GETTLER-RYAN INC. 7100 Redwood Blvd., Suite 104, Novato, CA 94945
Phone (415) 893-1515, Fax (415) 893-1517

TRANSMITTAL

TO: Mr. Barney Chan
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

DATE: March 15, 2000
PROJECT NO. 140123.04/140070.03
SUBJECT: Response letter
Tosco Station No. 5325
Tosco Station No. 3135

From: Jed Douglas

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1	3/13/00	Response Letter
1	3/14/00	Workplan for Monitoring Well Installation

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COPIES TO: David De Witt - Tosco Marketing Company

GETTLER-RYAN INC.

WORK PLAN FOR MONITORING WELL INSTALLATION

at

#1

3693

Tosco (76) Service Station No. 3135
845 66th Avenue,
Oakland, California

Report No. 140070.03-2

Prepared for:

Mr. David De Witt
Tosco Marketing Company
2000 Crow Canyon Place Suite 400
San Ramon, California 94583

Prepared by:

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

415-893-1515

Jed A. Douglas
Project Geologist

Rancho Cordova

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

Stephen J. Carter
Senior Geologist
R.G. 5577

March 14, 2000

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WORK PLAN FOR MONITORING WELL INSTALLATION

at

Tosco (76) Service Station No. 3135
845 66th Avenue,
Oakland, California

Report No. 140070.03-2

INTRODUCTION

At the request of Tosco Marketing Company (Tosco), Gettler-Ryan Inc. (GR), has prepared this Work Plan to assess petroleum hydrocarbon impact to soil and groundwater in the downgradient vicinity of the subject site. This Work Plan was prepared in response to a Alameda County Environmental Health Services (ACEHS) letter dated February 16, 2000, requesting characterization of petroleum hydrocarbons in the southerly direction from the site. The proposed scope of work includes: preparing a site safety plan; obtaining the required well installation permit; updating the encroachment permit from the City of Oakland public works department; advancing one off-site soil boring; installing a groundwater monitoring well in the off-site boring; surveying the wellhead elevations; developing and sampling the well; collecting and submitting selected soil and groundwater samples for chemical analysis; arranging for Tosco's contractor to dispose of the investigation derived waste materials; and preparing a report presenting the observations associated with the soil boring and well installation and survey performance.

The scope of work proposed in this Work Plan is intended to comply with the State of California Water Resources Control Board's *Leaking Underground Fuel Tanks (LUFT) Manual* and *California Underground Storage Tank Regulations, 1994*, and the Regional Water Quality Control Board's (RWQCB) *Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites*.

SITE DESCRIPTION

The subject site is situated on the northwest corner of San Leandro Street and 66th Avenue in Oakland, California (Figure 1). Station facilities currently include two gasoline underground storage tanks (USTs), a 550-gallon waste oil UST, three dispenser islands under canopies, and a service station building. The product dispensers utilize a balanced vapor recovery system. Ten groundwater monitoring wells are present at the site. Locations of the pertinent site features are shown on Figure 2.

PREVIOUS ENVIRONMENTAL WORK

Historical data indicate the site has been a service station for approximately 53 years. Renovation of the site first occurred in 1967, when the size of the site expanded to its current configuration.

Two 10,000-gallon gasoline USTs, one 280-gallon waste oil UST and product piping were removed from the site in 1989. Confirmation soil samples collected from the UST pit indicated residual concentrations of Total Petroleum Hydrocarbons as gasoline (TPHg) up to 32 parts per million (ppm), benzene up to 1.2 ppm, and Total Oil and Grease (TOG) at less than 50 ppm. Confirmation soil samples collected from the product piping trench indicated residual concentrations of TPHg up to 20 ppm and benzene up to 0.13 ppm. After confirmation soil sampling was complete, approximately 5,000 gallons of groundwater was removed from the UST pit and properly disposed of. A groundwater sample was collected and analyzed after recharge of the UST pit and contained TPHg at 7,900 parts per billion (ppb) and benzene at 850 ppb.

