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Chevron

July 21, 1995

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

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

Mr. Scott Seery
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Chevron Service Station #9-6991
2920 Castro Valley Boulevard, Castro Valley, CA

Dear Mr. Seery:

Enclosed is the Well Installation work plan dated July 21, 1995, prepared by our consultant Gettler-Ryan, Inc. for the above referenced site.

The work plan includes advancing one soil boring, completing the soil boring as a ground water monitor well, and collecting and analyzing soil and ground water samples. This work will be done to characterize dissolved ground water concentrations immediately down gradient of the underground storage tanks.

As we discussed in our January 26, 1995, meeting, the results of this investigation will assist in determining whether establishing a non attainment area or site closure is warranted. If you have any questions or comments, please feel free to contact me at (510) 842-8134.

Sincerely,
CHEVRON U.S.A. PRODUCTS COMPANY

Mark A. Miller
Site Assessment and Remediation Engineer

Enclosure

cc: Mr. J.H. Ough

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GETTLER-RYAN INC.

WELL INSTALLATION
at
Chevron Service Station No. 9-6991
2920 Castro Valley Boulevard
Castro Valley, California

5296.01

Prepared for

Chevron USA Product Company
P.O. Box 5004
San Ramon, California 94583

Prepared by

Gettler-Ryan, Inc.
6747 Sierra Court, Suite J
Dublin, California 94568

Argy Leyton
Environmental Project Manager

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Senior Geologist
RG #5577

REGISTERED GEOLOGIST
STEPHEN J. CARTER
No. 5577
STATE OF CALIFORNIA

July 21, 1995

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WELL INSTALLATION WORKPLAN
for
Chevron Service Station #9-6991
2920 Castro Valley Boulevard
Castro Valley, California

INTRODUCTION

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

SITE HISTORY

The site is an active Chevron service station located at 2920 Castro Valley Boulevard in Castro Valley, California.

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

On September 11, 1990, Golden West Builders excavated and removed one 1,000-gallon waste oil tank and one 6,000-gallon unleaded fuel tank. The associated product lines were also removed. Two remaining underground storage tanks (USTs) were left in place, and new product lines were installed. No indications of leaks, perforations or signs of structural failure or corrosion were observed during tank removal activities.

Soil samples from UST removal activities were collected by Groundwater Technology, Inc. (GTI) of Concord, California. Soil samples collected and analyzed indicated that total oil and grease (TOG) were present in the soil and concentrations up to 2,000 parts per million (ppm) in the former waste oil tank pit. In addition, total petroleum hydrocarbons as diesel [TPH(D)] were detected at 1,000 ppm in the product line trench. Soil samples analyzed for total purgeable petroleum hydrocarbons as gasoline [TPPH(G)] contained less than 100 ppm hydrocarbons as gasoline or were non-detect. Groundwater samples collected from the tank pit indicated that TPPH(G) and benzene were present in groundwater at concentrations of 54,000 and 6,200 parts per billion (ppb), respectively.

Approximately 700 cubic yards (cy) of soil were excavated by GTI on September 18, 1990. Soil samples

were collected and analyzed for TPH(D) and TOG. Final soil sample samples collected and analyzed indicated that low-level or non-detectable concentrations of TPH(D) and TOG were present in the soil beneath the site. Groundwater samples collected and analyzed from the additional soil excavation activities indicated that 1,400 ppb hydrocarbons as gasoline were present in the groundwater.

On September 24 and 30, 1991, GTI installed three 3/4-inch monitoring wells (MW-1, MW-2 and MW-3) to approximately 21 feet below ground surface (bgs) using a 2-inch diameter hydraulically-driven coring system. TPPH(G) and benzene were not detected in soil samples collected and analyzed from the borings. Groundwater samples were collected from the newly installed wells on October 18, 1991. The groundwater samples were analyzed for TPPH(G) and benzene, toluene, ethylbenzene and xylenes (BTEX). Groundwater samples from well MW-1 were also analyzed for TOG. Hydrocarbons as gasoline were detected in the water samples from all three wells at concentrations up to 230 ppb. Benzene was detected in MW-1 at 45 ppb. TOG was not detected in the groundwater samples collected from well MW-1.

