Reviewed 12/13/91 SDS

Chevron U.S.A. Inc.
2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

91 [illegible]

Marketing Operations

R. B. Bellinger
Manager, Operations
S. L. Patterson
Area, Manager, Operations
C. G. Trimbach
Manager, Engineering

October 8, 1991

Mr. Larry Seto/Lowell Miller
Alameda County Health Agency
Hazmat Section
470 27th Street, Room 324
Oakland, California 94612

Re: Chevron Service Station #9-8139
16304 Foothill Boulevard
San Leandro, California 94578

Dear Mr. Seto,

Please find attached a copy of the 'Additional Soil and GroundWater Investigation Report' for the above mentioned site. Chevron has seven on-site g.w. monitoring wells, three on-site g.w. extraction wells and two off-site g.w. monitoring wells.

The remediation system is currently up and running. Since this quarterly monitoring event has transpired two of the monitor wells MW-4 and MW-5 have been drilled out and developed as two additional extraction wells. All three wells are producing ground water at a rate of approximately 1.33 gallons-per-minute.

I declare under penalty of perjury that the information contained in the attached report is true and correct, and that any recommended actions are appropriate under the current circumstances to the best of my knowledge.

Should you have any questions, please feel free to call me at (415) 842-9040.

Very Truly Yours,

Walter F. Posluszny Jr.
Environmental Engineer
Chevron U.S.A., Inc.

cc: Ms. Penny Silzer/Rich Hiett, RWQCB, 2101 Webster Street, Suite #500, Oakland, Ca.
File(MAC 9-8139R12)

ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION REPORT

CHEVRON SERVICE STATION NO. 9-8139
16304 Foothill Boulevard
San Leandro, California

September 23, 1991

Prepared for:

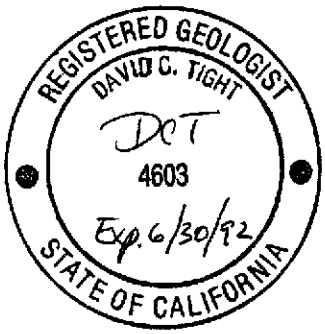
Mr. Walter Posluszny
Environmental Engineer
CHEVRON U.S.A., INC.
2410 Camino Ramon
San Ramon, California 94583

Prepared by:

BURLINGTON ENVIRONMENTAL INC.
CHEMPRO Division
950 Gilman Street, Suite B
Berkeley, California 94710

Kyle S. Flory
Project Geologist

David C. Tight, R.G. No. 4603
Investigation/Remediation Manager



CHV 149/306

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1.1 INTRODUCTION

This report presents the results of the additional soil and groundwater investigation conducted by Burlington Environmental Inc. - *Chempro Division* (Burlington) at the Chevron U.S.A., Inc. (Chevron) Service Station No. 9-8139, located at 16304 Foothill Boulevard in San Leandro, California. This investigation was requested by Chevron to further delineate the extent of subsurface contamination adjacent to the site, and provide additional groundwater extraction wells to allow for additional extraction and treatment of groundwater from beneath the site.

1.1.1 SCOPE OF WORK

The investigation consisted of the following tasks:

* Drilled and installed one monitoring well offsite
* Collected and analyzed one soil sample from the well boring for petroleum hydrocarbons
* Decommissioned two onsite groundwater monitoring wells and placed groundwater extraction wells in the boreholes provided by the decommissioning
* Developed the offsite groundwater monitoring well
* Conducted a water level survey in the new wells.
* Collected groundwater samples from the new wells, and submitted the samples for analysis for petroleum hydrocarbons
* Surveyed the new wells for location and elevation

1.2 BACKGROUND

1.2.1 Site Description

The site is occupied by an operating service station located on Foothill Boulevard in southern San Leandro, California (see Figure 1). The service station is located approximately 250 feet east of Highway 580, and 6,000 feet south of Lake Chabot. Properties surrounding the site are occupied primarily by residential housing and small commercial businesses (see Figure 2).

1.2.2 Reported Leaks

Chevron has reports of two petroleum leaks detected from the underground storage tanks and pipelines located onsite. The leaks were detected in April 1982 and December 1986.

In April 1982 all tanks and lines were tested to confirm the existence of a reported fuel leak. A corroded section in the regular gasoline vapor line was discovered and a temporary spot repair was performed on the line. Shortly thereafter, the 17-year-old tank and line system was replaced. During the tank and line installation two vapor monitoring wells were installed in the tank excavation pit.

In December 1986 the station reported petroleum inventory losses. A full system tank test was conducted to confirm the existence of a leak. The Chevron spill/leak reporting form reports the discovery of a leak in the regular gasoline tank system. The leak was repaired and retested tight on December 30, 1986, by Gettler-Ryan, Inc.

1.2.3 Site Monitoring

On June 29, 1989, EA conducted a soil-vapor survey at the Chevron facility. Very low concentrations of light hydrocarbons were detected near the tank field and the west end of the south pump island. Measurable concentrations of benzene (1 part per million [ppm]) were detected near the west corner of the tank field. EA noted that high vacuums and long release times were required to obtain vapor samples from most sampling locations.

In December 1989 Burlington (formerly Chempro) conducted an investigation to determine the extent of soil and groundwater contamination. During the investigation four soil borings were drilled and completed as 2-inch-diameter monitoring wells. In addition, a survey of active, inactive, and destroyed wells, located within a 1/2-mile radius of the site was conducted.

In May through August 1990, Burlington conducted a remedial site investigation onsite and offsite. The work consisted of drilling and installing four wells onsite and one well offsite. The wells were developed and sampled. Additionally, aquifer parameters were calculated by conducting hydraulic testing in extraction well E-1.

During Burlington's remedial investigation low levels of petroleum hydrocarbons were detected in soil samples collected from MW-5, MW-6, MW-7, and E-1. A maximum of 130 ppm total petroleum hydrocarbons as gasoline (TPH) was encountered in boring MW-5 soil samples. The maximum TPH and benzene concentrations in the groundwater was detected in MW-5 at 28,000 parts per billion (ppb) and 920 ppb, respectively. Based on the results, an additional soil and groundwater investigation workplan was developed, and the additional investigation was implemented. The following report has been prepared for Chevron to document the investigation results.

1.3 LIMITATIONS

Services provided hereunder were performed in accordance with current, generally-accepted environmental consulting principles and practices. The conclusions and recommendations presented reflect opinions based on these practices. No other warranty, expressed or implied, is made.

2.0 INVESTIGATIVE METHODS

The additional investigation field work was conducted in June 1991. The field work was described in the "Workplan For Additional Soil And Groundwater Investigation", dated February 1, 1991.

The field work consisted of drilling and sampling one soil boring, installing a groundwater monitoring well in the boring, and collecting and analyzing soil and groundwater samples. In addition, two groundwater monitoring wells were decommissioned and groundwater extraction wells were installed in the boreholes provided by the decommissioning. The groundwater extraction wells were sampled following installation.

The following sections describe the methods used during the investigation. The results and interpretations are discussed in Section 3.

2.1 DECONTAMINATION AND QUALITY ASSURANCE PROCEDURES

All equipment that was placed in the borings or wells, or that came into contact with groundwater was either steam cleaned or washed with detergent and rinsed with tap water and distilled water. The procedures used for decontamination are presented in Appendix A.

2.2 WELL DECOMMISSIONING

On June 10, 1991, groundwater monitoring wells, MW-4 and MW-5, were decommissioned with 8-inch-OD HSA to depths of 30 feet BGL. The boreholes were then reamed with 10-inch-OD HSA to 30.5 feet BGL. Four-inch-diameter extraction wells (E-2 and E-3) were installed in the boreholes provided by the decommissioning activities (see Section 2.4). Well decommissioning procedures are presented in Appendix A.

2.3 SOIL BORING

On June 11, 1991, after encroachment permits were acquired, one boring was drilled in the center median strip of Foothill Boulevard. The boring was drilled to determine the subsurface lithology, evaluate the presence of soil contamination, and provide for monitoring well installation. The boring was drilled by Baylands

Drilling, Inc., of Menlo Park, California, with a CME-55 drill rig. The boring is labeled MW-9. The boring location is shown on Figure 2.

Before the borings were drilled, drilling permits were obtained from the Alameda County Flood Control and Water Conservation District (ACFC & WCD) (see Appendix B). In addition, the boring location was cleared with Underground Service Alert (USA).

In the offsite boring, MW-9, the first four feet of soil were excavated with a hand auger to ensure that there were no subsurface obstructions. The boring was then advanced with hollow-stem auger drilling equipment, consisting of 8-inch outside-diameter (OD) hollow-stem augers (HSA). Soil samples were collected at 5-foot intervals with a 2-inch-diameter modified-California split-spoon sampler. The lithology was logged in the field by a geologist using the Unified Soil Classification System. The logging was reviewed by a California State-registered geologist. Soil sampling procedures are presented in Section 2.4 and Appendix A. The boring logs are presented in Appendix B.

A two-inch-diameter monitoring well was constructed in boring MW-9 (see Section 2.4). All soil cuttings generated during the drilling operation were drummed, labeled, and stored onsite pending the results of the chemical analysis. All drummed soil was disposed of by Burlington in accordance with Chevron guidelines.

2.4 SOIL SAMPLING

Soil samples were chosen for chemical analysis, during the drilling of MW-9, using a portable photoionization detector (PID) (PhotoVac Micro Tip II) to determine the presence or absence of total volatile organic compounds in the samples. Sample handling and quality assurance/quality control procedures are detailed in Appendix A.

Chemical analysis of the soil samples was performed by Superior Precision Analytical, Inc. (Superior) of San Francisco, California. The samples were accompanied by chain-of-custody documentation which are presented in Appendix C.

Selected soil samples obtained from boring MW-9 were analyzed for TPH (as gasoline) using modified Environmental Protection Agency (EPA) method 8015, and BTEX by EPA method 8020. Rinsate samples were taken daily from the split-spoon sampler and analyzed for the same parameters.

Soil samples were not collected during the decommissioning of wells MW-4 and MW-5. The soil and grout produced during the decommissioning was placed in drums for subsequent disposal. The drummed soil and grout produced during the decommissioning was sampled for chemical analysis by Superior. The results of the analysis are presented in Appendix C.

2.5 MONITORING AND EXTRACTION WELL INSTALLATION

A groundwater monitoring well was installed in boring MW-9. Groundwater extraction wells, E-2 and E-3, were installed in the boreholes produced by the decommissioning of monitoring wells MW-5 and MW-4, respectively. The monitoring and extraction well locations are shown on Figure 2.

Monitoring well MW-9 is constructed with 2-inch-diameter, schedule 40 polyvinyl chloride (PVC) well casing. Extraction wells E-2 and E-3 are constructed with 4-inch-diameter schedule 40 PVC casing. The wells are screened with 0.010-inch machine-slotted well screen. The casing and screen assemblies are terminated with a flush-threaded bottom cap.

Approximately 10 feet of screen were installed in wells MW-9, E-2, and E-3. In addition, extraction wells E-2 and E-3 were constructed with 5-foot sumps attached below the screened interval for the collection of fines entering the well during groundwater extraction. The well construction details are presented on Table 1 and in Appendix B.

To prevent interconnection between hydraulically separate zones encountered during drilling, bentonite bottom seals were placed in the annular space below the screened interval in wells E-2 and E-3, before the sand packs were installed (see Table 1 and Appendix B). Well installation procedures are presented in Appendix A.

2.6 GROUNDWATER SAMPLING

Prior to the sampling of the wells, monitoring well MW-9 was developed to remove fine-grained sediments from the well casing and sand pack, and align the grains of the aquifer material around the screen interval for more efficient groundwater flow into the well. This development helps create and maintain a properly functioning well and obtain representative water-quality samples. Well development procedures are presented in Appendix A.

Development and steam-cleaning water was temporarily contained in 55-gallon drums. The fluid was subsequently pumped through the groundwater treatment system.

