TERRA VAC

DRILLING REPORT
FORMER CHEVRON STATION 9-4816
301 14th STREET
OAKLAND, CALIFORNIA
PROJECT #30-0220

8-31-95

STID 478

Chevron

Chevron U.S.A. Products Company
6001 Bollinger Canyon Rd., Bldg. L
P.O. Box 5004
San Ramon, CA 94583-0804

Site Assessment & Remediation Group
Phone (510) 842-9500

September 28, 1995

Ms. Jennifer Eberle
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Former Chevron Service Station #9-4816
301 14th Street, Oakland, CA

Dear Ms. Eberle:

Enclosed is the Drilling Report dated August 31, 1995, prepared by our consultant Terra Vac Corporation for the above referenced site. Two vapor extraction wells (VEW-4 and VEW-5) and two air sparging wells (SP-1 and SP-2) were installed. This work was performed as proposed in the Addendum Remediation Work Plan dated March 28, 1995, prepared by Terra Vac, and will be incorporated into the remediation system.

Soil samples collected were submitted to Sequoia Analytical for analysis of TPH-G and BTEX. The results of these analyses are summarized in Table 1 of the report.

Startup of the remediation system will occur as scheduled on October 2, 1995. We will closely monitor system performance and continue to keep your office up to date on the remediation progress.

If you have any questions or comments, please feel free to contact me at (510) 842-8134.

Sincerely,
CHEVRON U.S.A. PRODUCTS COMPANY

Mark A. Miller
Site Assessment and Remediation Engineer

Enclosure

cc: Mr. J.N. Robbins, CHVPK/V1156
Ms. B.C. Owen

Ms. Beth D. Castleberry
Gray, Cary, Ware & Freidenrich
400 Hamilton Avenue
Palo Alto, CA 94301-1825

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TERRA VAC

DRILLING REPORT
FORMER CHEVRON STATION 9-4816
310 14TH STREET
OAKLAND, CALIFORNIA

Prepared For

Chevron U.S.A. Products Company
6001 Bollinger Canyon Road
San Ramon, California 94583

Prepared By

Terra Vac Corporation
San Leandro, California

Karel L. Detterman, R.G.
Project Geologist

Timothy M. Warner
Project Manager

James A. Perkins, R.G.
Division Manager

REGISTERED GEOLOGIST
JAMES A. PERKINS
6/96
Nº 4472
STATE OF CALIFORNIA

August 31, 1995

DRILLING REPORT
FORMER CHEVRON STATION 9-4816
301 14th STREET
OAKLAND, CALIFORNIA

1.0 INTRODUCTION

The site, located at 301 14th Street in Oakland, was formerly a Chevron Service Station (No. 9-4816). The underground storage tanks (USTs) and associated piping were removed from the site in February 1991. Previous environmental investigations conducted at the site since 1990 have confirmed the presence of petroleum hydrocarbons in the soil and groundwater beneath the service station site. Since 1991, a variety of remedial activities, including soil vapor extraction and groundwater pump and treat, have occurred at the site. The site is currently fenced and vacant with the exception of a groundwater pump and treat system enclosed in a fenced equipment compound. Prior to this drilling event, there were three vapor extraction wells, five groundwater monitoring wells and one recovery well located on-site and six groundwater monitoring wells located off-site (Figure 1).

Chevron contracted Terra Vac to design and install a dual vacuum extraction (DVE) and air sparging remedial system at the former station. Included in the project is the installation of two new vapor extraction wells and two air sparging wells. The new wells will be incorporated into the remedial system.

2.0 FIELD INVESTIGATION

On July 20 and July 21, 1995, Spectrum Exploration, Inc., under the direction of Terra Vac, drilled and completed two air sparging wells (SP-1 and SP-2) and two vapor extraction wells (VEW-4 and VEW-5). A CME 75 truck mounted drill rig using 10 and 12-inch diameter hollow-stem augers was used to drill the borings. The total depth and screen interval of each well was determined in the field based on subjective evaluation of petroleum hydrocarbon concentrations (PID measurements), lithologies, and groundwater levels.