On December 4, 1991, groundwater samples were collected from the three on-site monitoring wells. The groundwater samples were analyzed for TPPH(G), TPH(D), BTEX, and TOG. Hydrocarbons were detected in the samples collected and analyzed from wells MW-1 and MW-2. MW-1 contained TPH(D) and benzene at concentrations of 3.9 and 170 ppb, respectively. MW-2 contained TPPH(G), TPH(D) and benzene at concentrations of 440, 130 and 30 ppb, respectively. The samples from well MW-1 were also analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and metals (cadmium, chromium, lead, nickel and zinc). These analytes were not detected in the samples collected from well MW-1.

Three additional two-inch groundwater monitoring wells (MW-4, MW-5 and MW-6) were installed by GTI from September 25 through October 10, 1992. One well, MW-6, was installed, off-site, in the downgradient groundwater flow direction. Soil samples collected from the well installation activities were analyzed for TPPH(G), TPH(D) and BTEX. No hydrocarbons were detected with the exception of TPH(D) at 5 ppm in the sample collected from MW-6 at 5 ft bgs. Groundwater samples were collected from the six monitoring wells on October 27, 1992. Well MW-6 contained TPPH(G) and BTEX at concentrations of 600 and 22 ppb, respectively. Groundwater samples from wells MW-1, MW-2 and MW-3 contained TPH(D) at concentrations of 54, 100 and 120 ppb, respectively.

In March, 1993, GTI performed a site reconnaissance, reviewed the project files at the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and Alameda County Department of Environmental Health (ACDEH), and Castro Valley Sanitary District maps to identify other possible sources of hydrocarbons in the off-site well, MW-6. Two of the three monitoring wells located at 2896 Castro Valley Boulevard, immediately west of the Chevron site, contained hydrocarbons, according to the groundwater monitoring report reviewed by GTI personnel. The westward to southward gradient direction fluctuations at the 2896 Castro Valley Boulevard site are similar to

those observed at the Chevron site. A 21" diameter storm sewer is beneath the north side of Castro Valley Boulevard. A 36" diameter storm sewer line runs beneath the south side and is immediately adjacent to MW-6. Both sewer lines are between the Chevron site and monitoring well MW-6.

A quarterly groundwater monitoring program was initiated for wells MW-1, MW-2 and MW-3 in October 1991 and wells MW-4, MW-5 and MW-6 were added to the monitoring program in October 1992.

GEOLOGIC SETTING

The site is located in Alameda County, in the City of Castro Valley. The topography in the site vicinity is relatively flat. Regionally, the San Leandro Hills lie to the north and the Walpert Ridge lies to the east. The closest surface water is the San Francisco Bay located approximately 1 mile 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.

Based on previous well installation activities, the site is generally underlain by clay and silty clay with lesser amounts of sand and gravel. Previous groundwater sampling events indicate that groundwater is approximately 8 to 13 feet below existing grade. Based on local topography and previous sampling events, groundwater flow direction beneath the site varies from westerly to southerly.

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 data, prepare a site-specific health safety plan.

2. Drill one on-site soil boring (MW-7) to a depth of approximately 20 feet below ground surface. The soil samples from the boring will be surveyed in the field with an organic vapor meter (OVM) to evaluate whether volatile hydrocarbons are present in the samples. OVM readings and field observations will be used to select soil samples from the monitoring well boring 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 the boring.

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

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

One on-site soil boring (MW-7) will be drilled at the location shown on Figure 2 and a monitoring well will be constructed in the boring.

The well 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 locate on-site 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 log 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 boring.

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/boring, 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 boring 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 well 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) bailer. Groundwater removed from the well will be transported to the Chevron Refinery in Richmond, California.

Groundwater samples will be collected from the new well no sooner than 24 hours after development of the well. 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 for delivery to the 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 well 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 well 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