Groundwater samples were collected for analysis from the monitoring and extraction wells on June 24, 1991. The results of the groundwater analyses and the analytical methods used are presented on Table 2.

The groundwater samples were collected under strict chain-of-custody procedures, which followed the guidelines established by Chevron and the EPA. Chain-of-custody forms are included in Appendix C. A detailed description of the sampling technique is presented in Appendix D. Groundwater purging records are presented in Appendix E.

Groundwater samples collected were analyzed by Superior for TPH by EPA method 8015, and BTEX by EPA method 8020/602. Duplicate groundwater samples were collected from E-2. Bailer rinsate samples were collected before the duplicate groundwater samples were collected to check the effectiveness of the decontamination procedures. The rinsate samples were analyzed for the same parameters as the groundwater samples collected from the respective wells. Table 2 provides a summary of the sampling parameters and analytical techniques used.

2.7 WATER-LEVEL SURVEY

On June 24, 1991, the water-level in each well was obtained to determine the groundwater flow direction and gradient in the vicinity of the wells surveyed. The

wells were inspected for phase-separated hydrocarbons (PSH) before taking the water-level measurements (see Appendix D).

2.8 WELL-HEAD SURVEY

On June 26, 1991, Nowack & Associates, Inc., professional land surveyors of Santa Clara, California, surveyed the locations and elevations of the newly installed monitoring and extraction wells at the site. The locations were surveyed to the nearest 1-foot northing and easting, and the elevations were surveyed to the closest 0.01-foot MSL. The well-head survey data are presented in Table 3 and Appendix F.

3.0 RESULTS

3.1 GEOLOGY

The regional and site geology were presented in Burlington's Soil and Groundwater Investigation Report, dated February 21, 1990. The boring completed during this investigation further characterizes the local geology beneath the area adjacent to the site.

The site is underlain by distal alluvial cone deposits of sandy clays, clayey sands, and gravelly sands (Maslonkowski, 1984). The subsurface geology, extending down to a depth of approximately 40 feet is dominated by a series of grey to yellowish brown, low- to high-plasticity clays. Dispersed within the clays are sand and coarse gravel lenses. The lithology encountered during drilling is presented on the boring logs in Appendix B.

3.2 HYDROGEOLOGY

During drilling, saturated clayey sands and clayey gravel lenses were encountered between moist sandy clays. During the previous site investigations, groundwater was encountered under confining to subconfining pressure while drilling MW-1 through MW-8.

3.2.1 Groundwater Elevation, Gradient and Flow Direction

The results of the water-level survey conducted on June 24, 1991, are presented in Table 4. As shown in the table, the depth to groundwater found in wells MW-9, E-2, and E-3 at the time of the June 24 survey ranged from 107.49 to 107.84 feet above MSL. Depth-to-water (DTW) measurements were taken with an electric water level sounder using the top of casing as the reference elevation (see Appendix D). The DTW values were converted to groundwater elevations relative to MSL by subtracting the DTW from the surveyed well-head elevation (see Section 2.7).

Based on the groundwater elevation data, the potentiometric surface beneath the site slopes south to southwest, suggesting that the groundwater flows to the south to southwest. Groundwater elevation data in this investigation were collected only from the new wells. Therefore, no groundwater gradient data is

presented in this report. The remedial investigation conducted by Burlington in 1990 indicated a groundwater gradient of approximately 0.034 ft/ft (Burlington, 1990).

3.3 GEOCHEMICAL RESULTS

3.3.1 Soil Geochemistry

The PID measurements taken during the drilling operation provided qualitative data on the occurrence of total volatile organics in the boring soils. The maximum PID reading in MW-9 soils was detected just above the groundwater surface at 15 feet BGL.

The chemical analysis of the soil sample confirmed the qualitative PID readings. Low levels of petroleum hydrocarbons were detected in the 15-foot sample from MW-9, with 43 and 0.08 ppm of TPH and BTEX, respectively (see Table 5).

One quality assurance rinsate sample was collected during the drilling procedure, and analyzed for TPH and BTEX. Analysis of the rinsate sample collected before drilling MW-9 detected 0.7 toluene and 0.9 ppb xylenes. The detected levels of these analytes are lower than the detection limits for soil analyses and do not appear to influence the results of the soil sampling. No other detections were found in the rinsate samples.

3.3.2 Groundwater Geochemistry

Groundwater samples were collected from monitoring well MW-9 and extraction wells E-2 and E-3 on June 24, 1991. A summary of the analytical techniques and results are presented on Table 2. The CARs are presented in Appendix C.

Monitoring well MW-9 had TPH and benzene concentrations of 16,000 ppb and 94 ppb, respectively. Extraction well E-2 had TPH and benzene concentrations of 2,900 ppb and 460 ppb, respectively. Extraction well E-3 had TPH and benzene concentrations of 5,300 ppb and 150 ppb, respectively. No detectable concentrations of the analyzed parameters were found in the rinsate samples collected during the sampling event. Decontamination procedures are therefore

considered to be adequate. Sample concentrations are considered to be representative of site conditions.

4.0 SUMMARY

This site investigation conducted at the Chevron Service Station No. 9-8139, in San Leandro, California, was conducted to further delineate the extent of subsurface contamination adjacent to the site, and provide additional groundwater extraction wells. Offsite soil boring MW-9 was drilled and completed as a two-inch groundwater monitoring well. Groundwater monitoring wells MW-4 and MW-5 were decommissioned, and two groundwater extraction wells were installed in the boreholes provided by the decommissioning. MW-9 was developed, and the new monitoring and extraction wells were sampled.

The geologic and hydrogeologic data generated in this investigation indicate that the area adjacent to the site (beneath MW-9) is underlain by low permeability silty and sandy clays. During the June 24, 1991, water-level survey, the groundwater elevation in the three new wells installed ranged from 107.49 to 107.84 feet above MSL.

Low levels of petroleum hydrocarbons were detected in the soil sample collected and analyzed from the 15-foot interval from boring MW-9. Concentrations of 43 ppm and 0.08 ppm TPH and benzene, respectively, were found.

Detectable concentrations of TPH and BTEX have been found in the groundwater from wells MW-9, E-2, and E-3. The highest levels were found in well MW-9. During the June 24, 1991, sampling event, 16,000 ppb TPH and 94 ppb benzene were detected in the groundwater of MW-9. Groundwater samples collected from extraction wells E-2 and E-3 had detectable TPH at concentrations of 2,900 ppb and 5,300 ppb, respectively. Groundwater samples collected from extraction wells E-2 and E-3 had detectable benzene at concentrations of 460 ppb and 150 ppb, respectively.

5.0 REFERENCES

Burlington. 1990. Remedial Investigation, Chevron Service Station No. 9-8139. San Leandro, California. November 7, 1990.

Chempro. 1990. Soil and Groundwater Investigation, Chevron Service Station No. 9-8139. San Leandro, California. February 21, 1990.

EA Engineering, Science, and Technology, Inc. 1989. Report of Investigation, Soil Vapor Contaminant Assessment, Chevron Service Station 9-8139. San Leandro, California. July 14, 1989.

Maslonkowski, Dennis P. 1984. Groundwater in the San Lorenzo Alluvial Cones of the East Bay Plain of Alameda County. Alameda County Flood Control and Water Conservation District, Hayward, California. June 1989.

Table 1
WELL CONSTRUCTION
Chevron Service Station No. 9-8139

Well	Well-head Elevation (ft-MSL)	Boring Depth ft-BGL)	Casing Depth t-BGL)	Surface-Seal Interval (ft-BGL)	Bottom-Seal Interval (ft-BGL)	Screen Interval (ft-BGL)	Casing Diameter I.D. (inch)	Screen Slot Size (inch)
MW-9	124.20	27	27	0-15	NA	17-27	2	0.010
E-2	125.79	30.5	30.5	0-13	25-30.5	15-25	4	0.010
E-3	125.22	30.5	30.5	0-13	25-30.5	15-25	4	0.010

NOTES:
ft-MSL = Feet above mean sea level
ft-BGL = Feet below ground level
NA = Not applicable
I.D. = Inside diameter

Table 2
GROUNDWATER ANALYSES AND ANALYTICAL TECHNIQUES
Chevron Service Station No. 9-8139

WELL DESIGNATION	SAMPLE DATE	SAMPLE NO.	TPH Gasoline	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES
Detection Method			M8015	8020	8020	8020	8020
Detection Limit			50	0.5	0.5	0.5	0.5
[illegible]	6/24/91	WS-37-SL	[illegible]	94	300	180	2500
E-2	6/24/91	WS-34-SL	2900	460	130	35	330
Duplicate	6/24/91	WS-35-SL	3000	480	140	37	380
E-3	6/24/91	WS-36-SL	5300	150	130	120	640
RINSATE	6/24/91	RS-5-SL	<50	<0.5	<0.5	<0.5	<0.5
TRIP BLANK	6/24/91	TB-5-SL	<50	<0.5	<0.5	<0.5	<0.5

NOTES:
Groundwater chemistry values presented in parts per billion (ppb)

Table 3

WELL-HEAD SURVEY DATA

Chevron Service Station No. 9-8139

Well Designation	Ground-Level Elevation (ft-MSL)	TOC Elevation (ft-MSL)	Northing (feet)	Easting (feet)
MW-1	127.28	127.09	5006	4969
MW-2	126.37	125.98	4989	5031
MW-3	127.04	126.77	4939	5103
MW-4	125.43	125.22	4898	5075
MW-5	126.12	125.85	4897	5122
MW-6	124.83	124.18	4893	5027
MW-7	127.47	126.86	4979	5081
MW-8	124.25	123.61	4833	5121
MW-9	124.51	124.20	4836	5164
E-1	127.29	124.95	4920	5103
E-2	126.15	125.79	4898	5121
E-3	125.53	125.22	4898	5075

NOTES:
ft-MSL: Feet above mean sea level
TOC: Top of casing
Wells MW-1 through MW-8 & E-1 Surveyed by Ruth & Going, Inc.
Wells MW-1 through MW-4 Surveyed on 12/11/89
Wells MW-5 through MW-8, MW-3, and E-1 surveyed on 9/6/90
Wells MW-9, E-2, and E-3 Surveyed by Nowack & Assoc. on 6/26/91.
MW-3 wellhead modified on 9/6/90

