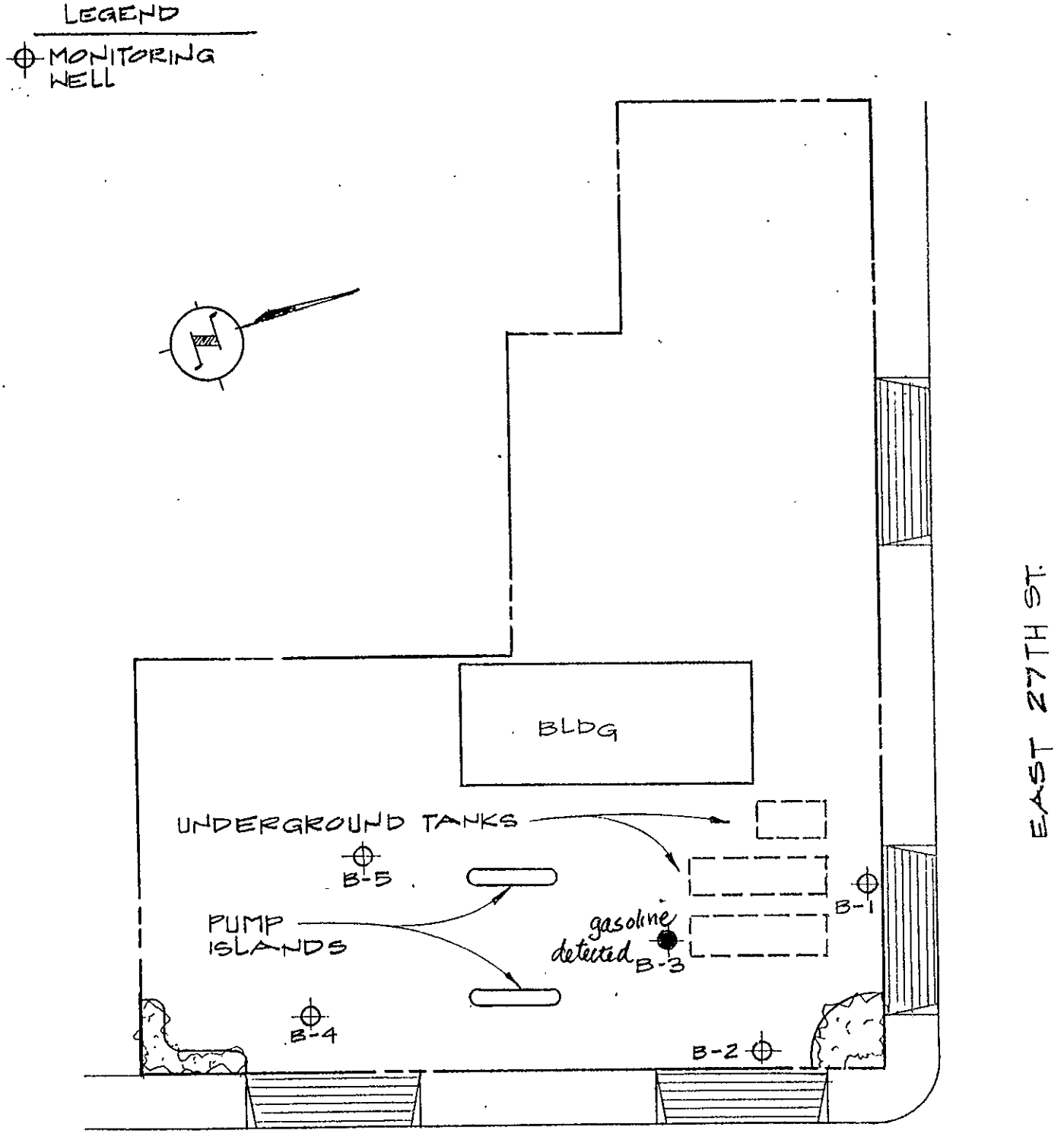
- Chevron would submit an indemnification letter to our office and the RWQCB. Chevron further offered to close out a "well" on the neighboring residential property at 3032 Davis St. This "well" was investigated and determined to be either a utility port or an irrigation well. When examined, no slotting or water was found.

In September 1997, the City of Oakland accepted the title to MW-13 along with the responsibility for the continual monitoring of the well as part of the release at 2662 Fruitvale Ave., the former Texaco site.

After three and one half years of semi-annual monitoring and the acceptance of the recommendations of the LLNL report, a Tier 2 RBCA was performed to evaluate potential risk to human health from volatilization from groundwater. The RBCA was reviewed by M. Logan, County risk assessor, and approved. Using a target risk of 1E-6, the SSTL of 0.098 mg/l was not exceeded when compared to the highest residual benzene concentration of 0.017 mg/l found in MW-5. In addition, a well survey was performed on the neighboring residential properties. With the exception of the potential "well" at 3032 Davis St., no wells were found at properties in the nearby area. With this in mind, no risk management plan or indemnification letter was required by our office. **Historical groundwater monitoring results and the RBCA SSTL Value and Tier1/Tier2 Evaluation tables are attached.**

Based on current guidelines, this site is recommended for closure as a low risk soil and groundwater case since:

- The site has been adequately characterized with on and off-site borings and monitoring wells
- The apparent source, the underground tanks and contaminated soils, has been removed
- Long term monitoring indicates a stable or decreasing plume. Parameters measured (DO, Redox) indicate conditions conducive of natural bioremediation. After the last monitoring event on September 1997, ORC was added to MW1-R, MW-4, MW-5, MW-9 and MW-10 to increase the DO.
- A Tier 2 RBCA indicates that no unacceptable risk to human health exists.

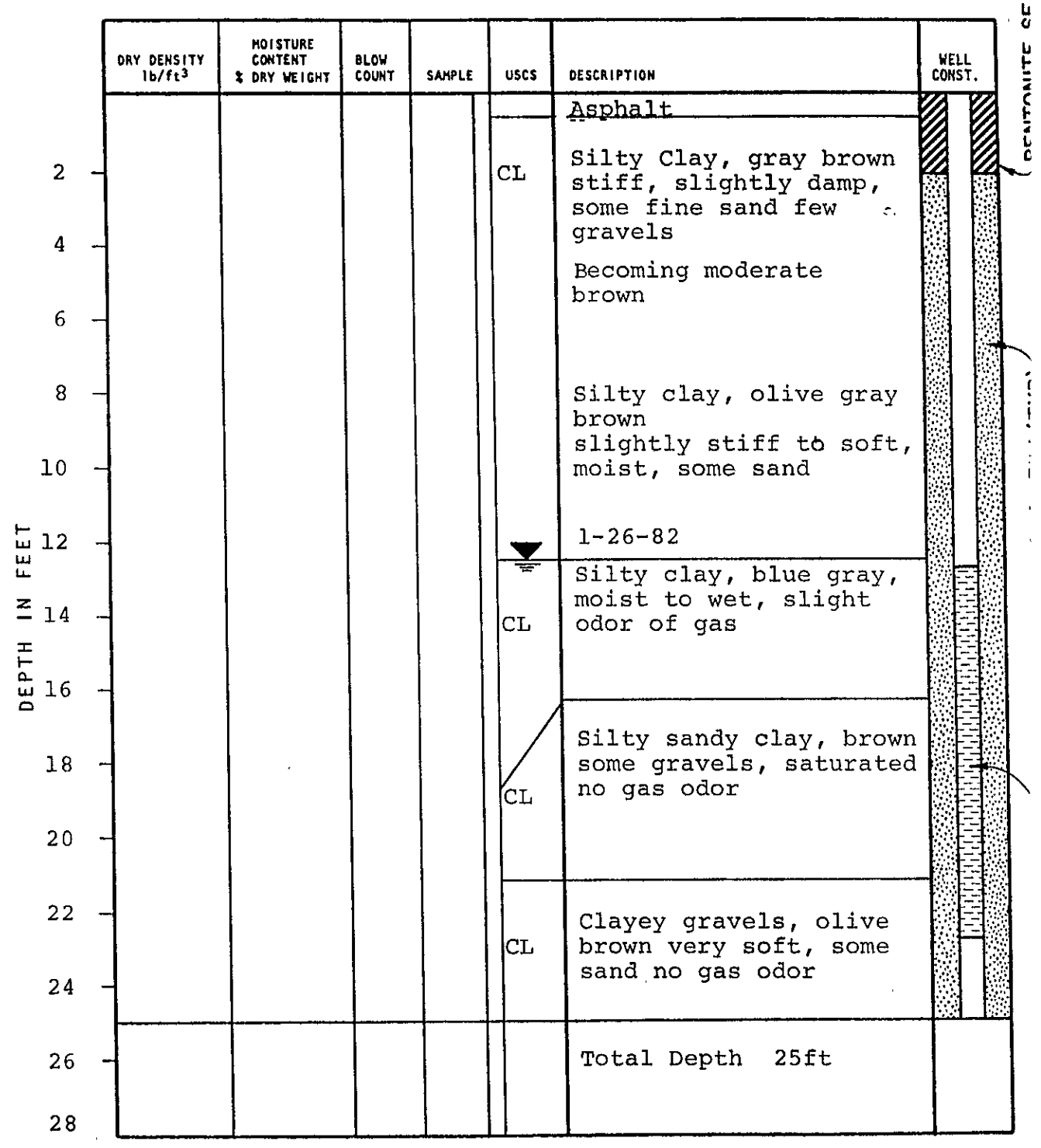


ENVIROSCIENCE

FIGURE A

CHEVRON STATION - OAKLAND, CA.

MONITORING WELL LOCATION



J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: FK DATE: 2/5/82

CHECKED BY: MLS DATE: 2/5/82

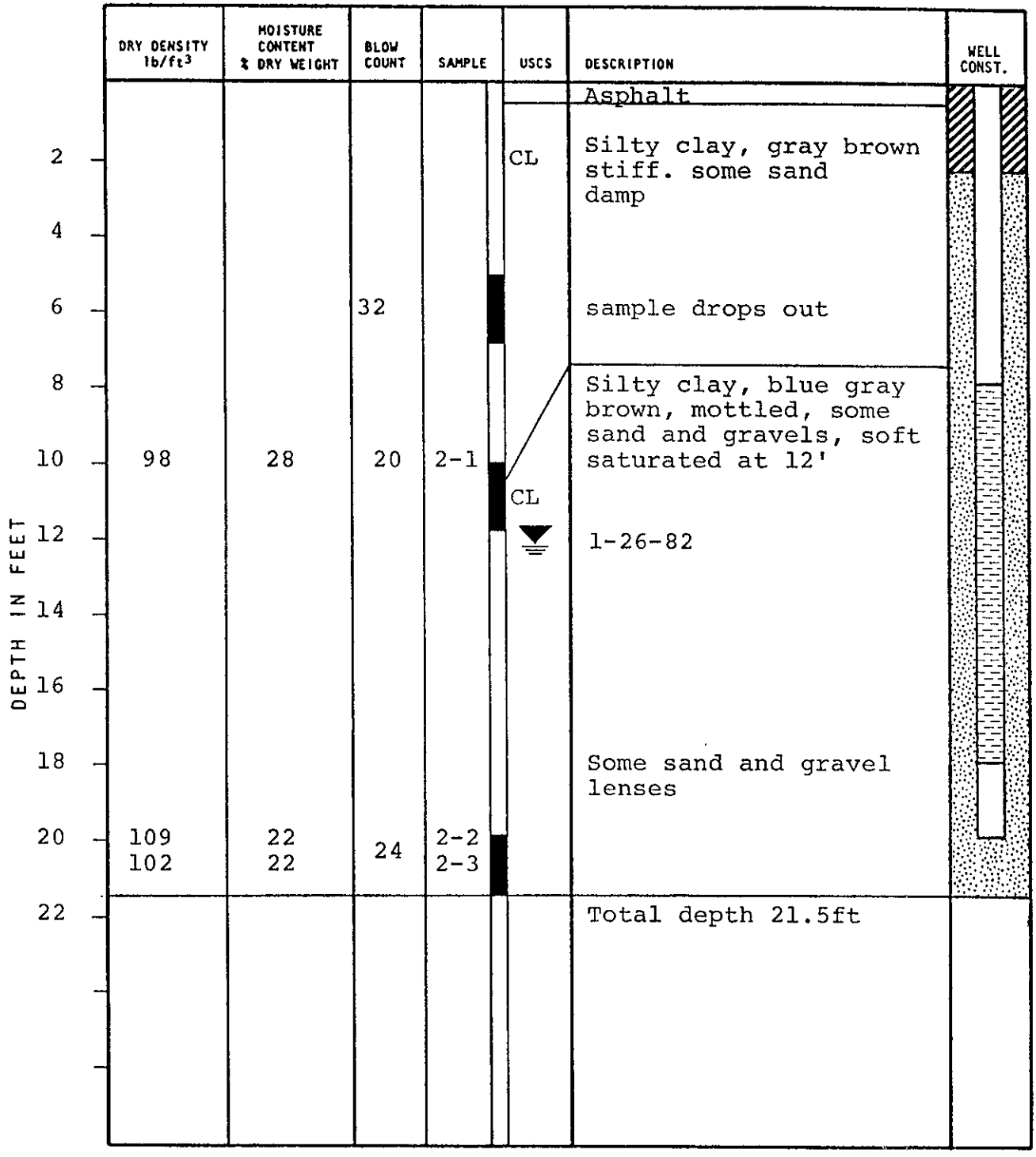
IT/DE LONG'S CHEVRON
OAKLAND, CALIFORNIA