Three 2-inch groundwater monitoring wells (MW-1 through MW-3) and two shallow soil borings (EB-1 and EB-2) were installed at the site in April of 1990 (Figure 2). The three monitoring wells were installed to depths of approximately 22 feet below ground surface (bgs). Soil samples indicated concentrations of TPHg ranging from 2.2 to 6.8 ppm in well boring MW-2. In soil boring EB-2, TPHg was detected at concentrations ranging from 2,400 to 12,000 ppm. TOG was detected at 7,000 ppm and Total Petroleum Hydrocarbons as diesel (TPHd) at 1,400 ppm. Benzene was detected in soil samples from the three well borings at concentrations ranging from 0.0075 to 0.012 ppm, and in the two soil borings at concentrations ranging from 5 to 84 ppm. The groundwater sample from well MW-3 was reported as nondetect (ND) for all analytes. Groundwater samples from wells MW-1 and MW-2 contained concentrations of TPHg at 22,000 ppb and 65,000 ppb, and benzene at 590 ppb and 3,300 ppb, respectively.

Three 2-inch groundwater monitoring wells (MW-4 through MW-6) were installed at the site in August of 1990. Soil samples indicated detectable concentrations in only one of the well borings, MW-6, at the following concentrations: TPHg ranging from 2.5 to 160 ppm, benzene ranging from 0.24 to 3.4 ppm, TPHd ranging from 5.1 to 93 ppm, and TOG at 200 ppm. Groundwater samples from well MW-5 were reported as ND. Groundwater samples from wells MW-4 and MW-6 contained concentrations of TPHg at 62,000 ppb and 12,000 ppb, and benzene at 810 ppb and 1,700 ppb, respectively. TPHd was detected in well MW-6 at a concentration of 1,000 ppm.

A Hydropunch groundwater study was performed at the site in January of 1991. Seven Hydropunch sampling points were installed and groundwater samples collected and analyzed. One sample contained TPHg at a concentration of 92 ppb, and benzene at 0.8 ppb.

In March of 1991, the pre-1967 UST pit was over-excavated, and two concrete slabs were removed from depths of approximately 8.5 and 10 feet bgs. Approximately 2,000 cubic yards of impacted soil was removed from the site and properly disposed of. Confirmation soil samples collected from the former UST pit indicated residual concentrations of TPHg at concentrations ranging from 53 to 1,400 ppm. Elevated residual concentrations of TPHg remained in the soil due to the over-excavation being limited by existing product piping. Prior to back-filling the pit, approximately 20,000 gallons of groundwater was pumped from the former UST pit and properly disposed of.

Three 2-inch groundwater monitoring wells (MW-8 through MW-10) were installed in the streets adjacent to the site in September of 1992 (Figure 2). Soil samples were collected and analyzed and indicated detectable concentrations in one of the well borings, MW-10, at the following concentrations: TPHg ranging from ND to 210 ppm, benzene ranging from ND to 0.58 ppm, and TPHd ranging from ND to 39 ppm. Groundwater samples from the three wells were analyzed and samples from MW-8 and MW-9 were reported as ND for all analytes. Groundwater samples from well MW-10 contained concentrations of TPHg at 740 ppb, benzene at 11 ppb, and TPHd at 1600 ppb.

One 2-inch groundwater monitoring well (MW-7) was installed at the site in April of 1993. Soil samples were collected and analyzed and indicated no detectable concentrations of petroleum hydrocarbons. Groundwater samples from the new well were analyzed and indicated no detectable concentrations of petroleum hydrocarbons.

Groundwater monitoring and sampling of the 10 wells has been ongoing at the site since 1990. Historical monitoring and sampling data is presented in Table 1. Historical groundwater flow directions have varied from northeast, northwest, southwest and southeast, and currently flows toward the south at a gradient of 0.02 feet/feet.

In August of 1998, Oxygen Releasing Compound (ORC) was installed in monitoring well MW-6 to assist with biological attenuation of hydrocarbon compounds. Starting in 1999, the following bio-attenuation parameters have been measured at the site: nitrate; sulfate; ferrous iron; dissolved oxygen; and, oxidation-reduction potential. The results of the measurements of these parameters are presented in GR's annual monitoring and sampling report for the site, dated April 9, 1999. Review of the parameters are inconclusive at this time as to whether bio-attenuation is occurring at the site.