Table 4
GROUNDWATER ELEVATION DATA
Chevron Service Station No. 9-8139

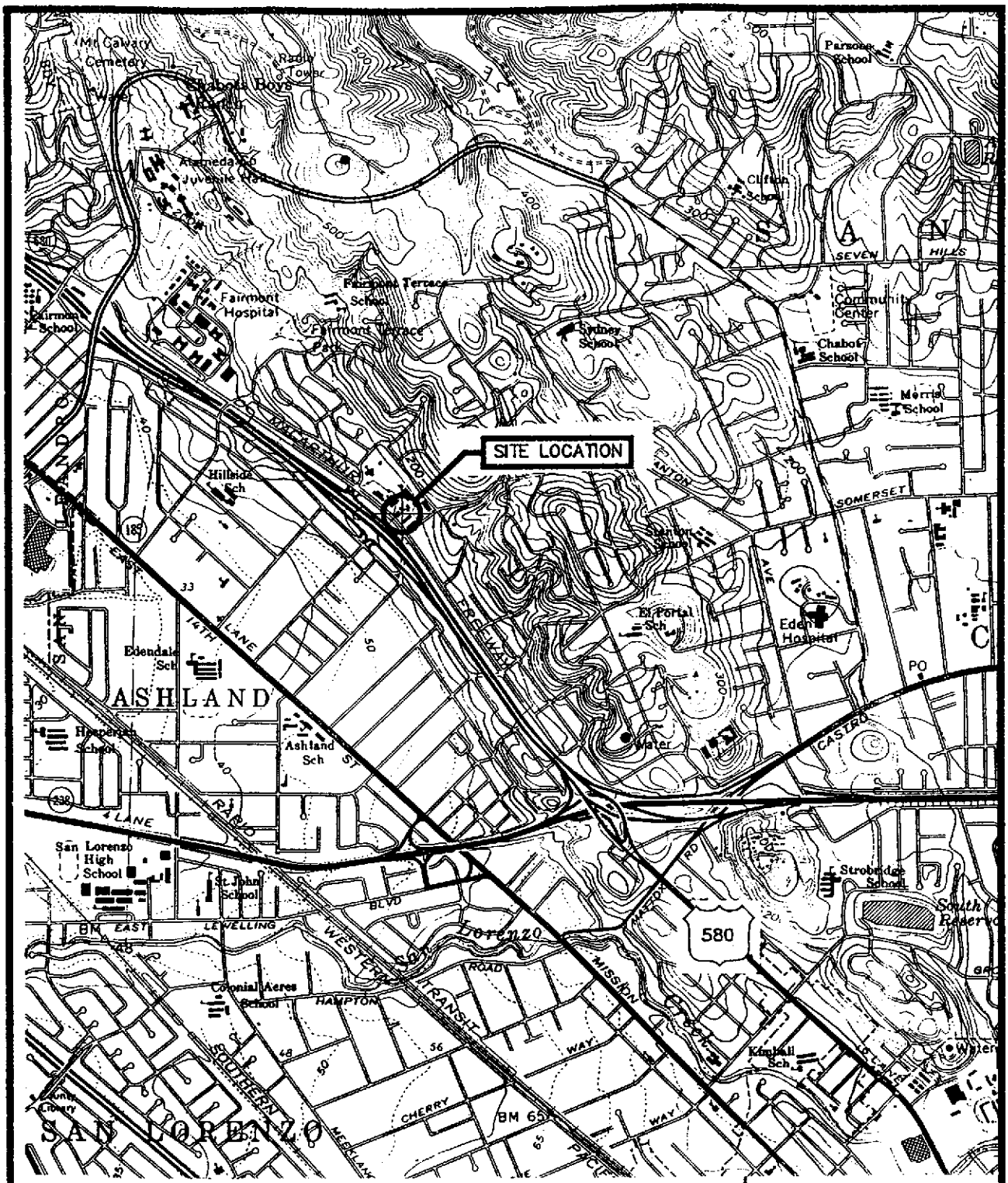
Well Designation	Date Measured	TOC Elevation (ft-MSL)	Depth to Water (ft-BTOC)	PSH (ft)	Water Elevation (ft-MSL)
MW-9	6/24/91	124.20	16.71	ND	107.49
E-2	6/24/91	125.79	18.01	ND	107.78
E-3	6/24/91	125.22	17.38	ND	107.84

NOTES:
TOC: Top of casing
ft-MSL: Feet above mean sea level
ft-BTOC: Feet below top of casing
PSH: Phase-separated hydrocarbons
ND: Not detected

Table 5
SOIL ANALYSES AND ANALYTICAL TECHNIQUES
Chevron Service Station No. 9-8139

SOIL BORING	SAMPLE DEPTH	DATE SAMPLED	SAMPLE NO.	TPH Gasoline	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENE
Detection Method				M8015	8020	8020	8020	8020
Detection Limit (ppm)				1	0.005	0.005	0.005	0.005
MW-9	15	6/11/91	SS-9A-SL	43	0.08	0.11	0.26	1.9

NOTES:
Soil chemistry values presented in parts per million (ppm)

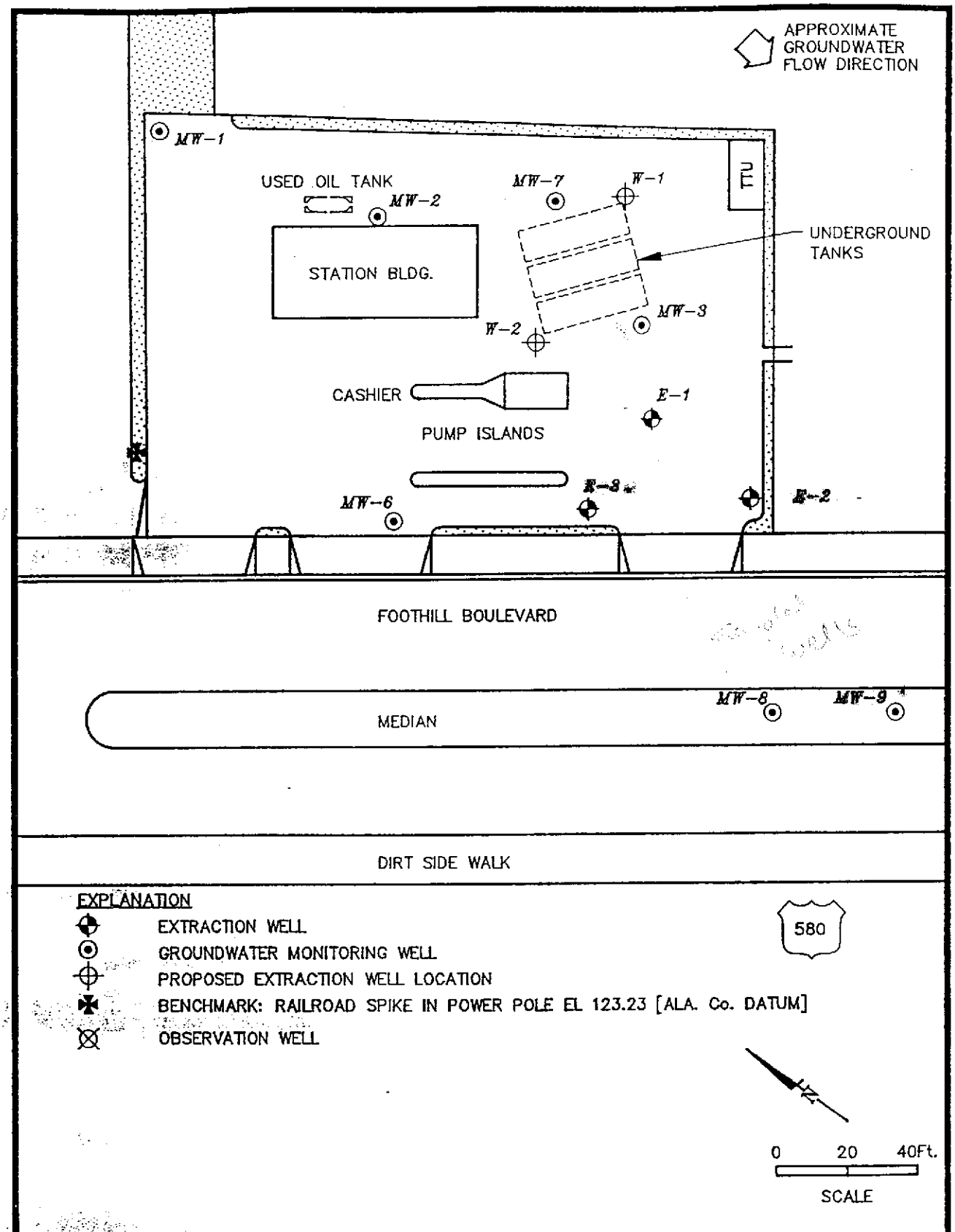


Hayward, California [NE/4 Hayward 15' Quadrangle]
N3737.5–W12200/7.5

BURLINGTON ENVIRONMENTAL, INC.
CHEMPRO Division

SITE LOCATION MAP
Chevron Service Station No. 9–8139
16304 Foothill Boulevard
San Leandro, California

DRAWN BY: JU	
DATE: 3/29/91	
PROJECT No. 1158	FIGURE 1
Drawing No. A0615823	



BURLINGTON ENVIRONMENTAL INC.
CHEMPBO Division

SITE VICINITY MAP
Chevron Service Station No. 9-8139
16304 Foothill Boulevard
San Leandro, California

Figure 1

Project No. CHV149/158

Drawn By PPK | Date 6/28/91

Reviewed By : | Date :

Drawing No. A0615802

Appendix A

EXPLORATORY BORING,
SOIL SAMPLING,
DECONTAMINATION AND QUALITY ASSURANCE SAMPLING,
WELL DECOMMISSIONING,
MONITORING AND EXTRACTION WELL INSTALLATION,
AND
WELL DEVELOPMENT PROCEDURES

Appendix A

Exploratory Boring,
Soil Sampling,
Decontamination and Quality Assurance Sampling,
Well Decommissioning,
Monitoring and Extraction Well Installation,
and
Well Development Procedures

EXPLORATORY BORING

Before the exploratory borings were drilled a number of actions were taken: drilling and encroachment permits were obtained from the appropriate agencies prior to drilling. In addition, Underground Service Alert (USA) was contacted to schedule visits to the site by public and private utility companies. Each company located its utilities with the aid of maps, and the locating service verified and marked these locations. All utility clearances were coordinated with the client or client representative before drilling began.

Field personnel began drilling by excavating the first four feet of soil with a hand auger to ensure that there were no subsurface obstructions. The Exploratory boring to be completed as 2-inch-diameter monitoring well was drilled with 8-inch outer-diameter (OD) hollow-stem augers (HSA). The borings for the 4-inch-diameter extraction wells were drilled with 10-inch OD HSA. The augers were steam cleaned before each boring was drilled.

SOIL SAMPLING

Soil samples were collected while drilling to evaluate the geochemistry and stratigraphy of the soil beneath the boring location. The soil was sampled by driving an 18-inch-long modified-California split-spoon sampler fitted with 2-inch-diameter brass liners beyond the tip of the auger into undisturbed soil. The split-spoon sampler was driven into the soil with a 140-pound hammer. As the sampler was driven into the soil, blow counts were recorded for each 6-inches of penetration. The blows were recorded on the boring logs. Samples were collected every 5 feet or less, depending on the lithology encountered. Soil samples were classified and logged according to the Unified Soil Classification

System. The work was supervised by a California State registered geologist to ensure that it met regulatory standards.

Soil samples were selected for chemical analysis using a photoionization detector (PID). The PID determines the relative concentration of total volatile organic compounds. The soil samples were selected for analysis where 1) the PID reading first detected a reading above the background level, 2) at the point above this interval where the PID reading was negligible, 3) at the first point below the contaminated interval where the PID reading was negligible, and 4) at the water table. If no contaminants were detected with the PID, the sample collected 5 feet above the water table was submitted for analysis

Each soil sample was sealed inside the brass liners with aluminium foil (shiny side towards the sample) and polypropylene end caps, and wrapped with duct tape. The soil samples were labeled, and stored in an iced cooler for shipment to a California Department of Health Services (DHS)-approved laboratory. At the time of sampling, each sample was logged on a Chain-of-Custody record which accompanied the sample to the laboratory. Soil samples selected for analysis had the request for analysis noted on the Chain-of-Custody. The remaining soil samples were sent to the laboratory on a hold for analysis basis.

Soil sampling equipment was steam cleaned between each boring and washed in an Alconox solution and rinsed in distilled water between each sampling point. The 2-inch-diameter brass liners which were placed in the split-spoon sampler for soil sample collection had previously been steam-cleaned.

Drill cuttings were drummed and temporarily stored on site. Each drum was labeled with the soil boring number and depth from which the soils were extracted. Drill cuttings were disposed of using the appropriate method based on the analyses of the soil samples collected during drilling.