LOG OF BORING NO. 1

PROJECT NO. B-1172-1

PLATE

2



J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: FK DATE: 2/5/82

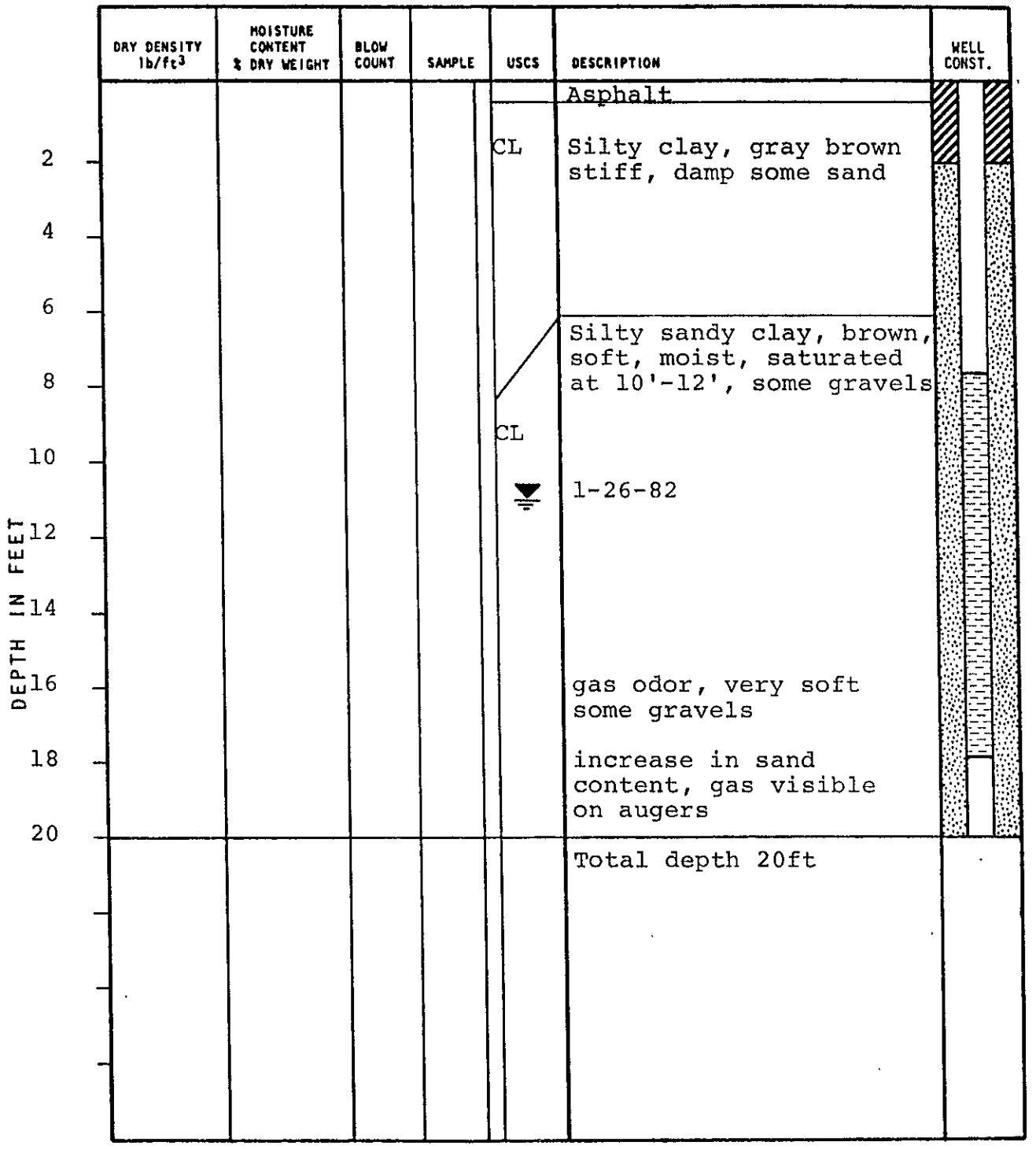
CHECKED BY: MLS DATE: 2/5/82

IT/DE LONG'S CHEVRON
OAKLAND, CALIFORNIA

LOG OF BORING NO. 2

PROJECT NO. B-1172-1

PLATE 3



J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

IT/DE LONG'S CHEVRON
OAKLAND, CALIFORNIA

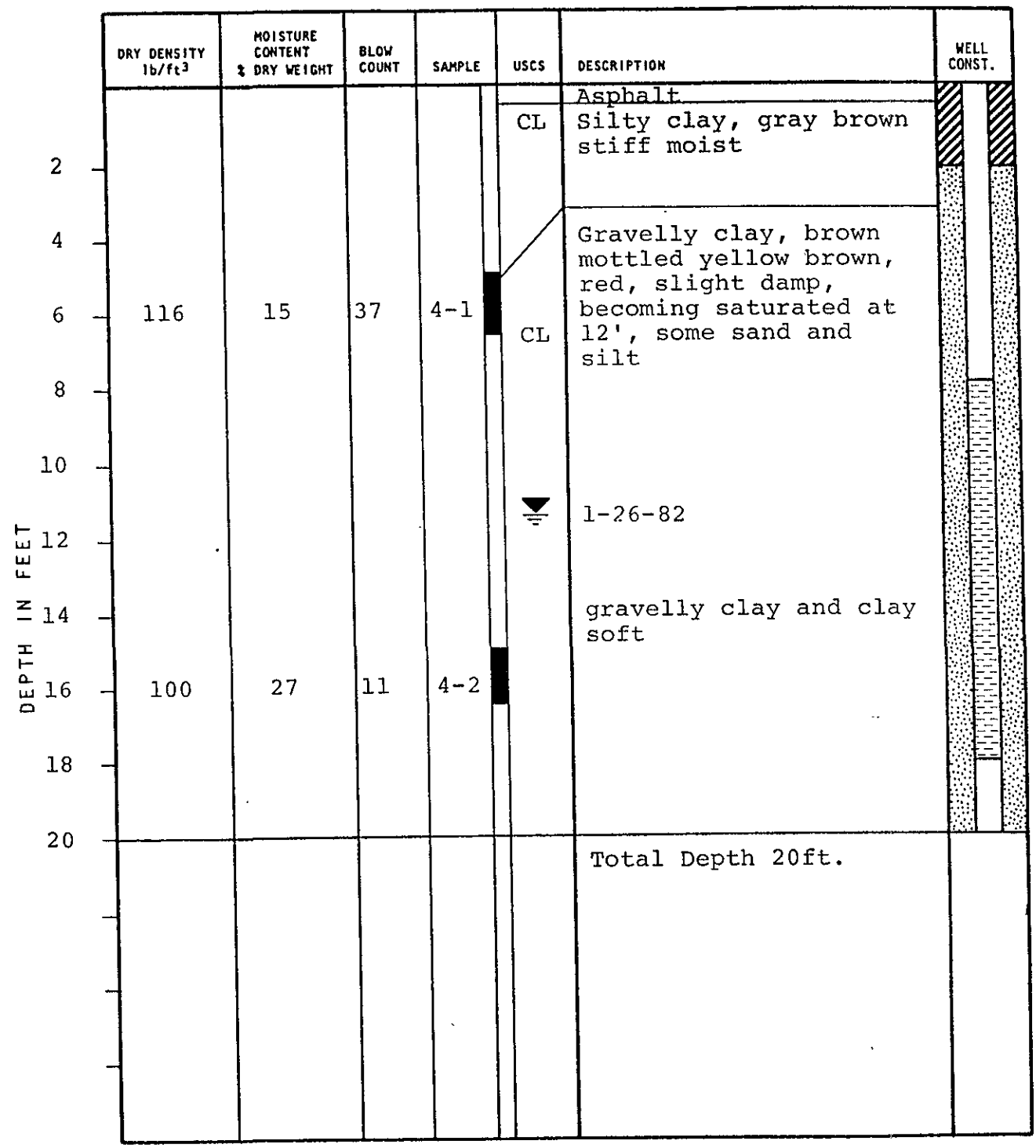
LOG OF BORING NO. 3

PLATE 4

PREPARED BY: FK DATE: 2/5/82

CHECKED BY: MLS DATE: 2/5/82

PROJECT NO. B-1172



J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: FK DATE: 2/5/82

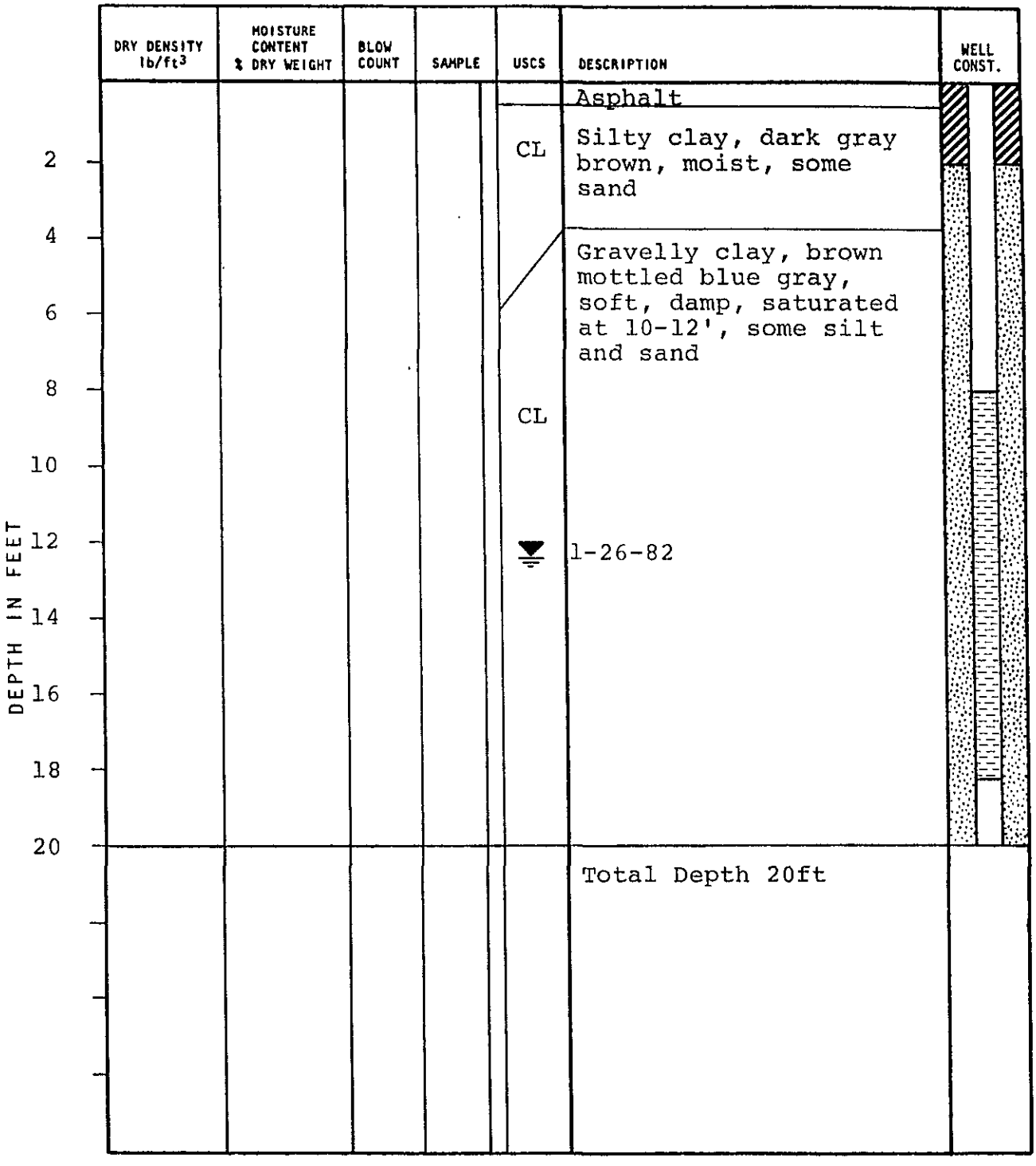
CHECKED BY: MLS DATE: 2/5/82

IT/DE LONG'S CHEVRON
OAKLAND, CALIFORNIA

LOG OF BORING NO. 4

PROJECT NO. B-1172-1

PLATE 5



J.H. KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PREPARED BY: FK DATE: 2/5/82

CHECKED BY: MLS DATE: 2/5/82

IT/DE LONG'S CHEVRON
OAKLAND, CALIFORNIA

LOG OF BORING NO. 5

PROJECT NO. B-1172-1

PLATE 6

TABLE #A

Chevron Station #4340

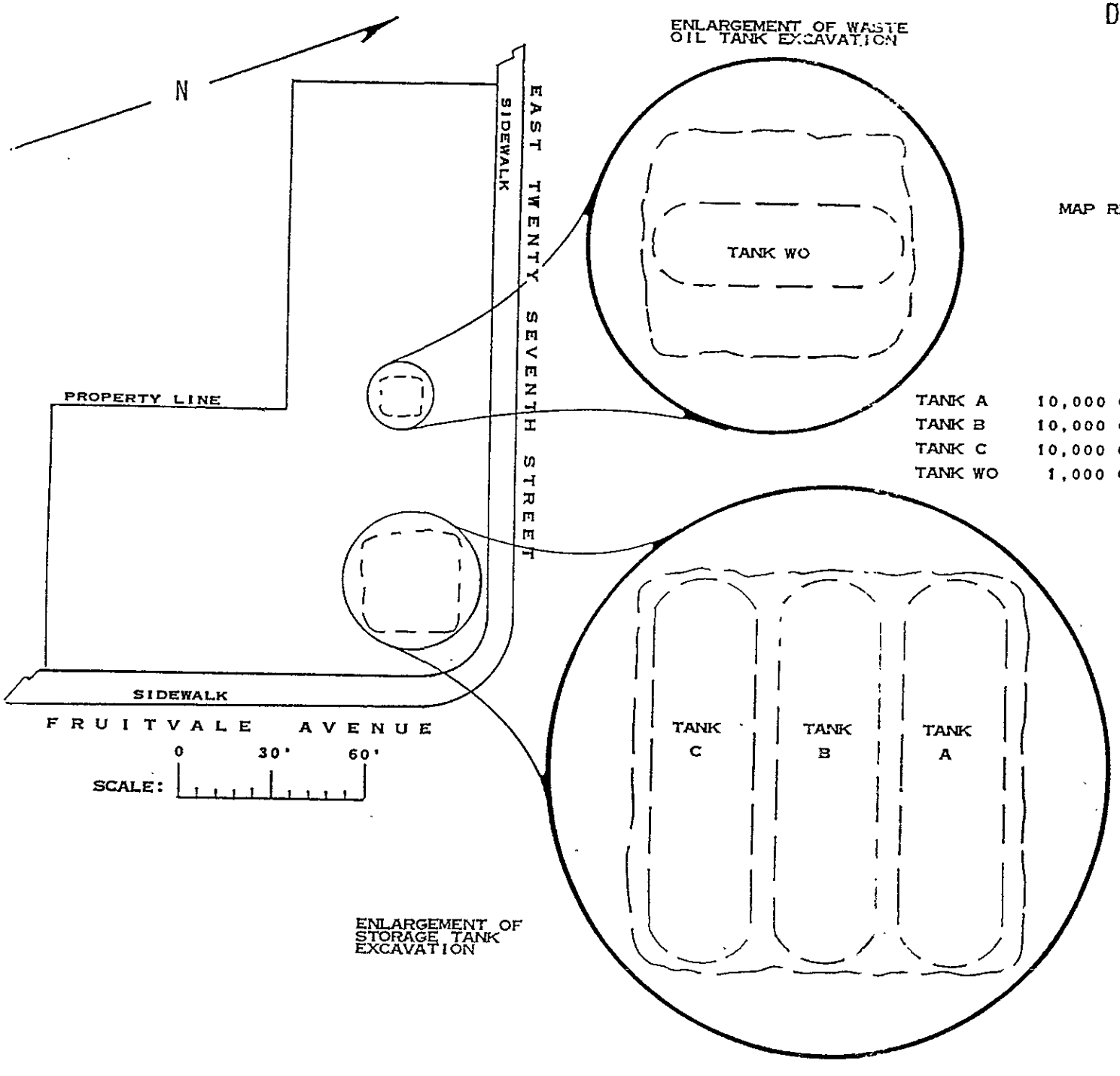
WELL B-5	1/27/82 INITIAL	2/4/82 FOLLOW-UP	2/4/82 FOLLOW-UP	2/5/82 FOLLOW-UP
PPM	>1000	>1000	75	>1000
LEL	30	30	5	38
GWL	12.0 Feet	11.83 Feet	11.99 Feet	12.00 Feet
Remarks:				
Sample	Strong Odor No Sheen Cloudy Bailed 5 gal	Strong Odor No Sheen Clear Pumped	No Odor No Sheen Clear	Strong Odor No Sheen Clear

TABLE #A

Chevron Station #4340

WELL B-1	1/27/82 INITIAL	2/4/82 FOLLOW-UP	2/4/82 FOLLOW-UP	2/5/82 FOLLOW-UP
PPM	200	150	300	100
LEL	0	5	15	5
GWL(below surface)	12.0 Feet	11.62 Feet	12.15 Feet	12.10 Feet
Remarks:				
Sample	Slight Odor No Sheen Cloudy Bailed 5 gal	No Odor No Sheen Clear Pumped	No Odor No Sheen Clear	No Odor No Sheen Clear
WELL B-2				
PPM	20	75	0	
LEL	0	10	0	
GWL	10.8 Feet	10.89 Feet	10.92 Feet	
Remarks:				
Sample	No Odor No Sheen Cloudy	No Odor No Sheen Clear	No Odor No Sheen Clear	
WELL B-3				
PPM	>1000	>1000	50	>1000
LEL	10	50	5	38
GWL	11.8 Feet	11.31 Feet	11.32 Feet	11.66 Feet
Remarks:				
Sample	Strong Odor Sheen Cloudy Bailed 5 gal	Strong Odor No Sheen Clear Pumped	Slight Odor No Sheen Clear	Strong Odor No Sheen Clear
WELL B-4				
PPM	300	100	0	
LEL	3	2.5	0	
GWL	10.0 Feet	10.79 Feet	10.87 Feet	
Remarks:				
Sample	No Odor No Sheen Cloudy Bailed 5 gal	No Odor No Sheen Clear Pumped	No Odor No Sheen Clear Clear Water	

