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 FEB 25 PM 4:04

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ENGINEERING DEPT.

Marketing Operations

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

February 15, 1991

Mr. Rafat Shahid
Alameda County Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Re: Former Chevron Station # 9-5630
997 Grant Avenue
San Lorenzo, California 94580

Dear Mr. Shahid:

Enclosed we are forwarding the Preliminary Site Assessment/Well Installation Report dated February 8, 1991, conducted by our concultant GeoStrategies, Inc. at the above referenced site. As indicated in the report, four (4) borings were advanced and completed into groundwater monitoring wells. Analytic testing of the soils detected TPH-gasoline in samples collected from boring C-2, C-3, and C-4 at concentrations of 99, 140, and 890 ppm, respectively. These concentrations were detected between 9 and 10 feet below grade. Groundwater was encountered at approximately eleven (11) feet. Laboratory analysis of the groundwater detected Benzene at concentrations ranging from ND to 4 ppb.

All improvements including the underground storage tanks have been removed. Samples collected beneath the former product tanks and pump islands detected elevated levels of petroleum hydrocarbon contaminants.

Based on these findings, it appears that the groundwater has not been impacted significantly. To prevent further transport of the contaminants from the soils to the groundwater, Chevron has initiated overexcavation in the area of the former tank complex and former piping trenches to remove the elevated levels detected and to assess the magnitude and extent of the subsurface contamination.

The overexcavation activity will be documented in the tank closure report that will be forwarded to you for your review.

If you have any questions or comments please do not hesitate to contact Nancy Vukelich at (415) 842-9581.

Very truly yours,
C.G. Trimbach

By _____
Nancy Vukelich

Enclosure
NLV/jmr

cc: Mr. Lester Feldman
RWQCB - Bay Area
1800 Harrison Street
Suite 700
Oakland, CA 94612

Mr. W.T. Scudder
CUSA Property Management Specialist

GeoStrategies Inc. 91 FEB 25 PM 4:04
Hazmat

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PRELIMINARY SITE ASSESSMENT/WELL INSTALLATION REPORT

Former Chevron Service Station No. 5630
997 Grant Avenue
San Lorenzo, California

727801-2

February 8, 1991

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545

(415) 352-4800

February 8, 1991

Gettler-Ryan Inc.
2150 West Winton Avenue
Hayward, California 94545

Re: PRELIMINARY SITE ASSESSMENT AND WELL INSTALLATION REPORT
Former Chevron Service Station No. 5630
997 Grant Avenue
San Lorenzo, California

Gentlemen:

This report has been prepared by GeoStrategies Inc. (GSI) and summarizes the ground-water monitoring well installation and soil sampling performed at the above referenced location (Plate 1). Soil borings C-1 through C-4 were drilled on November 12 and 13, 1990, and subsequently completed as ground-water monitoring wells. The locations of each well are shown on Plate 2. Field work and laboratory analyses were performed to comply with State of California Water Resources Control Board guidelines for investigating leaking underground storage tanks.

SITE BACKGROUND

In September, 1986, the product tanks failed a petrotite test due to leaks found in the vent lines. After the lines were replaced, the system was re-tested and the results showed that the system tested tight.

The most recent tank test performed in November 1989 indicated that the tanks tested tight.

During the fall of 1990, the Service Station building, pump islands and underground fuel tanks were removed.

FIELD PROCEDURES

On November 12 and 13, 1990, four soil borings were drilled using a truck-mounted hollow stem auger drilling rig. The borings were subsequently completed as ground-water monitoring wells (C-1 through C-4). The well locations were chosen to explore soil and groundwater conditions in a presumed down-gradient direction from the pump islands, underground fuel tanks and waste oil tank.

Field work was performed according to GSI Field Methods and Procedures (Appendix A). Soil samples were collected at five-foot depth intervals, using a modified California split-spoon sampler fitted with clean brass tube liners. A GSI geologist observed the drilling, described the soil samples using the Unified Soil Classification System (ASTM D-2488) and prepared a lithologic log for each borehole. Boring logs are presented in Appendix B.

Soil Sampling

A 4-inch long brass tube of soil from each sample interval was used to perform head-space analysis in the field to screen for the presence of Volatile Organic Compounds (VOCs). Head-space analysis involved transferring soil from a brass liner into a clean glass jar and immediately covering the jar with aluminum foil secured with a ring-type threaded lid. After approximately twenty minutes, the foil was pierced and the head-space within the jar was analyzed for total organic vapor measured in parts per million (ppm) using an Organic Vapor Monitor (OVM) photoionization detector. Head-space analysis results are presented on the exploratory boring logs in Appendix B.

Selected soil samples retained for chemical analysis were collected in clean brass liners, covered on both ends with aluminum foil and sealed with plastic end caps. The samples were labeled, entered on a Chain-of-Custody form and transported in a cooler with blue ice to Superior Analytical Laboratory, Inc. (Superior), a State-certified environmental laboratory located in San Francisco, California.

Monitoring Well Construction

Borings C-1 through C-4 were drilled with 8-inch-diameter hollow-stem augers to total depths ranging from 27.0 to 33.5 feet. The monitoring wells were constructed in these borings through the hollow-stem augers using 2-inch-diameter Schedule 40 PVC well casing and 0.020-inch factory-slotted well screen. Lonestar #2/12 graded sand was placed in the annular space across the entire screened interval and at least two feet above the top of the screen. A two-foot bentonite seal was placed above the filter pack, followed by a concrete well seal to the ground surface. A traffic-rated vault box with a cover was placed at the ground surface and a locking cap with lock was then placed on each well. After the concrete seal was given sufficient time to set-up, each well was developed using methods outlined in GSI's Field Methods and Procedures. Well construction details are presented with the boring logs in Appendix B.

HYDROGEOLOGIC CONDITIONS

The project site is located on the gently west-sloping surface of the San Francisco Bay Plain. The eastern shoreline of the San Francisco Bay is approximately 1.5 miles southwest of the site, and San Lorenzo Creek is approximately 1800 feet north of the site. No other perennial streams are mapped in the vicinity of the site.

The site is underlain by alluvial sediments consisting of interbedded silty clay, clayey silt and minor silty fine sand. Small, probably discontinuous lenses of silty sand to sandy silt were observed at depths of 3 to 12 feet. These lenses may contain limited volumes of perched groundwater. Borings [redacted] encountered a bed of loose, porous, damp to wet fine sandy silt to clayey silt, at depths of approximately 19 to 28 feet. This bed may contain groundwater under partial artesian pressure. Clay and minor clayey silt was encountered below the sandy silt bed. Borings [redacted] encountered interbedded clay, sandy clay and clayey silt, which contained increasing amounts of moisture with depth.

Groundwater was first encountered in the borings at a depth of approximately 18 to 19 feet below ground surface. Depth-to-water measurements, taken by Gettler-Ryan Inc. (G-R) on December 5, 1990, indicated that ground-water levels stabilized in the wells at depths ranging between 11.39 feet and 11.70 feet below the surveyed top of the well box. A hydraulic gradient of 0.003 was calculated from the potentiometric data (Plate 3). Shallow groundwater appears to flow to the west beneath the site. A summary of the potentiometric data is presented in Table 1.

CHEMICAL ANALYSES

Soil and ground-water samples from Wells C-1 through C-4 were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX), according to EPA Method 8020. Soil and ground-water samples from Boring C-1, adjacent to the Waste Oil Tank, were also analyzed for Volatile Organic Compounds (VOCs) using EPA Method 8240, and Oil and Grease according to Standard Methods Method 503E. All Chemical analyses of soil and ground-water samples were performed by Superior.

Soil Analytical Results

Soil samples for chemical analysis were obtained from approximate depths of 5, 10, 15, and 20 feet in Borings C-2 and C-3; 5, 10, and 15 feet in Boring C-1; and 10, 15, and 20 feet in Boring C-4. The highest levels of TPH-Gasoline were reported in the 10-foot samples from Borings C-2, C-3, and C-4 at concentrations of 99 ppm, 140 ppm, and 890 ppm, respectively. TPH-Gasoline was also detected in the 5-foot sample from Borings C-2 and C-3 at concentrations of 3.0 ppm and 2.0 ppm, respectively. Benzene was identified in the 10-foot samples from Borings C-2, C-3, and C-4 at concentrations of 0.18 ppm, 0.20 ppm, and 2.8 ppm, respectively. TPH-Gasoline, Oil and Grease, and VOCs analyses performed on samples from Boring C-1 were reported as not detected (ND). Results of the soil chemical analyses are presented in Table 2. Soil chemical analytical reports are presented in Appendix C.

Ground-water Analytical Results

G-R collected ground-water samples from monitoring wells C-1 through C-4 on December 5, 1990. Prior to ground-water sampling, the wells were monitored for separate-phase hydrocarbons using an oil-water interface probe. A clear acrylic bailer was used to confirm interface probe results and to check for sheens. Separate-phase hydrocarbons or sheens were not observed in any of the wells.

TPH-Gasoline was reported as none-detected (ND) in each monitoring well. Benzene was detected in Wells C-2, C-3, and C-4 at concentrations of 0.7 parts per billion (ppb), 1.0 ppb, and 4.0 ppb, respectively. Benzene was reported as ND for the sample from Well C-1. In addition, VOCs and Oil and Grease analyses for Well C-1 were reported as ND. TPH-Gasoline and benzene chemical data for this sampling have been plotted on Plate 4 as a concentration map. A summary of the ground-water analytical data is presented in Table 1. The G-R ground-water sampling report, Chain-of-Custody forms and Superior analytical reports are presented in Appendix D.

SUMMARY OF FINDINGS

The results of this investigation are summarized below.

- Four exploratory borings were drilled on November 12 and 13, 1990, and completed as ground-water monitoring wells (C-1 through C-4).

- Based on exploratory borehole data, the lithology of the site appears to consist of interbedded clay and silty clay, below a veneer of local thin artificial fill. The shallow aquifer appears to be an interbedded clayey silt and fine sand unit ranging in thickness from 7 to 10 feet.

- Soil samples collected at the 10-foot sample depth interval contained concentrations of TPH-Gasoline ranging from 99 ppm to 890 ppm. All other soil samples above and below this depth contained TPH-Gasoline concentrations at or less than 3 ppm.

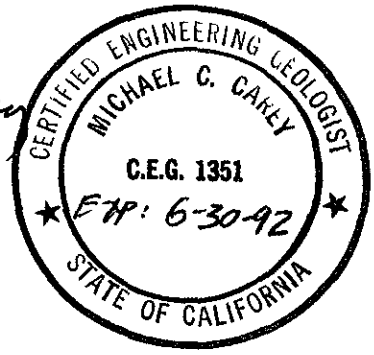
- Ground-water samples collected by G-R on December 5, 1990, contained non-detectable levels of TPH-Gasoline. Benzene concentrations ranged from ND to 4 ppb.

If you have any questions, please call.

GeoStrategies Inc. by,

Randall S. Young
Project Geologist

Michael Carey
Geologist
C.E.G. 1351



RSY/MC/mlg

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-G/Benzene Concentration Map

Appendix A: GSI Field Methods and Procedures
Appendix B: Exploratory Boring Logs/Well Construction Details
Appendix C: Soil Analytical Report
Appendix D: Gettler-Ryan Inc. Groundwater Sampling Reports

QC Review:

TABLE 1

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TOG (PPB)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)	DEPTH TO WATER (FT)
C-1	05-Dec-90	10-Dec-90	<50	<0.5	<0.5	<0.5	<0.5	<5000	24.08	11.64	----	12.44
C-2	05-Dec-90	10-Dec-90	<50	0.7	<0.5	<0.5	0.5	N/A	22.69	11.39	----	11.30
C-3	05-Dec-90	10-Dec-90	<50	1	0.7	<0.5	<0.5	N/A	23.45	11.70	----	11.75
C-4	05-Dec-90	10-Dec-90	<50	4	2	0.7	3	N/A	23.32	11.47	----	11.85
TB	05-Dec-90	10-Dec-90	<50	<0.5	<0.5	<0.5	<0.5	N/A	----	----	----	----

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 1.0 ppb Xylenes 1,750 ppb Ethylbenzene 680 ppb

CURRENT DHS ACTION LEVELS
Toluene 100 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion N/A = Not Analyzed TB = Trip Blank
TOG = Total Oil and Grease

Notes: 1. All data shown as <x are reported as ND (none detected).
2. Static Water elevations referenced to mean sea level (MSL).
3. DHS Action Levels and MCLs are subject to change pending State review.