PROPOSED SCOPE OF WORK

GR proposes to install one off-site groundwater monitoring well in 66th Avenue (Figure 2) to comply with the ACEHS request for groundwater delineation at the site. Based on information from previous site investigations, first groundwater is expected to occur at approximately 5 feet bgs. It is anticipated, based on previous site investigations, that groundwater flows toward the south. GR Field Methods and Procedures are included in Appendix A. To perform this scope of work, GR proposes the following tasks:

Task 1. Pre-Field Activities

Prepare a site-specific safety plan and obtain the necessary well installation permit from the ACEHS. Update the encroachment permit from the City of Oakland Department of Public Works to install monitoring wells in a public street. Notify Underground Service Alert (USA) a minimum of 48 hours prior to drilling. A subsurface utility locator will inspect each proposed well location for buried utilities.

Task 2. Monitoring Well Installation

Advance one off-site soil boring to 20 feet bgs, and install a groundwater monitoring well in the boring. Drilling and well construction activities will be performed by a California licensed driller. A GR geologist will observe the drilling, collect soil samples for chemical analyses, describe the encountered soil, and prepare a log of the boring. The boring will be advanced using 8-inch-diameter hollow-stem augers and a truck-mounted drill rig. The initial five feet will be advanced with a hand auger to clear the boring location. The proposed well boring location is shown on Figure 2.

The groundwater monitoring well will be constructed of 2-inch-diameter Schedule 40 polyvinyl chloride (PVC) well casing and 0.010-inch machine slotted PVC well screen. Based on data from installation of monitoring well MW-10, GR anticipates encountering pavement, roadbase and fill materials to a depth of approximately 4 feet bgs. To insure the well screen will not be located in the roadbase materials, GR proposes to construct the well as follows: the screened interval will extend from 5 to 20 feet bgs to accommodate groundwater fluctuations. Actual construction of the well may vary based on conditions encountered during drilling. Proposed well construction details are shown on Figure 3.

Soil from each sampled interval will be screened in the field for the presence of volatile organic compounds using a photoionization detector (PID). These data will be collected for reconnaissance purposes only, and will not be used as verification of the presence or

absence of petroleum hydrocarbons. Field screening data will be recorded on each boring log.

Soil samples collected for description and possible chemical analysis will be obtained from each boring at five-foot intervals, as a minimum. Although the actual number of samples submitted for chemical analysis will depend on site conditions and field screening data, GR anticipates a minimum of one unsaturated soil sample collected from just above the first encountered groundwater will be submitted for chemical analysis as described in Task 5.

Drill cuttings will be stockpiled at the site pending disposal. Stockpiled cuttings will be placed on and covered with plastic sheeting. Four soil samples from the drill cuttings will be collected for disposal characterization as described in Appendix A. These samples will be submitted to the laboratory for compositing into one sample, then analyzed as described in Task 5. Upon approval from the landfill, the drill cuttings will be transported by a Tosco-approved soil hauler to Forward Landfill, located in Manteca, California. Water generated during cleaning of the drilling equipment will be stored at the site in properly labeled drums.

Task 3. Wellhead Survey

Following well installation, the top of the well casing will be surveyed to mean sea level by a California-licensed surveyor. Horizontal coordinates of the well locations will be obtained at the same time.

Task 4. Well Development and Sampling

The newly installed groundwater monitoring well will be developed after being allowed to stand a minimum of 72 hours following installation. The groundwater samples from the well will be collected immediately upon completion of well development. Groundwater purged from the well during development and sampling, and any decontamination rinsate, will be transported to the Tosco Refinery in Rodeo, California, for disposal. The groundwater samples will be analyzed as described in Task 5.

Task 5. Laboratory Analyses

All samples will be submitted to a California-certified Hazardous Materials Testing Laboratory. Soil and groundwater samples will be analyzed for TPHg, TPHd, BTEX, and MtBE by EPA Methods 5030/8015/8020. Select soil samples and all groundwater samples will also be analyzed for MtBE by EPA Method 8260. The disposal

characterization sample from the soil stockpile will be analyzed for TPHg, TPHd, BTEX, MtBE, and total lead, as required by the disposal facility.

Task 6. Reporting

Following receipt and analysis of all data, a report will be prepared which summarizes the procedures and the results associated with this investigation. This report will be submitted to Tosco for their use and distribution.

PROJECT STAFF

Mr. Stephen Carter, a Registered Geologist in the State of California (R.G. No. 5577), will provide technical oversight and review of the work. Mr. David Vossler, Project Manager, will supervise and direct field and office operations. GR employs a staff of geologists, engineers, and technicians who will assist with the project.