DECONTAMINATION PROCEDURES

Proper decontamination and cleansing of all equipment was performed to prevent cross-contamination between wells and sampling locations. The two methods of decontamination used at the site were steam cleaning and detergent washing

followed by tap water and distilled water rinses. During field work, all equipment that was placed in the borings or wells, or that came in contact with groundwater was decontaminated as follows:

Equipment	Decontamination procedures
Drill Rig	Steam cleaned prior to arriving on-site
Augers	Steam cleaned prior to drilling each boring
Drill Tools	Steam cleaned prior to drilling each boring
Split-Spoon Sampler	Steam cleaned between each boring, then Alconox™ (Alconox) washed, and tap water and distilled water rinsed between each sampling interval
PVC Casing	Steam cleaned before installing in well
Well Development Equipment	Alconox washed, and steam cleaned
Water Level Sensor	Alconox washed, tap water and distilled water rinsed between each use
Pumps	Steam cleaned between each use
Bailers	Steam cleaned between each use
Teflon™ Sampling Bailer	Alconox washed, then steam cleaned and rinsed with distilled water prior to sampling each well

The water used for steam cleaning was obtained from the site or was contained in the water tank of the drill rig or driller's support truck. Deionized water was used for rinses. The water generated during decontamination procedures was stored in 55-gallon drums onsite and was disposed of by a contractor.

Quality Assurance Sampling

One rinsate sample was collected at the beginning of each day or after 20 samples had been collected to determine if the sampling equipment was adequately decontaminated. After decontamination, rinse samples were collected from the equipment used for sampling (split-spoon sampler or Teflon™ bailer). The rinse samples were taken by: (1) trickling or rinsing deionized water through the split-spoon sampler and across the brass liners which the soils contacted, or through the inside of the Teflon bailer, and (2) filling the appropriate sample vial

for analysis. The rinse samples were labeled, placed in coolers, noted on the sample log and chain-of-custody forms, and handled according to EPA procedures. The samples were sent to the analytical laboratory and analyzed for the same parameters as the soil or groundwater samples collected after the rinse samples were taken.

WELL DECOMMISSIONING

Groundwater monitoring wells were decommissioned by drilling out the polyvinyl chloride (PVC) well pipe with 8-inch OD HSA to depths of 30 feet BGL. The borings were then reamed with 10-inch OD HSA to a depth of 30.5 feet BGL. Soil samples were not collected during the decommissioning of the wells. The soil and grout produced during the decommissioning activities was sampled for soil disposal purposes only. The soils was drummed and subsequently sampled by driving a hand-held drive sampler with brass liners into the drummed soil. The full liners will be removed, the ends covered with foil, capped, taped, and placed in an iced cooler pending laboratory analysis. Drill cuttings were disposed of using the appropriate method based on the analyses of the soil samples collected during drilling.

WELL INSTALLATION

One soil boring was completed as a monitoring well by installing 2-inch-diameter, flush-threaded, PVC casing inside the boring. Soil borings were completed as extraction wells by installing 4-inch diameter, flush-threaded, PVC casing inside the borehole. No solvent cements were used on the casing. The screened casing will be machine-slotted with 0.010-inch slots. Screened sections of casing in the monitoring well extend across the saturated interval 5 to 10 feet above the first encountered water. The screened sections of the extraction wells screen the saturated interval and do not extend above the first encountered water due to confined conditions of the aquifer. A threaded bottom cap was attached to the bottom of the casing. The annular space surrounding the casing was at least 2 inches thick, and packed with No. 2/12 to approximately 2 feet above the top of the screened interval. A minimum of 1 foot of bentonite seal was set above the sandpack and neat cement was tremie-grouted to the surface.

A traffic-rated vault box with a locking device was set in concrete to protect the wells. Well tags were affixed to the casing for identification. Well locations were surveyed to the closest 1-foot Northing and Easting and top-of-casing elevations were measured to the nearest 0.01 foot. Detailed well completion diagrams were then prepared.

Well Development

Monitoring and extraction wells were developed by surging, swabbing, and bailing methods until a non-turbid discharge or stabilization of parameters was obtained. During well development the groundwater was monitored for pH, temperature, and specific conductivity until the parameters stabilized within ten percent of the last reading. All development equipment was steam cleaned between wells. Development and steam-cleaning water was contained in 55-gallon drums until the water could be pumped through the groundwater treatment system located onsite.

Appendix B

BORING LOGS, WELL CONSTRUCTION DETAILS, AND WELL INSTALLATION PERMIT

BORING LOG

PROJ. No.: CHV-149/306
PROJ. NAME: Chevron Service Station No. 9-8139
16304 Foothill Boulevard, San Leandro, CA
DRAWING No. : A1030603 PAGE: 1 OF 2

MONITORING WELL MW-9
TOP OF CASING : 124.20Ft.(MSL)
TOTAL BORING DEPTH 27Ft.
BY: KSF DATE: 6/11/91

Pocket Pene-trometer TSF	Recovery (in./in.)	Blow Count (blows /6")	Sample Depth (feet)	Well Detail	Strati-graphic Column	Description
			0		FILL	SILTY CLAY, FILL, brown, silty clay, with sand, gravel, and cobbles.
					CL	SILTY CLAY (CL), dark brown (7.5Y, 3/3); 80-90% low plasticity fines; 10-20% very fine to coarse sand; hard; trace limonite nodules; slightly moist; no product odor.
>4.5	18/18	2 8 13	5			
			10			●10Ft: dark yellowish brown (10Y, 3/4), stiff.
2.2	18/18	4 4 9				
			15			●15Ft: 70-80% low plasticity fines; 20-30% fine to very coarse sand; trace fine gravel; very stiff; dry; slight product odor.
3.0 >4.5	18/18	4 8 9				●16Ft: 75-85% low plasticity fines; 10-20% very fine to coarse sand; 0-5% fine gravel; hard; dry; no product odor.
			▽		SC	
			20			

NOTES: Boring was drilled with 8" outside diameter hollow-stem augers. Soil samples were collected at 5ft intervals using a 2" diameter modified-California split-spoon sampler with brass liners. A groundwater monitoring well was installed using 2" diameter sch 40 PVC and 0.010" machine slotted PVC screen.

RG#4603, Exp 6/30/92

BORING LOG

PROJ. No.: CHV-149/306
PROJ. NAME: Chevron Service Station No. 9-8139
16304 Foothill Boulevard, San Leandro, CA
DRAWING No. : A1030604 PAGE: 2 OF 2

MONITORING WELL MW-9
TOP OF CASING : 124.20Ft(MSL)
TOTAL BORING DEPTH 27Ft.
BY: KSF DATE: 6/11/91

Pocket Penetrometer TSF	Recovery (In./In.)	Blow Count (blows /6")	Sample Depth (feet)	Well Detail	Stratigraphic Column	Description
3.5	18/18	5 13 18	20		SC	SANDY CLAY (SC), Dark yellowish brown (10YR, 3/4); 60-70% low plasticity fines; 30-40% fine to very coarse sand, trace fine gravel; stiff; limonite nodules; caliche deposits; wet; no product odor.
					CL	SILTY CLAY (CL), dark yellowish brown (10Y, 3/4), 85-95% low plasticity fines; 5-15% very fine to fine sand; trace limonite nodules; trace Fe-oxide staining; stiff; slightly moist; no product odor.
		2	25			
1.5	18/18	4 6				BORING TERMINATED AT 27.0 FEET
			30			
			35			
			40			

NOTES: Boring was drilled with 8" outside diameter hollow-stem augers. Soil samples were collected at 5ft intervals using a 2" diameter modified-California split-spoon sampler with brass liners. A groundwater monitoring well was installed using 2" diameter sch 40 PVC and 0.010" machine slotted PVC screen.

BORING LOG

PROJ. No.: CHV-149/306
PROJ. NAME: Chevron Service Station No. 9-8139
16304 Foothill Boulevard, San Leandro, CA
DRAWING No. : A1030601 PAGE: 1 OF 1

EXTRACTION WELL E-2
TOP OF CASING : 125.79Ft.(MSL)
TOTAL BORING DEPTH 30.5Ft.
BY: KSF DATE: 6/10/91

Pocket Pene-trometer TSF	Recovery (in./in.)	Blow Count (blows /6")	Sample Depth (feet)	Well Detail	Strati-graphic Column	Description
			0			FOR LITHOLOGIC DETAILS SEE BORING LOG FOR MONITORING WELL MW-5
			10			
			20			
			30			
			40			

NOTES: Monitoring well Mw-5 was decommissioned with 8" diameter hollow-stem augers to 30ft. Boring was reamed with 10" diameter hollow-stem augers to 30.5ft. A groundwater extraction well was installed using 4" diameter sch 40 PVC and 0.010" machine slotted PVC screen.

RG#4603
exp: 6/30/92

BORING LOG

PROJ. No.: CHV-149/306
PROJ. NAME: Chevron Service Station No. 9-8139
16394 Foothill Boulevard, San Leandro, CA
DRAWING No. :A1030602 PAGE: 1 OF 1

EXTRACTION WELL E-3
TOP OF CASING : 125.22Ft.(MSL)
TOTAL BORING DEPTH 30.5Ft.
BY: KSF DATE: 6/10/91

Pocket Pene-trometer TSF	Recovery (in./in.)	Blow Count (blows /6")	Sample Depth (feet)	Well Detail	Stratl-graphic Column	Description
			0			FOR LITHOLOGIC DETAILS SEE BORING LOG FOR MONITORING WELL MW-4
			10			
			20			
			30			
			40			

NOTES: Monitoring well Mw-5 was decommissioned with 8" diameter hollow-stem augers to 30ft. Boring was reamed with 10" diameter hollow-stem augers to 30.5ft. A groundwater extraction well was installed using 4" diameter sch 40 PVC and 0.010" machine slotted PVC screen.

David Griffith RG No. 4603
Exp: 6/30/92

WELL DETAILS

BURLINGTON ENVIRONMENTAL, INC. CHEMPRO, Division

PROJECT No. CHV-149/306 Drawing No. : A1030607

PROJECT NAME: Chevron Service Station No. 9-8139

LOCATION 16304 Foothill Boulevard, San Leandro, Ca

WELL PERMIT No. 91134

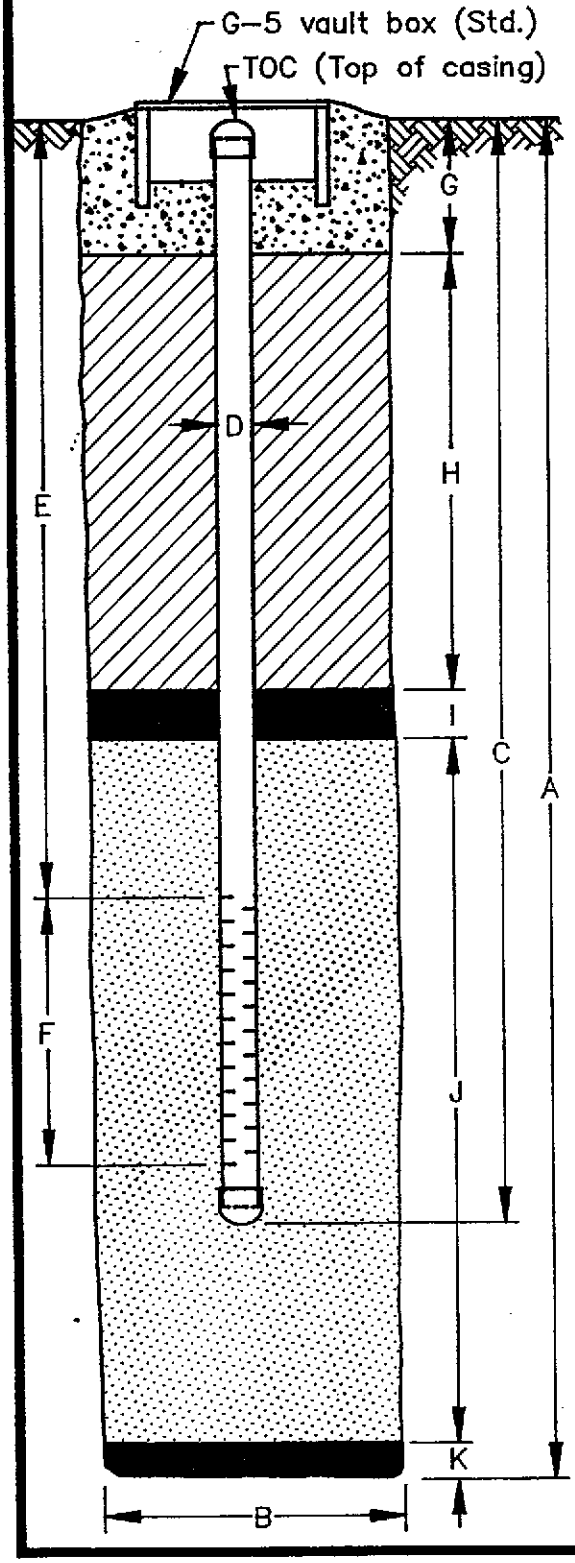
BORING/WELL No. MW-9

TOP OF CASING ELEVATION 124.20Ft.