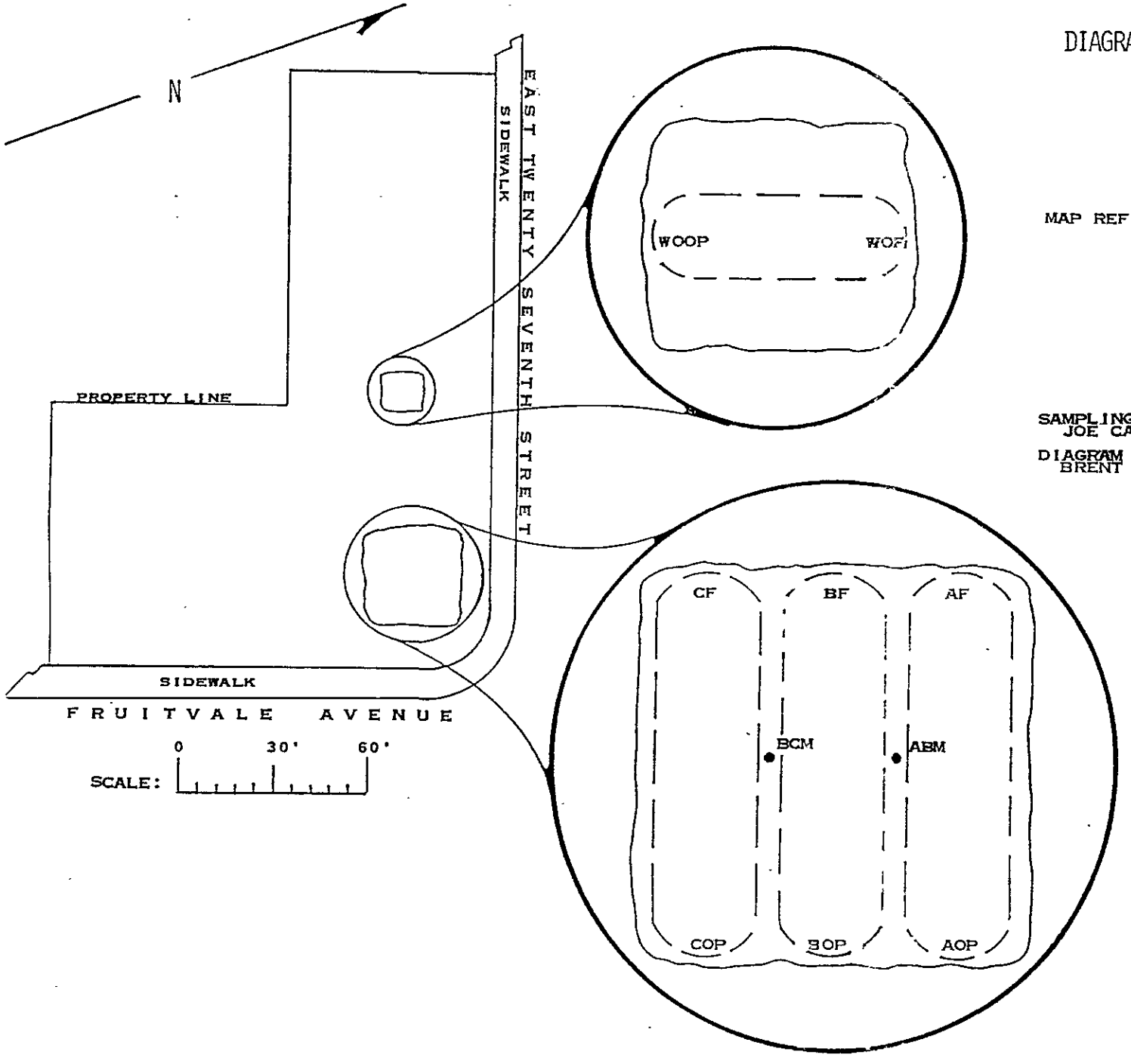
DIAGRAM ONE



MAP REF: THOMAS BROTHERS
ALAMEDA COUNTY
P.12 B-1

TANK A	10,000 GAL. FIBERGLASS, GASOLINE TANK
TANK B	10,000 GAL. FIBERGLASS, GASOLINE TANK
TANK C	10,000 GAL. FIBERGLASS, GASOLINE TANK
TANK WO	1,000 GAL. FIBERGLASS, WASTE OIL TANK

DIAGRAM TWO



MAP REF: THOMAS BROTHERS
ALAMEDA COUNTY
P.12 B-1

SAMPLING PERFORMED BY
JOE CARRERA

DIAGRAM PREPARED BY
BRENT ADAMS

TABLE 1

TABLE OF SAMPLING LOCATIONS AND ANALYTICAL RESULTS

I.D. GIVEN THIS SAMPLE AREA	SAMPLE DEPTH IN FT. BELOW GRADE	SAMPLING LOCATION DICTATED BY	TYPE & METHOD FOR THE SAMPLE OBTAINED	SAMPLE MATRIX	DATE SAMPLED	BTS CHAIN OF CUSTODY I.D.	BTS SAMPLE I.D.	NAME OF DOHS HMTL LABORATORY	LABORATORY SAMPLE I.D.	ANALYTICAL RESULTS IN PARTS PER MILLION -- PPM TPH AS GAS	BEN-ZENE	TOL-UENE	XY-LENES	ETHY BEN-ZENE
AP	14	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#7	SEQUOIA	8021629	190	5.9	7.6	7.8	2.4
Aop	14	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#9	SEQUOIA	8021631	210	ND	ND	ND	ND
ABH	14	ELECTIVE	EXPLOR	SOIL	2/23/88	88054-J-1	#4	SEQUOIA	8021626	440	5.2	1.2	41	7.2
BP	14	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#5	SEQUOIA	8021627	160	2.8	3.7	7.9	2.4
Bop	14	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#3	SEQUOIA	8021625	30	ND	ND	ND	ND
BCH	14	ELECTIVE	EXPLOR	SOIL	2/23/88	88054-J-1	#1	SEQUOIA	8021623	12	ND	ND	ND	ND
	10	ELECTIVE	EXPLOR	SOIL	2/23/88	88054-J-1	#2	SEQUOIA	8021624	170	ND	ND	0.21	ND
CP	14	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#6	SEQUOIA	8021628	1,600	8.1	52	97	19
Cop	14	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#8	SEQUOIA	8021630	18	ND	ND	1.3	0.3

I.D. GIVEN THIS SAMPLE AREA	SAMPLE DEPTH IN FT. BELOW GRADE	SAMPLING LOCATION DICTATED BY	TYPE & METHOD FOR THE SAMPLE OBTAINED	SAMPLE MATRIX	DATE SAMPLED	BTS CHAIN OF CUSTODY I.D.	BTS SAMPLE I.D.	NAME OF DOHS HMTL LABORATORY	LABORATORY SAMPLE I.D.	ANALYTICAL RESULTS PPM TPH-HBP DIESEL	PPM TOTAL OIL & GREASE	(PARTS PER BIL PPB EPA 8010 COMPOUNDS	PPB EPA 80 COM
WoP	12	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#11	SEQUOIA	8021634	ND	ND	ND	ND
Woop	12	STANDARD	INTRFACE	SOIL	2/23/88	88054-J-1	#10	SEQUOIA	8021633	13	1,500	ND	ND

TABLE 1

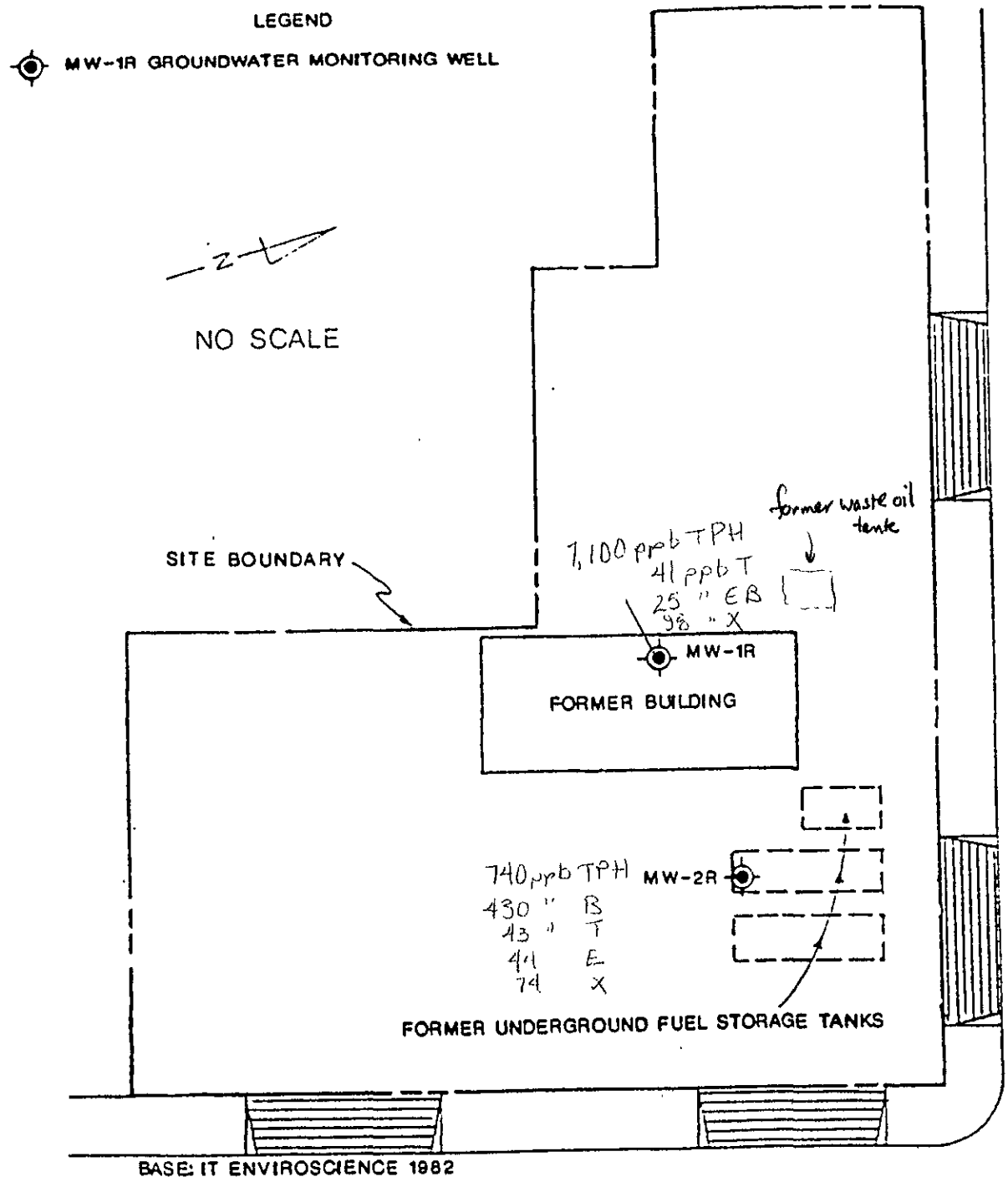
TABLE OF SAMPLING LOCATIONS AND ANALYTICAL RESULTS

I.D. GIVEN THIS SAMPLE AREA	SAMPLE DEPTH IN FT. BELOW GRADE	SAMPLING LOCATION DICTATED BY	TYPE & METHOD FOR THE SAMPLE OBTAINED	SAMPLE MATRIX	DATE SAMPLED	BTS CHAIN OF CUSTODY I.D.	BTS SAMPLE I.D.	NAME OF DOHS RMTL LABORATORY	LABORATORY SAMPLE I.D.	ANALYTICAL RESULTS IN PARTS PER MILLION -- PPM TPH AS GAS	BEN-ZENE	TOL-UENE	XY-LENES	ETHYL BEN-ZENE
AF	14	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#7	SEQUOIA	8021629	190	5.9	7.6	7.8	2.4
	16	ELECTIVE	CONFIRM	SOIL	3/2/88	88062-C-1	#3	SEQUOIA	8030068	22	0.32	0.87	1.4	---
Aop	14	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#9	SEQUOIA	8021631	210	ND	ND	ND	ND
	17.5	ELECTIVE	CONFIRM	SOIL	3/2/88	88062-C-1	#5	SEQUOIA	8030070	ND	ND	ND	ND	---
ABM	14	ELECTIVE	EXPLOR	SOIL	2/23/88	88054-J-1	#4	SEQUOIA	8021626	440	5.2	1.2	41	7.2
	18	ELECTIVE	CONFIRM	SOIL	3/2/88	88062-C-1	#2	SEQUOIA	8030067	150	2.1	3.2	17	---
BF	14	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#5	SEQUOIA	8021627	160	2.8	3.7	7.9	2.4
Bop	14	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#3	SEQUOIA	8021625	30	ND	ND	ND	ND
BCM	14	ELECTIVE	EXPLOR	SOIL	2/23/88	88054-J-1	#1	SEQUOIA	8021623	12	ND	ND	ND	ND
	16	ELECTIVE	EXPLOR	SOIL	2/23/88	88054-J-1	#2	SEQUOIA	8021624	170	ND	ND	0.21	ND
	17	ELECTIVE	CONFIRM	SOIL	3/2/88	88062-C-1	#1	SEQUOIA	8030066	6.9	0.35	ND	ND	---
CF	14	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#6	SEQUOIA	8021628	1,600	8.1	52	97	19
	18	ELECTIVE	CONFIRM	SOIL	3/2/88	88062-C-1	#4	SEQUOIA	8030069	11	0.31	0.64	0.25	---
Cop	14	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#8	SEQUOIA	8021630	18	ND	ND	1.3	0.32
STOCK	3"	SURVEY	BAAQMD MODIFD	SOIL	3/2/88	88062-C-1	#7A-D	SEQUOIA	8030072	73	2.5	3.6	6.9	---
STOCK	3"	SURVEY	BAAQMD MODIFD	SOIL	3/2/88	88062-C-1	#8A-D	SEQUOIA	8030073	140	0.91	1.1	2.1	---

TABLE 1

TABLE OF SAMPLING LOCATIONS AND ANALYTICAL RESULTS

I.D. GIVEN THIS SAMPLE AREA	SAMPLE DEPTH IN FT. BELOW GRADE	SAMPLING LOCATION DICTATED BY	TYPE & METHOD FOR THE SAMPLE OBTAINED	SAMPLE MATRIX	DATE SAMPLED	BTS CHAIN OF CUSTODY I.D.	BTS SAMPLE I.D.	NAME OF DOHS HMTL LABORATORY	LABORATORY SAMPLE I.D.	ANALYTICAL RESULTS PPM TPH-HBP DIESEL	PPM TOTAL OIL & GREASE	(PARTS PER BI PPB EPA 8010 COMPOUNDS	PPI EP CO
WoF	12	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#11	SEQUOIA	8021634	ND	ND	ND	ND
Woop	12	STANDARD	INTERFACE	SOIL	2/23/88	88054-J-1	#10	SEQUOIA	8021633	13	1,500	ND	ND
	15	ELECTIVE	CONFIRM	SOIL	3/2/88	88062-C-1	#6	SEQUOIA	8030071	ND	ND	---	



ensco environmental services, Inc.

SITE PLAN

FORMER CHEVRON SERVICE STATION #9-4340

2681 FRUITVALE AVENUE

OAKLAND, CALIFORNIA

REVIEWED BY:	APPROVED BY:
BVT	
JOB # 1907G	DRAWN BY BVT
DATE 4/10/89	DRAWING # FIG. 2

Ensco Environmental Services, Inc.
Project No. 1907G

Chevron # 9-4340
Oakland, California

TABLE 2
GROUNDWATER ANALYSES DATA

SAMPLE	DEPTH (feet)	TPHG (ppb)	BENZENE (ppb)	TOLUENE (ppb)	ETHYL BENZENE (ppb)	XYLENES (ppb)
SOIL						
1R-1	6	ND	ND	ND	ND	ND
1R-2	11	ND	ND	ND	ND	ND
2R-1	6	ND	ND	ND	ND	ND
2R-2	11	ND	ND	ND	ND	ND
WATER						
MW-1R	---	7,100	ND	41	25	98
MW-2R	---	740	430	43	44	74
Bailer Blank		ND	ND	ND	ND	ND

TPHG = Total Petroleum Hydrocarbon as Gasoline
ND = Not Detected

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
Oakland, California

PROJECT NUMBER: 1907G

BORING NO. MW-1R.