SCHEDULE

Implementation of the proposed scope of work will commence upon receipt of regulatory approval, well installation permits, and an encroachment permit.

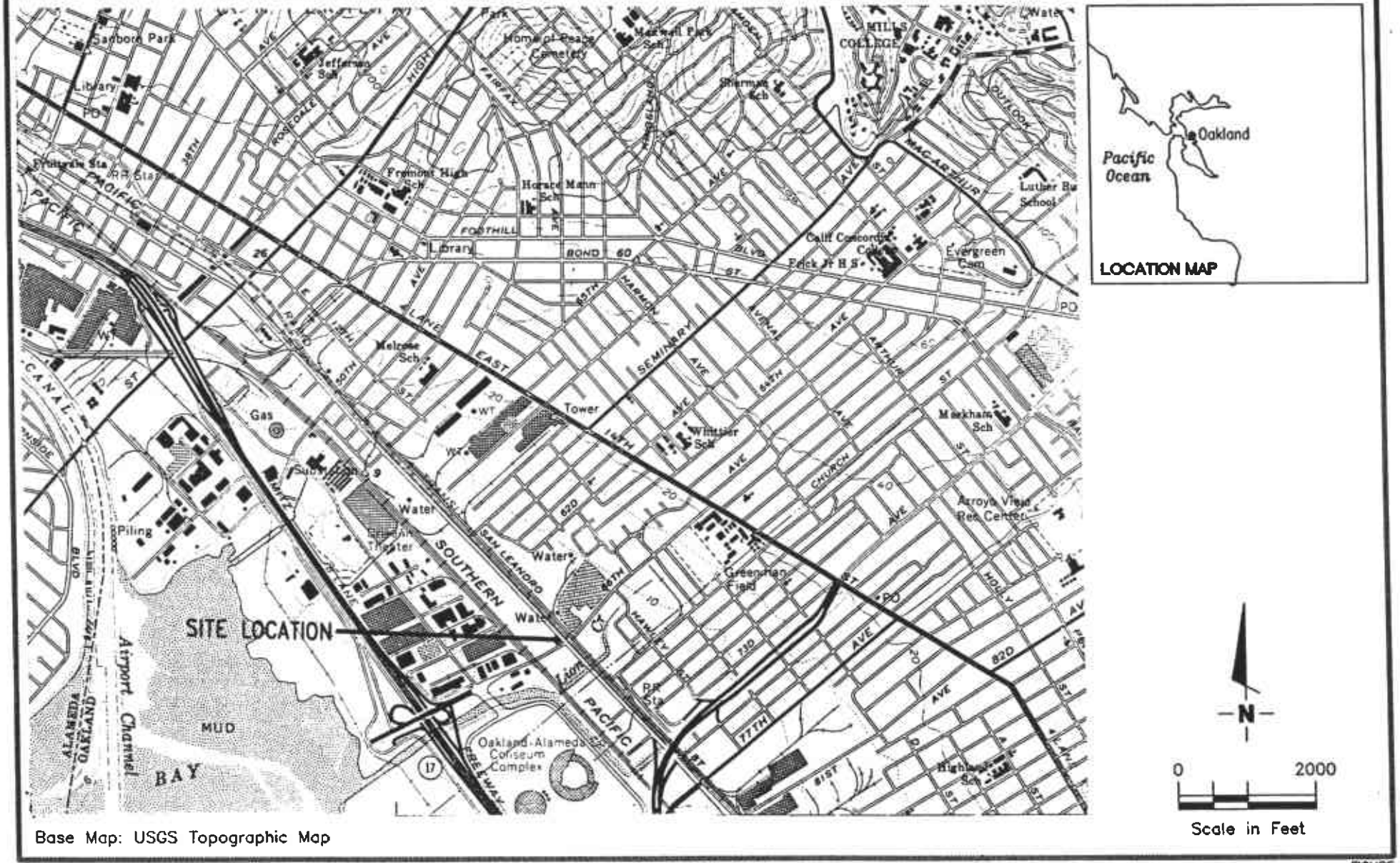
REFERENCES

U.S. Geological Survey, 1959, Oakland East Quadrangle, California, 7.5 Minute Series (Topographic): Scale 1:24,000, photorevised 1980.