GROUND SURFACE ELEVATION 124.51Ft.

DATUM MSL

INSTALLATION DATE 6/11/91



EXPLORATORY BORING

A. Total depth 27 ft.

B. Diameter 8 in.

Drilling method 8" HSA

WELL CONSTRUCTION

C. Total casing length 26.5 ft.

Material SCH 40 PVC

D. Diameter 2 in.

E. Depth to top of perforations 17 ft.

F. Perforated length 10 ft.

Perforated interval from 17 to 27 ft.

Perforation type MACHINE-SLOTTED

Perforation size 0.010 INCH

G. Surface seal 1 ft.

Seal material CONCRETE

H. Backfill 12 ft.

Backfill material CEMENT-BENTONITE GROUT

I. Seal 2 ft.

Seal material BENTONITE PELLETS

J. Gravel pack 12 ft.

Pack material No. 2/12 SAND

K. Bottom seal/fill – ft.

Material –

Form prepared by KSF

WELL DETAILS

BURLINGTON ENVIRONMENTAL, INC.
CHEMPRO, Division

PROJECT No. CHV-149/306 — Drawing No. : A1030608

PROJECT NAME: Chevron Service Station No. 9-8139

LOCATION 16304 Foothill Boulevard, San Leandro, Ca

WELL PERMIT No. 91134

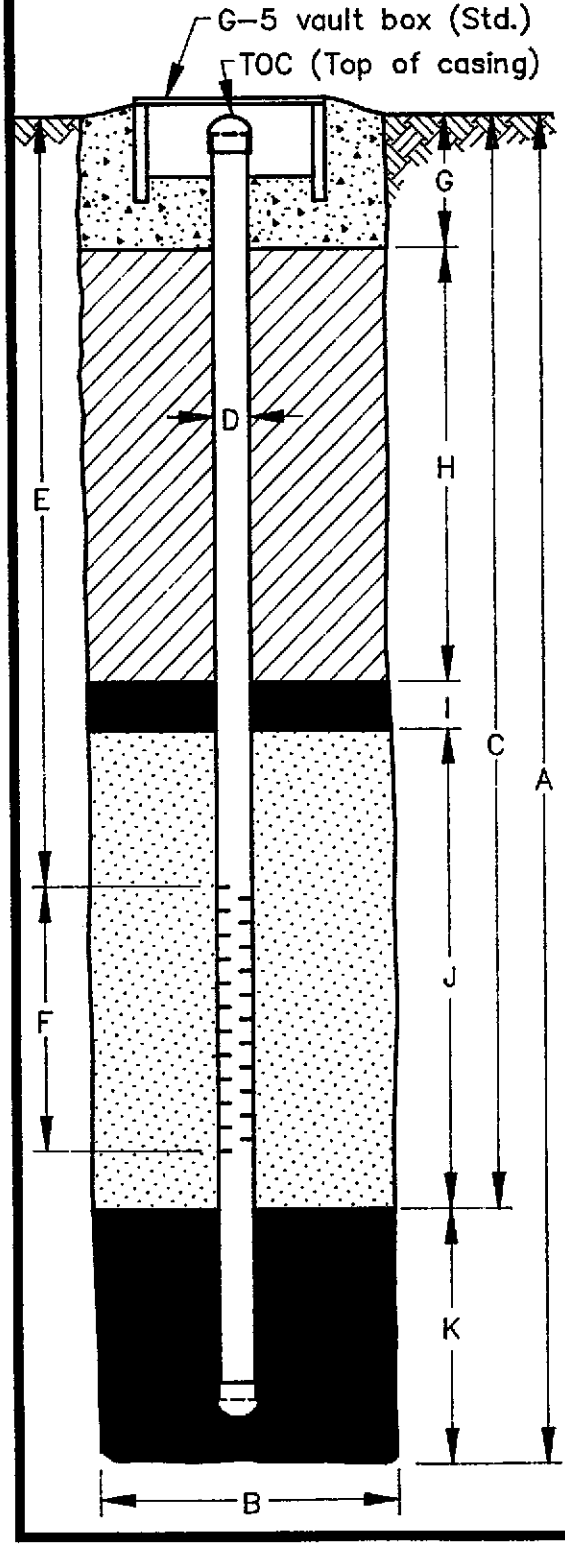
BORING/WELL No. E-2

TOP OF CASING ELEVATION 125.79Ft

GROUND SURFACE ELEVATION 126.15Ft.

DATUM MSL

INSTALLATION DATE 6/10/91



EXPLORATORY BORING

A. Total depth: 30.5 ft.
B. Diameter: 10 in.
Drilling method: 8"ø+10"ø HSA

WELL CONSTRUCTION

C. Total casing length: 30 ft.
Material: SCH 40 PVC
D. Diameter: 4 in.
E. Depth to top of perforations: 15 ft.
F. Perforated length: 10 ft.
Perforated interval from 15 to 25 ft.
Perforation type: MACHINE-SLOTTED
Perforation size: 0.010 INCH
G. Surface seal: 1.5 ft.
Seal material: CONCRETE
H. Backfill: 9.5 ft.
Backfill material: CEMENT-BENTONITE GROUT
I. Seal: 2 ft.
Seal material: BENTONITE PELLETS
J. Gravel pack: 13 ft.
Pack material: No. 2/12 SAND
K. Bottom seal/fill: 4.5 ft.
Material: HOLE PLUG

Form prepared by KSF

WELL DETAILS

BURLINGTON ENVIRONMENTAL, INC. CHEMPRO, Division

PROJECT No. CHV-149/306 Drawing No. : A1030609

PROJECT NAME: Chevron Service Station No. 9-8139

LOCATION 16304 Foothill Boulevard, San Leandro, Ca

WELL PERMIT No. 91133/91134

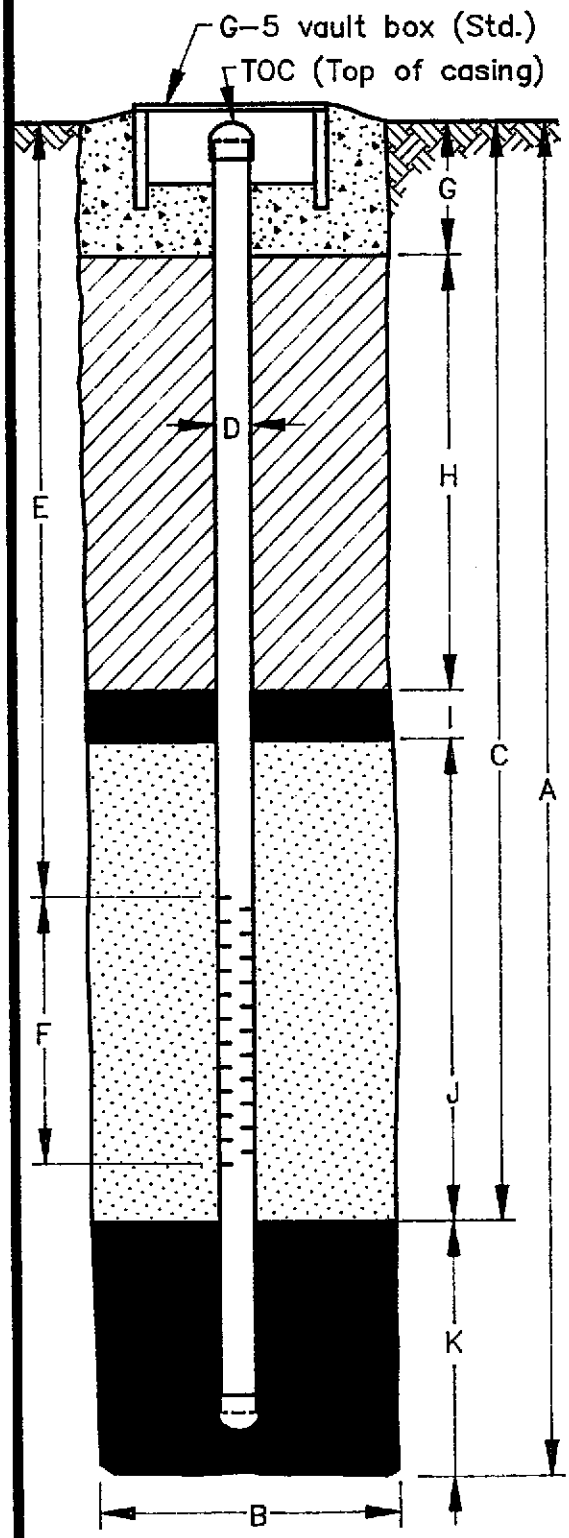
BORING/WELL No. E-3

TOP OF CASING ELEVATION 125.22Ft.

GROUND SURFACE ELEVATION 125.53Ft.

DATUM MSL

INSTALLATION DATE 6/10/91



EXPLORATORY BORING

A. Total depth 30.5 ft.

B. Diameter 10 in.

Drilling method 8"ø+10"ø HSA

WELL CONSTRUCTION

C. Total casing length 30 ft.

Material SCH 40 PVC

D. Diameter 4" in.

E. Depth to top of perforations 15 ft.

F. Perforated length 10 ft.

Perforated interval from 15 to 25 ft.

Perforation type MACHINE-SLOTTED

Perforation size 0.010 INCH

G. Surface seal 1.5 ft.

Seal material CONCRETE

H. Backfill 9.5 ft.

Backfill material CEMENT-BENTONITE GROUT

I. Seal 2 ft.

Seal material BENTONITE PELLETS

J. Gravel pack 13 ft.

Pack material No. 2/12 SAND

K. Bottom seal/fill 4.5 ft.

Material HOLE PLUG

Form prepared by KSF

LOG OF EXPLORATORY BORING

PROJECT NUMBER 987158 — BORING NO. MW-4

PROJECT NAME CHEVRON SERVICE STATION NO. 9-8139 — PAGE 1 OF 2

BY K. Elliot — DATE 11/30/89 — SURFACE ELEV. 125.43 ft.

PID (ppm)	RECOVERY (in/in)	BLOW CT. (blws/6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-GRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT AND FILL	
							SANDY CLAY (CL), very dark grayish brown (10YR, 3/2); 75-85% low plasticity fines; 10-20% coarse sand; trace fine gravel; angular clasts; very stiff; damp.	
43.8	16/18	7 13 20		5			@ 5.5': dark yellowish brown (10 YR, 4/6); 60-70% low plasticity fines; 20-30% fine sand; trace coarse sand; trace angular gravel; very stiff; damp.	
51.8	18/18	4 5 9		10			@ 10': decreasing sand content.	
1600	18/18	6 8 17	12/4/89 ▼	15			@ 15': green mottling; moderate hydrocarbon odor.	
			11/30/89 ▽	20				

REMARKS

Boring was drilled using eight-inch-diameter hollow-stem augers. Soil samples were collected using a two-inch-diameter modified California split-spoon sampler. The boring was sealed with neat cement grout from 22.75 to 26.5 feet, and converted to a two-inch-diameter monitor well. See attached Well Detail.