DATE DRILLED: 2/16/89

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
1-5			GC-CL	CLAYEY GRAVEL-GRAVELLY CLAY, very dark grayish brown (10YR 3/2), 35-45% subrounded to rounded fine to medium gravel, 10-20% fine to coarse sand, loose, moist, no petroleum odor		
3-5			CL	SILTY CLAY, very dark brown (10YR 2/2), 25-35% silt, minor fine to medium sand, 1-3% rootholes, low plasticity, stiff, very moist, no petroleum odor		
6-8	IR-1	27	CL	SILTY CLAY, dark brown (10YR 3/3), 20-30% silt, 10-20% angular to subrounded fine to coarse gravel, 1-3% rootholes, low plasticity, very stiff, moist, no petroleum odor		0
9			CL	GRAVELLY CLAY, dark brown (10YR 3/3), 25-35% subrounded to rounded fine to very coarse gravel, 10-20% silt, low plasticity, very stiff, moist, no petroleum odor		
10-12	IR-2	7	SW-SM	GRAVELLY SAND, dark yellowish brown (10YR 4/4), 70-80% fine to coarse sand, 10-20% subrounded fine to medium gravel, minor fines, loose, very moist to wet, no petroleum odor		0
13-14			CL	SANDY CLAY, slightly mottled olive gray (5Y 4/2) with dark yellowish brown (10YR 4/4), 20-30% fine sand, 10-20% silt, 3-5% black organic matter (stringers), low plasticity, stiff, very moist, no petroleum odor	▽	
15-17		7	SC	CLAYEY SAND, mottled dark yellowish brown (10YR 4/4) with dark blueish gray (5B 4/1), 75-85% fine to coarse sand, 5-10% subangular to subrounded fine gravel, loose, wet, strong petroleum odor and sheen at 17.5 feet, localized increase in gravel (10-20%)		240
18-20			CL	SILTY CLAY, mottled gray (5Y 5/1) with yellowish red (5YR 5/6), 15-25% silt, 5-15% sand, 1-3% black organic matter, medium plasticity, soft, wet, slight petroleum odor		
21		14	GW-GC	GRAVELLY SAND, brown (10YR 4/3), 65-75% fine to coarse sand, 15-25% subangular to subrounded fine to very coarse gravel, clay binder, medium dense, wet, slight petroleum odor		40
				Bottom of boring = 21.5 feet		

SUPERVISED AND APPROVED BY R.G./C.E.G

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
Oakland, California

PROJECT NUMBER: 1907G

BORING NO. MW-2R

DATE DRILLED: 2/16/89

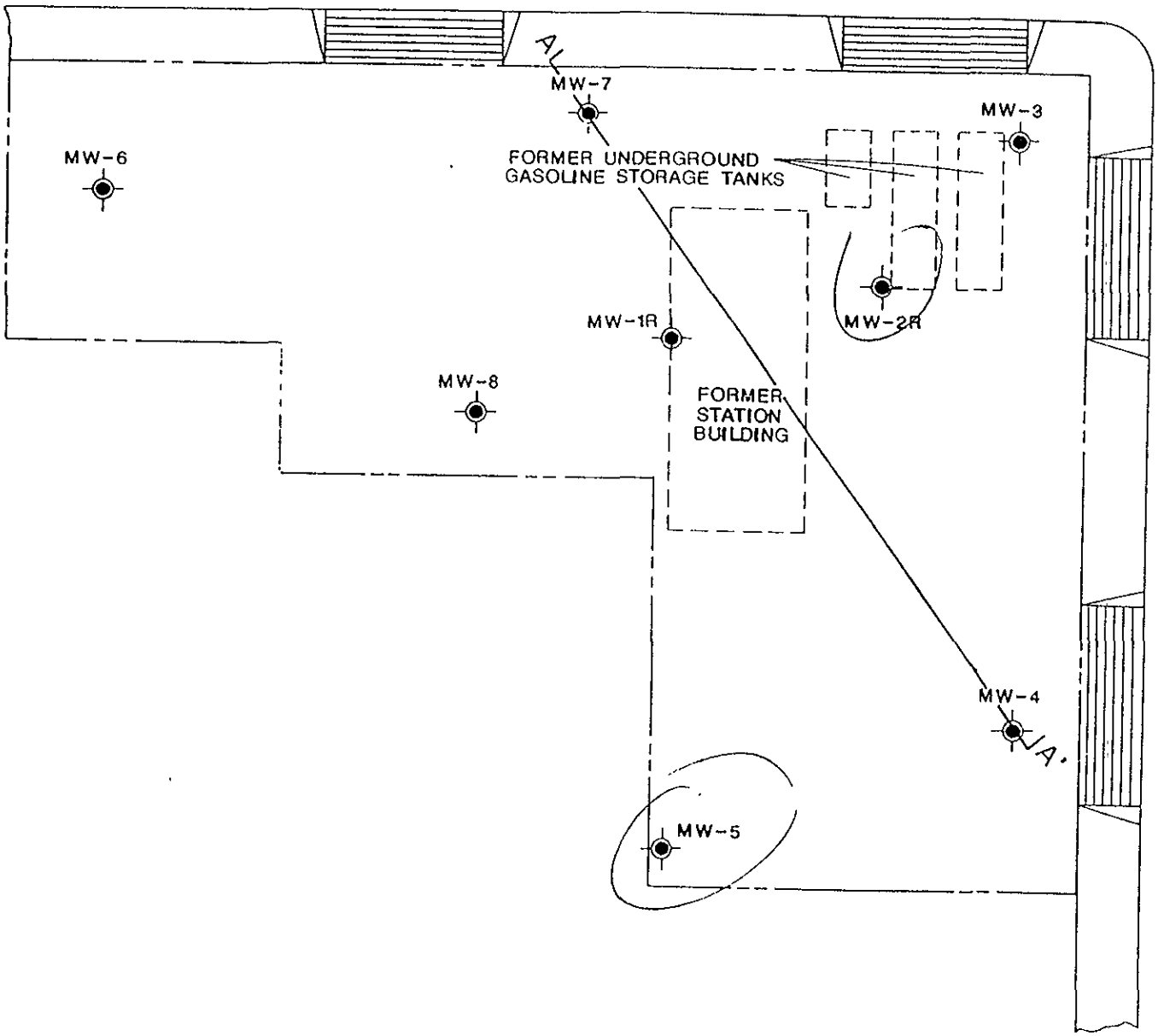
LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm
1–2				FILL: sandy gravel, very dark grayish brown (10YR 3/2), 40-50% subangular to subrounded fine to coarse gravel, 35-45% fine to coarse sand, clay binder, loose, moist, no petroleum odor		
3–7	2R-1	9		FILL: silty clay, very dark brown (10YR 2/2), 20-30% silt, 10-20% subrounded to rounded fine to medium gravel, 5-10% sand, low plasticity, medium stiff, moist, no petroleum odor		0
8–13	2R-2	4		FILL: clayey gravel (pea gravel), dark brown (7.5YR 3/2), 75-85% subrounded to rounded fine to medium gravel, very loose, moist to wet, no petroleum odor	▽	0
14–15			CL	SILTY CLAY, mottled gray (5Y 5/1) with yellowish red (5YR 5/6), 15-25% silt, 5-15% fine sand, medium plasticity, medium stiff, wet, no petroleum odor		
16–17			CL	SANDY CLAY, dark yellowish brown (10YR 4/4), 40-50% fine to medium sand, 1% black organic matter, clay binder, soft, wet, no petroleum odor		
18–19			GW-GC	GRAVELLY SAND, brown (10YR 4/3), 70-80% fine to coarse sand, 15-25% angular to subrounded gravel, clay binder, loose, wet, no petroleum odor		
20–21				Bottom of boring = 19 feet		

SUPERVISED AND APPROVED BY R.G./C.E.G. LDP

APPENDIX A APPENDIX B

EAST 27TH STREET

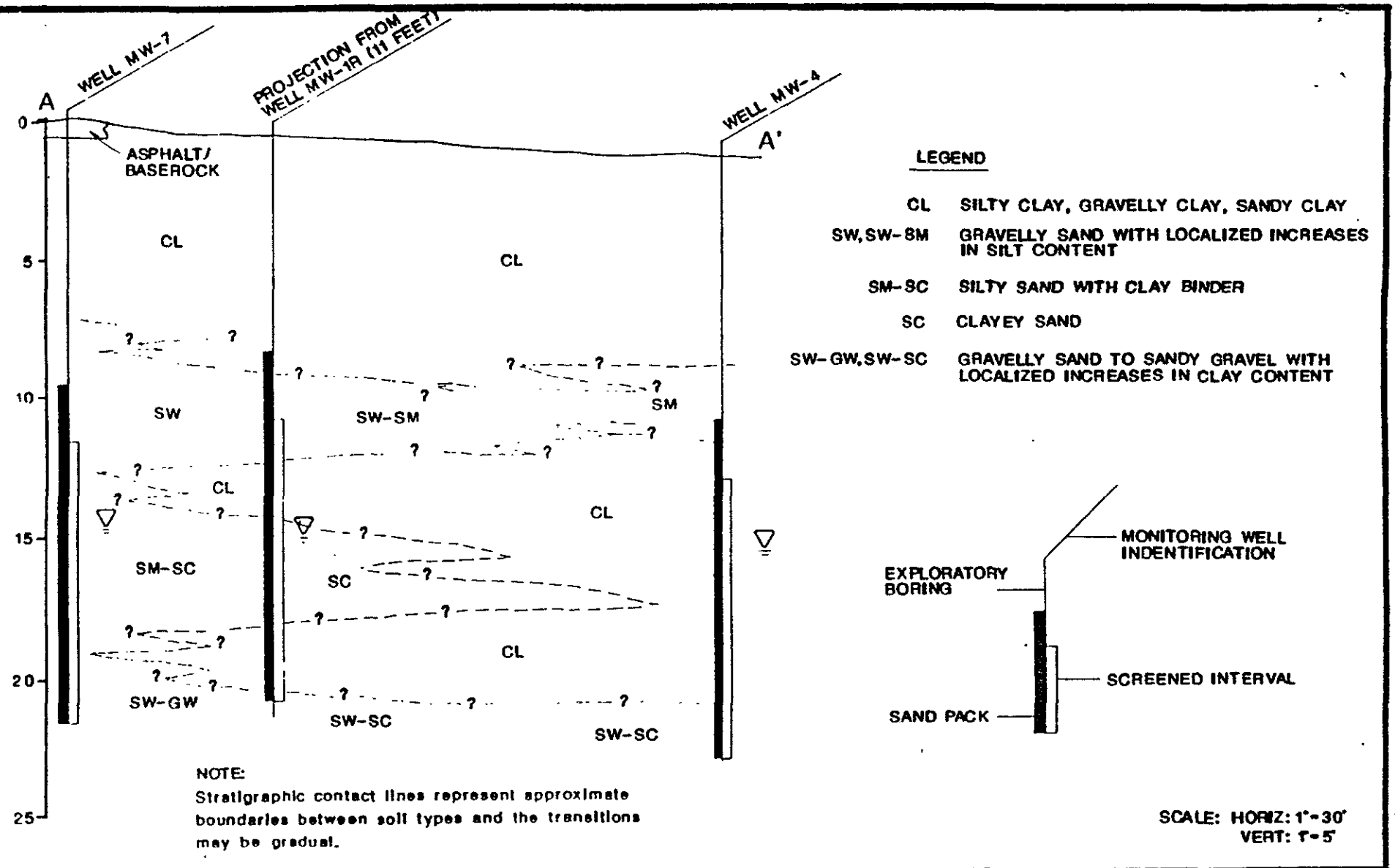


FRUITVALE AVE

REV	DESCRIPTION	DATE	BY	APPD
	2681 Fruitvale Ave Oakland.			

onsco environmental services, Inc.

Fig 1



NOTE:
Stratigraphic contact lines represent approximate boundaries between soil types and the transitions may be gradual.

SCALE: HORIZ: 1"=30'
VERT: 1"=5'

ensco environmental services, inc.

CROSS SECTION A - A'

FORMER CHEVRON SERVICE STATION NO. 9-4340

2681 FRUITVALE AVENUE

OAKLAND, CALIFORNIA

REVIEWED BY:	APPROVED BY:
BVT	TTB
JOB # 1907G	DRAWN BY: J.C.
DATE: 6-26-89	DRAWING #: FIG. 3

TABLE 3
SOIL ANALYSES DATA

Sample	Depth (feet)	TPHG (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl Benzene (ppm)	Xylenes (ppm)
3-1	5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
3-2	10	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
3-3	15	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
4-1	5.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
4-2	10.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
4-3	15.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
5-1	5.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
5-2	10.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
5-3	15.5	36	< 0.1	0.2	0.3	0.6
6-1	5 5	< 1 0	< 0.1	< 0 1	< 0.1	< 0.1
6-2	10 5	< 1.0	< 0.1	< 0.1	< 0 1	< 0.1
6-3	15 5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
7-1	5.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
7-2	10	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
8-1	5 5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1
8-2	10.5	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1

TPHG = Total Petroleum Hydrocarbon as Gasoline
< 0 1 = Not Detected above indicated detection limit
ppm = parts per million

Ensco Environmental Services, Inc.
Project No 1907G

Chevron # 9-4340
Oakland, California

TABLE 4
GROUNDWATER ANALYSES DATA

Sample	Date	TPHG (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Xylenes (ppb)	Well Elevation (ft.)	Depth to Water (ft.)
MW-1R	3/10/89	7,100	< 0.5	41	25	98	104.49	13.89
	5/26/89	4,600	< 0.5	< 0.5	60	190	--	14.87
MW-2R	3/10/89	740	430	43	44	74	103.57	12.25
	5/26/89	240	5.2	1.4	2.0	4.0	--	13.15
MW-3	5/26/89	< 50	< 0.5	0.5	1.0	5.0	103.89	13.60
MW-4	5/26/89	110	< 0.5	< 0.5	< 0 5	< 1.0	102.68	13.00
MW-5	5/26/89	34,000	3,600	< 0.5	1,700	5,400	103.68	14.50
MW-6	5/26/89	< 50	< 0.5	< 0.5	< 0.5	< 1.0	104.87	15.19
MW-7	5/26/89	< 50	< 0.5	< 0.5	< 0.5	< 1.0	104.36	14.63
MW-8	5/26/89	< 50	< 0.5	< 0.5	< 0.5	< 1.0	105.59	16.14
Bailer Blank	3/10/89	< 50	< 0.5	< 0.5	< 0.5	< 1.0		
	5/26/89	< 50	< 0.5	< 0.5	< 0.5	< 1.0		

TPHG = Total Petroleum Hydrocarbon as Gasoline
ND = Not Detected above indicated detection limit
ppb = parts per billion
MCL = Maximum Contaminant Level
AL = Action Level

Current Department of Health Services Action Levels In Drinking Water (Standards)

Benzene	1.0 ppb (MCL)
Toluene	100 ppb (AL)
Ethyl Benzene	680 ppb (MCL)
Xylenes	1750 ppb (MCL)

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-3

DATE DRILLED: 5/23/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
1				FILL: Sandy Gravel, very dark grayish brown (10YR 3/2)		
2				FILL: Silty Clay, very dark brown (10YR 2/2), 20-30% silt, 10-20% fine sand, 5-10% very fine to medium subangular to subrounded gravel, 1-3% rootholes, low plasticity, very stiff, moist, NOS.		
3						
4						
5	3-1	36				0
6						
7				FILL: Sandy Gravel, grayish brown (10YR 5/2), 75-85% angular to subrounded fine to coarse gravel, 10-20% fine to very coarse sand, minor clay binder, loose, very moist, NOS.		
8						
9						
10	3-2	7				0
11						
12						
13			CL	SILTY CLAY, mottled gray (5Y 5/1) with yellowish red (5YR 5/6), 30-40% silt, 5-15% very fine sand, 1-3% black organic matter, 3-5% roots and rootholes infilled with bluish gray (5/8 5/1) clay, low to medium plasticity, stiff to very stiff, very moist, NOS.		
14						
15	3-3	17				0
16						
17						
18			ML	SANDY SILT, mottled gray (5Y 5/1) with yellowish red (5YR 5/6), 35-45% very fine to fine sand, minor coarse sand, minor clay binder, stiff, very moist to wet.	▽	
19						
20		14				0
21			SW-SM	SAND, strong brown (9.5YR 4/6), 85-95% very fine to coarse sand, minor silt, trace fine to medium gravel, poorly sorted, medium dense, wet, NOS.		

REVIEWED BY B.G./C.E.G.

APPENDIX C APPENDIX D APPENDIX E

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-3

DATE DRILLED: 5/23/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
22			SW	SAND as above		
23						
24			GW	GRAVELLY SAND, dark yellowish brown (10YR 4/4), 75-85% fine to coarse sand, 10-20% angular to subrounded fine to coarse gravel, poorly sorted, dense, wet, NOS.		
25						
26		34				0
				Bottom of boring = 26 feet		
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						

REVIEWED BY R.C./C.F.C.