Kaprealian Engineering Incorporated, 1993, Continuing Groundwater Investigation and Quarterly Report, Unocal Service Station #3135, 845 – 66th Avenue, Oakland, California, Dated June 10, 1993.

Gettler-Ryan Inc., 2000, Groundwater Monitoring and Sampling Report, Annual 2000 – Event of February 2, 2000, dated March 8, 2000.

California Regional Water Quality Control Board, 1994, Appendix B, Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites, Requests for Closure, in Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure: dated March 1, 1994.



Base Map: USGS Topographic Map

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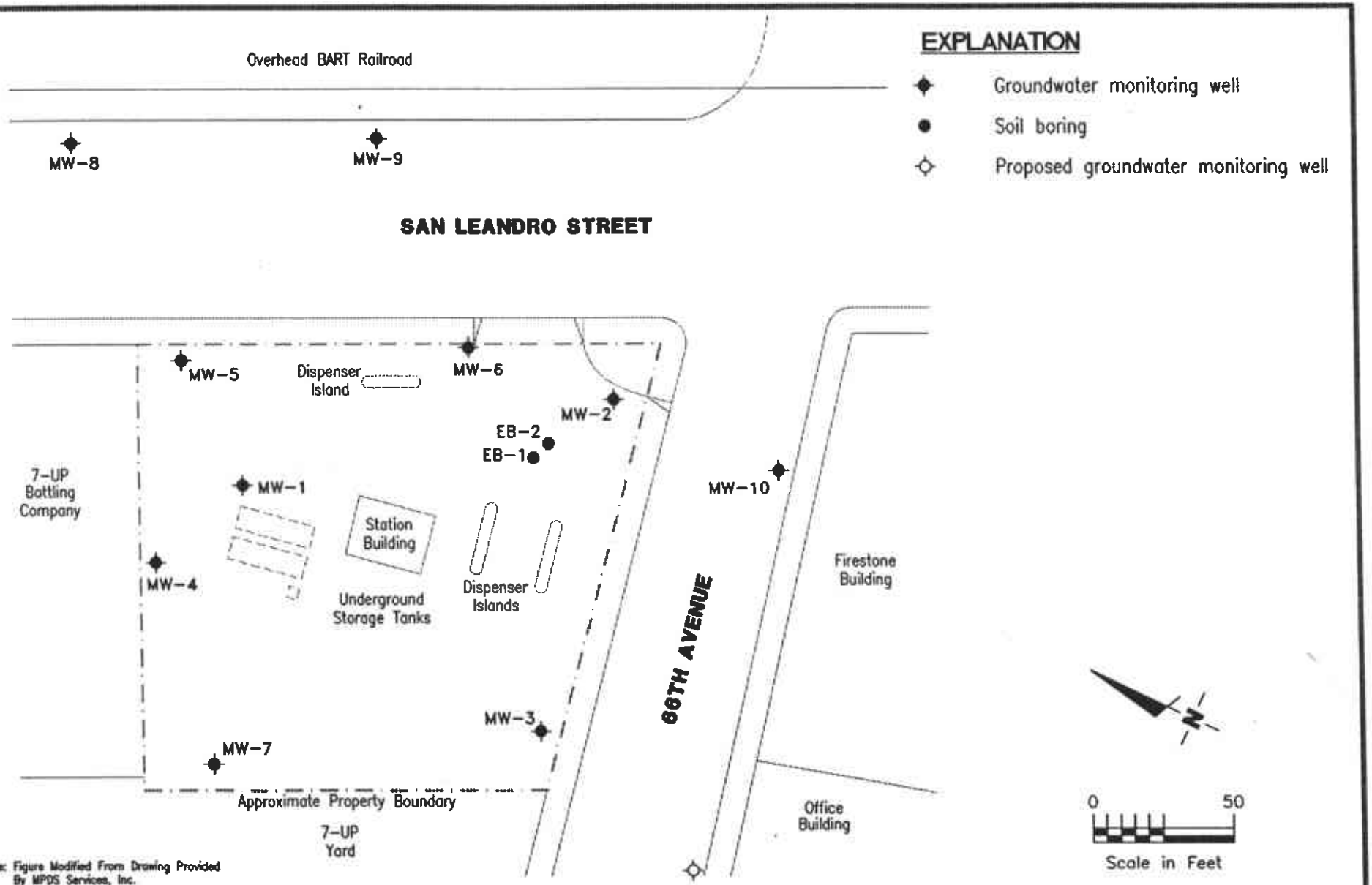
6747 Sierra Ct., Suite J (925) 551-7555
Dublin, CA 94568

