# GETTLER-RYAN INC.



**WELL INSTALLATION**
at
Former Chevron Service Station No. 9-2384
15526 Hesperian Boulevard
San Lorenzo, California

5265.01

Prepared for

Chevron USA Product Company
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WELL INSTALLATION WORKPLAN
for
Former Chevron Service Station #9-2384
15526 Hesperian Boulevard
San Lorenzo, California

## INTRODUCTION

Gettler-Ryan, Inc. (G-R) is pleased to present this workplan for the installation of two off-site groundwater monitoring wells at the above-referenced location (Figure 1). The groundwater monitoring wells will be installed to assess the absence or presence of dissolved hydrocarbons in soil and groundwater and to verify the groundwater flow direction and gradient beneath the site.

## SITE HISTORY

The site is a former Chevron service station located at 15526 Hesperian Boulevard in San Lorenzo, California.

The following site history was obtained from Chevron project files supplied to Gettler-Ryan, Inc.

On March 31, 1991, the former service station was closed and the product dispensers were removed. On May 30, 1991, the underground storage tanks (USTs) and associated piping were removed from the site by R.L. Stevens. The USTs were visually inspected and determined to be in good condition with no obvious structural failure or apparent leaks. Blaine Tech Services Inc. (Blaine) collected samples from beneath the former USTs and along the product line trenches. The soil samples were analyzed for total purgeable petroleum hydrocarbons as gasoline [TPPH(G)] and benzene, toluene, ethylbenzene and xylenes (BTEX).

Hydrocarbons as gasoline were detected in the soil samples collected and analyzed at concentrations ranging from 220 to 2,800 parts per million (ppm). Benzene was also detected at concentrations as high as 21 ppm. Four of the soil samples collected and analyzed from the product line trenches indicated that no detectable levels of hydrocarbons as gasoline were present in the soil at laboratory method detection limits. In addition, organic lead analysis was performed on the soil samples collected from beneath the former leaded gasoline tank. No lead concentrations greater than 0.22 ppm were detected.

On August 5, 1991, a soil remediation program was implemented to removed all unsaturated soils

containing TPPH(G) concentrations greater than 10 ppm. Approximately 650 cubic yards (cy) of soil were excavated from the vicinity of the former USTs. The excavated soils were aerated on-site and subsequently used as backfill material for the excavation. The soils were backfilled and compacted on-site with the approval of Alameda County Department of Environmental Health.

In May 1992, Groundwater Technology, Inc. (GTI) installed three on-site groundwater monitoring wells (MW-1, MW-2 and MW-3). Well MW-3 was initially installed in a wrong location. The well was subsequently abandoned and replaced in the originally defined location. Analytical results of soil samples collected and analyzed during well installation activities of the misplaced well MW-3 indicated that benzene and hydrocarbons as gasoline were present in soil beneath the site at concentrations of of 0.34 ppm and 400 ppm, respectively. Soil samples collected and analyzed during well installation activities of wells MW-1, MW-2 and the correctly located MW-3 indicated that hydrocarbons as gasoline and benzene were not detected at laboratory method detection limits.

Groundwater samples were collected on June 4, 1992 from the newly installed wells. The groundwater samples were analyzed for TPPH(G) and BTEX. Hydrocarbons as gasoline were detected in wells MW-2 and MW-3 at concentrations of 6,700 and 460 parts per billion (ppb). In addition, benzene was detected in these same wells at concentrations of 910 and 12 ppb, respectively. Hydrocarbons as gasoline or BTYEX components were not detected in the groundwater samples collected and analyzed from well MW-1.

In June 1993, GTI drilled three additional soil borings, two on-site (Mw-4 and MW-6) and one off-site (MW-5), and installed groundwater monitoring wells in the borings. Soil samples collected and analyzed from the well installation activities did not contain hydrocarbons as gasoline or BTEX components at laboratory method detection levels.

Groundwater samples were collected from all site wells on July 2, 1993. Hydrocarbons as gasoline and BTEX components were not detected in the groundwater samples from wells MW-1 and MW-5. Benzene was not detected in well MW-4 at laboratory method detection limits, however, hydrocarbons as gasoline were detected at 80 ppb from this well. Well MW-2 contained hydrocarbons as gasoline and benzene at 2,100 and 45 ppb, respectively. Well MW-3 contained hydrocarbons as gasoline and benzene at concentrations of 610 and 73 ppb, respectively. The highest concentrations of gasoline and benzene were detected in well MW-6 at concentrations of 14,000 and 330 ppb, respectively.