APPENDIX C APPENDIX D APPENDIX E

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron # 9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-4

DATE DRILLED. 5/23/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
1–5						
6	4-1	28	CL	SILTY CLAY, very dark grayish brown (10YR 3/2), 35-45% silt, 15-25% very fine to coarse sand, minor fine gravel, low to medium plasticity, stiff to very stiff, damp, NOS.		0
7–8						
9			SM	SILTY SAND, dark brown (5Y 4/1), 65-75% very fine to coarse sand, 20-30% silt, trace gravel, poorly sorted, medium dense, NOS.		
10						
11	4-2	19	CL	SILTY CLAY, dark brown (10YR 3/3), 20-30% silt, rootholes, dark gray (N4/), low to medium plasticity, stiff, moist, NOS.		0
12–14						
15				same as above, color change to brown (10YR 5/3), wet, NOS.	▽	
16	4-3	12				0
17–19						
20			SW-SC	GRAVELLY SAND, dark yellowish brown (10YR 4/4), 60-70% very fine to very coarse sand, 15-25% very fine to medium gravel, minor clay binder, poorly sorted, medium dense to dense, wet, NOS.		
21		25		Bottom of boring = 21.5 feet		0

APPENDIX C APPENDIX D APPENDIX E

REVIEWED BY

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron # 9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-5

DATE DRILLED: 5/23/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
1–4				SANDY SILT, dark reddish brown (5YR 2.5/2), 10-20% very fine to medium sand, soft, damp, NOS		
4–5			CL	SILTY CLAY, dark brown (7.5YR 3/2), 30-40% silt, 5-15% disseminated very fine to medium sand with localized increases, low to medium plasticity, hard, damp, NOS		
6	5-1	36				0
7–8				*≈ 7 feet; gravel lens, subangular, very coarse (up to 40mm.*		
10–11	5-2	18		SILTY CLAY, dark brown (7.5YR 3/4), slight mottled dark gray (7.5YR 4/0), 30-40% silt, trace gravel, rootholes, stiff, low to medium plasticity, moist, NOS.		0
13–14			SC	CLAYEY SAND, brown (10YR 4/3), mottled with dark gray (7.5YR 4/0), 75-85% very fine to medium sand, 20-30% clay, localized iron staining, reddish brown (5YR 4/4), rootholes, poorly sorted, medium dense, wet, strong product odor.	▽	
16	5-3	16				0
18–19				SILTY SAND, very dark gray (7.5YR 3/0 65-75% very fine to medium sand, 30-40% silt, minor plant matter, weak random bedding, well sorted, dense, wet, no product odor		
20–21			SM	GRAVELLY SAND, olive brown (2.5Y 4/4) mottled with yellowish red (5YR 4/6), 10-20% fine to coarse gravel, 55 to 65% fine to coarse sand, clay binder, poorly sorted, medium dense, wet, NOS		
		22	SW-SC			0
				Bottom of boring = 21.5 feet		

APPENDIX C
APPENDIX D
APPENDIX E

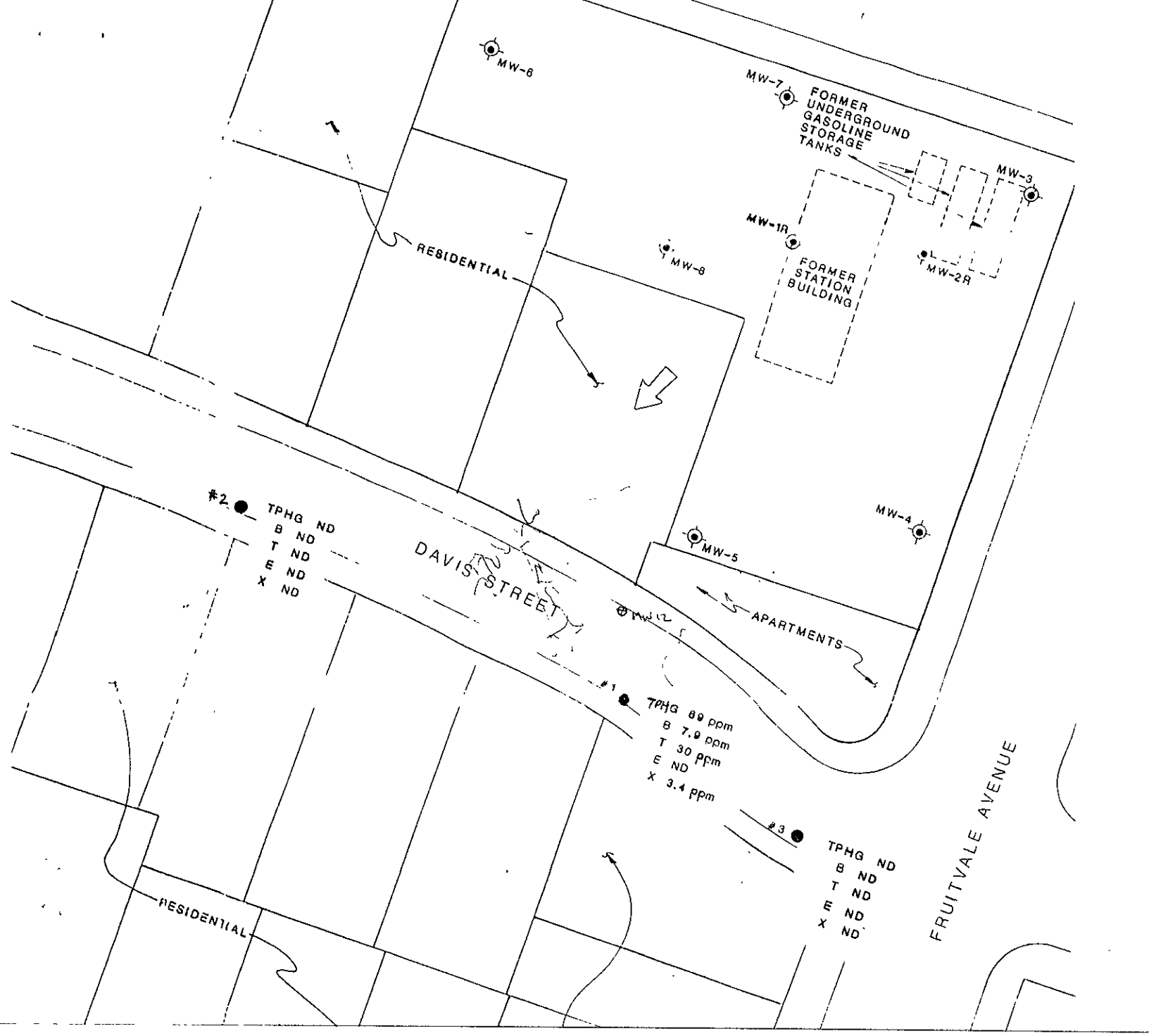

MW-6
MW-7
FORMER UNDERGROUND GASOLINE STORAGE TANKS
MW-3
MW-1R
MW-8
MW-2R
FORMER STATION BUILDING
RESIDENTIAL
#2
TPHG ND
B ND
T ND
E ND
X ND
MW-5
MW-4
DAVIS STREET
APARTMENTS
#1
TPHG 89 ppm
B 7.9 ppm
T 30 ppm
E ND
X 3.4 ppm
#3
TPHG ND
B ND
T ND
E ND
X ND
FRUITVALE AVENUE
RESIDENTIAL

Table 5

Grab Groundwater Results

Parameter	Reporting Limit (mg/L)	Descriptor, Lab No. and Results #1 08-22-89 1320 (-33444)	#2 08-22-89 1400 (-33445)	#3 08-22-89 1550 (-33446)	#4 08-22-89 1700 (-33447)
Dil/conc. factor, Mobile		1	1	1	1
PETROLEUM HYDROCARBONS					
Volatile, as Gasoline	0.050	69	ND	ND	ND
Benzene	0.001	7.9	ND	ND	0.001
Ethyl benzene	0.001	ND	ND	ND	ND
Toluene	0.002	30	ND	ND	ND
Xylenes, total	0.002	3.4	ND	ND	ND

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-6

DATE DRILLED: 5/24/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
				Asphalt, 2" baserock 3"		
1			CL	SILTY CLAY, dark brown (7.5YR 3/2), 30-40% silt, low plasticity, stiff, damp, NOS.		
2						
3						
4						
5						
6	6-1	33	CL	SILTY CLAY, dark yellowish brown (10YR 4/4), 25-35% silt, 15-25% very fine to medium sand, low plasticity, very stiff to hard, moist, NOS.		0
7						
8						
9						
10						
11	6-2	33	CL	SANDY CLAY, dark yellowish brown (10YR 4/4), 30-40% very fine to coarse sand, minor fine gravel, poorly sorted, very stiff to hard, moist, NOS.		0
12						
13						
14						
15			CL	SILTY CLAY, mottled brown (10YR 5/3) with reddish brown (2.5YR 4/4), 25-35% silt, 5-15% disseminated very fine to medium sand with localized increases, very stiff, moist, NOS.		
16	6-3	26				0
17				At approximately 17.5 feet, increase in gravel	▽	
18						
19						
20						
21		12	GW-GC	SANDY GRAVEL, brown (10YR 5/3), very fine to coarse gravel, 25-35% very fine to coarse sand, minor clay binder, poorly sorted, loose, wet, NOS.		0

APPENDIX C APPENDIX D APPENDIX E

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron # 9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-6

DATE DRILLED: 5/24/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
22			GW-GC	SANDY GRAVEL as above		
22			SM	SILTY SAND, brown (10YR 5/3), 35-45% silt, 55-65% very fine to medium sand, minor fine to coarse gravel, medium density, wet, NOS.		
23						
24						
25		45				0
				Bottom of boring = 25.0 feet		
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						

APPENDIX C
APPENDIX D
APPENDIX E

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-7

DATE DRILLED: 5/24/89

PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
0				Asphalt 1", Baserock 5"		
1-4			CL	SILTY CLAY, dark brown (7.5YR 3/2), 30-40% silt, 30-40% silt, 15-25% very fine to coarse sand, minor very fine to coarse gravel, low plasticity, stiff, damp, NOS		
5			CL			0
6	7-1	27		At 5 feet, localized sand lens.		
7-9			SW	GRAVELLY SAND, dark reddish brown (5YR 3/3), 70-80% medium to very coarse sand, 15-25% very fine to coarse gravel, poorly sorted, loose to medium dense, very moist to wet, NOS.		
10						
11	7-2	18				0
12-13						
14			S M-S C	SILTY SAND, brown (10YR 4/3), 80-90% very fine to very coarse sand, 25-35% silt, clay binder, trace medium gravel, medium dense, wet, NOS.	▽	
15						
16		25		At approximately 15.5 feet: localized increase in gravel fine to medium)		0
17-19						
20			GW-SW	SANDY GRAVEL-GRAVELLY SAND, yellowish brown (10YR 5/4), 40-50% very fine to very coarse sand, 40-50% very fine to coarse gravel, 5-10% silt, minor clay binder, poorly sorted, medium dense, wet, NOS.		
21		26				0
				Bottom of boring = 21.5 feet		

REVIEWED BY R.G./C.E.G.

APPENDIX C
APPENDIX D
APPENDIX E

EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: Chevron #9-4340
2681 Fruitvale Avenue
Oakland, California

BORING NO. MW-8

DATE DRILLED: 5/24/89

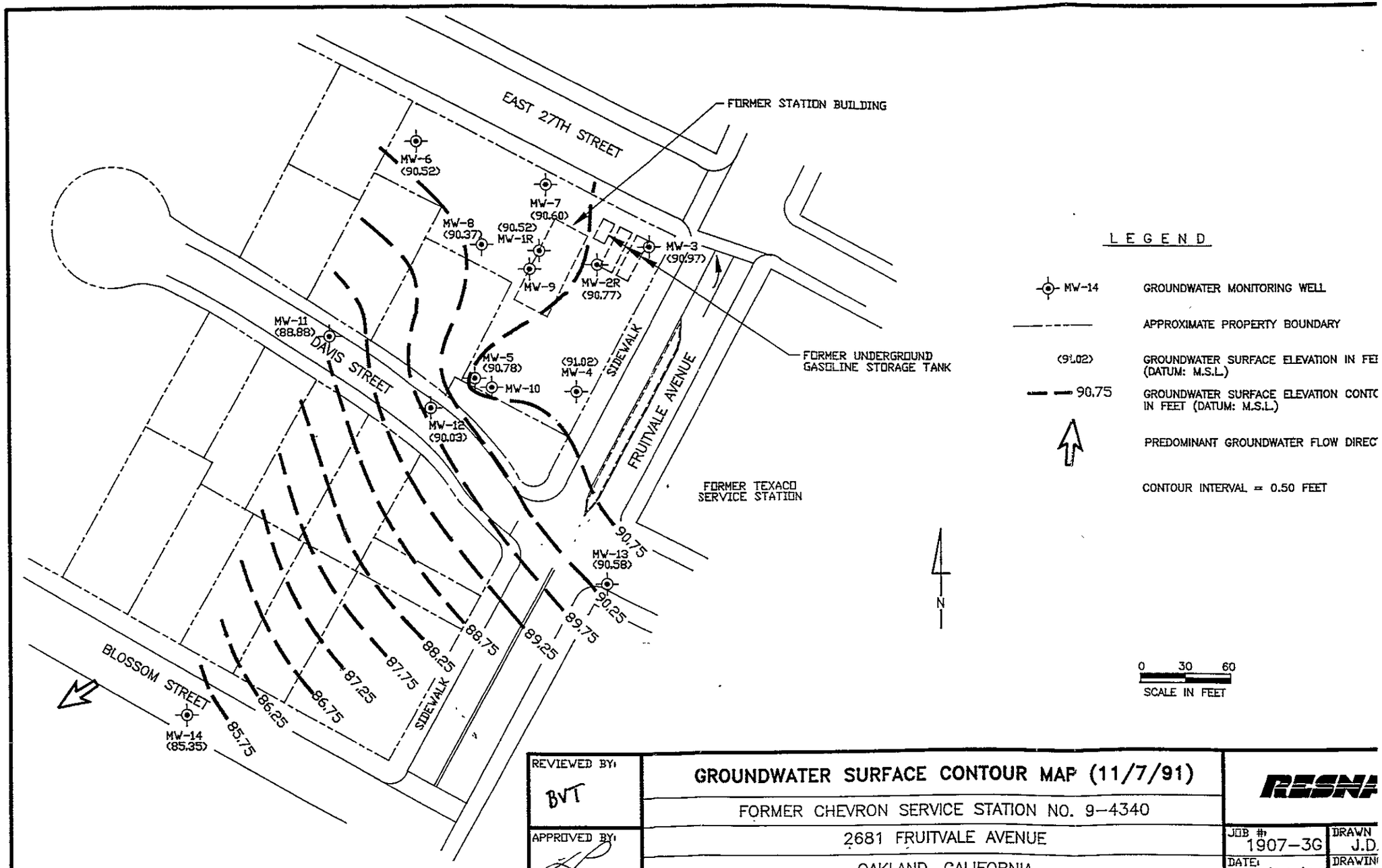
PROJECT NUMBER: 1907G

LOGGED BY: B.V.T.