Soil samples were collected at five foot intervals from each boring using a modified split-spoon sampler. The sampler was driven eighteen inches ahead of the augers using a standard 140 pound hammer repetitively dropped 30 inches. A minimum of three samples per boring were collected for lithology classification and volatile screening analysis. A hand-held ProREA-75 photo ionization detector (PID) was used to examine each set of soil samples collected. The Unified Soils Classification System was used in the field to describe the physical properties of the soil.

Each well was constructed of Schedule 40 PVC well screen and riser. A slot size of 0.010 inches was selected based on the targeted lithology (poorly graded fine sand) at the site. The filter pack for each well consists of Lone Star 12/20 silica sand. A one-foot thick bentonite seal was placed between the filter pack and the neat cement grout annular seal in wells VEW-4 and VEW-5. A bentonite seal a minimum of ten-feet thick was placed between the filter pack and the neat cement grout annular seal in wells SP-1 and SP-2. Well logs containing well construction information are presented in Appendix A. All wells were completed below grade.

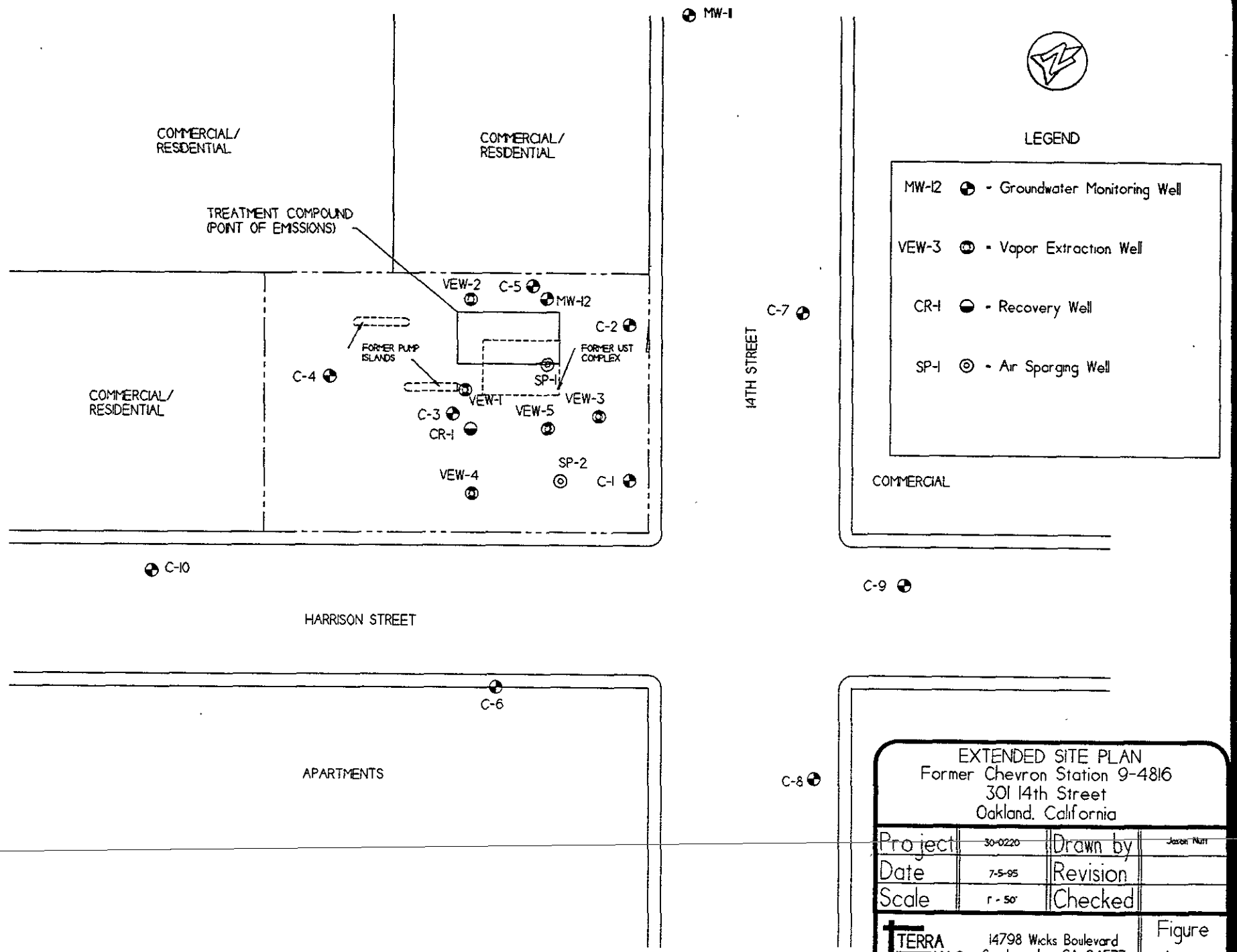
Decontamination procedures for on site equipment were followed to prevent cross contamination between borings. Prior to use, the soil sampler was cleaned using an Alconox wash and rinsed with potable water. Upon well completion, auger flights, the auger bit, and other pieces of intrusive equipment were steam cleaned to prevent cross contamination between borings.