Five of the six monitoring wells have been sampled quarterly since 1992; monitoring well MW-5 was paved over shortly after installation and was not uncovered until November 1993. Hydrocarbons as gasoline and benzene concentrations have consistently been very low or non-detectable in wells MW-1, MW-4 and MW-5. Based on previous groundwater sampling events, TPPH(G) and benzene concentrations appear to have been steadily decreasing in wells MW-2 and MW-3. Since its installation, TPPH(G) and benzene concentrations have declined significantly.

In July 1995, Gettler-Ryan (G-R) performed an area utility survey in the vicinity of the former Chevron services station. The purpose of the survey was to determine if any subsurface conduits existed that could serve as migrational pathways. A sanitary sewer exists in Sycamore Street (north of the former Chevron station) and in the south-bound lane of Hesperian Boulevard (immediately west of the site). The top of the sewer lines are at 9 feet below ground surface (bgs) and are approximately 6" diameter lines constructed of clay lining.

## GEOLOGIC SETTING

The site is located in Alameda County, in the Town of San Lorenzo. The topography in the site vicinity is relatively flat. Regionally, the Berkeley Hills lie to the east and the topography grades westerly into low-lands ending at San Francisco Bay. The closest surface waters are Lake Merritt located approximately 1 mile to the east and the San Francisco Bay located approximately 2 miles west of the site.

The site is located within the California Coast Ranges. The Coast Ranges have a Franciscan basement composed of graywackes, limestone, shale and radiolarian chert[1]. The site is tectonically bounded by the Hayward Fault Zone.

Locally, the site is generally underlain by silts and clays and lesser amounts of fine sands and local sandy gravels. Based on previous groundwater sampling events, groundwater is encountered 11 to 13 feet below existing grade. Based on local topography and previous sampling events, groundwater flow direction beneath the site is westerly.

## PROPOSED WORK

To further evaluate the absence or presence of hydrocarbons at the subject site, G-R proposes the following scope of work:

1. Using available site data, prepare a site-specific health safety plan.

2. Drill two off-site soil borings to a depth of approximately 25 feet below ground surface. The soil samples from the borings will be surveyed in the field with an organic vapor meter (OVM) to determine whether volatile hydrocarbons are present in the samples. OVM readings and field observations will be used to select soil samples from the monitoring well borings for analysis. At a minimum, one soil sample for chemical analysis will be collected from above the capillary

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Norris, Robert M. and Webb, Robert W., 1990, *Geology of California*, John Wiley and Sons, 537 pages.

fringe. Selected sample(s) will be analyzed for total purgeable petroleum hydrocarbons as gasoline [TPPH(G)], and benzene, toluene, ethylbenzene, and xylenes (BTEX).

3. Install one 2-inch diameter monitoring well in each boring.

4. Develop the newly installed wells. Sample the newly installed wells. Analyze the groundwater samples from the site wells for TPPH(G) and BTEX.

5. Survey the top of casing elevation of the newly installed wells. Measure depth to groundwater and product thickness (if present) in all wells. The survey and water level data will be used to verify the groundwater flow direction and gradient beneath the site.

6. Arrange for disposal of the drill cuttings from the boring, the steam-cleaning rinseate, and the monitoring well purge water.

7. Report the results.

Each of these tasks is described below.

**Task 1 - Site Safety Plan**

Using available site history information, G-R will prepare a site-specific safety plan. The safety plan will identify potential site hazards and specify procedures to protect site workers and surrounding community. The safety plan will be on-site during field operations.

**Tasks 2 and 3 - Drilling and Monitoring Well Installation**

Two off-site soil borings (MW-7 and MW-8) will be drilled at the locations shown on Figure 2 and a monitoring well will be installed in each of the borings.

The wells will be drilled by Bay Area Exploration, Inc. of Cordelia, California, C57 license #522125. Prior to drilling, Underground Service Alert (USA) will be notified and a private underground utility locator will identify USA non-member utilities.

All drilling equipment will be steam-cleaned prior to use and all sampling equipment will be washed between samples using an EPA-approved detergent such Alconox and rinsed with potable water.

The boring logs will be logged in accordance with Gettler-Ryan standard operating procedures.