DEPTH (ft.)	SAMPLE No	BLOWS/FOOT	UNIFIED SOIL CLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	HNU READING ppm
0				Asphalt 1", Baserock 5"		
6	8-1	40	ML	SANDY SILT, dark brown (10YR 3/3), 15-25% very fine to medium sand, clay binder, hard, damp, NOS		0
8				At 7 feet; localized increase in gravel		
9			SM	SILTY SAND, dark yellowish brown (10YR 3/4), 55 to 65% very fine to coarse sand, 35-45% silt, poorly sorted, medium dense, damp to moist, NOS.		
11	8-2	22				0
14			SM	SILTY SAND, dark yellowish brown (10YR 3/4), 75-85% very fine to very coarse sand, 10-15% fines, minor localized very fine to coarse gravel, loose, wet, NOS	▽	
16	8-3	10				0
19			SW	GRAVELLY SAND, dark yellowish brown (10YR 4/3), 75-85% very fine to very coarse sand, 10-15% very fine to very coarse gravel, 10-15% fines, poorly sorted, loose to medium dense, wet, NOS.		
21		38	SM	SILTY SAND, pale brown (10YR 6/3), 65-75% very fine to fine sand, 35-40% silt, dense, wet, NOS		0
				Bottom of boring = 21.5 feet		

REVIEWED BY R G /C E G

APPENDIX C
APPENDIX D
APPENDIX E



REVIEWED BY: BVT	GROUNDWATER SURFACE CONTOUR MAP (11/7/91)	RESNA
APPROVED BY:	FORMER CHEVRON SERVICE STATION NO. 9-4340	
	2681 FRUITVALE AVENUE	JOB #: 1907-3G / DRAWN: J.D.
	OAKLAND, CALIFORNIA	DATE: 11/26/91 / DRAWING: FIG 4

RESNA Industries, Inc.
Project No. 1907-3G

Former Chevron Station No. 9-4340
Oakland, California
November 26, 1991

TABLE 6

SUMMARY OF SOIL ANALYSES DATA

Sample	Date Sampled	Depth (feet)	TPHG (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl Benzene (mg/kg)	Total Xylenes (mg/kg)
1R-1	2/16/89	6	<1	<0.1	<0.1	<0.1	<0.1
1-R-2	2/16/89	11	<1	<0.1	<0.1	<0.1	<0.1
2R-1	2/16/89	6	<1	<0.1	<0.1	<0.1	<0.1
2R-2	2/16/89	11	<1	<0.1	<0.1	<0.1	<0.1
3-1	5/23/89	5	<1	<0.1	<0.1	<0.1	<0.1
3-2	5/23/89	10	<1	<0.1	<0.1	<0.1	<0.1
3-3	5/23/89	15	<1	<0.1	<0.1	<0.1	<0.1
4-1	5/23/89	5.5	<1	<0.1	<0.1	<0.1	<0.1
4-2	5/23/89	10.5	<1	<0.1	<0.1	<0.1	<0.1
4-3	5/23/89	15.5	<1	<0.1	<0.1	<0.1	<0.1
5-1	5/23/89	5.5	<1	<0.1	<0.1	<0.1	<0.1
5-2	5/23/89	10.5	<1	<0.1	<0.1	<0.1	<0.1
5-3	5/23/89	15.5	36	<0.1	0.2	0.3	0.6
6-1	5/24/91	5.5	<1	<0.1	<0.1	<0.1	<0.1
6-2	5/24/91	10.5	<1	<0.1	<0.1	<0.1	<0.1
6-3	5/24/91	15.5	<1	<0.1	<0.1	<0.1	<0.1
7-1	5/24/91	5.5	<1	<0.1	<0.1	<0.1	<0.1
7-2	5/24/91	10	<1	<0.1	<0.1	<0.1	<0.1
8-1	5/24/91	5.5	<1	<0.1	<0.1	<0.1	<0.1
8-2	5/24/91	10.5	<1	<0.1	<0.1	<0.1	<0.1
13-1	10/9/91	6	<1	<0.005	<0.005	<0.005	<0.005
13-2	10/9/91	10.5	130	0.11	<0.05	1.7	5.4
13-3	10/9/91	15.5	<1	<0.005	<0.005	<0.005	<0.005
SP-1 to SP-4	10/10/91	Composite	2	<0.005	<0.005	0.023	0.099

TPHG Total petroleum hydrocarbons as gasoline
mg/kg Milligrams per kilogram (parts per million)
<0.005 Not detected at or above the indicated laboratory detection limit

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-11

Date Drilled: 10/8/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
				Asphalt: 3" Baserock: 2"			
1-5			ML	SILT, dark reddish brown (5YR 2.5/2), 80-90% silt, 5-15% clay, 5-10% very fine- to fine-grained sand, <5% medium- to coarse-grained sand, low plasticity, stiff, moist At approximately 4 feet, color change to dark brown (7.5YR 3/4), increase in coarse-grained sand to fine gravel content (5-10%)			
6		23				0	
7-9				At approximately 7 feet, driller indicated presence of gravels. Thickness apparently <1 foot			
10-11		10	SM	SILTY SAND, brown to dark brown (7.5YR 4/4) 60-70% fine- to medium-grained sand, 20-30% silt, 5-15% coarse-grained sand to fine gravel, minor clay binder, poorly sorted, loose to medium dense, very moist to wet		0	
12-13					11/7/91 08:45		
14-15							
15					10/8/91 09:47		
16		12				0	
17-19			SW-SM	GRAVELLY SAND, dark grayish brown (10YR 4/2), 70-80% fine- to coarse-grained sand, 10-20% fine-medium gravel, 10-20% silt, poorly sorted, medium dense, saturated			
20			ML	SILT, brown (10YR 5/3), low plasticity, very stiff, damp			
21		38		Bottom of boring = 21.5 feet			

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-12

Date Drilled: 10/8/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
0				Asphalt: 3" Baserock: 2"			
1–9		39	ML	SILT, dark reddish brown (5YR 2.5/2), 80-90% silt, 5-15% clay, 5-10% very fine- to fine-grained sand, <5% medium- to coarse-grained sand, low plasticity, stiff, moist At approximately 4 feet, color change to dark brown (7.5YR 3/4), increase in coarse-grained sand to fine gravel content (5-15%)		0	
9–11		15	ML	SANDY SILT, brown to dark brown (7.5YR 4/4), 60-70% silt, 35-45% fine- to medium-grained sand, trace coarse-grained sand, low plasticity, stiff, very moist		0	
11–19		7	SM	SILTY SAND, dark yellowish brown (10YR 4/4), 85-95% fine- to medium-grained sand, 15-25% silt, well sorted, loose, very moist to saturated 11/7/91 09:15 10/8/91 12:33	▼ ▽		
19			ML	SILT, brown (10YR 5/3), low plasticity, very stiff, damp to moist			
19–21		42	GW-GM	SANDY GRAVEL, dark yellowish brown (10YR 3/4), 65-75% fine to coarse gravel, 30-40% fine- to coarse-grained sand, 5-15% fines, poorly sorted, dense, saturated			

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-12

Date Drilled: 10/8/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
22		8		At 22 feet, color change to dark bluish gray (5B 4/1)			
23				Bottom of boring = 22.5 feet			
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-13

Date Drilled: 10/9/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
				Asphalt: 4" Baserock: 3"			
1			ML	SILT, to dark brown (7.5YR 3/4), 80-90% silt, 5-15% fine-grained sand, clay binder, trace coarse-grained sand, 1-2% rootholes, low to medium plasticity, very stiff, moist			
6	13-1	24				100	
11	13-2	19		COLOR CHANGE, mottled dark yellowish brown (10YR 4/4) with greenish gray (5BG 5/1), 1-3% fine- to medium-grained sand	11/7/91 09:21	607	
13			CL	SILTY CLAY, mottled dark yellowish brown (10YR 4/4) with greenish gray (5BG 5/1), 60-70% clay, 30-40% silt, 3-5% fine- to medium-grained sand, 3-5% rootholes, medium plasticity, very moist (wet in rootholes)			
16	13-3	11				0	
17					10/9/91 09:25		
19			SP-SM	SAND, dark greenish gray (5BG 4/1), 90-95% sand, 5-10% silt, 1-3% roots, well sorted, loose, saturated			
21		6					

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-13

Date Drilled: 10/9/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
22			SP-SM	SAND, continued			
23			GW-GM	SANDY GRAVEL, dark yellowish brown (10YR 3/4), 60-70% fine to coarse gravel, 30-40% fine- to coarse-grained sand, 5-15% fines, poorly sorted, dense, saturated			
24							
25		33	ML	SILT, light yellowish brown (2.5YR 5/3), 95-100% silt, <5% fine-grained sand, low plasticity, stiff, moist			
26				Bottom of boring = 25 feet			
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-14

Date Drilled: 10/9/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
1				Asphalt: 3" Baserock: 6"			
2			ML	GRAVELLY SILT, very dark grayish brown (10YR 3/2), 60-70% silt, 20-30% fine to medium gravel, 10-20% fine- to coarse-grained sand, clay binder, low plasticity, very stiff, moist			
3							
4							
5							
6		25				0	
7							
8			ML	SANDY SILT, dark yellowish brown (10YR 4/4), 70-80% silt, 20-30% fine-grained sand, clay binder, low to medium plasticity, moist to very moist			
9							
10							
11		13	SM	SILTY SAND, yellowish brown (10YR 4/4), 55-65% fine- to coarse-grained sand, 25-35% silt, 10-20% fine to coarse gravel, poorly sorted, medium dense, very moist to wet		0	
12							
13				11/7/91 08:25	▼		
14			ML	SANDY SILT, mottled yellowish brown (10YR 5/4) with strong brown (7.5YR 5/6), 55-65% silt, 40-50% fine- to medium-grained sand, 3-5% coarse-grained sand to fine gravel, 3-5% rootholes, low plasticity, very moist to saturated (wet in rootholes)			
15							
16		9				0	
17							
18							
19				10/9/91 15:40	▽		
20				At approximately 19.5 to 20.5 feet, gradational color change to dark greenish gray (5GY 4/1)			
21		8	SM	SILTY SAND			

REVIEWED BY R.G./C.E.G.

RESNA EXPLORATORY BORING LOG

Project Name: Former Chevron Station 9-4340
Oakland, California

Boring No. MW-14

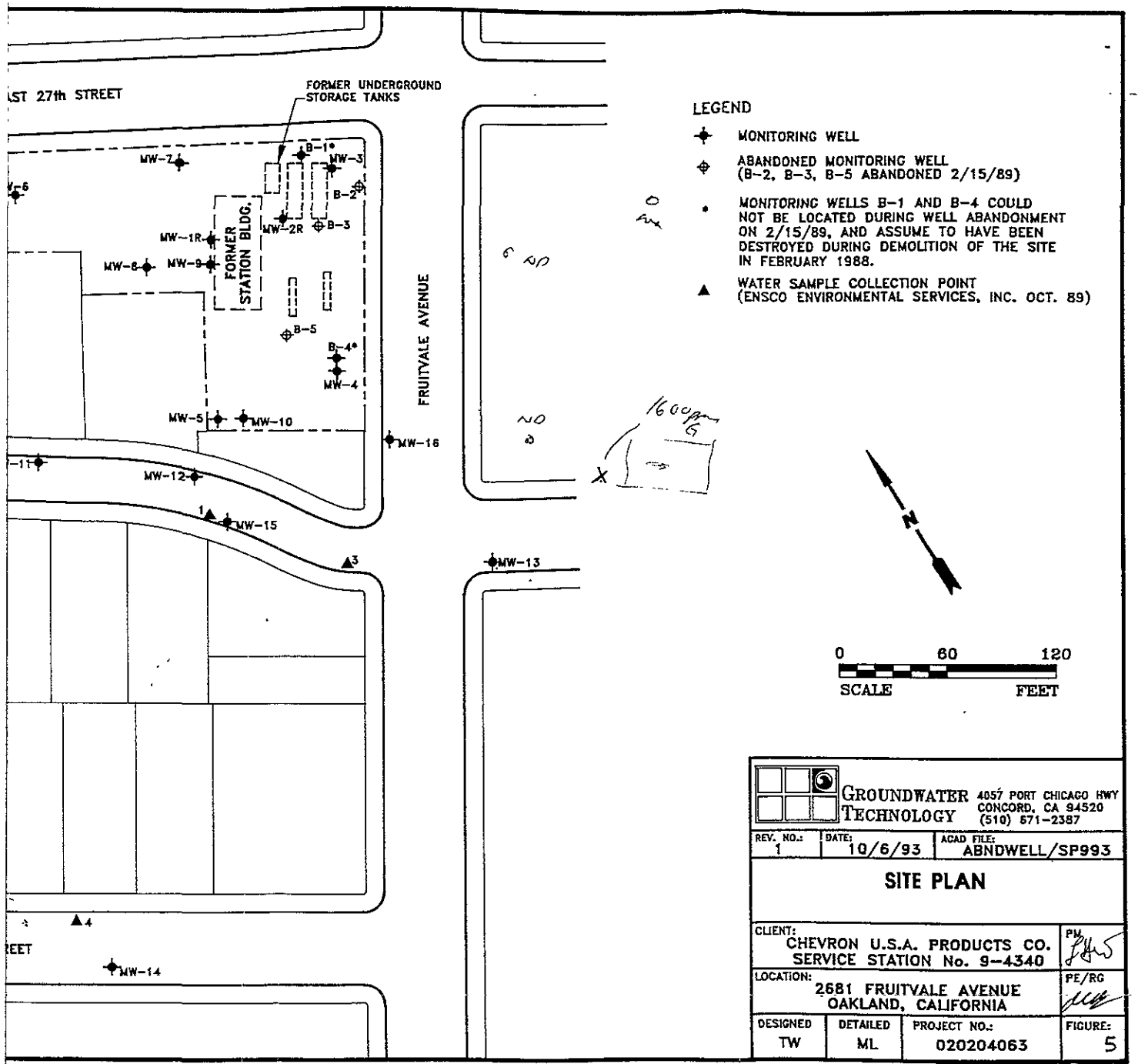
Date Drilled: 10/9/91

Project Number: 1907-3G

Logged By: B. Von Thaden

Depth (ft.)	Sample No.	Blows/Foot	Unified Soil Classification	SOIL DESCRIPTION	Water Level	PID Reading (ppm)	Well Construction
22			SM	SILTY SAND, mottled dark bluish gray (5B 4/1) with olive brown (2.5Y 4/3), 70-80% fine- to medium-grained sand, 20-30% silt, well sorted, loose, saturated			
23			SW-SM	GRAVELLY SAND, dark greenish gray (5GY 4/1), 70-80% fine- to coarse-grained sand, 20-30% fine-coarse gravel, 5-15% fines, poorly sorted, medium dense, saturated			
24							
25							
26		27	ML	SILT, light yellowish brown (2.5Y 5/3), low plasticity, very stiff, moist			
27				Bottom of boring = 26.5 feet			
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							
42							

REVIEWED BY R.G./C.E.G.



GROUNDWATER TECHNOLOGY
4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2387

REV. NO.:	DATE:	ACAD FILE:
1	10/6/93	ABNDWELL/SP993

SITE PLAN

CLIENT: CHEVRON U.S.A. PRODUCTS CO.
SERVICE STATION No. 9-4340

PM:

LOCATION: 2681 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

PE/RG:

DESIGNED	DETAILED	PROJECT NO.:	FIGURE:
TW	ML	020204063	5

TABLE 7
ANALYTICAL RESULTS FOR SOIL SAMPLES
COLLECTED ON JUNE 21 AND JULY 15, 1993
(Concentrations in Parts Per Million)

Date	Sample ID	Sample Depth (feet)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-G
06/21/93	MW-15	5	<0.005	<0.005	<0.005	<0.015	<1
06/21/93	MW-15	10	<0.005	<0.005	<0.005	<0.015	<1
07/15/93	MW-16	5	<0.005	<0.005	<0.005	<0.015	<1
07/15/93	MW-16	10	<0.005	<0.005	<0.005	<0.015	<1

TPH-G = Total petroleum hydrocarbons-as-gasoline

Drilling Log

GROUNDWATER TECHNOLOGY

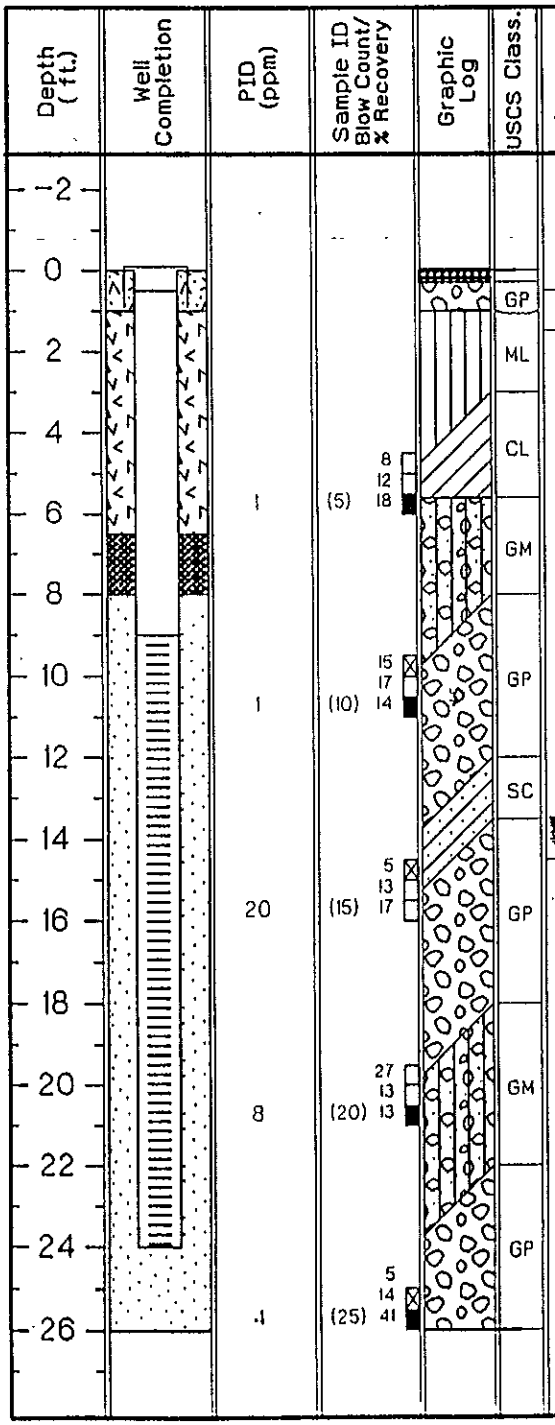
Monitoring Well MW-15

Project 2681 Fruitvale Ave. Owner Chevron
Location Oakland, CA Project No. 020204063 Date drilled 6-21-93
Surface Elev. 105.61 ft. Total Hole Depth 26 ft. Diameter 8 in.
Top of Casing 105.24 ft. Water Level Initial 14 ft. Static 13.86 ft.
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 9 ft. Type PVC SCH 40
Filter Pack Material #3 sand Rig/Core Type Mod. Cal. Split Spoon
Drilling Company SES Method Hollow Stem Auger Permit #
Driller Scott Fitchie Log By Doug Ford
Checked By David Kleesattel License No. RG# 5136

See Site Map For Boring Location

COMMENTS:

The well was set at approximately 24 feet below grade. The soil cuttings were placed on plastic while the decon water was placed in 55-gallon drums until disposal.