David C Tight RG#4603

LOG OF EXPLORATORY BORING

PROJECT NUMBER 987158 BORING NO. MW-4

PROJECT NAME CHEVRON SERVICE STATION NO. 9-8139 PAGE 2 OF 2

BY K. Elliot DATE 11/30/89 SURFACE ELEV. 125.43 ft.

PID (ppm)	RECOVERY (in/in)	BLOW CT. (blws/6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-GRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
74.9	14/18	5 5 11					SANDY CLAY (CL) (continued). @ 20': damp; no hydrocarbon odor.	
103	12/18	4 5 8		25			@ 25': 40-50% fine to medium sand; trace angular gravel. BOTTOM OF BORING AT 26.5 FEET.	
				30				
				35				
				40				

REMARKS

Boring was drilled using eight-inch-diameter hollow-stem augers. Soil samples were collected using a two-inch-diameter modified California split-spoon sampler. The boring was sealed with neat cement grout from 22.75 to 26.5 feet, and converted to a two-inch-diameter monitor well. See attached Well Detail.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 1158 — BORING NO. MW-5

PROJECT NAME CHEVRON SERVICE STATION NO. 9-8139 — PAGE 1 OF 2

BY D. Maupin — DATE 5/17/90 — SURFACE ELEV. ft.

PID (ppm)	POCKET PENETRO-METER ton/sq ft	BLOW CT. (blws/6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-GRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
							ASPHALT. FILL.	
10.2	3.0	6 13 24		5			SANDY CLAY (CL), yellowish brown (10YR, 5/8); 50-60% moderate to high plasticity fines; 40-50% fine to coarse sand; trace very fine gravel; damp; no product odor.	
15.5		5 8 11		10			@ 10': light olive brown (2.5Y, 5/4); 60-70% high plasticity fines; 30-40% fine to coarse sand; trace fine gravel; damp; no product odor.	
4622		6 11 23	5-17-90	15			CLAYEY SAND (SC), dark yellowish brown (10YR, 4/6); 30-40% moderate to high plasticity fines; 40-50% fine to coarse sand; 10-20% fine gravel; damp; strong product odor.	
3418	2.7	NA					@ 17': 40-50% moderate to high plasticity fines; 50-60% fine to coarse sand; strong product odor.	
	2.5	NA	5-17-90				@ 17.5-18.5': gravelly sand lense; 50-60% fine to coarse sand; 20-30% fine gravel.	
							@ 18': olive gray (5Y, 4/2); wet; strong product odor.	
				20			@ 19.5': gray coated worm holes, dominantly vertical.	

REMARKS

Boring was drilled using 6.5-inch diameter hollow-stem augers. Soil samples were collected at 5-foot intervals with a 2-inch diameter modified-California split-spoon sampler for the upper 16.5 feet of the boring. The remainder of the boring was sampled using a 2.5-inch diameter Moss continuous sampler. A groundwater monitor well was installed using 2-inch diameter PVC casing.

David P. Griffith RG#4603 exp: 6/30/92

LOG OF EXPLORATORY BORING

PROJECT NUMBER 1158 — BORING NO. MW-5

PROJECT NAME CHEVRON SERVICE STATION NO. 9-8139 — PAGE 2 OF 2

BY D. Maupin — DATE 5/17/90 — SURFACE ELEV. ft.

PID (ppm)	POCKET PENETRO-METER ton/sq ft	BLOW CT. (blws/6")	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO-GRAPHIC COLUMN	DESCRIPTION	WELL DETAIL
37.2	2.5	NA					CLAYEY SAND (SC), continued.	
		NA					@ 20': yellowish brown (10YR, 5/6); 35-45% moderate to high plasticity fines; 40-50% fine to coarse sand; 10-15% fine to medium gravel; Mn-oxide staining in soil; damp to moist; no product odor.	
40.4		NA					@ 21.5': damp to moist, no product odor.	
				25				
40.7	1.5	NA					@ 26': SANDY CLAY (CL), dark yellowish brown (10YR, 4/4); 65-75% high plasticity fines; 25-35% fine to coarse sand; trace fine gravel, subrounded to rounded; moist; no product odor.	
	3.8	NA						
22.1	>4.0	NA					@ 28.5': no product odor.	
				30			BORING TERMINATED AT 30 FEET.	
				35				
				40				

REMARKS

Boring was drilled using 6.5-inch diameter hollow-stem augers. Soil samples were collected at 5-foot intervals with a 2-inch diameter modified-California split-spoon sampler for the upper 16.5 feet of the boring. The remainder of the boring was sampled using a 2.5-inch diameter Moss continuous sampler. A groundwater monitor well was installed using 2-inch diameter PVC casing.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 ♦ (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

XCATION OF PROJECT CHEVRON SERVICE STATION
lo. 9-8139, 16304 FOOTHILL BLVD.
SAN LEANDRO, CALIFORNIA

.IENT
ame CHEVRON USA, INC.
ldress 2410 CAMINO RAMON Phone 415-842-9040
ity SAN RAMON Zip 94583

PPLICANT
ame CHEMICAL PROCESSORS, INC. (CHEMPRO)
ldress 950 'B' GILMAN Phone 415-524-9372
ity BERKELEY Zip 94710

/PE OF PROJECT
ell Construction — Geotechnical Investigation
Cathodic Protection ___ — General ___
Water Supply ___ — Contamination ___
Monitoring X — Well Destruction ___

ROPOSED WATER SUPPLY WELL USE
omestic ___ Industrial ___ Other ___
unicipal ___ Irrigation ___

RILLING METHOD:
ud Rotary ___ Air Rotary ___ Auger X
able ___ Other ___

RILLER'S LICENSE NO. 374152

ELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 35 ft.
Surface Seal Depth MAX PRACTICAL ft. Number 3 (MW-9) (E-3 & E-2)

EOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

STIMATED STARTING DATE MARCH 18, 1991
STIMATED COMPLETION DATE MARCH 20, 1991

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] Date 3/5/91

FOR OFFICE USE

PERMIT NUMBER 91133
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 7 Mar 91
Wyman Hong

121989

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 ♦ (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

PERMIT NUMBER 91134
LOCATION NUMBER 2S/2W 5F80 and 5F81

LOCATION OF PROJECT CHEVRON SERVICE STATION #9-8139, 16304 FOOTHILL BLVD., SAN LEANDRO, CALIFORNIA

CLIENT
Name CHEVRON USA, INC.
Address 2410 CAMINO RAMON Phone 415.842.9040
SAN RAMON Zip 94583

APPLICANT
Name CHEMICAL PROCESSORS, INC (CHEMPRO)
Address 950 'B' GILMAN ST. Phone 415.524.9372
BERKELEY Zip 94710

TYPE OF PROJECT
Well Construction
Cathodic Protection ___
Water Supply ___
Monitoring ___
Geotechnical Investigation
General ___
Contamination ___
Well Destruction X (OF MW-4 & MW-5)

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 374152

WELL PROJECTS
Drill Hole Diameter 10 in. Maximum
Casing Diameter ___ in. Depth 30 ft.
Surface Seal Depth ___ ft. Number 2 (MW-4 & MW-5)

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE MARCH 18, 1991
ESTIMATED COMPLETION DATE MARCH 20, 1991

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE [signature] Date 3/5/91

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

(E.) WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 7 Mar 91
Wyman Hong

121989

ALAMEDA COUNTY PUBLIC WORKS
399 ELMHURST STREET, HAYWARD, CALIFORNIA 94544
ROAD ENCROACHMENT PERMIT

(In accordance with Chapter 1 of Title 5, Streets and Highways, Ordinance Code, County of Alameda, an ordinance providing for the protection of Public Highways and rights of way thereof regulating the use thereof; and the manner in which the same may be altered, excavated under, obstructed or encroached upon; and providing penalties for the violation of the provisions thereof)

Issued To: CHEMPRO
950 'B' GILMAN STREET
BERKELEY, CA 94710
Phone: 524-9372

Permit Number: R00-910274
Issue Date: 5/24/1991
Expiration Date: 5/23/92
Permit Issue Receipt: 003402
Assessor Number: - - -
Work Order Number: 82020

Job Site: 16304 FOOTHILL BLVD
Township: SL

in compliance with and subject to all the terms, conditions and restrictions contained in Chapter 1 of Title 5 of said Ordinance Code and as stated below or printed as general or special provisions on any part of or attached to and made a part of this encroachment permit.

THE ABOVE APPLICANT HEREBY REQUESTS PERMISSION TO:
DRILL ONE 8" BORE APPROXIMATELY 34' DEEP IN THE MEDIAN STRIP ADJACENT TO FOOTHILL BLVD. TO INSTALL A MONITORING WELL (MW-9) FOR THE CHEVRON STATION AT 16304 FOOTHILL BLVD., SAN LEANDRO.

Attention is directed to the general provisions printed on the attached sheets of this permit and to the special provisions attached hereto and made a part hereof.

ALL MISCELLANEOUS GENERAL PROVISIONS AND THE FOLLOWING SPECIAL PROVISION NUMBERS:

C, K

THE OPERATOR SHALL NOTIFY THE COUNTY INSPECTOR AT 582-7781 PRIOR TO SAMPLING OF THE WELL; HOURS OF WORK ARE LIMITED TO 9:00 AM TO 3:30 PM, MONDAY THROUGH FRIDAY ONLY. ALL FLUIDS MUST BE COLLECTED AND DISPOSED OF IN A HAZARDOUS WASTE SITE; NO FLUIDS ARE TO BE DISCHARGED INTO THE ROAD GUTTER OR INTO THE STORM DRAIN SYSTEM.

THE LETTER OF CREDIT POSTED UNDER THIS PERMIT WILL BE RETAINED UNTIL THIS WELL IS DESTROYED AND THE MEDIAN IS RESTORED; SEPARATE ZONE 7 AND ROAD PERMITS WILL BE REQUIRED FOR DESTRUCTION.

OPERATION OF THE WELL BEYOND THE EXPIRATION DATE OF THIS PERMIT WILL REQUIRE ANNUAL RENEWAL.

This permit does not authorize, and it shall not be construed to authorize any infringement upon the property rights of owners of the fee title of the highway referred to herein. Notice of start of work and other required notices shall be given to the field office, 22341 Redwood Road, Castro Valley Phone (415) 582-7781.

Other Required Permits: ZONE 7 DRILLING PERMIT #91133
Bond Information: #3000 LC SAN PAOLO BANK NO. 220-796
Inspection Deposit: $ 25 CASH

By SEE APPLICATION Applicant Reviewed By: JKR
Work Completed: __/__/__
By JK Rogers ALAMEDA COUNTY Inspector: _____

Where no maps or plats are furnished, a sketch of the proposed work, showing location, name of road and other information must be made on a separate sheet, in triplicate.