TABLE 2

SOIL ANALYSES DATA

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TOG (PPM)
C-1-5.0	12-Nov-90	20-Nov-90	<1	<0.010	<0.015	<0.015	<0.015	<50
C-1-10.5	12-Nov-90	20-Nov-90	<1	<0.010	<0.015	<0.015	<0.015	<50
C-1-15.5	12-Nov-90	20-Nov-90	<1	<0.010	<0.015	<0.015	<0.015	<50
C-2-4.0	12-Nov-90	20-Nov-90	3	0.046	0.008	<0.005	0.036	N/A
C-2-9.0	12-Nov-90	20-Nov-90	[illegible]	0.18	0.22	0.96	1.5	N/A
C-2-14.0	12-Nov-90	20-Nov-90	<1	0.006	<0.005	<0.005	0.010	N/A
C-2-19.5	12-Nov-90	20-Nov-90	<1	<0.005	<0.005	<0.005	<0.005	N/A
C-3-5.5	12-Nov-90	20-Nov-90	2	1.7	0.019	0.036	0.037	N/A
C-3-10.5	12-Nov-90	20-Nov-90	[illegible]	0.20	0.041	1.4	0.93	N/A
C-3-15.5	12-Nov-90	20-Nov-90	<1	<0.005	0.008	<0.005	0.013	N/A
C-3-20.5	12-Nov-90	20-Nov-90	<1	<0.005	0.006	<0.005	0.011	N/A

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
TOG = Total Oil and Grease
PPM = Parts Per Million
N/A = Not Analyzed

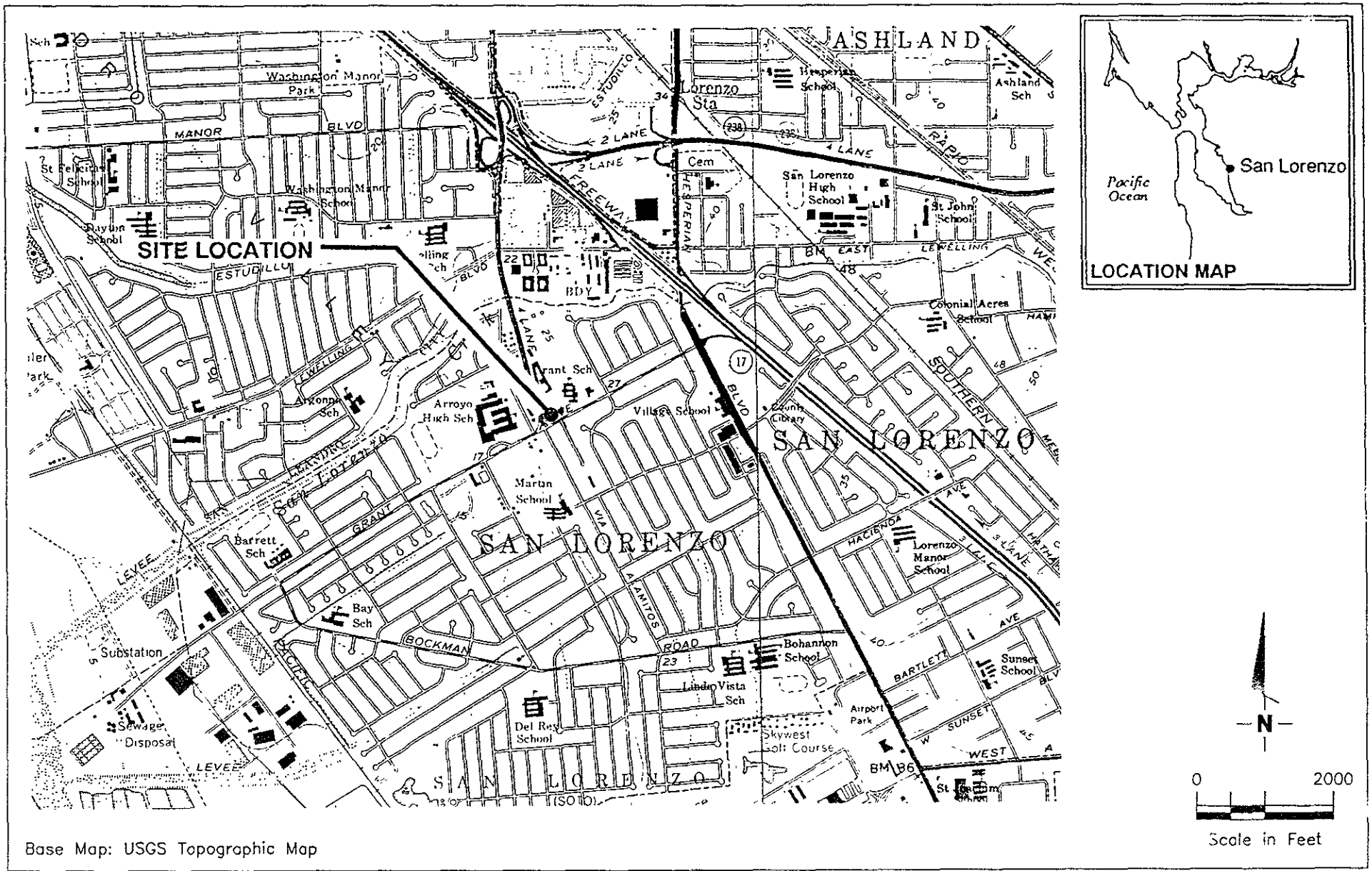
Notes: 1. All data shown as <x are reported as ND (none detected).
2. BTEX results for samples C-1-5.0, C-1-10.5 and C-1-15.5 were reported in micrograms per kilogram (parts per billion).

TABLE 2

SOIL ANALYSES DATA

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TOG (PPM)
C-4-10.5	12-Nov-90	21-Nov-90	890	2.8	26	22	110	N/A
C-4-15.5	12-Nov-90	20-Nov-90	<1	<0.005	<0.005	<0.005	0.008	N/A
C-4-20.5	13-Nov-90	20-Nov-90	1	0.007	0.014	0.008	0.043	N/A

ILLUSTRATIONS



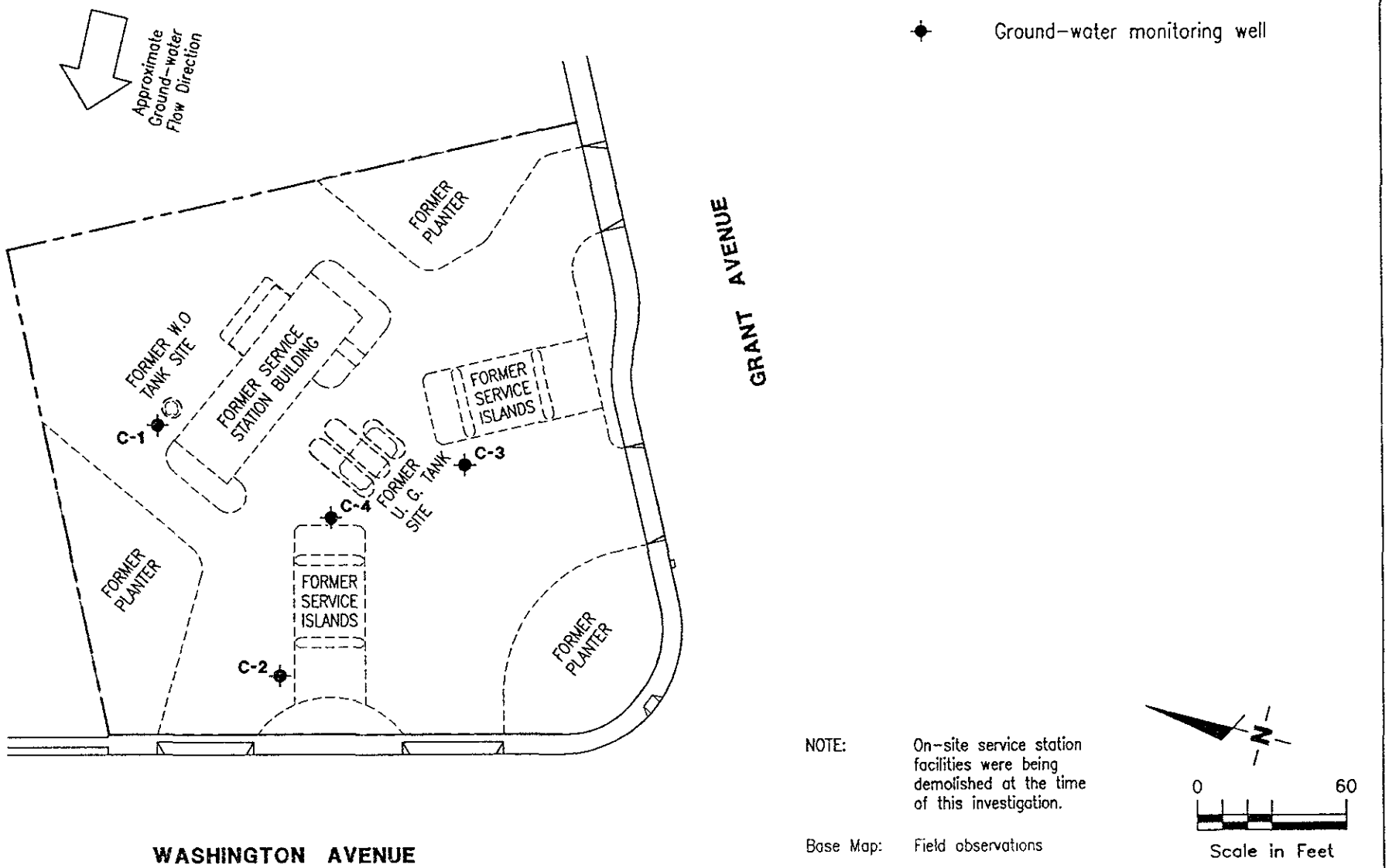
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
Former Chevron Service Station #5630
997 Grant Avenue
San Lorenzo, California

PLATE 1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE
7278		10/90	

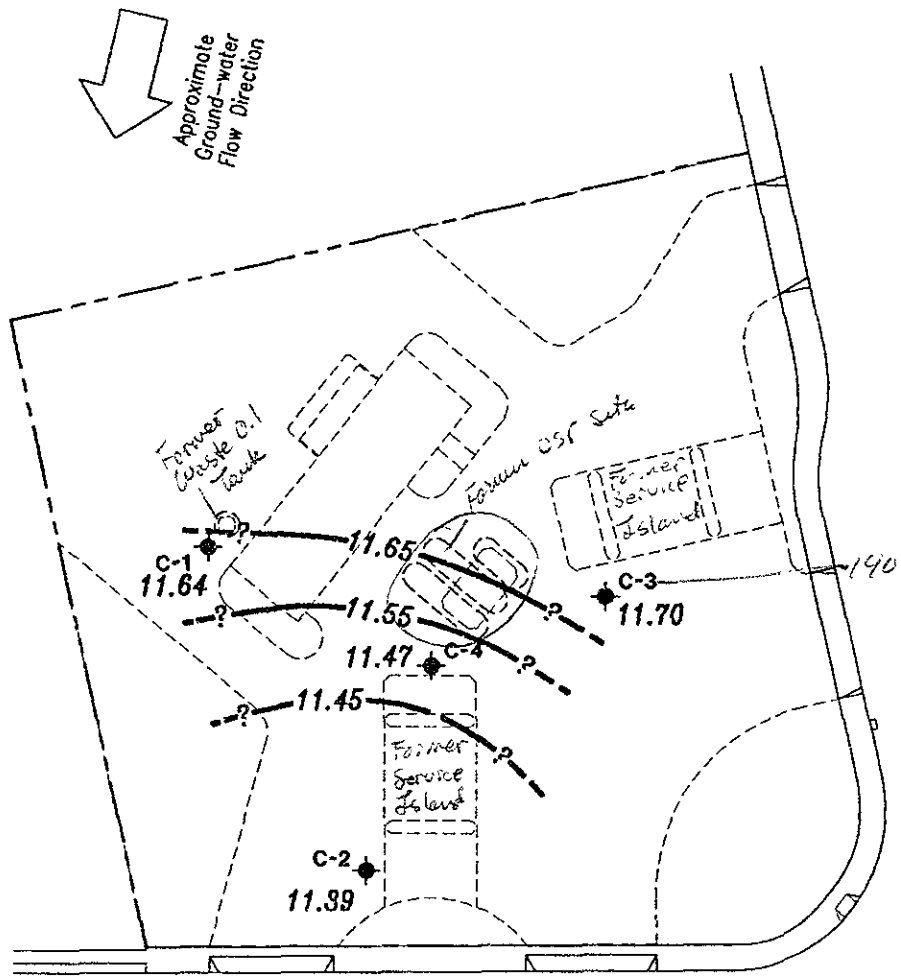


GeoStrategies Inc.

SITE PLAN
Former Chevron Service Station #5630
997 Grant Avenue
San Lorenzo, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
727801	MCC : CE61351	01/91	



EXPLANATION

- Ground-water monitoring well
- 99.99 — Ground-water elevation contour Approximate Gradient = 0.003
- 99.99 — Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on December 5, 1990

Note: Contours may be influenced by irrigation practices and/or site construction activities.

NOTE: On-site service station facilities were being demolished at the time of this investigation.

Base Map. Field observations

N

0 60

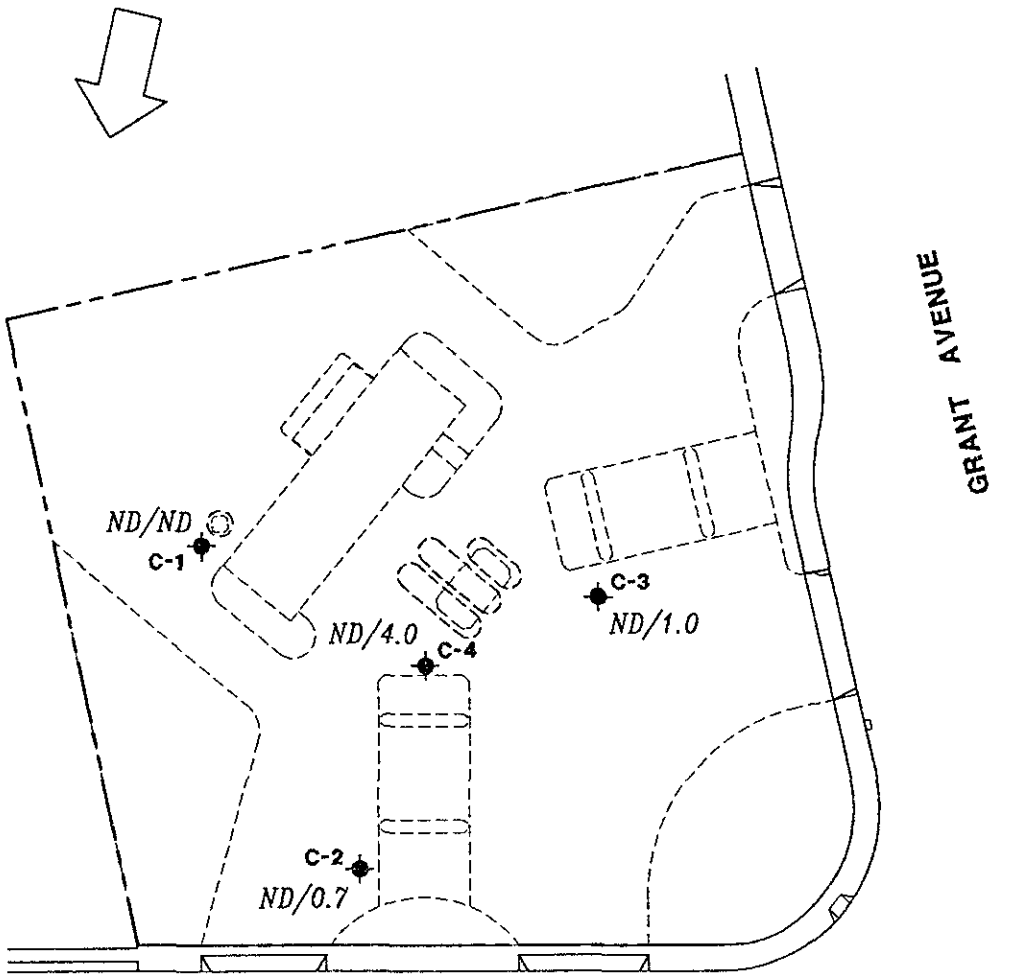
Scale in Feet

GeoStrategies Inc.