3.0 ANALYTICAL RESULTS

Selected soil samples collected during drilling were submitted for analytical testing. Upon return of the split-spoon, selected samples were capped, labeled and stored on ice until transported to the laboratory. A chain of custody form was initiated by the sampling personnel and completed during subsequent handling of the samples. Analytical testing was conducted by Sequoia Analytical Laboratories (a State of California certified laboratory) of Redwood City, California, using EPA method 8020 for Total Petroleum Hydrocarbons as gasoline (TPH-g) and EPA method 8015 for benzene, toluene, ethylbenzene and xylenes (BTEX). Results of analyses of samples are included in Appendix B. Elevated concentrations of petroleum hydrocarbons were found to be present at depths between 20 and 23 feet below grade in soil samples collected from the borings for SP-1, SP-2, VEW-4, and VEW-5. A summary of these results is presented in Table 1.

4.0 FINDINGS

Lithology in wells SP-1 and VEW-5 is characterized by a layer of silty gravel 8 to 18 feet below grade which is over- and under-lain by poorly graded fine sand to the total depth of 25 feet in VEW-5 and to 33 feet below grade in SP-1, where clay was encountered. Lithology in well SP-2 is characterized by a clayey sand from the surface to a depth of four feet below grade, underlain by a poorly graded fine sand to a depth of 34 feet, where silty clay was encountered to a total depth of 35 feet below grade. The lithology of well VEW-4 is characterized by a poorly graded sand from the surface to a depth of four feet, underlain by a silty sand to a depth of 15 feet, underlain by a poorly graded sand to a total depth of 25 feet below grade. Groundwater was observed at depths ranging from 15 to 20 feet.



EXTENDED SITE PLAN
Former Chevron Station 9-4816
301 14th Street
Oakland, California

Project	30-0220	Drawn by	Jason Nutt
Date	7-5-95	Revision	
Scale	1" = 50'	Checked	

TERRA VAC
14798 Wicks Boulevard
San Leandro, CA 94577
(510) 351-8900 fax: -0221

Figure 1

TABLE 1
SUMMARY OF ANALYTICAL RESULTS

Sample No.	TPH-g	Benzene	Toluene	Ethylbenzene	Xylene
SP1-20.2	3,100	13	47	39	280
SP2-20.0	1,900	15	72	34	220
VEW4-20.2	<1.0	0.081	0.0078	0.019	0.095
VEW5-23.7	28	7.0	7.6	0.52	2.4

Analytical results in mg/kg (ppm).
< Value = None detected above the specified detection limit.
Analysis by Sequoia Analytical Laboratories of Walnut Creek on July 21, 1995