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

Appendix C

CERTIFIED ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS

SUPERIOR ANALYTICAL LABORATORIES, INC.
825 ARNOLD, STE. 114 • MARTINEZ, CALIFORNIA 94553 • (415) 229-1512 DOHS #319

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 83332
CLIENT: Chempro
CLIENT JOB NO.: 158

DATE RECEIVED: 06/12/91
DATE REPORTED: 06/21/91

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
83332- 1	SS-1A,2A,3A,4A,5A,6A-SL	06/11/91	06/20/91
83332- 7	SS-7A-SL	06/11/91	/ /
83332- 8	SS-8A-SL	06/11/91	/ /
83332- 9	SS-9A-SL	06/11/91	06/21/91
83332-10	SS-10A-SL	06/11/91	/ /
83332-11	SS-11A-SL	06/11/91	/ /
83332-12	RS-1A-SL	06/11/91	06/21/91

Laboratory Number:	83332 1	83332 7	83332 8	83332 9	83332 10
ANALYTE LIST	Amounts/Quantitation Limits (mg/kg)				
OIL AND GREASE:	NA	NA	NA	NA	NA
TPH/GASOLINE RANGE:	240	NA	NA	43	NA
TPH/DIESEL RANGE:	NA	NA	NA	NA	NA
BENZENE:	0.84	NA	NA	0.08	NA
TOLUENE:	7.4	NA	NA	0.11	NA
ETHYL BENZENE:	4.2	NA	NA	0.26	NA
XYLENES:	25	NA	NA	1.9	NA

Laboratory Number:	83332 11	83332 12
ANALYTE LIST	Amounts/Quantitation Limits (ug/L)	
OIL AND GREASE:	NA	NA
TPH/GASOLINE RANGE:	NA	ND<50
TPH/DIESEL RANGE:	NA	NA
BENZENE:	NA	ND<0.5
TOLUENE:	NA	0.7
ETHYL BENZENE:	NA	ND<0.5
XYLENES:	NA	0.9

SUPERIOR ANALYTICAL LABORATORIES, INC.
825 ARNOLD, STE. 114 • MARTINEZ, CALIFORNIA 94553 • (415) 229-1512 DOHS #319

CERTIFICATE OF ANALYSIS

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 83332

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
mg/kg = part per million (ppm)

OIL AND GREASE ANALYSIS By Standard Methods Method 503E:
Minimum Detection Limit in Soil: 50mg/kg

Modified EPA-SW846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Soil: 1mg/kg
Standard Reference: NA

EPA-SW846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Soil: 1mg/kg
Standard Reference: 03/28/91

SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Soil: 0.005mg/kg
Standard Reference: 01/18/91

ANALYTE	REFERENCE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Oil & Grease	NA	NA	NA	NA	NA
Diesel	NA	NA	NA	NA	NA
Gasoline	03/28/91	200 ng	103/100	3	70-130
Benzene	01/18/91	200 ng	82/82	1	70-130
Toluene	01/18/91	200 ng	92/91	1	70-130
Ethyl Benzene	01/18/91	200 ng	93/93	0	70-130
Total Xylene	01/18/91	200 ng	95/91	0	70-130

Richard Srna, Ph.D.
Laboratory Director

[redacted] Chain of Custody - Recor[redacted]

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

Chevron Facility Number 9-8139
Facility Address 16304 FOOTHILL BLVD, SAN LEANDRO, CA
Consultant Project Number 158
Consultant Name BURLINGTON ENVIRONMENTAL INC - CHROMARO DIV.
Address 950 G GILMAN ST, BERKELEY, CA
Project Contact (Name) KYLE FLORY
(Phone) 524-7372 (Fax Number) 524-7439

Chevron Contact (Name) WALT POSUSZNY
(Phone) 842-9040
Laboratory Name SUPERIOR LABORATORY
Laboratory Release Number
Samples Collected by (Name) KYLE FLORY
Collection Date 6/11/91
Signature Kyle F. Flory

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)	Chlorinated HC (8010)	Non Chlorinated HC (8020)	Total Lead (AA)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)						HOLD	Remarks
SS-1A-SL	1	S	G	0820	—	Y	X													NOTE: COMPOSITE
SS-2A-SL	1	S	G	0825	—	Y	X													SAMPLES 1A
SS-3A-SL	1	S	G	0832	—	Y	X													THROUGH 6A
SS-4A-SL	1	S	G	0842	—	Y	X													AND THEN
SS-5A-SL	1	S	G	0900	—	Y	X													ANALYZE
SS-6A-SL	1	S	G	0910	—	Y	X													
SS-7A-SL	1	S	G	1015	—	Y	X												X	
SS-8A-SL	1	S	G	1025	—	Y	X												X	
SS-9A-SL	1	S	G	1030	—	Y	X													
SS-10A-SL	1	S	G	1040	—	Y	X												X	
SS-11A-SL	1	S	G	1050	—	Y	X												X	
RS-1A-SL	3	W	G	0959	HCL	Y	X													

Please initial:
Samples Stored in ice
Appropriate containers
Samples preserved
VOA's without headspace
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
[signature]		6/12 13:15	[signature]	Express IT	6-12-91 1315
[signature]	Express IT	6/12 1345			
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
[signature]			[signature] 6/12/91 1345		

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

COC-1.DWG/11 90/HCH

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081 DOHS #1332

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 12006
CLIENT: Chempro
CLIENT JOB NO.: 158

DATE RECEIVED: 06/25/91
DATE REPORTED: 06/28/91

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
12006- 1	TB-5-SL	06/24/91	06/26/91
12006- 2	RS-5-SL	06/24/91	06/26/91
12006- 3	WS-34-SL	06/24/91	06/26/91
12006- 4	WS-35-SL	06/24/91	06/26/91
12006- 5	WS-36-SL	06/24/91	06/26/91
12006- 6	WS-37-SL	06/24/91	06/26/91

Laboratory Number:	12006 1	12006 2	12006 3	12006 4	12006 5
ANALYTE LIST	Amounts/Quantitation Limits (ug/L)				
OIL AND GREASE:	NA	NA	NA	NA	NA
TPH/GASOLINE RANGE:	ND<50	ND<50	2900	3000	5300
TPH/DIESEL RANGE:	NA	NA	NA	NA	NA
BENZENE:	ND<0.5	ND<0.5	460	480	150
TOLUENE:	ND<0.5	ND<0.5	130	140	130
ETHYL BENZENE:	ND<0.5	ND<0.5	35	37	120
XYLENES:	ND<0.5	ND<0.5	330	380	640

Laboratory Number:	12006 6
ANALYTE LIST	Amounts/Quantitation Limits (ug/L)
OIL AND GREASE:	NA
TPH/GASOLINE RANGE:	16000
TPH/DIESEL RANGE:	NA
BENZENE:	94
TOLUENE:	300
ETHYL BENZENE:	180
XYLENES:	2500

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081 DOHS #1332

CERTIFICATE OF ANALYSIS

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 12006

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/l = part per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 503E:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA-SW846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/l
Standard Reference: NA

EPA-SW846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/l
Standard Reference: 08/24/90

SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/l
Standard Reference: 04/09/91

ANALYTE	REFERENCE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Oil & Grease	NA	NA	NA	NA	NA
Diesel	NA	NA	NA	NA	NA
Gasoline	08/24/90	200ng	95/93	0.7	63-111
Benzene	04/09/91	200ng	106/104	1.9	72-119
Toluene	04/09/91	200ng	103/101	2.0	70-116
Ethyl Benzene	04/09/91	200ng	103/101	1.5	73-119
Total Xylene	04/09/91	600ng	105/104	1.4	71-118

Richard Srna, Ph.D.
Laboratory Director

1L006

Chain-of-Custody-Recor

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

Chevron Facility Number 9-8139
Facility Address 16304 Foothill Blvd., San Leandro
Consultant Project Number 158
Consultant Name Chempro
Address 950-B Gilman St., Berkeley
Project Contact (Name) Felicia A Rein
(Phone) 524-7372 (Fax Number) 524-7439

Chevron Contact (Name) Walt Posloszny
(Phone) 842-9527
Laboratory Name Superior
Laboratory Release Number 4758680
Samples Collected by (Name) Daryl A. Lamb
Collection Date 6/24/91
Signature

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)	Chlorinated HC (8010)	Non Chlorinated HC (8020)	Total Lead (AA)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	Remarks
TB-5-5L	1	W	G	0800	HCL	Y	X							
RS-5-5L	3	W	G	0900	HCL	Y	X							
WS-34-5L	3	W	G	1050	HCL	Y	X							
WS-35-5L	3	W	G	1105	HCL	Y	X							
WS-36-5L	3	W	G	1155	HCL	Y	X							
WS-37-5L	3	W	G	1305	HCL	Y	X							

Please initial.
Samples Stored in ice.
Appropriate containers.
Samples preserved.
VOA's without headspace.
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
C. Brooks	CHEMPRO	6/25/91 10:09 AM	Don Ellefson	Exp-IT	6/25 - 1009
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Don Ellefson	Exp-IT	6/25 - 1054			
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time

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

COC-1.DWG/11 90/HCH

Appendix D

GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

Appendix D

GROUNDWATER SAMPLING AND ANALYSIS PROCEDURES

INTRODUCTION

The sampling and analysis procedures for water-quality monitoring programs are contained in this Appendix. These procedures will ensure that consistent and reproducible sampling methods are used, proper analytical methods are applied, analytical results are accurate, precise, and complete, and the overall objectives of the monitoring program are achieved.

SAMPLE COLLECTION

Sample collection procedures include equipment cleaning, water-level and total well-depth measurements, and well purging and sampling.

Equipment Cleaning

Sample bottles, caps, and septa were precleaned and provided by Superior Analytical. All sampling containers were used only once and discarded after analysis is complete.

Before starting the sampling event, all equipment to be placed in the well or come in contact with groundwater was disassembled and cleaned thoroughly with detergent water, then steam cleaned with service station tap water, and rinsed with Arrowhead™ distilled water. Any parts that may absorb contaminants, such as plastic pump valves or bladders, were cleaned as described above or replaced.

During the sampling event the equipment used in the well was washed with detergent, steam-cleaned, and rinsed with distilled water before purging or sampling the next well. The water level sounder was washed with detergent and

rinsed with distilled water before use in the each well. The rinsate water is stored in 55-gallon drums onsite and will be disposed of by Chevron.

Quality Assurance Samples

To determine if the Teflon bailer used for sampling had been sufficiently decontaminated, rinsate samples were taken. One rinsate sample was collected during each sampling event by filling the Teflon sampling bailer with distilled water and then decanting that water into the sample vails. The rinsate samples were analyzed for the same parameters that the well was sampled for (see Table 6). The samples were sent to Superior Analytical for analysis.

Water-Level, Floating-Hydrocarbon, and Total Well-Depth Measurements

Before purging and sampling, the depth to water, floating hydrocarbon thickness, and the well total depth were measured using an electric sounder, and a bottom-filling clear Lucite™ bailer. The electric sounder, manufactured by Slope-Indicator, Inc., is a transistorized instrument that uses a reel-mounted, two conductor, coaxial cable that connects the control panel to the sensor. Cable markings are stamped at 1-foot intervals. An engineers rule was used to measure the depths to the closest 0.01 foot. The water level was measured by lowering the sensor into the monitoring well. A low current circuit is completed when the sensor contacts the water, which serves as an electrolyte. The current is amplified and fed across an indicator light and audible buzzer, signaling when water has been contacted. A sensitivity control compensates for very saline or conductive water. After the water level had been determined the bailer was lowered to a point just below the liquid level, retrieved, and inspected for floating hydrocarbons.

0.5 feet of floating hydrocarbon was encountered in well MW-5. Four casing volumes were purged from the well to evacuate the free product but the well was not sampled. Floating hydrocarbon was not encountered in any of the other wells on or offsite. If floating product greater than 1/32-inch in thickness had been detected, a sample would not have been collected from that well.

All liquid measurements were recorded to the nearest 0.01 foot in the field logbook. The groundwater elevation at each monitoring well was calculated by subtracting the measured depth to water from the surveyed well-casing elevation. Well total depth was then measured by lowering the sensor to the bottom of the well. Well total depth, used to calculate purge volumes and to determine whether the well screen is partially obstructed by silt, was recorded to the nearest 0.5 foot in the field logbook.

Well Purging

Before sampling, standing water in the casing was purged from the monitoring wells using a piston pump or a bailer. In general, samples were collected from after a minimum of four casing volumes had been evacuated and the pH, electrical conductivity, and temperature had stabilized. MW-2 was bailed dry after the evacuation of two casing volumes. This well was allowed to recover to within 80% of its static water level and sampled.

The pH, electrical conductivity, and temperature meter were calibrated each day before beginning field activities. The calibration was checked once each day to verify meter performance. All field meter calibrations were recorded in the field log book. During the September sampling, the meter would not calibrate and samples were collected after four purge volumes were evacuated.