POTENTIOMETRIC MAP
Former Chevron Service Station #5630
997 Grant Avenue
San Lorenzo, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
727801	MCC:CEG 1351	01/91	



EXPLANATION

- ⌖ Ground-water monitoring well
- *99/9.9* TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on December 5, 1990
- *ND* Not Detected (See laboratory reports for detection limits)

NOTE: On-site service station facilities were being demolished at the time of this investigation.

Base Map: Field observations

N

0 60

Scale in Feet

GeoStrategies Inc.

TPH-G/BENZENE CONCENTRATION MAP
Former Chevron Service Station #5630
997 Grant Avenue
San Lorenzo, California

PLATE 4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
727801	MCC 1357	01/91	

APPENDIX A

GSI FIELD METHODS AND PROCEDURES

FIELD METHODS AND PROCEDURES

EXPLORATION DRILLING

Mobilization

Prior to any drilling activities, GeoStrategies Inc. (GSI) will verify that necessary drilling permits have been secured.

Utility locations will be located and drilling will be conducted so as not to disrupt activities at a project site. GSI will obtain and review available public data on subsurface geology and if warranted, the location of wells within a half-mile of the project site will be identified. Drillers will be notified in advance so that drilling equipment can be inspected prior to performing work.

Drilling

The subsurface investigations are typically performed to assess the lateral and vertical extent of petroleum hydrocarbons present in soils and groundwater. Drilling methods will be selected to optimize field data requirements as well as be compatible with known or suspected subsurface geologic conditions.

Monitoring wells are installed using a truck-mounted hollow-stem auger drill rig or mud-rotary drill rig. Typically, the hollow-stem rig is used for wells up to 100 feet, if subsurface conditions are favorable. Wells greater than 100-feet deep are typically drilled using mud-rotary techniques. When mud rotary drilling is used, an electric log will be performed for additional lithological information. Also during mud rotary drilling, precautions will be taken to prevent mud from circulating contaminants by using a conductor casing to seal off contaminated zones. Samples will be collected for lithologic logging by continuous chip, and where needed by drive sample or core as specified by the supervising geologist.

Soil Sampling

Shallow soil borings will be drilled using a truck-mounted hollow-stem auger drilling rig, unless site conditions favor a different drilling method. Drilling and sampling methods will be consistent with ASTM Method D-1452-80. The auger size will be a minimum 6-inch nominal outside-diameter (O.D). No drilling fluids will be used during this drilling method. The augers and other tools used in the bore hole will be steam cleaned before use and between borings to minimize the possibilities of cross-contamination between borings.

Soil samples are typically collected at 5-foot intervals as a minimum from ground surface to total depth of boring. Additional soil samples will be collected based on significant lithologic changes and/or potential chemical content. Soil samples from each sampling interval will be lithologically described by a GSI geologist (Figure 1). Soil colors will be described using the Munsell Color Chart. Rock units will be logged using appropriate lithologic terms, and colors described by the G.S.A. Rock Color Chart.

Head-space analyses will be performed to check for the evidence of volatile organic compounds. Head-space analyses will be performed using an organic vapor analyzer; either an OVA, HNU, or OVM. Organic vapor concentrations will be recorded on the GSI field log of boring (Figure 1). The selection of soil samples for chemical analysis are typically based on the following criteria:

1) Soil discoloration
2) Soil odors
3) Visual confirmation of chemical in soil
4) Depth with respect to underground tanks (or existing grade)
5) Depth with respect to ground water
6) OVA reading

Soil samples (full brass liners) selected for chemical analysis are immediately covered with aluminum foil and the liner ends are capped to prevent volatilization. The samples are labeled and entered onto a Chain-of-Custody form, and placed in a cooler on blue ice for transport to a State-certified analytical laboratory.

Soil cuttings are stockpiled on-site. Soils are sampled and analyzed for site-specific chemical parameters. Disposition of soils is dependent of chemical analytical results of the samples.

Soil Sampling - cont.

Soil borings not converted to monitoring wells will be backfilled (sealed) to ground surface using either a neat cement or cement-bentonite grout mixture. Backfilling will be tremied by continuously pumping grout from the bottom to the top of the boring where depth exceeds 20' or as required by local permit requirements.

All field and office work, including exploratory boring logs, are prepared under the direction of a registered geologist.

Monitoring Well Installation

Monitoring well casing and screen will be constructed of Schedule 40, flush-joint threaded polyvinylchloride (PVC). The well screen will be factory mill-slotted unless additional open area is required (eg. conversion to an extraction well in a low-yield aquifer). The screen length will be placed adjacent to the aquifer material to a minimum of 2-feet above encountered water. No screen shall be placed in a borehole that potentially creates hydraulic interconnection of two or more aquifer units. Screen slot size and well sand pack will be compatible with encountered aquifer materials, as confirmed by sieve analysis.

Monitoring wells will be completed below grade (Figure 2) unless special conditions exist that require above-grade completion design. In the event a monitoring well is required in an aquifer unit beneath an existing aquifer, the upper aquifer will be sealed off by installing a steel conductor casing with an annular neat cement or cement-bentonite grout seal. This seal will be continuously tremie pumped from the bottom of the annulus to ground surface.

The monitoring well sand pack will be placed adjacent to the entire screened interval and will extend a recommended minimum distance of 2-feet above the top of the screen. No sand pack will be placed that interconnects two or more aquifer units. A minimum 2-foot bentonite pellet or bentonite slurry seal will be placed above the sand pack. Sand pack, bentonite, and cement seal levels will be confirmed by sounding the annulus with a calibrated weighted tape. The remaining annular space above the bentonite seal will be grouted with a bentonite-cement mixture and will be tremie-pumped from the bottom of the annular space to the ground surface. The bentonite content of the grout will not exceed 5 percent by weight. A field log of boring and a field well completion form will be prepared by GSI for each well installed.

Decontamination of drilling equipment before drilling and between wells will consist of steam cleaning, and/or Alconox wash.

Well Development

All newly installed wells will be properly developed within 48 hours of completion. No well will be developed until the well seal has set a minimum of 12 hours. Development procedures will include one or more of the methods described below:

Bailing

Bailing will be used to remove suspended sediments and drilling fluids from the well, where applicable. The bailer will be raised and lowered through the column of water in the well so as to create a gentle surging action in the screened interval. This technique may be used in conjunction with other techniques, such as pumping, and may be used alone if the well is of low yield.

Pumping

Pumping will be used in conjunction with bailing or surging. The pump will be operated in such a manner as to gently surge the entire screened interval of the well. This may involve operating the pump with a packer type mechanism attached and slowly raising and lowering the pump, or by cycling the pump off and on to allow water to move in and out of the screened interval. Care will be used not to overpump a well.

Surging

Surging will be performed on wells that are screened in known or suspected high yield formations and/or on larger diameter (recovery) wells. A surge block will be raised and lowered through the entire screened interval, forcing water in and out of the well screen and sand pack. Pumping or air lifting will be used in conjunction with this method of development to remove any sediment brought into the well during surging.

Air Lifting

Air lifting will be used to remove sediment from wells as an alternative to pumping under certain conditions. When appropriate, a surge block designed for use with air lifting will be used to agitate the entire screened interval and water will be lifted out of the well using forced air. When air lifting is performed, the air source will be either nitrogen or filtered air and the procedure will be performed gently to prevent any damage to the well screen or casing and to insure that discharged water is contained.

Well Development - cont.

All well developing equipment will be thoroughly decontaminated prior to development using a steam cleaner and/or Alconox detergent wash and clean water rinse. During development procedures, field parameters (temperature, specific conductance and pH) will be monitored and recorded on well development forms (Figure 3). Equilibration requirements consist of a minimum of three readings with the following accuracy standards:

pH	± 0.1 pH units
Specific Conductance	± 10% of full scale reading
Temperature	± 0.5 degrees Celsius

The wells will be developed until water is visibly clear and free of sediment, and well purging parameters stabilized. A minimum of 8 to 10 well volumes will be purged from each well, if feasible. If well purging parameters have not stabilized before 10 casing volumes have been removed, well development will continue until purging parameters have stabilized and formation water is being drawn into the well. The adequacy of well development will be judged by the field technician performing the well development and based on known formation conditions.

Well Surveying

Monitoring wells will be surveyed to obtain top of box elevations to the nearest ±0.01 foot. Water level measurements will be recorded to the nearest ±0.01 foot and referenced to Mean Sea Level (MSL). If additional wells are required, then existing and newly installed wells are surveyed relative to MSL.

GROUND-WATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by Gettler-Ryan Inc. (G-R) for ground-water sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance objectives have been established by G-R to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise, and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality Control (QC) is maintained by G-R by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of G-R to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

- Accuracy - the degree of agreement of a measurement with an accepted referenced or true value.

- Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of the standard deviation.

- Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

- Comparability - expresses the confidence with which one data set can be compared to another.

- Representativeness - a sample or group of samples that reflects the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

As part of the G-R QA/QC program, applicable federal, state, and local reference guidance documents are followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents, and journals are incorporated into the G-R sampling procedures to assure that; (1) ground-water samples are properly collected, (2) ground-water samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analysis of samples are accurate and reproducible.

Guidance and Reference Documents Used to Collect Groundwater Samples

These documents are used to verify G-R sampling procedures and are consistent with current regulatory guidance. If site specific work and sampling plans are required, those plans will be developed from these documents, and newly received applicable documents.

U.S.E.P.A. - 330/9-51-002	NEIC Manual for Groundwater/Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 530/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - 600/4-82-057	Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (July, 1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986)
40 CFR 136.3e,Table II (Code of Federal Regulations)	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recover Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Control Board	Leaking Underground Fuel Tank (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)
State of California Water Resources Control Board	Title 23, (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Sections 2645, 2646, 2647, and 2648; Article 7, Sections 2670, 2671, and 2672 (October, 1986: including 1988 Amendments)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (November, 1988)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis, Volume 55, Pages 2212-2218 (December, 1983)
Napa County	Napa County Underground Storage Tank Program: Guidelines for Site Investigations; February 1989.
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Santa Clara Valley Water District	Investigation and Remediation at Fuel Leak sites: Guidelines for Investigation and Technical Report Preparation (March 1989)
Santa Clara Valley Water District	Revised Well Standards for Santa Clara County (July 18, 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983
American Petroleum Institute	A Guide to the Assessment and Remediation of Underground Petroleum Releases; API Publication 1628, February 1989
American Petroleum Institute	Literature Summary: Hydrocarbon Solubilities and Attenuations Mechanisms, API Publication 4414, August 1985
Site Specific (as needed)	General and specific regulatory documents as required.

Because ground-water samples collected by G-R are analyzed to the parts per billion (ppb) range for many compounds, extreme care is exercised to prevent contamination of samples. When volatile or semi-volatile organic compounds are included for analysis, G-R sampling crew members will adhere to the following precautions in the field:

1. A clean pair of new, disposable gloves are worn for each well being sampled.

2. When possible, samples are collected from known or suspected wells that are least contaminated (i.e. background) followed by wells in increasing order of contamination.

3. Ambient conditions are continually monitored to maintain sample integrity.

When known or potential organic compounds are being sampled for, the following additional precautions are taken:

1. All sample bottles and equipment are kept away from fuels and solvents. When possible, gasoline (used in generators) is stored away from bailers, sample bottles, purging pumps, etc.

2. Bailers are made of Teflon or Stainless Steel. Other materials such as plastic may contaminate samples with phthalate esters which interfere with many Gas Chromatography (GC) analyses.

3. Volatile organic ground-water samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples): sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle; the Teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

4. Extra Teflon seals are brought into the field in case seals are difficult to handle and/or are dropped. Dropped seals are considered contaminated and are not used. When replacing seals or if seals become flipped, care is taken to assure that the Teflon seal faces down.

Sample analysis methods, containers, preservatives and holding times are shown on Table 1.

Laboratory and field handling procedures of samples are monitored by including QC samples for analysis with every submitted sample lot from a project site. QC samples may include any combination of the following:

A. Trip Blank: Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic-free water. Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are not opened, and are returned from a project site with the project site samples for analysis.

B. Field Blank: Prepared in the field using organic-free water. These QC samples accompany project site samples to the laboratory and are analyzed for specific chemical parameters unique to the project site where they were prepared.