Description

(Color, Texture, Structure)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%

ASPHALT at grade.

COBBLES/GRAVEL to 12 inches below grade.

Clayey SILT, dark gray, about 70% silt, about 20% clay, about 10% fine to coarse sand, (moist, no hydrocarbon odor, medium stiff).

Silty CLAY, brown, about 50% clay, about 20% silt, about 10% fine sand, about 10% fine rounded gravel, about 10% medium to course sand, (moist, no hydrocarbon odor, very stiff).

Silty GRAVEL, brown, about 50% fine gravel, about 20% silt, about 10% fine sand, about 10% medium sand, about 10% coarse sand, (moist, no hydrocarbon odor, dense).

Poorly graded GRAVEL, brown, about 50% fine to coarse gravel, about 20% coarse sand, about 20% medium sand, about 10% fine sand, (moist, no hydrocarbon odor, dense).

Clayey SAND, brown, about 60% fine sand, about 20% clay, about 10% silt, about 10% medium to coarse sand, (very moist to wet, slight hydrocarbon odor).

Poorly graded GRAVEL, brown, about 50% fine to coarse gravel, about 20% coarse sand, about 20% medium sand, about 10% fine sand, (saturated, slight hydrocarbon odor, dense).

Silty GRAVEL, brown, about 50% gravel, about 20% silt, about 10% clay about 10% fine to medium sand, about 10% coarse sand, (saturated, no hydrocarbon odor, dense).

Poorly graded GRAVEL, brown, about 60% fine to coarse gravels, about 15% fine sand, about 10% medium sand, about 10% coarse sand about 5% silt, (saturated, no hydrocarbon odor, very dense).

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well MW-16

Project 2681 Fruitvale Ave. Owner Chevron
Location Oakland, CA Project No. 020204063 Date drilled 7-15-93
Surface Elev. 105.38 ft. Total Hole Depth 25 ft. Diameter 8 in.
Top of Casing 104.93 ft. Water Level Initial 14 ft. Static 12.48 ft.
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 9 ft. Type PVC SCH 40
Filter Pack Material #3 sand Rig/Core Type Mod. Cal. Split Spoon
Drilling Company SES Method Hollow Stem Auger Permit #
Driller Scott Fitchie Log By S.C. Hurley
Checked By David Kleesattel License No. RG# 5136 David Kleesattel

See Site Map For Boring Location

COMMENTS:

The well was set at approximately 24 feet below grade. The soil cuttings were placed on plastic while the decon water was placed in 55-gallon drums until disposal.

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50
0						ASPHALT at grade.
2						Silty CLAY, dark brown, about 50% clay, about 40% silt, about 10% fine sand, (moist, plastic, no hydrocarbon odor, stiff).
4		2.2	(5) 5 11 16		CL	
6						Silty CLAY, brown, about 60% clay, about 40% silt, (moist, plastic, hydrocarbon odor, stiff).
8						
10		0	(10) 5 10 15		ML	Sandy SILT, brown/gray, about 50% silt, about 30% fine to mediu sand, about 20% clay, (moist, no hydrocarbon odor, stiff).
12						Silty CLAY, dark brown, about 70% clay, about 25% silt, about 5% sand, (very moist, no hydrocarbon odor, plastic).
14		0.9	(15) 3 5 5		CL	Clay, mottled gray/brown, about 80% clay, about 20% silt, (wet, r hydrocarbon odor, plastic, medium stiff).
16						
18						SILT, mottled brown/orange, about 60% silt, about 20% clay, abo 20% fine sand, (saturated, no hydrocarbon odor, medium stiff).
20		7.6	(20) 3 5 6		ML	
22						SAND, brown, about 60% coarse sand, about 30% medium sand, a 10% fine sand, (saturated, no hydrocarbon odor, medium dense).
24		0	(25) 14 21 24		SP	
26						

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-1R											
03/10/89	104.49	90.60	13.89	--	7100	<0.5	41	25	98	--	--
05/26/89	104.49	89.62	14.87	--	4600	<0.5	<0.5	60	190	--	--
08/16/89	104.49	89.05	15.44	--	2100	<0.5	10	56	59	--	--
11/08/89	104.49	89.66	14.83	--	1100	2.0	1.0	60	80	--	--
02/23/90	104.49	91.07	13.42	--	4000	19	<0.3	<190	340	--	--
05/21/90	104.49	89.53	14.96	--	980	8.0	4.0	34	50	--	--
09/04/90	104.49	88.91	15.58	--	2400	6.0	<0.3	17	65	--	--
11/16/90	104.49	88.73	15.76	--	870	2.0	5.0	27	23	--	--
02/21/91	104.49	89.84	14.65	--	3400	<0.5	<0.5	71	92	--	--
05/13/91	104.49	90.03	14.46	--	840	<0.5	<0.5	23	30	--	--
08/06/91	104.49	89.12	15.37	--	370	<0.5	<0.5	8.9	6.5	--	--
11/07/91	104.49	90.52	13.97	--	--	--	--	--	--	--	--
02/26/92	104.49	93.71	10.78	--	--	--	--	--	--	--	--
06/18/92	104.49	89.36	15.13	--	350	0.8	<0.5	8.7	2.4	--	--
09/23/92	104.49	88.97	15.52	--	--	--	--	--	--	--	--
12/14/92	104.49	92.65	11.84	--	--	--	--	--	--	--	--
03/22/93	104.49	91.95	12.54	--	1500	9.0	1.0	40	43	--	--
06/04/93	104.49	90.26	14.23	--	600	5.0	0.8	10	10	--	--
08/13/93	104.49	92.48	15.07	--	--	--	--	--	--	--	--
09/10/93	107.55	92.39	15.16	--	230	<0.5	1.1	3.0	2.3	--	--
12/15/93	107.55	94.67	12.88	--	1000	6.0	2.0	35	30	--	--
03/10/94	107.55	94.52	13.03	--	1500	5.5	4.8	21	23	<5000	--
06/22/94	107.55	92.84	14.71	--	520	3.0	1.0	5.0	5.0	--	--
12/21/94	107.55	95.47	12.08	--	1600	<5.0	<5.0	29	12	<5000	--
06/30/95	107.55	94.03	13.52	--	180	<0.5	<0.5	2.6	0.69	<5000	--
10/27/95	107.55	92.14	15.41	--	73	<0.5	<0.5	<0.5	<0.5	<5000	<2.5
04/23/96	107.55	94.15	13.40	--	280	1.6	<0.5	5.9	0.54	<5000	4.8
12/13/96	107.55	96.12	11.43	--	900	<1.0	1.3	10	1.9	<5000	11
06/29/97	107.55	92.56	14.99	--	110	0.66	<0.5	<0.5	<0.5	<5000	<2.5
09/17/97	107.55	92.22	15.33	*	--	--	--	--	--	--	--

Historical Monitoring Results.

* See Table of Additional Analyses

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-3											
05/26/89	103.89	90.29	13.60	--	<50	<0.5	0.5	1.0	5.0	--	--
08/16/89	103.89	89.71	14.18	--	<50	<0.5	<0.5	<0.5	<1.0	--	--
11/08/89	103.89	90.26	13.63	--	<500	1.0	<0.3	1.0	2.0	--	--
02/23/90	103.89	91.51	12.38	--	200	3.0	<0.3	5.0	10	--	--
05/21/90	103.89	90.18	13.71	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
08/31/90	103.89	89.51	14.38	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/15/90	103.89	89.28	14.61	--	83	1.0	4.0	1.0	9.0	--	--
02/21/91	103.89	90.19	13.70	--	160	<0.5	<0.5	1.0	2.0	--	--
05/13/91	103.89	90.69	13.20	--	150	<0.5	<0.5	2.0	2.0	--	--
08/06/91	103.89	89.68	14.21	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/07/91	103.89	90.97	12.92	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/27/92	103.89	94.04	9.85	--	78	<0.5	<0.5	<0.5	<0.5	--	--
06/18/92	103.89	89.91	13.98	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/23/92	103.89	89.57	14.32	--	--	--	--	--	--	--	--
12/14/92	103.89	92.91	10.98	--	59	<0.5	<0.5	<0.5	0.8	--	--
03/22/93	103.89	92.46	11.43	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/04/93	103.89	90.84	13.05	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/13/93	106.95	93.07	13.88	--	--	--	--	--	--	--	--
09/10/93	106.95	92.99	13.96	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
12/15/93	106.95	94.88	12.07	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	106.95	95.23	11.72	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/22/94	106.95	93.38	13.57	--	<50	<0.5	<0.5	<0.5	<0.5	--	--

NO LONGER MONITORED OR SAMPLED

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-4											
05/26/89	102.68	89.68	13.00	--	110	<0.5	<0.5	<0.5	<1.0	--	--
08/16/89	102.68	89.23	13.45	--	480	<0.5	3.2	<0.5	3.7	--	--
11/08/89	102.68	89.57	13.11	--	<500	<0.3	<0.3	<0.5	<0.6	--	--
02/23/90	102.68	90.76	11.92	--	680	3.0	1.0	0.4	1.0	--	--
05/21/90	102.68	89.42	13.26	--	340	3.0	3.0	2.0	4.0	--	--
08/31/90	102.68	88.91	13.77	--	110	0.5	<0.3	0.9	<0.6	--	--
11/15/90	102.68	88.68	14.00	--	210	3.0	12	2.0	21	--	--
02/21/91	102.68	89.73	12.95	--	220	2.0	<0.5	0.5	1.0	--	--
05/13/91	102.68	89.96	12.72	--	430	4.0	<0.5	0.6	7.0	--	--
08/06/91	102.68	89.12	13.56	--	160	<0.5	<0.5	<0.5	2.0	--	--
11/07/91	102.68	91.02	11.66	--	1500	16	2.8	2.9	12	--	--
02/27/92	102.68	93.43	9.25	--	910	8.5	4.0	1.1	32	--	--
06/18/92	102.68	89.34	13.34	--	430	1.1	<0.5	<0.5	5.6	--	--
09/23/92	102.68	89.03	13.65	--	120	<0.5	<0.5	<0.5	1.7	--	--
12/14/92	102.68	92.45	10.23	--	510	3.0	2.8	3.5	7.0	--	--
03/22/93	102.68	91.78	10.90	--	620	3.0	3.0	3.0	7.0	--	--
06/04/93	102.68	90.21	12.47	--	720	3.0	4.0	4.0	14	--	--
08/13/93	105.75	92.48	13.27	--	--	--	--	--	--	--	--
09/10/93	105.75	92.39	13.36	--	74	<0.5	<0.5	<0.5	<1.5	--	--
12/15/93	105.75	94.18	11.57	--	160	1.0	<0.5	1.0	2.0	--	--
03/10/94	105.75	94.55	11.20	--	970	5.1	1.7	7.5	18	--	--
06/22/94	105.75	92.69	13.06	--	460	6.0	5.0	5.0	10	--	--
09/17/97	105.75	92.40	13.35	*	--	--	--	--	--	--	--

* See Table of Additional Analyses

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-6											
05/26/89	104.87	89.68	15.19	--	<50	<0.5	<0.5	<0.5	<1.0	--	--
08/16/89	104.87	89.13	15.74	--	<50	<0.5	<0.5	<0.5	<1.0	--	--
11/08/89	104.87	89.73	15.14	--	<500	<0.3	<0.3	<0.3	<0.6	--	--
02/22/89	104.87	91.15	13.72	--	<500	<0.3	<0.3	<0.3	<0.6	--	--
05/20/89	104.87	89.73	15.14	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
08/31/90	104.87	89.00	15.87	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/15/90	104.87	88.87	16.00	--	59	1.0	3.0	0.5	3.0	--	--
02/21/91	104.87	89.92	14.95	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
05/13/91	104.87	90.10	14.77	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/06/91	104.87	89.22	15.65	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/07/91	104.87	90.52	14.35	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/26/92	104.87	93.76	11.11	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/18/92	104.87	89.44	15.43	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/23/92	104.87	89.05	15.82	--	--	--	--	--	--	--	--
12/14/92	104.87	92.71	12.16	--	--	--	--	--	--	--	--
03/22/93	104.87	91.97	12.90	--	--	--	--	--	--	--	--
06/04/93	104.87	90.33	14.54	--	--	--	--	--	--	--	--
08/13/93	107.90	92.51	15.39	--	--	--	--	--	--	--	--
09/10/93	107.90	92.41	15.49	--	--	--	--	--	--	--	--
12/15/93	107.90	94.77	13.13	--	--	--	--	--	--	--	--
03/10/94	107.90	94.54	13.36	--	--	--	--	--	--	--	--
06/22/94	107.90	--	--	--	--	--	--	--	--	--	--

NO LONGER MONITORED OR SAMPLED

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-8											
05/26/89	105.59	89.45	16.14	--	<50	<0.5	<0.5	<0.5	<1.0	--	--
08/16/89	105.59	88.90	16.69	--	<50	<0.5	<0.5	<0.5	<1.0	--	--
11/08/89	105.59	89.49	16.10	--	<500	<0.3	<0.3	<0.3	<0.6	--	--
02/23/90	105.59	90.87	14.72	--	<500	<0.3	<0.3	<0.3	<0.6	--	--
05/21/90	105.59	89.39	16.20	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
08/31/90	105.59	88.76	16.83	--	<50	<0.3	<0.3	<0.3	<0.6	--	--
11/15/90	105.59	88.59	17.00	--	420	10	35	7.0	57	--	--
02/21/91	105.59	89.65	15.94	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
05/13/91	105.59	89.84	15.75	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/06/91	105.59	88.95	16.64	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
11/07/91	105.59	90.37	15.22	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
02/26/92	105.59	93.45	12.14	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/18/92	105.59	89.20	16.39	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/23/92	105.59	88.81	16.78	--	--	--	--	--	--	--	--
12/14/92	105.59	92.42	13.17	--	--	--	--	--	--	--	--
03/22/93	105.59	91.65	13.94	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/04/93	105.59	90.11	15.48	--	--	--	--	--	--	--	--
08/13/93	108.65	92.31	16.34	--	--	--	--	--	--	--	--
09/10/93	108.65	92.23	16.42	--	--	--	--	--	--	--	--
12/15/93	108.65	94.48	14.17	--	--	--	--	--	--	--	--
03/10/94	108.65	94.38	14.27	--	50	<0.5	<0.5	1.1	3.1	--	--
06/22/94	108.65	--	--	--	--	--	--	--	--	--	--

NO LONGER MONITORED OR SAMPLED

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-10											
05/13/91	102.37	89.32	13.05	--	18,000	390	5.0	380	1500	--	--
08/07/91	102.37	88.58	13.79	--	26,000	450	7.9	500	1600	--	--
11/08/91	102.37	90.38	11.99	--	3800	120	<5.0	190	1200	--	--
02/28/92	102.37	92.67	9.70	--	14,000	120	7.1	23	1300	--	--
06/18/92	102.37	88.85	13.52	--	19,000	240	<6.0	350	1200	--	--
09/23/92	102.37	88.49	13.88	--	14,000	78	<10	160	490	--	--
12/14/92	102.37	91.90	10.47	--	4000	67	9.7	57	620	--	--
03/22/93	102.37	91.22	11.15	--	11,000	110	13	25	510	--	--
06/04/93	102.37	89.65	12.72	--	13,000	210	14	150	700	--	--
08/13/93	105.42	91.99	13.43	--	--	--	--	--	--	--	--
09/10/93	105.42	91.92	13.50	--	<50	<0.3	<0.3	<0.3	<0.9	--	--
12/15/93	105.42	93.97	11.45	--	6500	69	16	57	190	--	--
03/10/94	105.42	93.98	11.44	--	8200	88	110	150	400	--	--
06/22/94	105.42	92.32	13.10	--	8400	40	17	57	120	--	--
12/21/94	105.42	94.81	10.61	--	2900	5.1	<5.0	8.3	16	--	--
06/30/95	105.42	93.64	11.78	--	2300	<5.0	<5.0	13	11	--	--
10/27/95	105.42	91.72	13.70	--	30,000	<20	<20	<20	100	--	<100
04/23/96	105.42	93.40	12.02	--	5000	<5.0	<5.0	32	18	--	<25
12/13/96	105.42	95.52	9.90	--	3000	<5.0	14	8.6	22	--	<25
06/29/97	105.42	92.07	13.35	--	8800	<12	29	25	22	--	<62
09/17/97	105.42	92.22	13.20	*	--	--	--	--	--	--	--