APPENDIX A

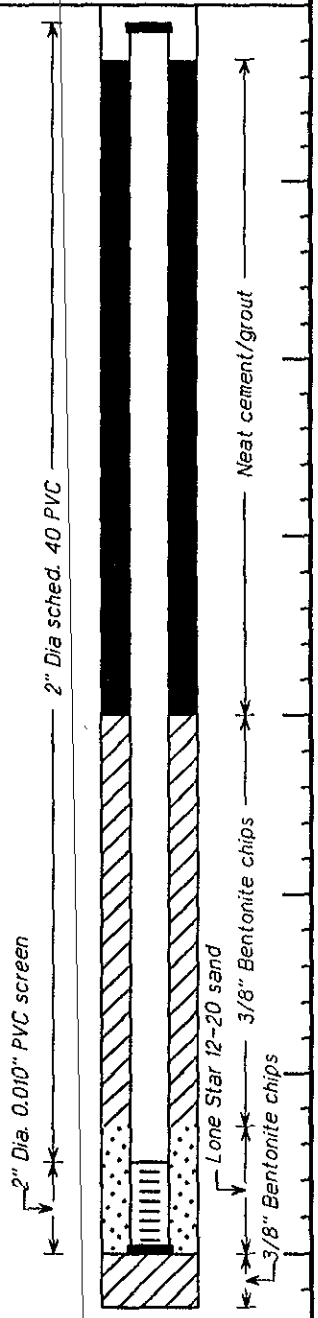
BORING/WELL LOGS

TERRA VAC CORPORATION
14798 Wicks Boulevard, San Leandro, CA 94577

LOG OF AIR SPARGE WELL SP-1

BLOWS/FT	PID (ppm)	SAMP.NO.	DEPTH (ft)	SAMPLES	SYMBOLS	MATERIALS DESCRIPTION
	55.2					SP — SAND, fine with trace coarse, dark brown (10YR3/3), loose, damp
12	31.7	SP1-5.3 SP1-5.6	5			AS above, dark olive gray (5Y3/2) mottling
						GM — GRAVEL, fine to medium, angular to sub-angular, silt (20-25%), sand (15-20%), very dark grayish brown (2.5Y3/2), medium dense, damp, trace brick fragments (backfill)
21	13.7	SP1-10.5 SP1-10.8	10			
8	31.7	SP1-15.0 SP1-15.3	15			AS above, loose
						SP — SAND, fine, olive gray (5Y4/2), very loose, wet, product sheen
2	364	SP1-20.2	20			
30	114	SP1-25.3 SP1-25.6	25			AS above, no product sheen
		No Sample Retrieved	30			±2" heaving sand in auger, no sample attempted
						CL — CLAY, silt (20-25%), trace sand, fine, pale olive (5Y6/3), very stiff, wet, medium plasticity
24	16.5	SP1-35.5 SP1-35.8	35			
			40			*Bottom of boring at 36.5 feet.*

WELL DIAGRAM



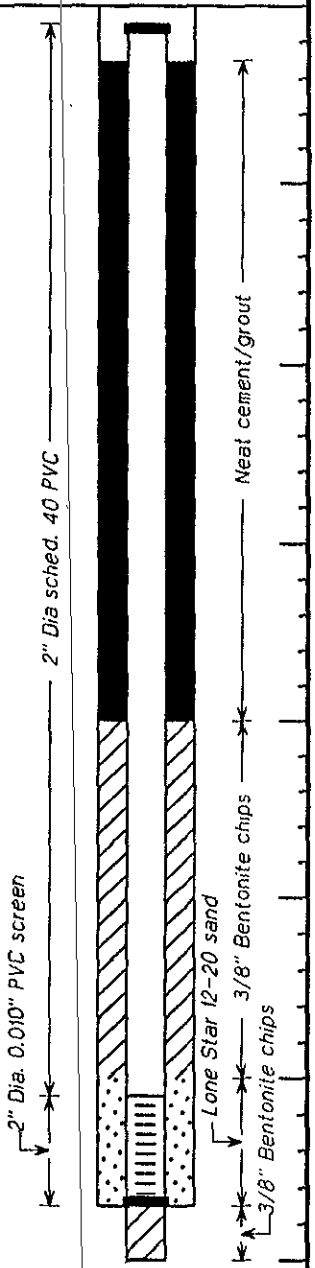
PROJECT Chevron	DRILLING COMPANY Spectrum Exploration, Inc.
LOCATION 310 14th Street, Oakland	DATE DRILLED 7/20/95
JOB NUMBER 30-0220	SURFACE ELEVATION Not surveyed
GEOLOGIST Cliff M. Garratt	TOTAL DEPTH OF HOLE 36.5 Feet
BORING DIAMETER 8 in. dia	FIRST OBSERVED GW 20 Feet