C. Duplicates: Duplicated samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.

D. Equipment Blank: Periodic QC sample collected from field equipment rinsate to verify decontamination procedures.

The number and types of QC samples are determined as follows:

A. Up to 2 wells - Trip Blank Only

B. 2 to 5 Wells - 1 Field Blank and 1 Trip Blank

C. 5 to 10 Wells - 1 Field blank, 1 Trip Blank, and 1 Duplicate

D. More than 10 Wells - 1 Field Blank, 1 Trip Blank, and 1 Duplicate per each 12 wells

E. If sampling extends beyond one day, quality control samples will be collected for each day.

Additional QC is performed through ongoing and random reviews of duplicate samples to evaluate the precision of the field sampling procedures and analytical laboratory. Precision of QC data is accomplished by calculating the Relative Percent Difference (RPD). The RPD is evaluated to assess whether values are within an acceptable range (typically ± 20% of duplicate sample).

SAMPLE COLLECTION

This section describes the routine procedures followed by G-R while collecting ground-water samples for chemical analysis. These procedures include decontamination, water-level measurements, well purging, physical parameter measurements, sample collection, sample preservation, sample handling, and sample documentation. Critical sampling objectives for G-R are to:

1. Collect ground-water samples that are representative of the sampled matrix and,

2. Maintain sample integrity from the time of sample collection to receipt by the analytical laboratory.

Sample analyses methods, containers, preservation, and holding times are presented in Table 1.

Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly cleaned and prepared in the laboratory. Sample bottles, bottle caps, and septa are protected from all potential chemical contact before actual usage at a sample location.

During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well. The equipment are decontaminated by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

Water-Level Measurements

Prior to purging and sampling a well, the static-water levels are measured in all wells at a project site using an electric sounder and/or calibrated portable oil-water interface probe (Figure 4). Both static water-level and separate-phase product thickness are measured to the nearest ±0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ±0.01 foot with a decimal scale tape.

Water-Level Measurements (continued)

The monofilament line used to lower the bailer is replaced between wells with new line to preclude the possibility of cross-contamination. Field observations (e.g. well integrity, product color, turbidity, water color, odors, etc.) are noted on the G-R Well Sampling Field Data Sheet shown in Figure 4. Before and after each use, the electric sounder, interface probe and bailer are decontaminated by washing with Alconox or equivalent detergent followed by rinsing with deionized water to prevent cross-contamination.

As mentioned previously, water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Well Purging

Before sampling occurs, well casing storage water and interstitial water in the artificial sand pack will be purged using (1) a positive displacement bladder pump constructed of inert, non-wetting, Teflon and stainless steel, (2) a pneumatic-airlift pumping system, (3) a centrifigal pumping system, or (4) a Teflon or Stainless steel bailer (Figure 5). Methods of purging will be assessed based on well size, location, accessibility, and known chemical conditions. Individual well purge volumes are calculated from borehole volumes which take into account the sand packed interval in the well annular space. As a general rule, a minimum of 3 and a maximum of 10 borehole volumes will be purged. Wells which dewater or demonstrate slow recharge periods (i.e. low-yield wells) during purging activities may be sampled after fewer purging cycles. If a low-yield (low recovery) well is to be sampled, sampling will not take place until at least 80 percent of the previously measured water column has been replaced by recharge, or as per local requirements. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used by the G-R sampling crew as indicators for assessing sufficient purging. Purging is continued until all three physical parameters have stabilized. Specific conductance (conductivity) meters are read to the nearest ± 10 umhos/cm, and are calibrated daily. pH meters are read to the nearest ± 0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 degree F. Calibration of physical parameter meters will follow manufacturers specifications. Monitoring wells will be purged according to the protocol presented in Figure 5. Collected field data during purging activities will be entered on the G-R Well Sampling Field Data Sheet shown in Figure 4. Copies of the G-R Field Data Sheets will be reviewed by the G-R Sampling Manager for accuracy and completeness.

DOCUMENTATION

Sample Container Labels

Each sample container will be labeled by an adhesive label, noted in permanent ink immediately after the sample is collected. Label information will include:

Sample point designation (i.e. well number or code)

Sampler's identification

Project number

Date and time of collection

Type of preservation used

Well Sampling Data Forms

In the field, the G-R sampling crew will record the following information on the Well Sampling Data Sheet for each sample collected:

Project number

Client

Location

Source (i.e. well number)

Time and date

Well accessibility and integrity

Pertinent well data (e.g. depth, product thickness, static water-level, pH, specific conductance, temperature)

Calculated and actual purge volumes

Chain-of-Custody

A Chain-of-Custody record (Figure 6) shall be completed and accompany every sample and every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from time of collections. The record will contain the following information:

- Sample or station number or sample identification (ID)
- Signature of collector, sampler, or recorder
- Date and time of collection
- Place of collection
- Sample type
- Signatures of persons involved in chain of possession
- Inclusive dates of possession

Samples shall always be accompanied by a Chain-of-Custody record. When transferring the samples, the individual relinquishing and receiving the samples will sign, date, and note the time on the Chain-of-Custody record. G-R will be responsible for notifying the laboratory coordinator when and how many samples will be sent to the laboratory for analysis, and what types of analyses shall be performed.

TABLE 1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIONS, AND HOLDING TIMES

Parameter	Analytical Method	Reporting Units	Container	Preservation	Maximum Holding Time
Total Petroleum Hydrocarbons (Gasoline)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon	cool, 4 C HCl to pH<2	14 days (maximum)
Benzene Toluene Ethylbenzene Xylenes (BTEX	EPA 8020	mg/l ug/l	50 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	7 days (w/o preservative) 14 days (w preservative)
Oil & Grease	SM 503E	mg/l ug/l	1 l glass, Teflon lined septum	H2S04 or HCl to pH<2	28 days (maximum)
Total Petroleum Hydrocarbons (Diesel)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Halogented Volatile Organics (chlorinated solvents)	8010	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Non chlorinated solvents	8020	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Volatile Organics	8240	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Semi-Volatile Organics	8270	mg/l ug/l	1 l amber glass, Teflon lined septum	cool, 4 C	7 days extract 40 days (maximum to analyze)
Specific Conductance (Field test)		umhos/cm			
pH (Field test)		pH units			
Temperature (Field test)		Deg F			

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FIELD EXPLORATORY BORING LOG

FIGURE 1

Field location of boring:	Project No.:	Date:	Boring No:
	Client:		
	Location:		
	City:		Sheet
	Logged by:	Driller:	of
Drilling method:	Casing installation data:		
Hole diameter:	Top of Box Elevation:		Datum:

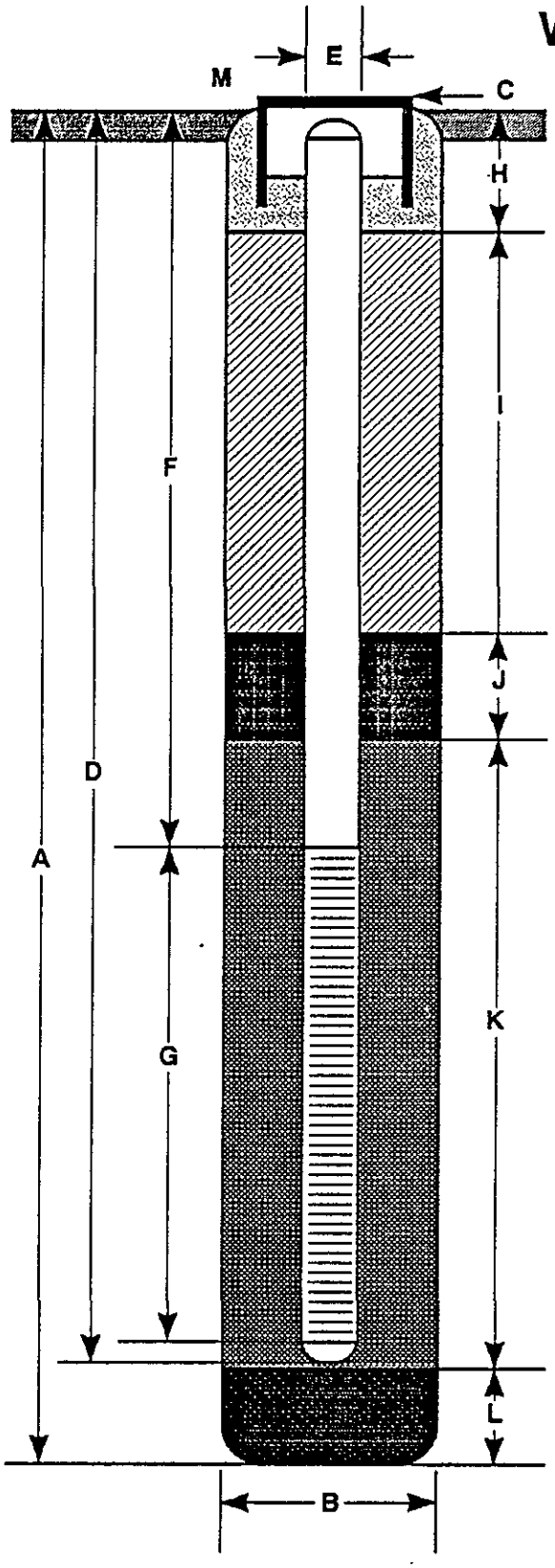
Water Level				
Time				
Date				

PID (ppm)	Blows/ft. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description

Remarks:

WELL CONSTRUCTION DETAIL

FIGURE 2



A Total Depth of Boring _____ ft.

B Diameter of Boring _____ in.
Drilling Method _____

C Top of Box Elevation _____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length _____ ft.
Material _____

E Casing Diameter _____ in.

F Depth to Top Perforations _____ ft.

G Perforated Length _____ ft.
Perforated Interval from _____ to _____ ft.
Perforation Type _____
Perforation Size _____ in.

H Surface Seal from _____ to _____ ft.
Seal Material _____

I Backfill from _____ to _____ ft.
Backfill Material _____

J Seal from _____ to _____ ft.
Seal Material _____

K Gravel Pack from _____ to _____ ft.
Pack Material _____

L Bottom Seal _____ ft.
Seal Material _____

M _____
_____

Note: Depths measured from initial ground surface

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Well Construction Detail

WELL NO.

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE

WELL DEVELOPMENT FORM FIGURE 3

Page_____ of_____

==========

(to be filled out in office)

Client_____ SS#_____ Job#_____

Name_____ Location_____

Well#_____ Screened Interval_____ Depth_____

Aquifer Material_____ Installation Date _____

Drilling Method_____ Borehole Diameter_____

Comments regarding well installation:_____

_____

_____

==========

(to be filled out in the field) Name_____

Date_____ Development Method_____

Total Depth_____ - Depth to liquid_____ = WaterColumn_____

Product thickness_____

_____ x _____ x _____ x 0.0408 = _____gals
Water Column Diameter (in.) #Vol

Purge Start_____ Stop_____ Rate_____ gpm

Gallons	Time	Clarity	Temp.	pH	Conductivity
0					

Total gallons removed_____ Development stop time_____

Depth to liquid _____at_____(time)

Odor of water_____ Water discharged to_____

Comments_____

_____

_____

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General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

FIGURE 4

COMPANY _____ JOB # _____

LOCATION _____ DATE _____

CITY _____ TIME _____

Well ID. _____ Well Condition _____

Well Diameter _____ in. Hydrocarbon Thickness _____ ft.

Total Depth _____ ft.

Depth to Liquid- _____ ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x _____ x(VF) _____ = (Estimated Purge Volume) _____ gal.

Purging Equipment _____

Sampling Equipment _____

Starting Time _____ Purging Flow Rate _____ gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume

Did well dewater? _____ If yes, time _____ Volume _____

Sampling Time _____ Weather Conditions _____

Analysis _____ Bottles Used _____

Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

FIGURE 5

Monitoring Well Sampling Protocol Schematic

Sampling Crew Reviews Project Sampling Requirements/Schedule

↓

Field Decontamination and Instrumentation Calibration

↓

Check Integrity of Well (Inspect for Well Damage)

↓

Measure and Record Depth to Water and Total Well Depth (Electric Well Sounder)

↓

Check for Floating Product (Oil/Water Interface Probe)

Floating Product Present

↓

Confirm Product Thickness (Acrylic or PVC Bailer)

↓

Collect Free-Product Sample

↓

Dissolved Product Sample Not Required

↓

Record Data on Field Data Form

Floating Product Not Present

↓

Purge Volume Calculation

$V = \pi (r/12)^2 h(\_\% \text{ vol})(7.48) = \_\_\_ / \text{gallons}$

V = Purge volume (gallons)

$\pi = 3.14159$

h = Height of Water Column (feet)

r = Borehole radius (inches)

↓

Evacuate water from well equal to the calculated purge volume while monitoring groundwater stabilization indicator parameters (pH, conductivity, temperature) at intervals of one casing volume.

Well Dewaters after One Purge Volume (Low yield well)

↓

Well Recharges to 80% of Initial Measured Water Column Height in Feet within 24 hrs. of Evacuation.