Soil samples will be collected at 5 foot intervals, at a minimum, or at changes of soil type or if hydrocarbon staining is present. Soil samples will be collected in clean or new stainless steel or brass sleeves. A soil sample will be collected from the capillary fringe in the borings.

The soil samples will be screened in the field with an OVM. If hydrocarbons are detected with the OVM or product odor is noted by the field geologist in the soil sample from the bottom of the proposed well/borings, G-R personnel will attempt to collect sufficient samples to define the vertical extent of hydrocarbons in the boring.

Drill cuttings will be stored on-site on visqueen sheeting and covered with visqueen pending disposal by Integrated Waste Management of Milpitas, California.

The soil samples from the borings will be analyzed for TPPH(G) and BTEX by EPA Methods 5030/8015 and 8020, respectively. All quality assurance/quality control (QA/QC) data from the laboratory will be included in the well installation report.

Information from the previous well installation work performed at the site indicate that the soils in the site vicinity are relatively fine-grained. The wells will be constructed with 0.010-inch machine-slotted well screen for the monitoring well and #2/12 sand for gravel pack around the well screen.

**Task 4 - Well Development, Groundwater Sampling and Analysis**

The monitoring wells will be developed no sooner than 72 hours after drilling with a vented surge block and bailing. Groundwater will be removed using steam-cleaned polyvinyl-chloride (PVC) bailers. Groundwater removed from the wells will be transported to the Chevron Refinery in Richmond, California.

Groundwater samples will be collected from the wells no sooner than 24 hours after development of the newly installed wells. Groundwater samples will be collected according to G-R Standard Operating Procedure - Quarterly Groundwater Sampling. The evacuated water will be transported to the Chevron Refinery in Richmond, California.

The water samples will be collected using Chevron-approved disposable bailers. Sample containers will be provided by the analytic laboratory prior to sampling. After water samples are collected in the sample containers, they will be labeled and maintained at 4 C prior to delivery to the analytical laboratory. Chain-of-custody records will be maintained for the samples. A trip blank will accompany the samples to the laboratory.

Groundwater samples from the wells and the trip blank will be analyzed for TPPH(G) and BTEX by EPA

Methods 5030/8015 and 8020, respectively. All QA/QC data from the laboratory will be included in the well installation report.

**Task 5 - Surveying and Groundwater Gradient**

The top of casing elevation of the new wells will be surveyed by a licensed land-surveyor. The casing will be surveyed relative to mean sea level.

Water and product (if present) levels will be measured in all site wells using an MMC flexi-dip interface probe. Water and product (if present) levels will be reported to the nearest 1/100th of a foot.

A potentiometric map will be prepared using survey and water level data.

**Task 6 - Drill Cuttings, Steam-cleaning Rinseate and Monitoring Well Purge Water Disposal**

The soil cuttings will be stored on-site on visqueen sheeting and covered with visqueen pending disposal by Integrated Waste Management of Milpitas, California.

The steam-cleaning rinseate and well development and purge water will be transported to the Chevron Refinery in Richmond, California.

**Task 7 - Report**

The report will be prepared and the field work conducted under the supervision of Stephen J. Carter, a California Registered Geologist (R.G. #5577).

A report presenting the results of the well installation and groundwater sampling will be prepared. The report will include:

TEXT:

- Executive Summary
- Site Background and History
- Geologic Setting
- Description of Soil Sampling and Subsurface Sediments
- Monitoring Well Installation Details
- Depth to Groundwater and Groundwater Flow Direction and Gradient
- Soil and Groundwater Analytical Data
- Conclusions

TABLES:

- Tabulated Soil and Groundwater Analytic Results
- Groundwater Elevation Data and Well Construction Data