VICINITY MAP
Tosco (76) Service Station No. 3135
845 66th Avenue
Oakland, California

FIGURE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
140070		12/99	



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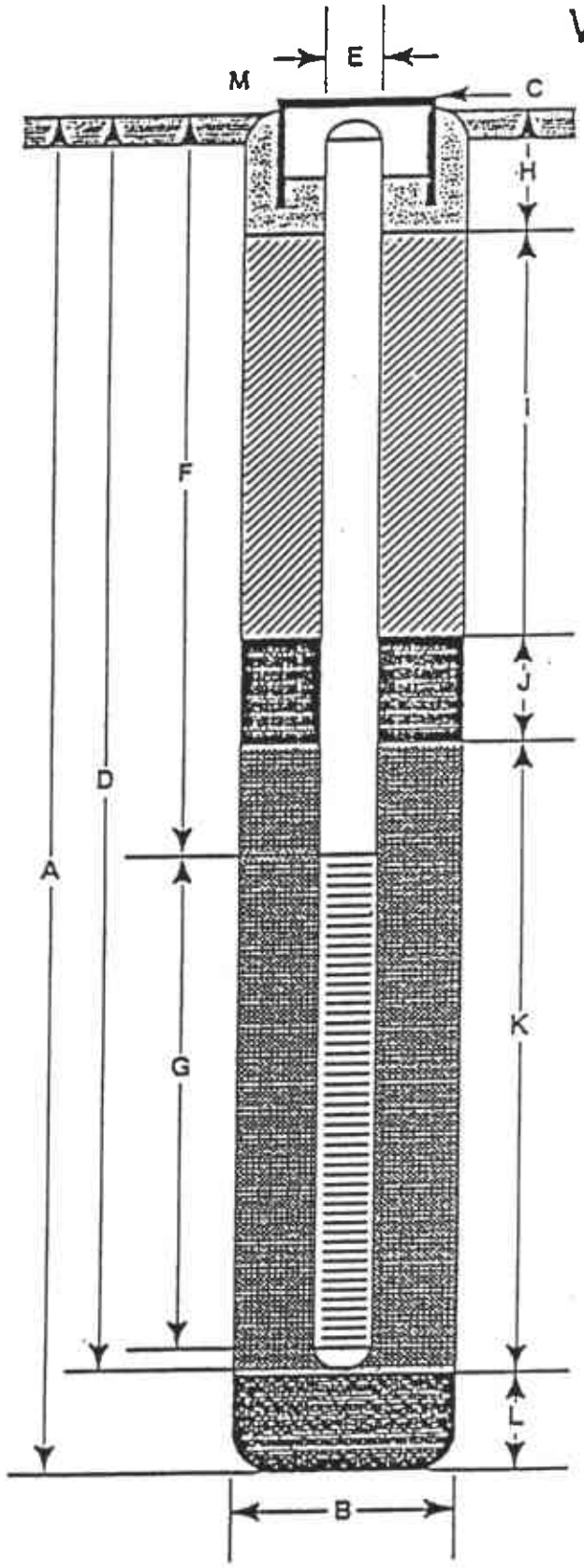
SITE PLAN
Tosco (76) Service Station No. 3135
845 66th Avenue
Oakland, California

FIGURE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
140070.03		03/00	

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 20 ft.

B Diameter of Boring 8 in.
Drilling Method hollow stem auger

C Top of Box Elevation to be surveyed ft.
☒ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length 20 ft.
Material schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 5 ft.

G Perforated Length 15 ft.
Perforated Interval from 5 to 20 ft.
Perforation Type factory machine slot
Perforation Size 0.010 in.