↓

Measure Groundwater Stability Indicator Parameters (pH, Temperature, Conductivity)

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Well Readily Recovers

↓

Record Groundwater Stability Indicator Parameters from each Additional Purge Volume

Stability indicated when the following Criteria are met:

pH :	± 0.1 pH units
Conductivity:	± 10%
Temperature:	1.0 degrees F

Groundwater Stability Achieved

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Groundwater Stability Not Achieved

↓

Continue Purging Until Stability is Achieved

↓

Collect Sample and complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION

Chain of Custody
FIGURE 6

COMPANY _____ JOB NO. _____

JOB LOCATION _____

CITY _____ PHONE NO. _____

AUTHORIZED _____ DATE _____ P.O. NO. _____

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY LAB: _____

DESIGNATED LABORATORY: _____ DHS #: _____

REMARKS: _____

DATE COMPLETED _____ FOREMAN _____

APPENDIX B
EXPLORATORY BORING LOGS
WELL CONSTRUCTION DETAILS

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

Perm	- Permeability
Consol	- Consolidation
LL	- Liquid Limit (%)
PI	- Plastic Index (%)
G_s	- Specific Gravity
MA	- Particle Size Analysis
2.5 YR 6/2	- Soil Color according to Munsell Soil Color Charts (1975 Edition)
5 GY 5/2	- GSA Rock Color Chart

☒	- No Soil Sample Recoverd
■	- "Undisturbed" Sample
⊠	- Bulk or Classification Sample
▽	- First Encountered Ground Water Level
▼	- Piezometric Ground Water Level
Penetration	- Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

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Unified Soil Classification - ASTM D 2488-85 and Key to Test Data

APPENDIX C
SOIL ANALYTICAL REPORT

Field location of boring: (See Plate 2)	Project No.: 727801	Date: 11/12/90	Boring No.: C-1
	Client: Chevron Service Station No. 5630		
	Location: 997 Grant Avenue		
	City: San Lorenzo, California		Sheet 1 of 2
	Logged by: KDM	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-Inches	Top of Box Elevation: 24.08		Datum: MSL

Water Level	17.5'		12.44'
Time	15:45		17:32
Date	11/13/90		12/5/90

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				0				
				1				PAVEMENT SECTION - 1.3 ft.
				2				SILTY CLAY (CL) - black (10YR 2/1), very stiff, damp, medium plasticity; 50% clay; 35% silt; 15% fine sand; trace fine gravel in cuttings.
				3				
				4				
	300		C-1-					SILTY SAND (SM) - dark grayish brown (10YR 4/2), medium dense, damp; 70% fine sand; 30% silt; trace worm burrows.
6.8	400	S&H	5.0	5				
	refusal			6				
				7				
				8				
				9				SILTY CLAY (CL/ML) - black (10YR 2/1), very stiff, damp, low plasticity; 60% clay; 45% silt; 5% fine sand; roots and rootholes; small white caliche concretions.
			C-1-	10				
1.5	18	S&H	10.5					
				11				
				12				
				13		▼		CLAY (CL) - light olive brown (2.5YR 5/4), stiff, moist, medium to high plasticity; 80% clay; 15% silt; 5% fine sand.
				14				
			C-1-	15				ocasional small (<1 mm) black and red-brown rock fragments.
1.5	10	S&H	15.5					
				16				
				17				
				18		▽		easier drilling at 17 feet. Water on sample rods at 17.5 feet.
				19				

Remarks: * Converted to equivalent Standard Penetration blows/ft.

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Log of Boring

BORING NO. C-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	Mcc: CE6 1351	11/90		

Field location of boring:

(See Plate 2)

Project No.:	727801	Date: 11/12/90	Boring No: C-1
Client:	Chevron Service Station No. 5630		
Location:	997 Grant Avenue		
City:	San Lorenzo, California		Sheet 2 of 2
Logged by:	KDM	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-Inches

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				20				SANDY SILT (ML) - pale yellow (2.5Y 7/4), loose, moist, low plasticity; 70% silt; 20% fine sand; 10% nodules of saturated fine sand and white caliche.
			C-1-					
1.5	4	S&H	20.5	21				
				22				grades to:
				23				50% silt; 40% fine sand; 10% scattered small caliche nodules; rare harder fragments (1/4 inch diameter).
				24				
			C-1-	25				
1.5	8	S&H	25.5	26				
				27				
				28				Stiffer at 28 feet.
				29				CLAY (CL) - pale yellow brown (2.5Y 7/4), very stiff, damp, medium plasticity; 70% clay; 25% silt; 5% fine sand.
			C-1-					
1.5	15	S&H	30.0	30				
				31				
				32				CLAYEY SILT (ML/CL) - pale yellow brown (2.5Y 7/4), medium stiff, slightly damp, medium plasticity; 50% silt; 40% clay; 10% fine sand.
			C-1-	33				
N/A	8	SPT	33.5	34				Bottom of sample at 33.5 feet.
				35				Bottom of boring at 33.5 feet.
				36				11/12/90
				37				
				38				
				39				

Remarks: N/A = Not Available

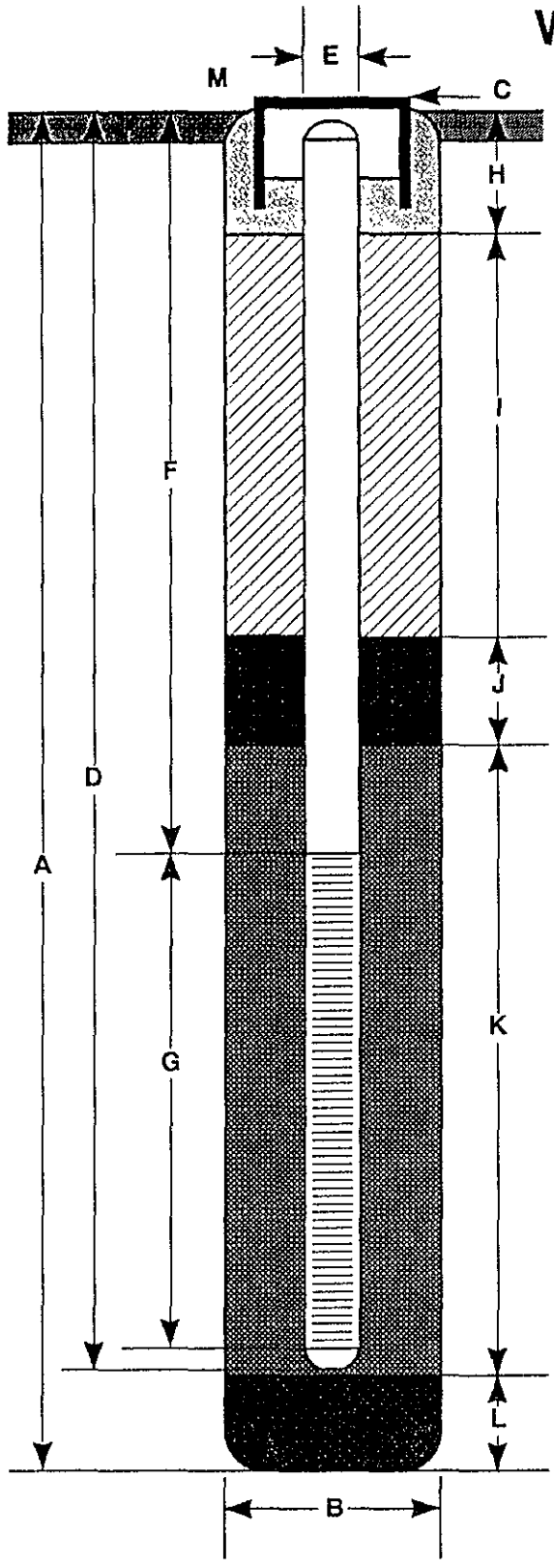
GeoStrategies Inc.

Log of Boring

BORING NO. C-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC: CEG 1351	11/90		

WELL CONSTRUCTION DETAIL



A *Total Depth of Boring* 33.5 ft.

B Diameter of Boring 8 in.
Drilling Method *Hollow Stem Auger*

C Top of Box Elevation 24.08 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 28 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 15 ft.

G Perforated Length 13 ft.
Perforated Interval from 15 to 28 ft.
Perforation Type Factory Slot
Perforation Size 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material Concrete

I Backfill from 1.5 to 10.5 ft.
Backfill Material Concrete

J Seal from 10.5 to 13 ft.
Seal Material Bentonite

K Gravel Pack from 13 to 28 ft.
Pack Material Lonestar #2/12 sand

L Bottom Seal 5.5 ft.
Seal Material Bentonite

M Vault box with locking cap and cover.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. **C-1**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	Mcc: CE6/351	11/90		

*Field location of boring:

(See Plate 2)

Project No.: 727801	Date: 11/12/90	Boring No: C-2	
Client: Chevron Service Station No. 5630			
Location: 997 Grant Avenue			
City: San Lorenzo, California		Sheet 1 of 2	
Logged by: KDM	Driller: Bayland		
Casing installation data:			
Drilling method: Hollow Stem Auger			
Hole diameter: 8-inches	Top of Box Elevation: 22.69	Datum: MSL	

Water Level	18.7'	11.0'		11.30'
Time	16:00	15:50		17:00
Date	11/12/90	11/13/90		12/5/90

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 1.3 ft. thick
				2				
				3				SANDY CLAY (CL) - black (2.5YR/), medium stiff, damp, medium plasticity; 50 % clay; 40% fine sand; 10% silt; trace worm burrows.
	150							
62	150	S&H	C-2-4.0	4				
	150							
				5				
				6				
				7				
				8				CLAYEY SAND (SC) - olive yellow (2.5YR 6/6), medium dense, damp; 50% medium sand; 30% clay; 10% coarse sand; 10% silt.
	250							
1274	250	S&H	C-2-9.0	9				
	250							
				10				
				11		▼		
				12				
				13				
7.9	9	S&H	C-2-14.0	14				CLAY (CL) - gray (2.5 YR/4), stiff, damp, medium plasticity; 70% clay; 25% silt; 5% diseminated caliche (white to gray color), small rootholes; dark staining along vertical soil pores or burrows.
				15				
				16				
				17				CLAYEY SILT (ML/CL) - olive yellow (2.5Y 6/6), medium stiff, moist; 60% silt; 10% fine sand; 25% clay; 5% rock fragments; very small rootholes.
				18				
				19		▽		
N/A	7	S&H	C-2-19.5	20				

Remarks: *Converted to equivalent Standard Penetration blow/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. C-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC : CEG 1351	11/90		

Field location of boring:

(See Plate 2)

Project No.: 727801	Date: 11/12/90	Boring No: C-2	
Client: Chevron Service Station No. 5630			
Location: 997 Grant Avenue			
City: San Lorenzo, California		Sheet 2 of 2	
Logged by: KDM	Driller: Bayland		

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				SANDY SILT (ML) - olive yellow (2.5Y 6/6), loose, saturated, small rootlets, trace caliche; 40% - 60% silt; 30% - 50% fine sand; 10% - 30% clay. Alternate sandy and silty beds, 1 to 2 inches thick.
				22				
				23				
50.3	7	S&H	C-2-24.0	24				
				25				
				26				
				27				
				28				harder drilling at 27.5 ft.
1.5	9	S&H	C-2-29.0	29				CLAY (CL) - olive yellow (2.5Y 6/6), stiff, moist, trace disemenated caliche; 60% clay; 30% silt; 10% fine sand.
				30				Bottom of Boring at 29.5 ft.
				31				Bottom of Sample at 29.5 ft.
				32				11/12/90
				33				
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

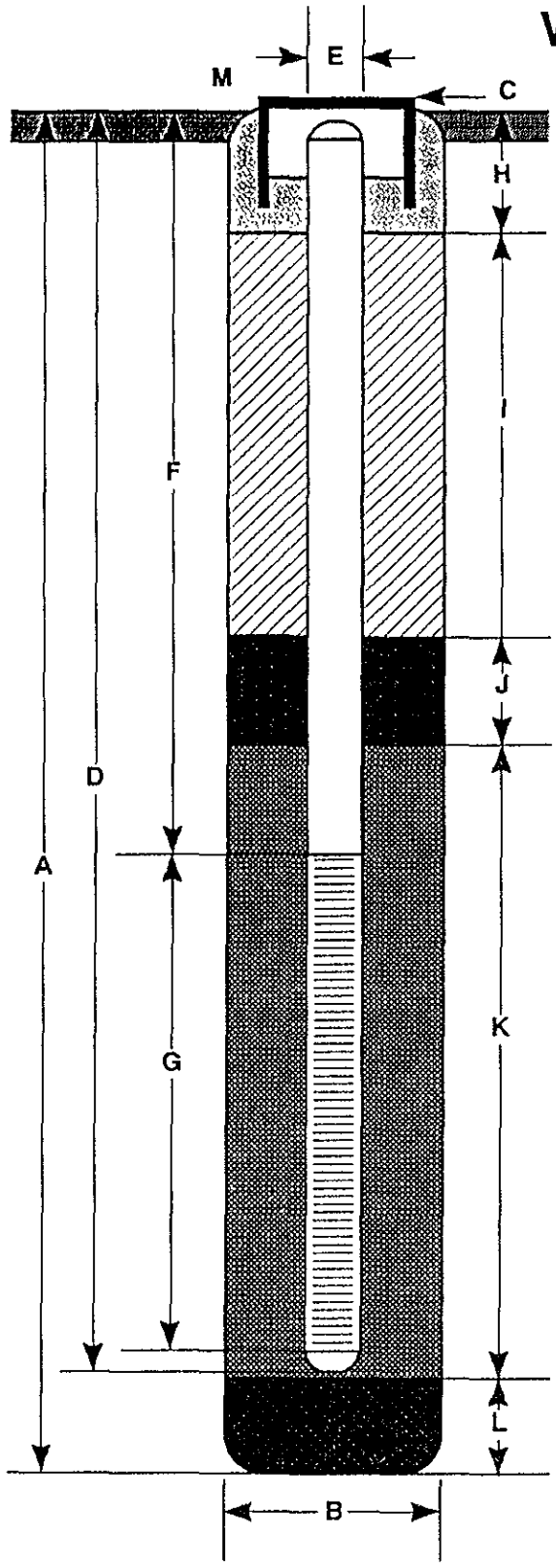
GeoStrategies Inc.

Log of Boring

BORING NO. C-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC: CEG 1351	11/90		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 29.5 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 22.69 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 28 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 15 ft.