Groundwater generated from well-purging operations were contained for temporary storage in 55-gallon drums. All drums were labeled and stored on site in a location designated by the station manager. The sampler recorded the following information on the drum label for each drum generated:

* Drum content (groundwater)
* Source (well identification code)
* Date generated
* Client contact
* Project number
* Name of sampler

The Chevron representative was notified that the water is ready for removal, and Burlington will transport the drums off-site when the water has been removed.

Well Sampling

A Teflon bailer was used for well sampling. Glass bottles of at least 40 milliliters volume and fitted with Teflon-lined septa were used in sampling for volatile organics. These bottles were filled completely to prevent air from remaining in the bottle. A positive meniscus forms when the bottle is completely full. A convex Teflon septum is placed over the meniscus to eliminate air. After capping, the bottle was inverted and tapped to verify that it did not contain air bubbles. The sample containers for other parameters were filled, and capped. Duplicate sample analysis was performed on groundwater samples taken from monitoring well MW-3 and were analyzed for the same chemical analyses.

SAMPLE HANDLING AND DOCUMENTATION

The following section specifies the procedures and documentation used during sample handling.

Sample Handling

All sample containers were labeled immediately following sample collection. Samples were kept cool with cold packs until received by the laboratory. Cold packs were replaced each day to maintain refrigeration. At the time of sampling, each sample was logged on a chain-of-custody record which accompanied the sample to the Chevron approved laboratory.

Sample Documentation

The following procedures were used during sampling and analysis to provide chain-of-custody control during sample handling from collection through storage. Sample documentation included the use of the following:

* Field logbooks to document sampling activities in the field
* Labels to identify individual samples

* Chain-of-custody record sheets for documenting possession and transfer of samples

Field Logbook

In the field, the sampler recorded the following information on the Water Sample Field Data Sheet for each sample collected:

* Project number
* Client name
* Location
* Name of sampler
* Date and time
* Pertinent well data (e.g.., casing diameter, depth to water, well depth)
* Calculated and actual purge volumes
* Purging equipment used
* Sampling equipment used
* Appearance of each sample (e.g.., color, turbidity, sediment)
* Results of field analyses (temperature, pH, electrical conductivity)
* General comments

The field logbooks were signed by the sampler.

Labels

Sample labels contained the following information:

* Project number
* Sample number (i.e.., well designation)
* Sampler's initials
* Date and time of collection

* Type of preservative used (if any)

Sampling and Analysis Chain-Of-Custody Record

The Sampling and Analysis Chain-Of-Custody Record, initiated at the time of sampling, contains, but is not limited to, the well number, sample type, analytical request, date of sampling, and the name of the sampler. The record sheet was signed, timed, and dated by the sampler when transferring the samples. The number of custodians in the chain of possessions were kept to a minimum.

Appendix E

WELL DEVELOPMENT AND GROUNDWATER SAMPLE DATA SHEETS

WATER DATA SHEET · WS-35-SL (Duplicate)

PROJECT NO.: 158-306 SAMPLE ID.: WS - 34 - SL

LOCATION: San Leandro DATE: 6/24/91

STATION NO.: 9.8139 WELL/SAMPLE

SAMPLER: DAL POINT DESIGNATION: E.2

[X] SAMPLING [ ] DEVELOPING [ ] BAILING FLOATING PRODUCT

Casing Diameter:
2 inch ____
3 inch ____
4 inch X
6 inch ____
other ____

Screened Int. (ft.): 15-25
Initial DTW (ft.): 18.01 @ 1015
Initial TD (ft.): 30.30
Water Column Height (ft.): 12.27
80 % Recovery (ft.): 20.47

Calc. Casing Vol. (gal.): 8.11
(2" = .17) (3" = .38) (4" = .66) (6" = 1.5)
Calc. Purge Vol. (gal.): 32.44
Final DTW (ft.): 24.15 @ 1043
Final TD (ft.): 30.33
Product Bailed (gal.): Ø

Casing Elev. (ft.): ____
TD (Actual) (ft.): 31

FIELD MEASUREMENTS

TIME	VOLUME (gal.)	pH (units)	TEMP. (degrees F)	E.C. (umhos/cm)	COLOR	DTW (if dry)
1020	8	8.60	62.5	$.62 \times 10^3$	Butterscotch/BRN	
1026	16	8.57	63.3	$.73 \times 10^3$	" "	
1032	24	8.47	63.1	$.68 \times 10^3$	" "	
1040	33	8.43	63.3	$.69 \times 10^3$	Butterscotch/TAN	

Odor? very slight

Actual Purge Vol. (gal.): 33

PURGE METHOD:
___ Bailer (Teflon)
X Bailer (PVC)
___ Well Wizard
___ Dedicated Bailer
___ Other ____

SAMPLE METHOD:
___ Bailer (Teflon)
X Bailer (PVC)
___ Dedicated Bailer
___ Other ____

REMARKS: oil/H_2O interface indicates NO floating product.
* After 16 gallons purged noticed A STREAK of product:
After 24 gallons observed A FEW STREAKS of product.
" 33 gallons observed " " " " " .

WEATHER: OVERCAST ~ 62°

WATER DATA SHEET

OJECT NO.: 158-306
CATION: San Leandro
ATION NO.: 9.8139
AMPLER: DAL

SAMPLE ID.: WS-36-SL
DATE: 6/24/91
WELL/SAMPLE
POINT DESIGNATION: E-3

☒ SAMPLING ☐ DEVELOPING ☐ BAILING FLOATING PRODUCT

Casing Diameter:
2 Inch ____
3 Inch ____
4 Inch X
6 Inch ____
other ____

Casing Elev. (ft.): ____

TD (Actual) (ft.): 30.5

Screened Int. (ft.): 15-25

Initial DTW (ft.): 17.38 @ 0932

Initial TD (ft.): 30.12

Water Column Height (ft.): 12.74

80 % Recovery (ft.): 19.92

Calc. Casing Vol. (gal.): 8.40
(2" = .17) (3" = .38) (4" = .66) (6" = 1.5)
Calc. Purge Vol. (gal.): 33.63

Final DTW (ft.): 26.62 @ 1150

Final TD (ft.): 30.20

Product Bailed (gal.): ____

FIELD MEASUREMENTS

TIME	VOLUME (gal.)	pH (units)	TEMP. (degrees F)	E.C. (umhos/cm)	COLOR	DTW (if dry)
0945	8.5	9.22	64.7	1.31×10^3	Butterscotch/BRN	30.11
0950	2	9.89	63.8	1.04×10^3	Butterscotch/BRN	28.22
1030	—	—	—	—	—	27.50
1116	—	—	—	—	—	26.62
1150	—	—	—	—	—	—
1155	Sampled					

Odor? None

Actual Purge Vol (gal.): 10.5

PURGE METHOD:
___ Bailer (Teflon)
X Bailer (PVC)
___ Well Wizard
___ Dedicated Bailer
___ Other ____

SAMPLE METHOD:
X Bailer (Teflon)
___ Bailer (PVC)
___ Dedicated Bailer
___ Other ____

COMMENTS: Oil/H_2O interface probe indicates no floating product
WENT DRY after ~ 10.5 gallons. WAITED 2 HOURS
Sample COLLECTED.

WATER DATA SHEET

JECT NO.: 158-306

OCATION: SAN LEANDRO

ATION NO.: 9.8139

MPLER: OAL

SAMPLE ID.: WS-37-SL

DATE: 6/24/91

WELL/SAMPLE POINT DESIGNATION: MW-9

[X] SAMPLING [ ] DEVELOPING [ ] BAILING FLOATING PRODUCT

sing Diameter:
2 inch X
3 inch
4 inch
6 inch
other

asing Elev. (ft.):

Screened Int. (ft.): 17-27

Initial DTW (ft.): 16.71 @ 1236

Initial TD (ft.): 26.68

Water Column Height (ft.): 9.97

80 % Recovery (ft.): 18.70

Calc. Casing Vol. (gal.): 1.69
(2" = .17) (3" = .38) (4" = .66) (6" = 1.5)

Calc. Purge Vol. (gal.): 6.78

Final DTW (ft.): 16.73 @ 1258

Final TD (ft.): 26.65

Product Bailed (gal.): Ø

D (Actual) (ft.): 27

FIELD MEASUREMENTS

TIME	VOLUME (gal.)	pH (units)	TEMP. (degrees F)	E.C. (umhos/cm)	COLOR	DTW (if dry)
1240	2	8.40	62.8	.68 x 10^3	TAN	
1244	4	8.28	63.4	.67 x 10^3	TAN	
1248	6	8.21	64.7	.66 x 10^3	BUTTERSCOTCH/ BRN	
1254	8	8.17	63.9	.66 x 10^3	BUTTERSCOTCH/ BRN.	

Odor? NONE

Actual Purge Vol. (gal.): 8

URGE METHOD:
___ Bailer (Teflon)
X Bailer (PVC)
___ Well Wizard
X Dedicated Bailer
___ Other

SAMPLE METHOD:
X Bailer (Teflon)
___ Bailer (PVC)
X Dedicated Bailer
___ Other

KS: oil/H2O interface probe indicates no floating product.
Sampled at 1305.

FIELD REPORT
WATER LEVEL / FLOATING PRODUCT SURVEY

PROJECT NO.: 158-306
LOCATION: 16304 Foothill Blvd., SAN LEANDRO
SAMPLER: DARYL A. LAMB
STATION NO.: 9.8139
DATE: 6-24-91
TIME AND DATE OF SYSTEM START-UP:

WELL ID	TOTAL DEPTH (Feet)	WELL DIAMETER (in)	DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	TIME	COMMENTS
E-2	30.30	4	18.0	—	—	1015	
E-3	30.12	4	17.38	—	—	0932	
MW-9	26.68	2	16.71	—	—	1236	

Appendix F

WELL-HEAD SURVEY DATA SHEETS

2775 Park Avenue
Santa Clara, CA 95050
(408) 243-4066
FAX (408) 243-4764

Nowack & Associates, Inc.
Civil Engineers/Planners

Chemical Processors Inc.
Chevron Station No. 9-8139
16304 Foothill Blvd
San Leandro CA
Job No. 91-258

Point	Desc.	Northing	Easting	Elevation
402	E-2	4898.2407	5121.3835	126.15 RIM 125.79 PVC
403	E-3	4898.2437	5075.2886	125.53 RIM 125.22 PVC
501	MW-1	5006.4566	4968.8419	127.88 RIM 127.09 PVC
502	MW-2	4989.0815	5030.5792	126.37 RIM 125.98 PVC
503	MW-3	4939.3489	5102.6793	127.04 RIM 126.84 PVC
504	MW-4	4898.2437	5075.2886	125.42 RIM 125.22 PVC
509	MW-9	4835.9866	5164.0142	124.51 RIM 124.20 PVC

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Santa Clara, CA 95050
(408) 243-4066
FAX (408) 243-4764

Nowack & Associates, Inc.
Civil Engineers/Planners

Project: CHEMPRO Wed Jun 26 15:46:19 1991
Site description:

MONITORING WELL SURVEY
SAN LEANDRO

Description:

N:	5006.4566	E:	4968.8419
	S 74-16-53 E		64.14
N:	4989.0815	E:	5030.5792
	S 55-24-11 E		87.59
N:	4939.3489	E:	5102.6793
	S 24-27-56 E		45.16
N:	4898.2407	E:	5121.3835
	S 34-24-10 E		75.45
N:	4835.9866	E:	5164.0142
	N 54-56-36 W		108.39
N:	4898.2437	E:	5075.2886
	N 44-31-43 W		151.79
N:	5006.4566	E:	4968.8419

AREA = 6960.73 square feet, 0.16 acres
Error North = 0.0011
Error East = 0.0038
Absolute Error = 0.0039
Perimeter = 532.52
Direction of error = N 74-07-10 E
Precision = 1 in 135998

501
MW-1

101

102
NAIL

502
MW-2

503
MW-3

403
E-3

402
E-2

103
PK

509
MW-9