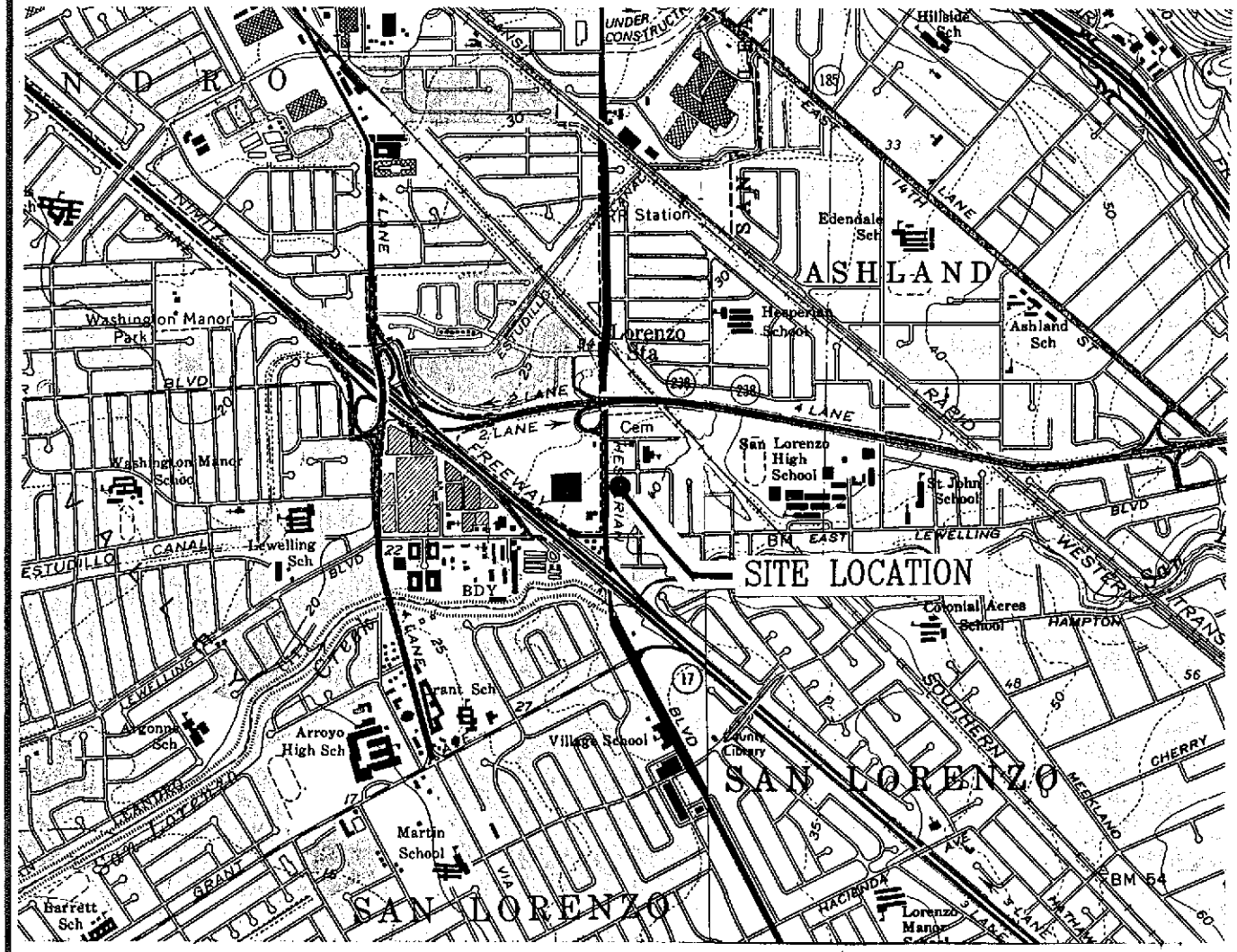
FIGURES:

- Site Vicinity Map
- Monitoring Well Location and Potentiometric Map

APPENDIX:

- Boring Logs and Well Construction Details
- Chain-of-Custody Documents and Laboratory Analytic Results
- Field Methods and Procedures
- G-R Field Data Sheets
- Well Installation Permits
- Survey Data