G Perforated Length 13 ft.
Perforated Interval from 15 to 28 ft.
Perforation Type Factory Slot
Perforation Size 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material Concrete

I Backfill from 1.5 to 11 ft.
Backfill Material Concrete

J Seal from 11 to 13 ft.
Seal Material Bentonite

K Gravel Pack from 13 to 28 ft.
Pack Material Lonestar #2/12 sand

L Bottom Seal 1.5 ft.
Seal Material Native Material

M Vault box with locking cap and cover.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. C-2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC: CE6 1351	11/90		

Field location of boring:

(See Plate 2)

Project No.:	727801	Date: 11/12/90	Boring No: C-3
Client:	Chevron Service Station No. 5630		
Location:	997 Grant Avenue		
City:	San Lorenzo, California		Sheet 1 of 2
Logged by:	KDM	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: 23.45 Datum: MSL

Water Level	18.0'	11.5'		11.75'
Time	15:40	16:00		15.55
Date	11/12/90	11/13/90		12/5/90

PID (ppm)	Blows/ft*. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				0				
				1				PAVEMENT SECTION 1.0 ft.
				2				SANDY CLAY (CL) - black (10YR 2/1), medium stiff, damp, low to medium plasticity.
				3				
				4				
	150			5				
	200							
78	200	S&H	C-3-5.5	6				SANDY SILT (ML) - black (10YR 2/1), medium stiff, damp, low to medium plasticity; 70% silt; 20% sand; 10% clay; discoloration from product.
				7				
				8				
				9				COLOR CHANGE to very dark grayish brown (2.5YR 3/2), damp, low plasticity; 70% silt; 25% sand; 5% clay.
				10				
750	13	S&H	C-3-10.5	11				
				12		▼		
				13				easy drilling at 12.5 ft.
				14				
				15				CLAY (CL) - dark grayish brown (10YR 4/2), stiff, saturated, medium to high plasticity; rootholes; 75% clay; 15% silt; 10% sand;
29	10	S&H	C-3-15.5	16				
				17				
				18		▽		Water on rods at 18.0 ft.
				19				

Remarks: * Converted to equivalent Standard Penetration blow/ft.

GSI GeoStrategies Inc.

Log of Boring

BORING NO. C-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	Mcc: CEG 1351	11/90		

Field location of boring: (See Plate 2)	Project No.: 727801	Date: 11/12/90	Boring No: C-3
	Client: Chevron Service Station No. 5630		
	Location: 997 Grant Avenue		Sheet 2
	City: San Lorenzo, California		of 2
	Logged by: KDM	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:	Datum:	

								Water Level				
								Time				
								Date				
PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description				
								COLOR CHANGE to dark brown (10YR 3/13) at 19.0 ft., medium stiff; 80% clay; 10% silt; 10% fine sand; open burrows; rootholes.				
6	6	S&H	C-3-20.5	20								
				21								
				22								
				23				Harder drilling at 23.5 ft.				
				24								
			C-3-					COLOR CHANGE to light olive brown (2.5YR 5/4) at 24.0 ft.; damp.				
3.5	9	S&H	25.5	25								
				26								
				27				Bottom of Boring at 27.0 ft.				
				28				Bottom of Sample at 27.0 ft.				
				29				11/12/90				
				30								
				31								
				32								
				33								
				34								
				35								
				36								
				37								
				38								

Remarks:

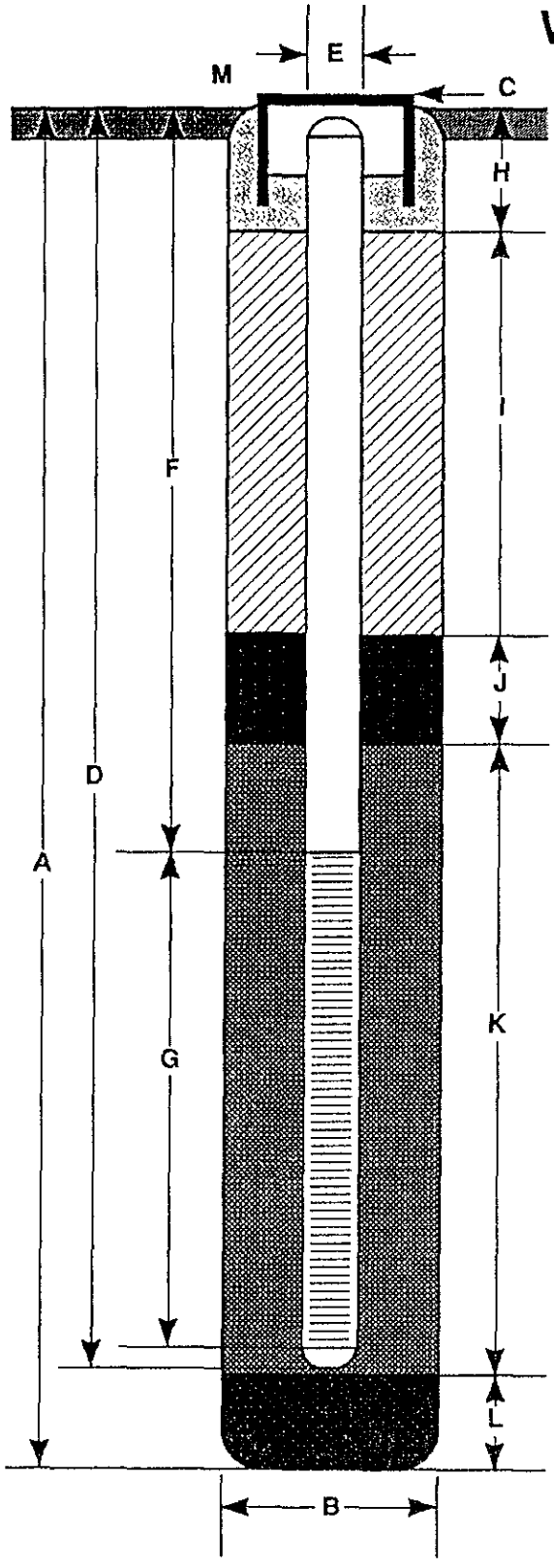
GeoStrategies Inc.

Log of Boring

BORING NO. C-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCL: CE61351	11/90		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring: 27 ft.

B Diameter of Boring: 8 in.
Drilling Method: Hollow Stem Auger

C Top of Box Elevation: 23.45 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length: 28 ft.
Material: Shedule 40 PVC

E Casing Diameter: 2 in.

F Depth to Top Perforations: 17 ft.

G Perforated Length: 10 ft.
Perforated Interval from: 17 to 27 ft.
Perforation Type: Factory Slot
Perforation Size: 0.020 in.

H Surface Seal from: 0.0 to 1.5 ft.
Seal Material: Concrete

I Backfill from: 1.5 to 13 ft.
Backfill Material: Concrete

J Seal from: 13 to 15 ft.
Seal Material: Bentonite

K Gravel Pack from: 15 to 27 ft.
Pack Material: Lonestar #2/12 sand

L Bottom Seal: 0.0 ft.
Seal Material: Native Material

M Vault Box with locking cap and cover.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. C-3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC: CEG 1351	11/90		

Field location of boring: (See Plate 2)	Project No.: 727801	Date: 11/13/90	Boring No: C-4
	Client: Chevron Service Station No. 5630		
	Location: 997 Grant Avenue		
	City: San Lorenzo, California		Sheet 1 of 2
	Logged by: KDM	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation: 23.32		Datum: MSL

Water Level	19.0'	14.0'	12.0'	11.85'
Time	14:30	15:00	16:05	16:36
Date	11/13/90	11/13/90	11/13/90	12/5/90

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				0				PAVEMENT SECTION 1.0 ft.
				1				FILL - GRAVELLY SAND, dense, slightly damp
				2				
				3				
				4				
	200			5				SANDY CLAY (CL) - black (10YR 2/1), medium stiff,
	200							damp, low to medium plasticity; 60% clay; 20% silt; 20%
0	200	S&H	C-4-5.5	6				sand.
				7				
				8				
				9				
				10				
1994	14	S&H	C-4-10.5	11				COLOR CHANGE to olive brown (2.5Y 4/4) at 9.0 ft., stiff,
								damp; 50% clay; 25% silt; 25% sand; trace shell
				12		▼		fragments.
				13				
				14		▼		
				15				CLAY (CL) - grayish brown (2.5Y 4/2), medium stiff,
0	8	S&H	C-4-15.5					damp, medium to high plasticity; 70% clay; 25% silt; 5%
				16				sand; gray oxidation staining along small rootholes and
				17				soil pores.
				18				
				19		▽		

Remarks: * Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. C-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC : CEG 1351	11/90		

Field location of boring:

(See Plate 2)

Project No.: 727801	Date: 11/13/90	Boring No. C-4	
Client: Chevron Service Station No. 5630			
Location: 997 Grant Avenue			
City: San Lorenzo, California		Sheet 2 of 2	
Logged by: KDM	Driller: Bayland		

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Casing installation data:

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				20				CLAYEY SILT (ML) - light olive brown (2.5YR 5/4), medium stiff, damp, medium plasticity; 60% silt; 35% clay; 5% fine sand.
15.5	6	S&H	C-4-20.5	21				
				22				
				23				
				24				
				25				
7.9	7	S&H	C-4-25.5	26				
				27				
				28				
				29				
				30				
N/A	6	S&H	C-4-30.5	31				Bottom of Boring at 30.5 ft.
				32				Bottom of Sample at 30.5 ft.
				33				11/13/90
				34				
				35				
				36				
				37				
				38				
				39				

Remarks:

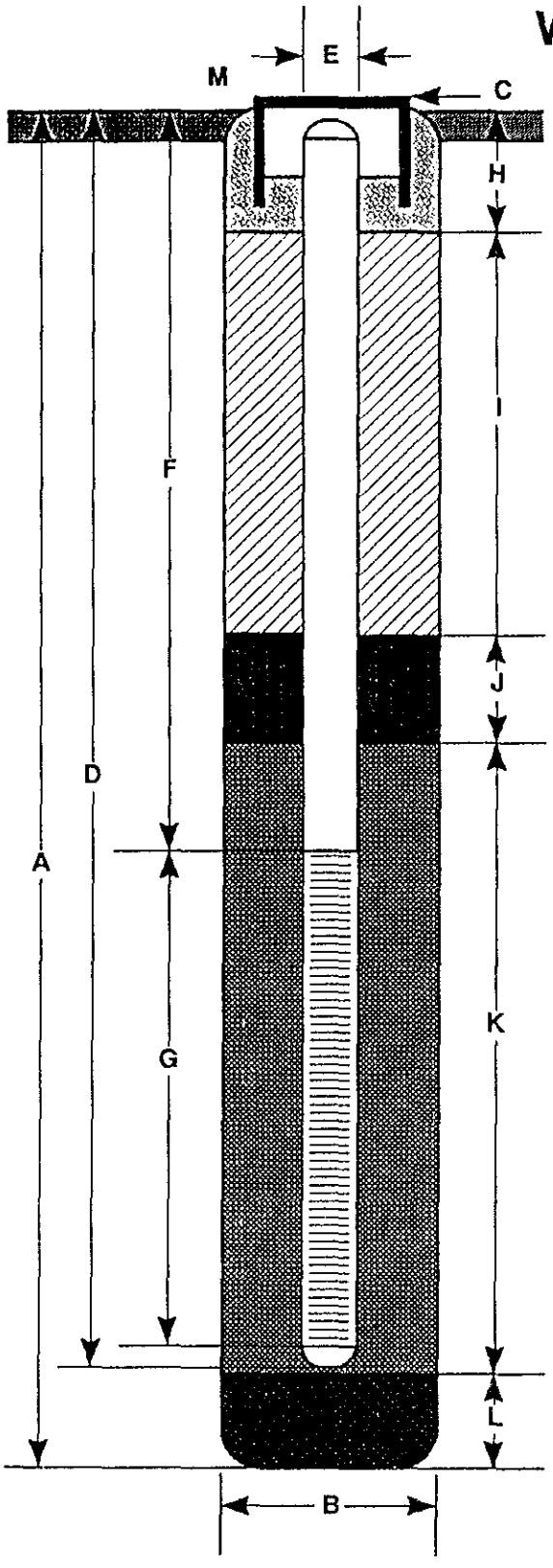
GeoStrategies Inc.

Log of Boring

BORING NO. C-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC: CEG 1351	11/90		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 30.5 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 23.32 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 29 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 17 ft.