TERRA VAC CORPORATION
14798 Wicks Boulevard, San Leandro, CA 94577

LOG OF AIR SPARGE WELL SP-2

BLOWS/FT	PID (ppm)	SAMP.NO.	DEPTH (ft)	SAMPLES	SYMBOLS	MATERIALS DESCRIPTION
	353.9				SC	SAND, fine, clay (15-20%), dark yellowish brown (10YR4/4), medium dense, damp
38	6.8	SP2-5.5 SP2-5.8	5		SP	SAND, fine, dark yellowish brown (10YR4/6), dense, damp
16	48.9	SP2-10.2 SP2-10.5	10			AS above, yellowish brown (10YR5/8), medium dense, damp, iron staining
22	43.3	SP2-15.2 SP2-15.5	15			AS above, olive brown (2.5Y4/4)
24	326.8	SP2-20.0	20			AS above, olive (5Y4/3), wet
58	99.6	SP2-25.5 SP2-25.8	25			AS above, dark greenish grey (5GY4/1), very dense
54	35.5	SP2-30.5 SP2-30.8	30			AS above, olive brown (2.5Y4/3)
16	10.0	SP2-34.0	35		CL	CLAY, silt (15-20%), sand (10-15%), fine, light yellow brown, (2.5Y6/3), stiff, wet, medium plasticity
			40			*Bottom of boring at 33.5 feet.*

WELL DIAGRAM



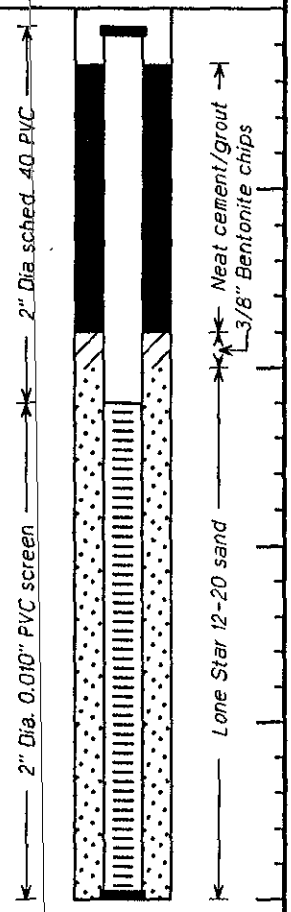
PROJECT Chevron	DRILLING COMPANY Spectrum Exploration, Inc.
LOCATION 310 14th Street, Oakland	DATE DRILLED 7/21/95
JOB NUMBER 30-0220	SURFACE ELEVATION Not surveyed
GEOLOGIST Cliff M. Garratt	TOTAL DEPTH OF HOLE 33.5 Feet
BORING DIAMETER 8 in. dia	FIRST OBSERVED GW 20 Feet

TERRA VAC CORPORATION
14798 Wicks Boulevard, San Leandro, CA 94577

LOG OF VAPOR EXTRACTION WELL VEW-4

BLOWS/FT	PID (ppm)	SAMP.NO.	DEPTH (ft)	SAMPLES	SYMBOLS	MATERIALS DESCRIPTION
	6.7					SP SAND, fine, dark brown (10YR3/3), loose, damp, some brick & concrete fragments (Backfill)
34	3.6	VEW4-5.5 VEW4-5.8	5			SM SAND, fine, silt (15-20%), yellowish brown (10YR5/5), dense, damp
16	5.9	VEW4-10.3 VEW4-10.6	10			AS above, medium dense, damp
						AS above, trace gravel, medium, rounded
17	9.9	VEW4-15.3 VEW4-15.6	15			SP SAND, fine, trace silt, dark yellowish brown (10YR4/4), medium dense, damp
24	44.0	VEW4-20.2 VEW4-20.5	20			AS above, dark olive grey (5Y3/2), wet
36	16.9	VEW4-23.7 VEW4-24.0	25			AS above, dense
						Bottom of boring at 25.0 feet.
			30			
			35			
			40			