* See Table of Additional Analyses

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-12											
11/08/91	102.16	90.03	12.13	--	9200	240	9.7	960	1100	--	--
02/28/92	102.16	92.34	9.82	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/18/92	102.16	88.58	13.58	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/23/92	102.16	88.25	13.91	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/14/92	102.16	91.40	10.76	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/93	102.16	90.57	11.59	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/04/93	102.16	89.26	12.90	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
08/13/93	105.19	91.64	13.55	--	--	--	--	--	--	--	--
09/10/93	105.19	91.58	13.61	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
12/15/93	105.19	93.54	11.65	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	105.19	93.30	11.89	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/22/94	105.19	91.84	13.35	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/21/94	105.19	94.09	11.10	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/30/95	105.19	92.17	13.02	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
10/27/95	105.19	90.88	14.31	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
04/23/96	105.19	92.79	12.40	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
12/13/96	105.19	94.84	10.35	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
06/29/97	105.19	91.70	13.49	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
09/17/97	105.19	91.48	13.71	*	--	--	--	--	--	--	--
MW-13											
11/08/91	101.20	90.58	10.62	--	21,000	910	95	1200	2200	--	--
02/28/92	101.20	92.54	8.66	--	26,000	1100	93	1200	2300	--	--
06/18/92	101.20	89.70	11.50	--	19,000	850	57	1100	1600	--	--
09/23/92	101.20	--	--	--	--	--	--	--	--	--	--
12/14/92	101.20	--	--	--	--	--	--	--	--	--	--
03/22/93	101.20	--	--	--	17,000	1200	67	1100	1500	--	--
06/04/93	101.20	89.97	11.23	--	13,000	1000	41	750	900	--	--
08/13/93	104.24	92.28	11.96	--	--	--	--	--	--	--	--
09/10/93	104.24	92.18	12.06	--	140,000	1500	500	3900	13,000	--	--
12/15/93	104.24	94.09	10.15	--	30,000	1600	170	1700	4300	--	--
03/10/94	104.24	93.94	10.30	--	15,000	980	170	1200	1600	--	--
06/22/94	104.24	92.34	11.90	--	38,200	1820	<50	1560	2600	--	--

NO LONGER MONITORED OR SAMPLED

* See Table of Additional Analyses

Cumulative Table of Well Data and Analytical Results

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

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	TOG	MTBE
MW-16											
08/13/93	104.93	92.45	12.48	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	104.93	92.12	12.81	--	60	<0.5	<0.5	1.3	4.8	--	--
12/15/93	104.93	93.89	11.04	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/10/94	104.93	94.01	10.92	--	52	<0.5	<0.5	0.9	3.6	--	--
06/22/94	104.93	92.38	12.55	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/21/94	104.93	94.72	10.21	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/30/95	104.93	92.63	12.30	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
10/27/95	104.93	91.90	13.03	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/23/96	104.93	93.53	11.40	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
12/13/96	104.93	95.07	9.86	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
06/29/97	104.93	92.47	12.46	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
09/17/97	104.93	92.18	12.75	*	--	--	--	--	--	--	--
TRIP BLANK											
06/18/92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/23/92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/14/92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
03/22/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/04/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
09/10/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/15/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--
03/10/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/22/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
12/21/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
06/30/95	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
10/27/95	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--
04/23/96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
12/13/96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5
06/29/97	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	<2.5

* See Table of Additional Analyses

ADDITIONAL ANALYSES

Analytical values are in parts per million (ppm)

DATE	Notes	Total Alkalinity	Ferrous Iron	Nitrate as Nitrate	Sulfate
MW-15					
09/17/97	--	300	0.35	12	22
MW-16					
09/17/97	--	240	0.39	<1.0	12

Note: Blaine Tech Services, Inc. began routine monitoring of the groundwater wells at this site on November 1, 1994. Earlier field data and analytical results are drawn from the September 27, 1994 Groundwater Technology, Inc. report.

ABBREVIATIONS:
TPH = Total Petroleum Hydrocarbons
TOG = Total Oil & Grease
MTBE = Methyl t-Butyl Ether

Former Chevron - 2681 Fruitvale Avenue, Oakland. CA

Barney,

I reviewed the risk assessment, dated September 22, 1997 from Cambria.
They used the maximum concentration (17 ppb of benzene) found in the wells (except MW-13) in the past 4 quarters and compared it with the Tier 2 SSTL's derived for the groundwater to indoor air pathway.
They did not do the soil to indoor air pathway because none of the shallow borings located after the overexcavation had any contamination . The only soil contamination with gasoline and benzene from a boring was in MW-13 which is probably as you said from another source.

They were very conservative by using 10-6 as the target risk. They also calculated ingestion for an offsite source (about 1300 feet away). It looked like this was not a problem based on the SSTL's calculated.

But I wanted to know what kind of receptors we have offsite and why 1300 feet was selected? Also, I wanted some rationale for the volumetric air and water content they had used. Sam, the consultant mentioned he will get back to me on these issues. Also, do you think there is a potential that the water may be used for ingestion onsite. If not ingestion, then atleast, to water the plants?
Even, if we O.K the risk assessment, since it is a residential scenario, I think we need to ask them for a risk management plan which would include the condition that groundwater will not be used for drinking, irrigation, and maybe they should notify the neighbours of the groundwater condition

Madhulla Logan

RA is fine.

I thought we needed a Risk Manager plan but they did a well survey + to [illegible] most probably there are no wells in creeks

Table 1 - Conceptual Model for Risk Assessment

Item		Comment
Contaminant Source Media:	Underlying Ground Water	No hydrocarbons have been detected in unsaturated soils beneath the site. Soil previously impacted by hydrocarbons was excavated.
Potential Chemicals of Concern (COC):	BTEX	All chemicals detected in representative samples.
Representative COC Source Concentrations in Ground Water:	benzene: 0.017 ppm toluene: 0.029 ppm ethylbenzene: 0.025 ppm xylenes: 0.022 ppm	Maximum June 1997 ground water concentrations (benzene in MW-5, toluene, ethylbenzene and xylenes in MW-10) (Attachment E). Benzene concentration is also the approximate average concentration in MW-5 since June 1995.
Target Carcinogenic Risk Level:	$1x10^{-6}$	Conservative target risk level, considering a residential receptor scenario.
Non-Carcinogenic Hazard Quotient:	1.0	Consistent with ASTM default value.
Benzene Slope Factor:	0.1 $(mg/kg/day)^{-1}$	Defined by CalEPA.
BTEX = Benzene, toluene, ethylbenzene, and xylenes.		

Tier 1 Analysis

Consistent with the tiered approach adopted by the ASTM RBCA guidelines, Cambria initially quantified the risk associated with the site COCs by performing a Tier 1 evaluation. As outlined in ASTM (1995), the site-specific COC source concentrations are compared to highly-conservative, generic Tier 1 RBSLs, which are based on simplified equations and generalized site conditions. Table 2 contains the results of our comparison of site COC source concentrations to Tier 1 RBSLs.

As shown in Table 2, the exposure scenarios exceeding the Tier 1 standards is volatilization of benzene from ground water into on-site indoor air and residential ingestion of benzene in on-site ground water. These scenarios served as the basis for our Tier 2 analysis.

Table 2 - Results of Tier 1 Analysis for Benzene

Exposure Pathway	Receptor Scenario	RBCA Tier 1 RBSL for Benzene: Target Risk Level	Applicable RBSL (USEPA)	California EPA RBSL (0.29xRBSL)	Representative Concentration for Benzene	Representative Concentration vs RBSL: Exceed	Below
Volatilization from ground water to outdoor air	Residential	$1x10^{-6}$	11 mg/L	3.19 mg/l	0.017 mg/l		X
Volatilization from ground water to indoor air	Residential	$1x10^{-6}$	0.024 mg/l	0.006 mg/l	0.017 mg/l	X	
On site ground water ingestion	Residential	$1x10^{-6}$	0.0029 mg/l	0.008 mg/l	0.017 mg/l	X	

RBSL = Risk-based screening level

As shown in Attachment G, the site concentrations for toluene, ethylbenzene, and xylenes are below all corresponding RBSLs.

As inferred from the above table, exposure pathways for which the site-specific benzene concentrations exceed the Tier 1 RBSLs are:

- Volatilization of benzene from ground water to indoor air on site; and,
- Ingestion of benzene in on-site ground water.

Tier 2 Analysis

In Cambria's Tier 2 analysis, we re-evaluated the two exposure scenarios failing the generic Tier 1 analysis by using site-specific data as input into the Tier 2 RBCA Spreadsheet System. Standard exposure scenarios inherent to the ASTM risk evaluation employ additional conservative assumptions consistent with state and federal guidelines. Risk related input parameters such as duration and frequency are selected to represent the maximally exposed individual and are not an accurate portrayal of time spent at a place of residence or business. The quantitative effect of these uncertainties contributes to overestimation of the overall potential health risk. Because ingestion of ground water beneath the site is not likely, and no well survey information was available from the files reviewed, we conservatively assumed that an off-site residential ground water receptor existed approximately 1/4-mile (1,300 ft) down gradient of the site in the Tier 2 analysis. We also conservatively estimated that the benzene concentration in the off-site receptor equaled the recent maximum benzene concentration in on-site ground water. Our assigned values for key input variables and our

justification for use of these values are summarized in Table 3 below and in Attachment H. The results of our Tier 2 analysis are summarized in Table 4 and Attachment H.

Table 3 - Assigned Key Parameter Values

Parameter	Units	Default Value	Value Used in Cambria Evaluation	Justification for Use of Value
Depth to Ground Water (DTW)	cm	300	427	Based on quarterly ground water monitoring data (DTW = 14 ft bgs).
Vadose Zone Porosity	cm^3/cm^3 of soil	0.38	0.45	Typical for fine-grained soils such as clay (*Schroeder et al., 1995*).
Moisture Content in the Vadose Zone	cm^3 of water/cm^3 of soil	0.12	0.34	At field capacity, based on historic ground water depth and the ability of fine-grained sediments to hold water (*Schroeder et al., 1993*).
Air Content in the Vadose Zone	cm^3 of air/cm^3 of total volume	0.26	0.11	Difference of total porosity and moisture content.
Foundation Crack Fraction	cm^2 cracks/cm^2 total area	0.01	0.001	Standard for new commercial building (*TAC, 1997*).
Saturated Hydraulic Conductivity	cm/sec	NA	0.03	Calculated from aquifer pump test.

Schroeder *et al.*, 1993 HELP: Hydrologic Evaluation of Landfill Performance Model, Volume 3. U.S. Army Corps of Engineers.
Technical Advisory Committee (TAC), 1997. Oakland Urban Redevelopment Program.

Table 4 - Results of Tier 2 Analysis

Exposure Scenario	Target Risk Level	Cal EPA Benzene SSTL	Benzene Site-Specific Concentration	Result
Volatilization of benzene from ground water into indoor air on-site	$1x10^{-6}$	0.75	0.017	Site-specific source concentration is less than the SSTL considerably.
Ingestion of benzene in ground water by an off-site residential receptor about 1,300 ft away	$1x10^{-6}$	0.075	0.017	Site-specific source concentration is less than the SSTL.

All concentrations in ppm.
SSTL = Site-specific target level.
COCC = Chemical of potential concern source concentration.

As shown below in Table 5, the risk associated with potential exposure to the site-specific benzene source concentration is significantly less than the target risk level set forth by the USEPA. In addition to evaluating the risk associated with ingestion of ground water from a receptor 1,300 ft (1/4-mile) downgradient of the site, we also calculated SSTLs at intermediate, alternate points of compliance. As shown in Attachment H, a benzene concentration of 17 ppb[3] is protective of the target risk level of 10^{-6}. Based on the Domenico solution without biodegradation, the model estimates this concentration occurs 260 ft downgradient of the source. Benzene has been recently detected at a lesser distance (about 160 ft) in ground water from on-site monitoring well MW-5, indicating the model is overestimating downgradient fate and transport of benzene. In addition, no benzene has been detected in off-site monitoring wells MW-12 and MW-15 for over four years.

Although a well survey has not been conducted, it is very unlikely that a water supply well would be screened in the uppermost water-bearing sediments. In the event that water supply wells exist in the vicinity of the site, they would presumably be screened in a deeper aquifer. Petroleum hydrocarbons are immiscible liquids and the hydrocarbon ground water mixing zone is typically less than 4 ft deep. Therefore, it is unlikely that a supply well would be affected. No SPHs have ever been observed beneath the site, the areal extent of the hydrocarbon plume is decreasing, and hydrocarbon concentrations are expected to further decline due to intrinsic biodegradation. In addition, no biodegradation was assumed in advection-dispersion model used to estimate the off-site fate and transport of benzene. Therefore, the actual risk associated with potential exposure to benzene in ground water is expected to be significantly less due to the simplified, conservative nature of the ASTM RBCA.

Table 5 - Comparison of Risk Levels

Exposure Scenario	Calculated Risk Level	Target Risk Level	Result
Volatilization of benzene from ground water into on-site indoor air	2.2×10^{-8}	1×10^{-6}	Site-specific source concentration is protective of target risk level.
Ingestion of benzene in ground water by an off-site residential receptor located about 1,300 ft downgradient	2.3×10^{-7}	1×10^{-6}	Site-specific source concentration is protective of target risk level.

[3] The results shown in Attachment H are based on the default ASTM benzene slope factor of 0.029 $(mg/kg\text{-}day)^{-1}$. To account for the more conservative Cal/EPA benzene slope factor of 0.1 $(mg/kg\text{-}day)^{-1}$, we multiply the benzene concentration values in Attachment H by the correction factor of 0.29 (e.g., 56 ppb x 0.29 = 17 ppb).

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Former Chevron Service Station 9-4340
Site Location: 2681 Fruitvale Avenue, Oakland, California

Completed By: Cambria Env. Tech. Inc
Date Completed: 4/2/1998

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-6
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

Cal EPA SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion			X Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable Cal-EPA SSTL	Cal SSTL Exceeded?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-2	Benzene	1.7E-2	NA	NA	NA	9.8E-2	NA	NA	NA	9.8E-2	☐	<1
100-41-4	Ethylbenzene	2.5E-2	NA	NA	NA	>Sol	NA	NA	NA	>Sol	☐	<1
108-88-3	Toluene	2.9E-2	NA	NA	NA	4.5E+2	NA	NA	NA	4.5E+2	☐	<1
1330-20-7	Xylene (mixed isomers)	2.2E-2	NA	NA	NA	>Sol	NA	NA	NA	>Sol	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-273-IBX-894

Output Table 1

RBCA TIER 1/TIER 2 EVALUATION

Site Name: Former Chevron Service Statio
Site Location: 2681 Fruitvale Avenue, Oaklan
Job Identification: 31-693.2
Date Completed: 4/2/98
Completed By: Cambria Env Tech, Inc

Software: GSI RBCA Spreadsheet
Version: 1.0.1

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

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

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

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

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

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	2.2E+06	1.0E+06
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
W.gw	Lehgth of affect. soil parallel to groundwater (cm)	***3.0E+03***	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)	1.0E+02	
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	***9.4E+02***
Ugw.tr	Groundwater seepage velocity (cm/yr)	***2.5E+03***
Ks	Saturated hydraulic conductivity(cm/s)	3.0E-03
grad	Groundwater gradient (cm/cm)	1.0E-02
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***1.5E+01***		
hv	Vadose zone thickness (cm)	***4.1E+02***		
rho	Soil density (g/cm^3)	***1.5***		
foc	Fraction of organic carbon in vadose zone	0.01		
phi	Soil porosity in vadose zone	***0.45***		
Lgw	Depth to groundwater (cm)	***4.3E+02***		
Ls	Depth to top of affected subsurface soil (cm)	1.0E+02		
Lsubs	Thickness of affected subsurface soils (cm)	2.0E+02		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	***0.4***	***0.34***	***0.34***
phi.a	Volumetric air content	***0.05***	***0.11***	***0.11***

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

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