G Perforated Length 22 ft.
Perforated Interval from 17 to 29 ft.
Perforation Type Factory Slot
Perforation Size 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material Concrete

I Backfill from 1.5 to 13 ft.
Backfill Material Concrete

J Seal from 13 to 15 ft.
Seal Material Bentonite

K Gravel Pack from 17 to 29 ft.
Pack Material Lonestar #2/12 sand

L Bottom Seal 1.5 ft.
Seal Material Native Material

M Vault box with locking cap and cover.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. C-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
727801	MCC: CE6 1351	11/90		

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 11204
CLIENT: Chevron USA
CLIENT JOB NO.: 7278

DATE RECEIVED: 11/15/90
DATE REPORTED: 11/24/90

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
11204- 1	C-1-5	11/12/90	11/20/90
11204- 2	C-1-10.5	11/12/90	11/20/90
11204- 3	C-1-15.5	11/12/90	11/20/90
11204- 4	C-2-4.0	11/12/90	11/20/90
11204- 5	C-2-9.0	11/12/90	11/20/90
11204- 6	C-2-14.0	11/12/90	11/20/90
11204- 7	C-2-19.5	11/12/90	11/20/90
11204- 8	C-3-5.5	11/12/90	11/20/90
11204- 9	C-3-10.5	11/12/90	11/20/90
11204-10	C-3-15.5	11/12/90	11/20/90

Laboratory Number:	11204 1	11204 2	11204 3	11204 4	11204 5
ANALYTE LIST	Amounts/Quantitation Limits (mg/kg)				
OIL AND GREASE:	ND<50	ND<50	ND<50	NA	NA
TPH/GASOLINE RANGE:	ND<1	ND<1	ND<1	3	99
TPH/DIESEL RANGE:	NA	NA	NA	NA	NA
BENZENE:	NA	NA	NA	0.046	0.18
TOLUENE:	NA	NA	NA	0.008	0.22
ETHYL BENZENE:	NA	NA	NA	ND<.005	0.96
XYLENES:	NA	NA	NA	0.036	1.5

Laboratory Number:	11204 6	11204 7	11204 8	11204 9	11204 10
ANALYTE LIST	Amounts/Quantitation Limits (mg/kg)				
OIL AND GREASE:	NA	NA	NA	NA	NA
TPH/GASOLINE RANGE:	ND<1	ND<1	2	140	ND<1
TPH/DIESEL RANGE:	NA	NA	NA	NA	NA
BENZENE:	0.006	ND<.005	1.7	0.20	ND<.005
TOLUENE:	ND<.005	ND<.005	0.019	0.041	0.008
ETHYL BENZENE:	ND<.005	ND<.005	0.036	1.4	ND<.005
XYLENES:	0.010	ND<.005	0.037	0.93	0.013

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 11204
CLIENT: Chevron USA
CLIENT JOB NO.: 7278

DATE RECEIVED: 11/15/90
DATE REPORTED: 11/24/90

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
11204-11	C-3-20.5	11/12/90	11/20/90
11204-12	C-4-10.5	11/12/90	11/21/90
11204-13	C-4-15.5	11/12/90	11/20/90
11204-14	C-4-20.5	11/13/90	11/20/90

Laboratory Number:	11204 11	11204 12	11204 13	11204 14
ANALYTE LIST	Amounts/Quantitation Limits (mg/kg)			
OIL AND GREASE:	NA	NA	NA	NA
TPH/GASOLINE RANGE:	ND<1	890	ND<1	1
TPH/DIESEL RANGE:	NA	NA	NA	NA
BENZENE:	ND<.005	2.8	ND<.005	0.007
TOLUENE:	0.006	26	ND<.005	0.014
ETHYL BENZENE:	ND<.005	22	ND<.005	0.008
XYLENES:	0.011	110	0.008	0.043

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

CERTIFICATE OF ANALYSIS

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
Diesel by Modified EPA SW-846 Method 8015
Gasoline by Purge and Trap: EPA MEthod 8015/5030
ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-846 Methods 5030 and 8020

QA/QC INFORMATION
SET: 11204

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:
Duplicate RPD 2%
Minimum Detection Limit in Soil: 20mg/kg

Modified EPA Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Soil: 10mg/kg
Daily Standard run at 200mg/L; %Diff Diesel = NA
MS/MSD Average Recovery = NA: Duplicate RPD = NA

8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Soil: 1mg/kg
Daily Standard run at 2mg/L; %Diff Gasoline = <15%
MS/MSD Average Recovery = 90%: Duplicate RPD = 3%

8020/BTXE
Minimum Quantitation Limit in Soil: 0.005mg/kg
Daily Standard run at 20ug/L; %Diff = <15%
MS/MSD Average Recovery = 104%: Duplicate RPD = <1%

Richard Srna, Ph.D.
Laboratory Director

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

CERTIFICATE OF ANALYSIS

LABORATORY NO. 11204-1
CLIENT: Chevron USA

DATE RECEIVED: 11/15/90
DATE REPORTED: 11/26/90
JOB NO. 7278

#9278

EPA SW-846 METHOD 8240 - VOLATILE ORGANICS
by Gas Chromatography/ Mass Spectrometry

SAMPLE: C-1-5

Compound	ug/kg	Compound	ug/kg
Chloromethane	ND<50	Cis-1,3-Dichloropropene	ND<15
Bromomethane	ND<50	Trichloroethene	ND<15
Vinyl Chloride	ND<50	Dibromochloromethane	ND<15
Chloroethane	ND<50	1,1,2-Trichloroethane	ND<15
Methylene Chloride	ND<50	Benzene	ND<10
Acetone	ND<50	Trans-1,3-Dichloropropene	ND<15
Carbon disulfide	ND<15	2-Chloroethyl vinyl ether	ND<15
Trichlorofluoromethane	ND<15	Bromoform	ND<15
1,1-Dichloroethene	ND<15	4-Methyl-2-Pentanone	ND<50
1,1-Dichloroethane	ND<15	2-Hexanone	ND<50
1,2-Dichloroethene (total)	ND<15	Tetrachloroethene	ND<15
Chloroform	ND<15	1,1,2,2-Tetrachloroethane	ND<15
1,2-Dichloroethane	ND<15	Toluene	ND<15
2-Butanone	ND<100	Chlorobenzene	ND<15
1,1,1-Trichloroethane	ND<15	Ethylbenzene	ND<15
Carbon Tetrachloride	ND<15	Styrene	ND<15
Vinyl Acetate	ND<50	Total Xylenes	ND<15
Bromodichloromethane	ND<15	1,3-Dichlorobenzene	ND<15
1,2-Dichloropropane	ND<15	1,2&1,4-Dichlorobenzenes	ND<15

ug/kg = part per billion (ppb)
QC DATA:

Surrogate Recoveries		QC Limits water	QC Limits soil
1,2-DCA-d4.....	106%	76-114	81-117
Toluene-d8.....	103%	88-110	81-140
Bromofluorobenzene.....	91%	86-115	74-121

comments:

Richard Srna, Ph.D.
Laboratory Director

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

CERTIFICATE OF ANALYSIS

LABORATORY NO. 11204-2
CLIENT: Chevron USA

DATE RECEIVED: 11/15/90
DATE REPORTED: 11/26/90
JOB NO. 7278

EPA SW-846 METHOD 8240 - VOLATILE ORGANICS
by Gas Chromatography/ Mass Spectrometry

SAMPLE: C-1-10.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	ND<50	Cis-1,3-Dichloropropene	ND<15
Bromomethane	ND<50	Trichloroethene	ND<15
Vinyl Chloride	ND<50	Dibromochloromethane	ND<15
Chloroethane	ND<50	1,1,2-Trichloroethane	ND<15
Methylene Chloride	ND<50	Benzene	ND<10
Acetone	ND<50	Trans-1,3-Dichloropropene	ND<15
Carbon disulfide	ND<15	2-Chloroethyl vinyl ether	ND<15
Trichlorofluoromethane	ND<15	Bromoform	ND<15
1,1-Dichloroethene	ND<15	4-Methyl-2-Pentanone	ND<50
1,1-Dichloroethane	ND<15	2-Hexanone	ND<50
1,2-Dichloroethene (total)	ND<15	Tetrachloroethene	ND<15
Chloroform	ND<15	1,1,2,2-Tetrachloroethane	ND<15
1,2-Dichloroethane	ND<15	Toluene	ND<15
2-Butanone	ND<100	Chlorobenzene	ND<15
1,1,1-Trichloroethane	ND<15	Ethylbenzene	ND<15
Carbon Tetrachloride	ND<15	Styrene	ND<15
Vinyl Acetate	ND<50	Total Xylenes	ND<15
Bromodichloromethane	ND<15	1,3-Dichlorobenzene	ND<15
1,2-Dichloropropane	ND<15	1,2&1,4-Dichlorobenzenes	ND<15

ug/kg = part per billion (ppb)
QC DATA:

Surrogate Recoveries		QC Limits water	QC Limits soil
1,2-DCA-d4.....	103%	76-114	81-117
Toluene-d8.....	106%	88-110	81-140
Bromofluorobenzene.....	100%	86-115	74-121

comments:

Richard Srna, Ph.D.
Laboratory Director

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

CERTIFICATE OF ANALYSIS

LABORATORY NO. 11204-3
CLIENT: Chevron USA

DATE RECEIVED: 11/15/90
DATE REPORTED: 11/26/90
JOB NO. 7278

EPA SW-846 METHOD 8240 - VOLATILE ORGANICS
by Gas Chromatography/ Mass Spectrometry

SAMPLE: C-1-15.5

Compound	ug/kg	Compound	ug/kg
Chloromethane	ND<50	Cis-1,3-Dichloropropene	ND<15
Bromomethane	ND<50	Trichloroethene	ND<15
Vinyl Chloride	ND<50	Dibromochloromethane	ND<15
Chloroethane	ND<50	1,1,2-Trichloroethane	ND<15
Methylene Chloride	ND<50	Benzene	ND<10
Acetone	ND<50	Trans-1,3-Dichloropropene	ND<15
Carbon disulfide	ND<15	2-Chloroethyl vinyl ether	ND<15
Trichlorofluoromethane	ND<15	Bromoform	ND<15
1,1-Dichloroethene	ND<15	4-Methyl-2-Pentanone	ND<50
1,1-Dichloroethane	ND<15	2-Hexanone	ND<50
1,2-Dichloroethene (total)	ND<15	Tetrachloroethene	ND<15
Chloroform	ND<15	1,1,2,2-Tetrachloroethane	ND<15
1,2-Dichloroethane	ND<15	Toluene	ND<15
2-Butanone	ND<100	Chlorobenzene	ND<15
1,1,1-Trichloroethane	ND<15	Ethylbenzene	ND<15
Carbon Tetrachloride	ND<15	Styrene	ND<15
Vinyl Acetate	ND<50	Total Xylenes	ND<15
Bromodichloromethane	ND<15	1,3-Dichlorobenzene	ND<15
1,2-Dichloropropane	ND<15	1,2&1,4-Dichlorobenzenes	ND<15

ug/kg = part per billion (ppb)
QC DATA:

Surrogate Recoveries		QC Limits water	QC Limits soil
1,2-DCA-d4.....	107%	76-114	81-117
Toluene-d8.....	102%	88-110	81-140
Bromofluorobenzene.....	101%	86-115	74-121

comments:

Richard Srna, Ph.D.
Laboratory Director

OUTSTANDING QUALITY AND SERVICE

Chain-of-Custody Record

Job # 11204

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

Chevron Facility Number: 5630
Consultant Release Number:
Consultant Project Number: 7278
Consultant Name: Getler-Ryan Inc.
Address: 2150 W. Winton Ave., Hayward
Fax Number: (415) 783-1089
Project Contact (Name): Randy Young
(Phone): (415) 352-4800

Chevron Contact (Name): Nancy Vukelich
(Phone):
Laboratory Name: Superior Analytical Laboratory
Contract Number: 4247210
Samples Collected by (Name): Mike Carey / Kevin McGraw
Collection Date: 11/12/90, 11/13/90
Signature: Kevin D. McGraw

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803				Remarks
C-1-5		1	S	G	10:00		✓	✓		✓		✓					TOC	TH (Gro) EPA 8240
C-1-10.5		1	S	G	10:10		✓	✓		✓		✓						
C-1-15.5		1	S	G	10:17		✓	✓		✓		✓						
C-2-4.0		1	S	G	1:10		✓	✓			✓							
C-2-9.0		1	S	G	1:17		✓	✓			✓							
C-2-14.0		1	S	G	1:25		✓	✓			✓							
C-2-19.5		1	S	G	1:35		✓	✓			✓							
C-3-5.5		1	S	G	3:20		✓	✓			✓							
C-3-10.5		1	S	G	3:25		✓	✓			✓							
C-3-15.5		1	S	G	3:33		✓	✓			✓							
C-3-20.5		1	S	G	3:45		✓	✓			✓							
C-4-10.5		1	S	G	2:10		✓	✓			✓							
C-4-15.5		1	S	G	2:20		✓	✓			✓							

Please initial: CMJ
Samples Stored in ice. Yes
Appropriate containers. Yes Glass Brass Steel
Samples preserved. NA
VOA's without headspace. NA
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	Turn Around Time (Circle Choice)
Kevin D. McGraw	GSI	11-15-90 0710		Getler Ryan	11-15-90 0710	24 Hrs
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	48 Hrs
	G/R	11-15-90 1130				5 Days
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time	(10 Days)
			Cecilia D. Joaquin		11/15/90 12:30	

Printed in U.S.A.

MS 5136 (6 89)

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94: 3
FAX (415) 842-9591

Chevron Facility Number 5630

Consultant Release Number ____ Consultant Project Number 7278

Consultant Name Gettler - Ryan Inc

Address 2150 W. Winton Ave., Hayward

Fax Number (415) 783-1089

Project Contact (Name) Randy Young

(Phone) (415) 352-4800

Chevron Contact (Name) Nancy Vukelich

(Phone) ____

Laboratory Name Superior Analytical Laboratory

Contract Number 42477210

Samples Collected by (Name) Mike Carey / Kevin McGraw

Collection Date 11/13/90

Signature Kevin D. McGraw

Sample Numbe.	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803			Remarks
C-4-20.5		1	S	G	2:30		✓	✓			✓						Gas BTXE scores

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

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	Turn Around Time (Circle Choice)
Kevin D. McGraw	GSI	11-15-90 0700		Gettler Ryan	11-15-90 0700	24 Hrs
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	48 Hrs
	Gettler Ryan	11-15-90 12:30				5 Days
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time	(10 Days)
			Cecilia G. Joaquin		11/15/90 12:30	

Printed in U.S.A.

MS 5136 (6 89)

APPENDIX D

GETTLER-RYAN INC. GROUND-WATER SAMPLING REPORT

gettler — ryan inc.

December 20, 1990

GROUNDWATER SAMPLING REPORT

Chevron U.S.A. Inc.
Post Office Box 5004
San Ramon, California 94583-0804

Referenced Site: Former Chevron Service Station #5630
997 Grant Ave./Washington Ave.
San Lorenzo, California

Sampling Date: December 5, 1990

This report presents the results of the groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on December 5, 1990 at the referenced location. The site is occupied by a former operating service station located on the northeast corner of Grant Avenue and Washington Avenue. The former service station has underground storage tanks which contained petroleum products.