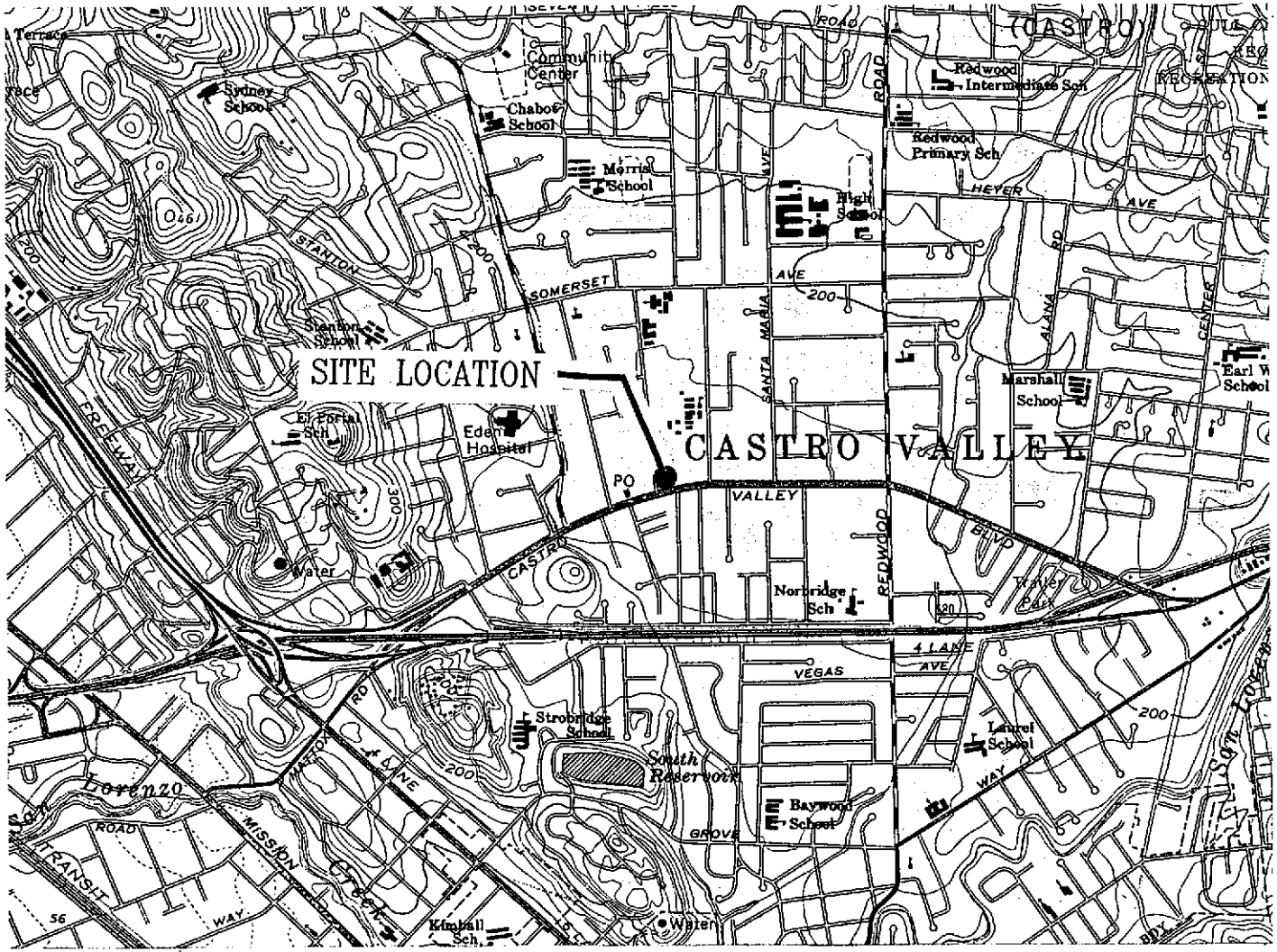
FIGURES:

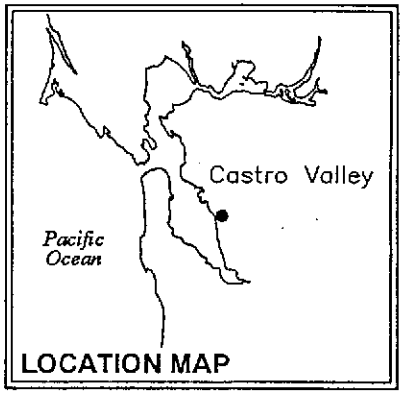
- Site Vicinity Map
- Monitoring Well Location and Potentiometric Map

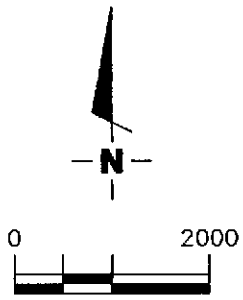
APPENDIX:

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

FIGURES







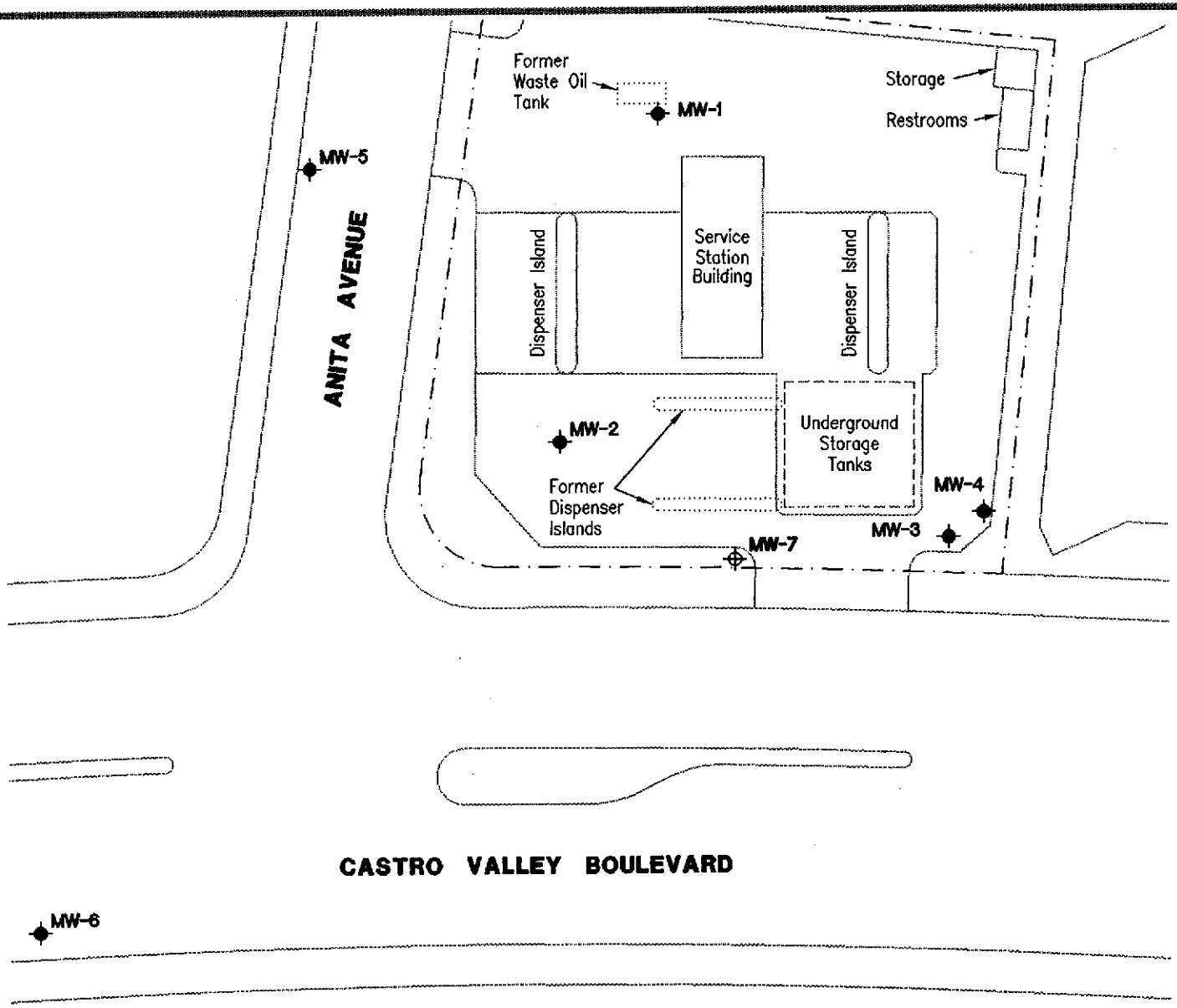
Base Map: USGS Topographic Map

Gettler - Ryan Inc.
6747 Sierra Ct., Suite J (510) 551-7555
Dublin, CA 94568

VICINITY MAP
Chevron Service Station No. 9-6991
2920 Castro Valley Boulevard
Castro Valley, California

FIGURE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
5296		July, 1995	



EXPLANATION

- Groundwater monitoring well
- Proposed groundwater monitoring well

N

0 40

Scale in Feet

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Dublin, CA 94568
(510) 551-7555

PROPOSED AND EXISTING MONITORING WELL LOCATION MAP
Chevron Service Station No. 9-6991
2920 Castro Valley Boulevard
Castro Valley, California

FIGURE
2

JOB NUMBER
5296.01

REVIEWED BY

DATE
July, 1995

REVISED DATE

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.