WELL DIAGRAM



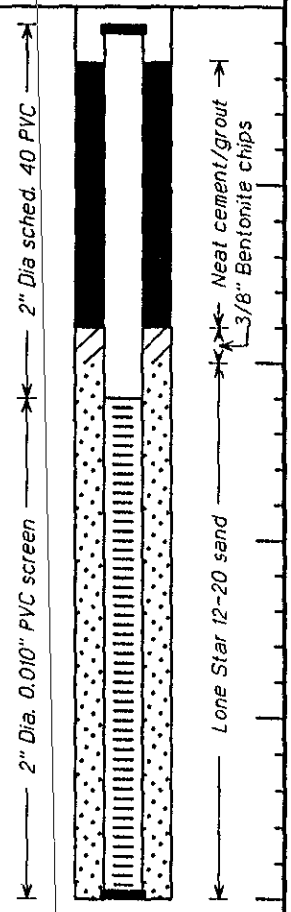
PROJECT Chevron	DRILLING COMPANY Spectrum Exploration, Inc.
LOCATION 310 14th Street, Oakland	DATE DRILLED 7/20/95
JOB NUMBER 30-0220	SURFACE ELEVATION Not surveyed
GEOLOGIST Cliff M. Garratt	TOTAL DEPTH OF HOLE 25.0 Feet
BORING DIAMETER 8 in. dia	FIRST OBSERVED GW 20 Feet

TERRA VAC CORPORATION
14798 Wicks Boulevard, San Leandro, CA 94577

LOG OF VAPOR EXTRACTION WELL VEW-5

BLOWS/FT	PID (ppm)	SAMP.NO.	DEPTH (ft)	SAMPLES	SYMBOLS	MATERIALS DESCRIPTION
	5.1					SP — SAND, fine, olive brown (2.5Y4/3), loose, damp
29	12.1	VEW5-5.5 VEW5-5.8	5			AS above, fines (5%), olive brown (2.5Y4/4), medium dense, iron staining, broken glass, visqueen, concrete rubble, (Backfill)
						GM — GRAVEL, fine to medium, sub-angular to angular, silt (30-35%), sand (10%) fine, olive grey (5Y4/2), stiff, medium dense, damp
19	6.3	VEW5-10.5 VEW5-10.8	10			
6	10.4	VEW5-15.5 VEW5-15.8	15			AS above, light olive brown (2.5Y5/3), loose, wet
						SP — SAND, fine, silt (5-10%), dark greenish grey (5G4/1), loose, wet
3	425	No Sample Retrieved	20			
18	135	VEW5-23.7	25			*Bottom of boring at 25.0 feet.*
			30			
			35			
			40			

WELL DIAGRAM



PROJECT Chevron	DRILLING COMPANY Spectrum Exploration, Inc.
LOCATION 310 14th Street, Oakland	DATE DRILLED 7/20/95
JOB NUMBER 30-0220	SURFACE ELEVATION Not surveyed
GEOLOGIST Cliff M. Garratt	TOTAL DEPTH OF HOLE 25.0 Feet
BORING DIAMETER 8 in. dia	FIRST OBSERVED GW 15 Feet

APPENDIX B

ANALYTICAL RESULTS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Terra Vac Corp.	Client Project ID:	Chevron #9-4816 / #30.0220	Sampled: Jul 20, 1995
14798 Wicks Blvd.	Sample Matrix:	Soil	Received: Jul 21, 1995
San Leandro, CA	Analysis Method:	EPA 5030/8015 Mod./8020	Reported: Jul 28, 1995
Attention: Tim Warner	First Sample #:	507-1375	

QC Batch Number:	SP072595 8020EXA	SP072595 8020EXA	SP072595 8020EXA	SP072595 8020EXA