There are currently four groundwater monitoring wells on site at the location shown on the attached site map. Wells C-1 thru C-4 were developed on November 26, 1990. Prior to sampling, all wells were inspected for total well depth, water levels, and presence of separate phase hydrocarbons using an electronic interface probe. A clean acrylic bailer was used to visually confirm the presence and thickness of separate phase hydrocarbons. Groundwater depths ranged from 11.30 to 12.44 feet below grade. Separate phase hydrocarbons were not observed in any monitoring wells.

The wells were then purged and sampled. The purge water was contained in drums for proper disposal. Standard sampling procedure calls for a minimum of four case volumes to be purged from each well. Each well was purged while pH, temperature, and conductivity measurements were monitored for stability. Details of the final well purging results are presented on the attached Table of Monitoring Data. In cases where a well dewatered or less than four case volumes were purged, groundwater samples were obtained after the physical parameters had stabilized. Under such circumstances the sample may not represent actual formation water, due to low flow conditions.

Samples were collected, using Teflon bladder pumps, in properly cleaned and laboratory prepared containers. All sampling equipment was thoroughly cleaned after each well was sampled and steam cleaned upon completion of work at the site. The samples were labeled, stored on blue ice, and transported to the laboratory for analysis. A trip blank, supplied by the laboratory, was included and analyzed to assess quality control. Analytical results for the trip blank are included in the Certified Analytical Report (CAR's). Chain of custody records were established noting sample identification numbers, time, date, and custody signatures.

2150 west winton avenue • hayward, california 94545-1210 • (415) 783-7500

The samples were analyzed by Superior Analytical Laboratory Inc., located at 1555 Burke, Unit 1, San Francisco, California. The laboratory is assigned a California DHS-HMTL Certification number of 1332. The results are presented as a Certified Analytical Report, a copy of which is attached to this report.

Tom Paulson
Sampling Manager

attachments

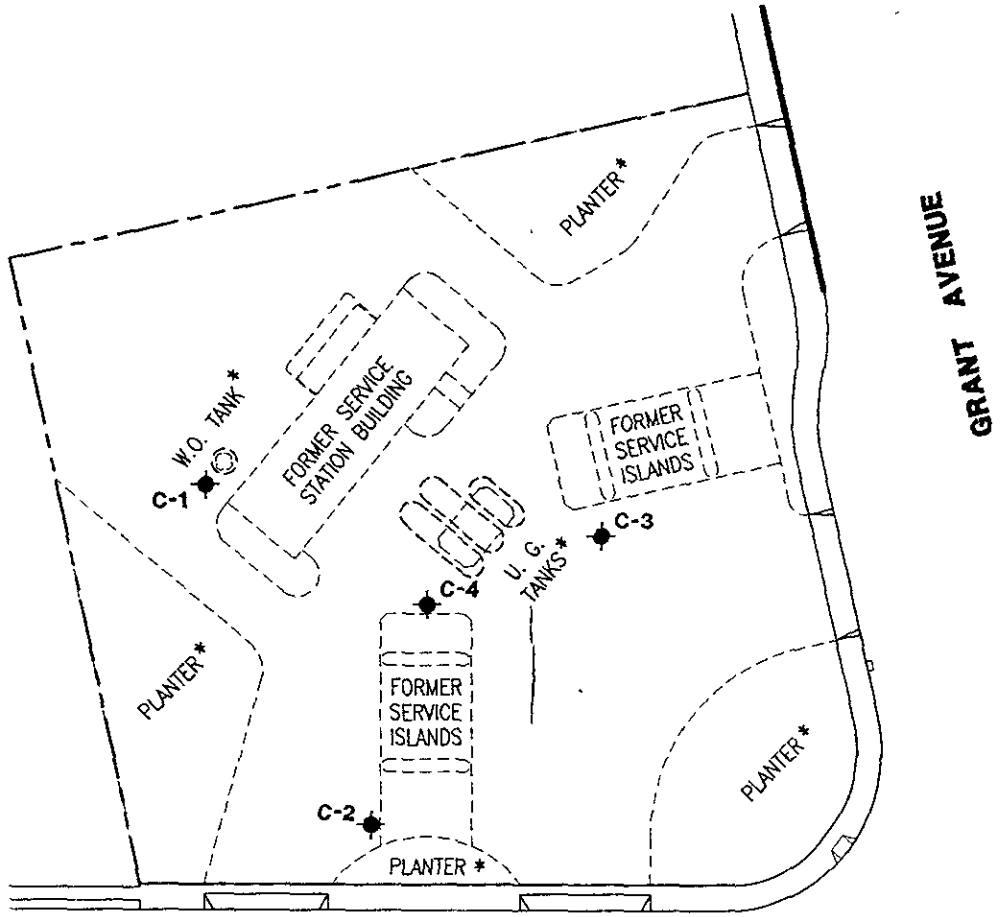
TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	C-1	C-2	C-3	C-4
Casing Diameter (inches)	2	2	2	2
Total Well Depth (feet)	28.2	27.7	27.1	28.9
Depth to Water (feet)	12.44	11.30	11.75	11.85
Free Product (feet)	none	none	none	none
Reason Not Sampled	----	----	----	----
Calculated 4 Case Vol.(gal.)	10.7	11.2	10.4	11.6
Did Well Dewater?	no	no	no	no
Volume Evacuated (gal.)	14.0	13.0	14.0	14.9
Purging Device	Bladder	Bladder	Bladder	Bladder
Sampling Device	Bladder	Bladder	Bladder	Bladder
Time	17:32	17:00	15:55	16:36
Temperature (F)*	66.9	68.3	69.5	68.6
pH*	7.20	7.15	7.19	7.23
Conductivity (umhos/cm)*	946	1017	1156	970

* Indicates Stabilized Value

EXPLANATION

✦ Ground-water monitoring well



* NOTE: On-site service station facilities were being demolished at the time of this investigation.

Base Map: Field observations

N

0 60

Scale in Feet

GeoStrategies Inc.

SITE PLAN
Former Chevron Service Station #5630
997 Grant Avenue
San Lorenzo, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7278	RG/CEG	12/90	

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

CERTIFICATE OF ANALYSIS

LABORATORY NO. 11263-1
CLIENT: Chevron USA

DATE RECEIVED: 12/06/90
DATE REPORTED: 12/13/90
JOB NO. 3278

EPA SW-846 METHOD 8240 - VOLATILE ORGANICS
by Gas Chromatography/ Mass Spectrometry

SAMPLE: C-1

Compound	ug/l	Compound	ug/l
Chloromethane	ND<10	Cis-1,3-Dichloropropene	ND<3
Bromomethane	ND<10	Trichloroethene	ND<3
Vinyl Chloride	ND<10	Dibromochloromethane	ND<3
Chloroethane	ND<10	1,1,2-Trichloroethane	ND<3
Methylene Chloride	ND<10	Benzene	ND<2
Acetone	ND<10	Trans-1,3-Dichloropropene	ND<3
Carbon disulfide	ND<3	2-Chloroethyl vinyl ether	ND<3
Trichlorofluoromethane	ND<3	Bromoform	ND<3
1,1-Dichloroethene	ND<3	4-Methyl-2-Pentanone	ND<10
1,1-Dichloroethane	ND<3	2-Hexanone	ND<10
1,2-Dichloroethene (total)	ND<3	Tetrachloroethene	ND<3
Chloroform	ND<3	1,1,2,2-Tetrachloroethane	ND<3
1,2-Dichloroethane	ND<3	Toluene	ND<3
2-Butanone	ND<20	Chlorobenzene	ND<3
1,1,1-Trichloroethane	ND<3	Ethylbenzene	ND<3
Carbon Tetrachloride	ND<3	Styrene	ND<3
Vinyl Acetate	ND<10	Total Xylenes	ND<3
Bromodichloromethane	ND<3	1,3-Dichlorobenzene	ND<3
1,2-Dichloropropane	ND<3	1,2&1,4-Dichlorobenzenes	ND<3

ug/l = part per billion (ppb)
QC DATA:

Surrogate Recoveries		QC Limits water	QC Limits soil
1,2-DCA-d4.....	105%	76-114	81-117
Toluene-d8.....	100%	88-110	81-140
Bromofluorobenzene.....	98%	86-115	74-121

comments:

Richard Srna, Ph.D.
Laboratory Director

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

CERTIFICATE OF ANALYSIS

LABORATORY NO. 11263-5
CLIENT: Chevron USA

DATE RECEIVED: 12/06/90
DATE REPORTED: 12/13/90
JOB NO. 3278

EPA SW-846 METHOD 8240 - VOLATILE ORGANICS
by Gas Chromatography/ Mass Spectrometry

SAMPLE: Trip Blank

Compound	ug/l	Compound	ug/l
Chloromethane	ND<10	Cis-1,3-Dichloropropene	ND<3
Bromomethane	ND<10	Trichloroethene	ND<3
Vinyl Chloride	ND<10	Dibromochloromethane	ND<3
Chloroethane	ND<10	1,1,2-Trichloroethane	ND<3
Methylene Chloride	ND<10	Benzene	ND<2
Acetone	ND<10	Trans-1,3-Dichloropropene	ND<3
Carbon disulfide	ND<3	2-Chloroethyl vinyl ether	ND<3
Trichlorofluoromethane	ND<3	Bromoform	ND<3
1,1-Dichloroethene	ND<3	4-Methyl-2-Pentanone	ND<10
1,1-Dichloroethane	ND<3	2-Hexanone	ND<10
1,2-Dichloroethene (total)	ND<3	Tetrachloroethene	ND<3
Chloroform	ND<3	1,1,2,2-Tetrachloroethane	ND<3
1,2-Dichloroethane	ND<3	Toluene	ND<3
2-Butanone	ND<20	Chlorobenzene	ND<3
1,1,1-Trichloroethane	ND<3	Ethylbenzene	ND<3
Carbon Tetrachloride	ND<3	Styrene	ND<3
Vinyl Acetate	ND<10	Total Xylenes	ND<3
Bromodichloromethane	ND<3	1,3-Dichlorobenzene	ND<3
1,2-Dichloropropane	ND<3	1,2&1,4-Dichlorobenzenes	ND<3

ug/l = part per billion (ppb)
QC DATA:

Surrogate Recoveries		QC Limits water	QC Limits soil
1,2-DCA-d4.....	102%	76-114	81-117
Toluene-d8.....	103%	88-110	81-140
Bromofluorobenzene.....	101%	86-115	74-121

comments:

Richard Srna, Ph.D.

Laboratory Director

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

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 11263
CLIENT: Chevron USA
CLIENT JOB NO.: 3278

DATE RECEIVED: 12/06/90
DATE REPORTED: 12/13/90

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
11263- 1	C-1	12/05/90	12/10/90
11263- 2	C-2	12/05/90	12/10/90
11263- 3	C-3	12/05/90	12/10/90
11263- 4	C-4	12/05/90	12/10/90
11263- 5	Trip Blank	12/05/90	12/10/90

Laboratory Number:	11263 1	11263 2	11263 3	11263 4	11263 5
ANALYTE LIST	Amounts/Quantitation Limits (ug/l)				
OIL AND GREASE:	ND<5000	NA	NA	NA	NA
TPH/GASOLINE RANGE:	ND<50	ND<50	ND<50	ND<50	ND<50
TPH/DIESEL RANGE:	NA	NA	NA	NA	NA
BENZENE:	ND<0.5	0.7	1	4	ND<0.5
TOLUENE:	ND<0.5	ND<0.5	0.7	2	ND<0.5
ETHYL BENZENE:	ND<0.5	ND<0.5	ND<0.5	0.7	ND<0.5
XYLENES:	ND<0.5	0.5	ND<0.5	3	ND<0.5

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

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

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 11263

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: NA

SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/l
Standard Reference: 10/22/90

ANALYTE	REFERENCE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Oil & Grease	10/16/90	10mg	66/72	9	50-110
Diesel	NA	NA	NA	NA	NA
Gasoline	10/22/90	200ng	91/86	6	75-125
Benzene	10/22/90	200ng	82/81	1	75-130
Toluene	10/22/90	200ng	87/86	1	75-130
Ethyl Benzene	10/22/90	200ng	94/95	1	75-130
Total Xylene	10/22/90	200ng	90/90	0	75-130

Richard Srna, Ph.D.
Laboratory Director

Chain-of-Custody-Record

Job # 11263

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

Chevron Facility Number #5630
Facility Address 997 Grant Av, San Lorenzo
Consultant Project Number #3278
Consultant Name Kettler Ryan Inc
Address 2150 W. Winton, Hayward
Project Contact (Name) Tom Paulson
(Phone) (415)783-7581 (Fax Number)

Chevron Contact (Name) Nancy Vukelich
(Phone)
Laboratory Name Superior
Laboratory Release Number 4247210
Samples Collected by (Name) Randall F. Hedegaard
Collection Date 12-05-90
Signature Randall F. Hedegaard

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)	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)	EPA 8240	Remarks
C-1	8	W		1732	None/HCl	Yes	✓		✓					✓	3-40ml-THCgas 3-40ml-8240; ILTOG-2
C-2	3	↓		1700	HCl	↕	✓								
C-3	↓			1555	↓		✓								
C-4	↓			1636			✓								
TripBlnk	2	↓		—		↓	✓							✓	

Please initial:
Samples Stored in ice. — yes
Appropriate containers. — yes
Sample preserved. — yes
VOA's w/out headspace — yes
Comments: OK

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Randall F. Hedegaard	Kettler Ryan	12-5-90/1840	Refrigerator	G/R	12-5-90/1840
[illegible]	G/R	12-6-90/10:00	[illegible]	G/R	12-6-90 p.m.
[illegible]	G/R	12-6-90/12:00	M. Hollenberg		12/6/90 12:30

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