H Surface Seal from surface to 1.5 ft.
Seal Material concrete

I Backfill from 1.5 to 3.5 ft.
Backfill Material neat cement

J Seal from 3.5 to 4.5 ft.
Seal Material hydrated bentonite

K Gravel Pack from 4.5 to 20 ft.
Pack Material Lonestar # 2/12 sand

L Bottom Seal NA ft.
Seal Material NA

M Traffic-rated water-resistant well box, locking well cap with lock

Figure 3
Tosco (76) Service Station NO. 3135
845 - 66th Avenue
Oakland, California

Note: Depths measured from initial ground surface

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Well Construction Detail

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
140070.03		March, 2000		

APPENDIX A

GR FIELD METHODS AND PROCEDURES

GETTLER-RYAN INC.
FIELD METHODS AND PROCEDURES

Site Safety Plan

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

Collection of Soil Samples

Exploratory soil borings are drilled by a California-licensed well driller. A GR 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 exploratory soil boring with a split-barrel sampler or other appropriate sampling device fitted with clean brass or 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 soil is described using the Unified Soil Classification System (ASTM 2488-84) 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 or aluminum foil, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Samples are selected for chemical analysis based on:

a. depth relative to underground storage tanks and existing ground surface
b. depth relative to known or suspected groundwater
c. presence or absence of contaminant migration 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

A PID 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 some soil from one of the sample tubes not retained for chemical analysis and immediately covering the end of the tube with a plastic cap. The PID probe is inserted into the headspace inside the tube through a hole in the plastic cap. Head-space screening results are recorded on the boring log. Head-space screening procedures are performed and results recorded as reconnaissance data. GR does not consider field screening techniques to be verification of the presence or absence of hydrocarbons.

Stockpile Sampling

Stockpile samples consist of four individual sample liners collected from each 100 cubic yards (yd^3) of stockpiled soil material. Four arbitrary points on the stockpiled material are chosen, and discrete soil sample is collected at each of these points. Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and then driving the stainless steel or brass tube into the stockpiled material with a wooden mallet or hand driven soil sampling device. The sample tubes are then covered on both ends with Teflon sheeting, capped, labeled, placed in the cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Stockpiled soils are covered with plastic sheeting after completion of sampling.

Construction of Monitoring Wells

Monitoring wells are constructed in the exploratory 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 generally extends from the total well depth to a point above the groundwater. An appropriately-sized sorted sand is placed in the annular space adjacent to the entire screened interval. A bentonite transition seal 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 cap. A lock is placed on the well cap to prevent vandalism and unintentional introduction of materials into the well.

Storing and Sampling of Drill Cuttings

Drill cuttings are stockpiled on plastic sheeting or stored in drums depending on site conditions and regulatory requirements. Stockpile samples are collected and analyzed on the basis of one composite sample per 50 cubic yards of soil. Stockpile samples are composed of four discrete soil samples, each collected from an arbitrary location on the stockpile. The four discrete samples are then composited in the laboratory prior to analysis.

Each discrete stockpile sample is collected by removing the upper 3 to 6 inches of soil, and then driving the stainless or brass sample tube into the stockpiled material with a hand, mallet, or drive sampler. The sample tubes are then covered on both ends with Teflon sheeting, capped, labeled, and placed in a cooler with blue ice for preservation. A chain-of-custody form is initiated in the field and accompanies the selected soil samples to the analytical laboratory. Stockpiled soils are covered with plastic sheeting after completion of sampling.

Wellhead Survey

The top of the newly-installed well casing is surveyed by a California-licensed Land Surveyor to mean sea level (MSL).

Well Development

The purpose of well development is to improve hydraulic communication between the well and 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 the 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.

Groundwater Monitoring and Sampling

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

Water-Level Measurements

Prior to sampling each well, the static water level is measured using an electric sounder and/or calibrated portable oil-water interface probe. 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. The monofilament line used to lower the bailer is replaced between borings with new line to preclude the possibility of cross-contamination. Field observations (e.g. product color, turbidity, water color, odors, etc.) are noted. Water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Sample Collection and Labeling

A temporary PVC screen is installed in the boring to facilitate a grab groundwater sample collection. Samples of groundwater are collected from the surface of the water in each well or boring using the Teflon bailer or a pump. The water samples are then gently poured into laboratory-cleaned containers and sealed with Teflon-lined caps, and inspected for air bubbles to check for headspace. The samples are then labeled by an adhesive label, noted in permanent ink, and promptly placed in an ice storage. A Chain-of-Custody Record is initiated and updated throughout handling of the samples, and accompanies the samples to the laboratory certified by the State of California for analyses requested.