# FIGURES





N

0 2000

Scale in Feet

Base Map: USGS Topographic Map

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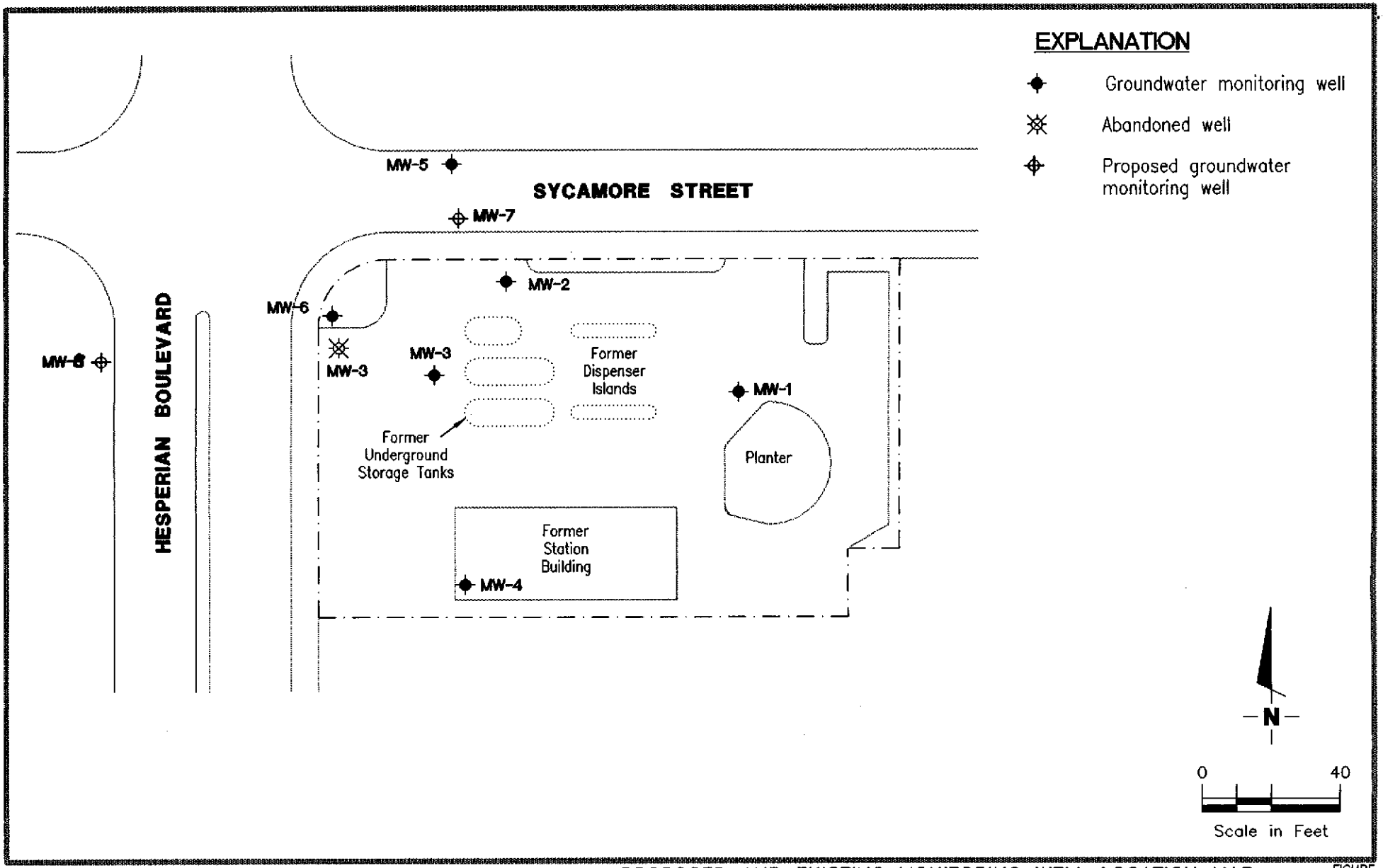
**VICINITY MAP**
Former Chevron Service Station No. 9-2384
15526 Hesperian Boulevard
San Lorenzo, California

FIGURE
**1**

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE |
|---|---|---|---|
| 5265 | | July, 1995 | |

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**PROPOSED AND EXISTING MONITORING WELL LOCATION MAP**
Former Chevron Service Station No. 9-2384
15526 Hesperian Boulevard
San Lorenzo, California

FIGURE
**2**

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE |
|---|---|---|---|
| 5265.01 | | July, 1995 | |

# APPENDIX

# GETTLER - RYAN

# FIELD METHODS AND PROCEDURES

## Site Safety Plan

Field work performed by Gettler-Ryan, Inc. (G-R) is conducted in accordance with G-R's Health and Safety Plan and the Site Safety Plan. G-R personnel and subcontractors who perform work at the site are briefed on the contents of these plans prior to initiating site work. The G-R geologist or engineer at the site when the work is performed acts as the Site Safety Officer. G-R utilizes a organic vapor meter (OVM) to monitor ambient conditions as part of the Health and Safety Plan.