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 507-1375 SP1-20.2	Sample I.D. 507-1376 SP2-20.0	Sample I.D. 507-1377 VEW4-20.2	Sample I.D. 507-1378 VEW5-23.7
Purgeable Hydrocarbons	1.0	3,100	1,900	N.D.	28
Benzene	0.0050	13	15	0.081	7.0
Toluene	0.0050	47	72	0.0078	7.6
Ethyl Benzene	0.0050	39	34	0.019	0.52
Total Xylenes	0.0050	280	220	0.095	2.4
Chromatogram Pattern:		Gasoline	Gasoline	--	Gasoline

Quality Control Data

Report Limit Multiplication Factor:	500	500	1.0	10
Date Analyzed:	7/25/95	7/25/95	7/25/95	7/25/95
Instrument Identification:	HP.2	HP.2	HP.2	HP.2
Surrogate Recovery, %: (QC Limits = 70-130%)	109	112	110	108

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

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Terra Vac Corp.
14798 Wicks Blvd.
San Leandro, CA
Attention: Tim Warner

Client Project ID: Chevron #9-4816 / #30.0220
Matrix: Solid
Work Order #: 507-1375 thru1378

Reported: Jul 28, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	SP072595	SP072595	SP072595	SP072595
	8020EXA	8020EXA	8020EXA	8020EXA
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	A Tuzon	A Tuzon	A Tuzon	A Tuzon
MS/MSD #:	5071460	5071460	5071460	5071460
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	7/25/95	7/25/95	7/25/95	7/25/95
Analyzed Date:	7/25/95	7/25/95	7/25/95	7/25/95
Instrument I.D.#:	HP.2	HP.2	HP.2	HP.2
Conc. Spiked:	0.40 mg/kg	0.40 mg/kg	0.40 mg/kg	1.2 mg/kg
Result:	0.46	0.46	0.47	1.42
MS % Recovery:	115	115	118	118
Dup. Result:	0.47	0.47	0.49	1.46
MSD % Recov.:	118	118	123	122
RPD:	2.6	2.6	4.1	3.3
RPD Limit:	0-20	0-20	0-20	0-20
LCS #:	1LCS072595	1LCS072595	1LCS072595	1LCS072595
Prepared Date:	7/25/95	7/25/95	7/25/95	7/25/95
Analyzed Date:	7/25/95	7/25/95	7/25/95	7/25/95
Instrument I.D.#:	HP.2	HP.2	HP.2	HP.2
Conc. Spiked:	0.40 mg/kg	0.40 mg/kg	0.40 mg/kg	1.2 mg/kg
LCS Result:	22.1	22.0	23.1	69.2
LCS % Recov.:	111	110	116	115
MS/MSD LCS Control Limits	55-145	47-149	47-155	56-140

SEQUOIA ANALYTICAL, #1271

Kenneth L. Wimer
Project Manager

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

** MS = Matrix Spike, MSD = MS Duplicate, IS = Instrument Spike, ISD = IS Duplicate, RPD = Relative % Difference

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number 9-4016
Facility Address 310 14th St, Oakland
Consultant Project Number 30-0220
Consultant Name Terra Vac Corp
Address 1498 Wicks Blvd San Leandro
Project Contact (Name) Tim Warner
(Phone) 510-351-8900 (Fax Number) 351-0221

Chevron Contact (Name) Mark Miller
(Phone)
Laboratory Name Sequoia
Laboratory Release Number 2172360
Samples Collected by (Name) Clifford Garratt
Collection Date July 20 & 21 1995
Signature

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed: BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (TCLP or AA)					Remarks
SP1-20.2		1	S	D		Cooler w/ blue ice		X												5071375
SP2-20.0		1	S	D		↓		X												5071376
VEW4-20.2		1	S	D				X												5071377
VEW5-23.7		1	S	D				X												5071378

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	Terra Vac	7-21-95 3:44		Priority	7-21-95 15:45
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	Priority	7-21-95 16:3			
Relinquished By (Signature)	Organization	Date/Time	Received for Laboratory By (Signature)		Date/Time
					7-21-95 16:60

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
5 Days
10 Days
As Contracted