## Collection of Soil Samples

Soil Borings are drilled by a California-licensed well driller. A G-R geologist is present to observe the drilling, collect soil samples for description, physical testing, and chemical analysis, and prepare a log of the exploratory soil boring. Soil samples are collected from the soil boring with a split-barrel sampling device fitted with 2-inch-diameter, clean brass stainless steel liners. The sampling device is driven approximately 18 inches with a 140-pound hammer falling 30 inches. The number of blows required to advance the sampler each successive 6 inches is recorded on the boring log. The encountered soils are described using the Unified Soil Classification System (ASTM2488-84) and the Munsell Soil Color Chart.

After removal from the sampling device, soil samples for chemical analysis are covered on both ends with teflon sheeting, capped, labeled, and placed in a cooler and maintained at 4 C for preservation. A chain-of-custody document is initiated in the field and accompanies the selected soil samples to analytical laboratory. Samples are selected for chemical analysis based on:

a. depth relative to underground storage tanks and existing surface
b. depth relative to known or suspected groundwater
c. presence or absence of contaminant pathways
d. presence or absence of discoloration or staining
e. presence or absence of obvious gasoline hydrocarbon odors
f. presence or absence of organic vapors detected by headspace analysis

## Field Screening of Soil Samples

An OVM is used to perform head-space analysis in the field for the presence of organic vapors from the soil sample. This test procedure involves removing soil from the tip of the sampling device sample or sample liner into a clean glass jar, and immediately covering the jar with aluminum foil secured under a ring-type threaded lid. After approximately twenty minutes, the foil is pierced and the atmosphere within the jar is tested using an OVM. Headspace screening results are recorded on the boring log. Head-space screening procedures are performed and results recorded as reconnaissance data. G-R does not consider field screening techniques to be verification of the presence or absence of hydrocarbons.

## Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory soil borings with Schedule 40 polyvinyl chloride (PVC) casing. All joints are thread-joined; no glues, cements, or solvents are used in well construction. The screened interval is constructed of machine-slotted PVC well screen which extends from the total well depth to a point above the groundwater. An appropriately-sized sorted sand is placed in the annular space above the sand, and the remaining annular space is sealed with neat cement or cement grout.

Wellheads are protected with water-resistant traffic-rated vault boxes placed flush with the ground surface. The top of the well casing is sealed with a locking waterproof cap. A lock is placed on the well cap to prevent vandalism and unitentional introduction of materials into the well.

## Measurement of Water Levels

The top of the newly installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL). Depth-to-groundwater in the well is measured from the top of the well casing with an electronic water-level indicator. Depth-to-groundwater is measured to the nearest 0.01-foot, and referenced to MSL.

## Well Development and Sampling

The purpose of well development is to improve hydraulic communication between the well and the surrounding aquifer. Prior to development, each well is monitored for the presence of separate-phase hydrocarbons and the depth-to-water is recorded. Wells are then developed by alternately surging the well with a bailer, then purging the well with a pump to remove accumulated sediments and draw groundwater into the well. Development continues until the groundwater parameters (temperature, pH, and conductivity) have stabilized. Wells are monitored and sampled on a quarterly basis by Chevron's monitoring and sampling contractor.

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MW-5
25.18
Sewer line
SYCAMORE ST.
50'
2 lines + parking lane on each side
water line
MW-2
25.17
electrical
SD
32'
8'
PLANTER
38'
MW-6
24.99
25.20
3
FORMER PUMP ISLANDS
MW-1
25.22
MW-3
25.09
25.10
PLANTER
FORMER UNDERGROUND STORAGE TANKS
25.00
24.90
FORMER STATION BUILDING
MW-4
24.83
N
Planter
42'
Fire hydrant
MW-8
Irrigation line
water line
electrical
55'
Sidewalk
3 lines
3 lines + turn line
HESPERIAN BLVD.

LEGEND

PROPERTY LINE
MONITORING WELL
ABANDONED MONITORING WELL (FORMER LOCATION OF MW-3)
X.XX POTENTIOMETRIC SURFACE ELEVATION (FT)
POTENTIOMETRIC SURFACE CONTOUR
GROUNDWATER FLOW DIRECTION

NOTE:
1. CONTOURS REPRESENT APPROXIMATE ELEVATIONS ABOVE MEAN SEA LEVEL.

0 FEET 30
SCALE

Base map from Groundwater Technology, Inc.

CAMBRIA
Environmental Technology, Inc.

Former Chevron Station 9-2384
15526 Hesperian Blvd.
San Lorenzo, California

\CHEVRON\9-2384\2385-QM.DWG

Ground Water Elevation

March 14, 1995

FIGURE
1