RESNA
Working To Restore Nature

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TRANSMITTAL

TO: Alameda County Health
Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

DATE: November 17, 1993
PROJECT NUMBER: 130063.01
SUBJECT: ARCO Station 6002

93 NOV 26 PM 1:02
ALCO HAZMAT

FROM: Erin D. Krueger

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	11/16/93	Work Plan for Initial Onsite Subsurface Investigation at ARCO Station 6002, 6235 Seminary Avenue, Oakland, California.

THESE ARE TRANSMITTED as checked below:

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REMARKS:
Copies: 1 to RESNA project file no. 130063.01

Erin D. Krueger, Staff Geologist

cc: Mr. Michael Whelan, ARCO

RESNA
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3315 Almaden Expressway, Suite 34
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November 16, 1993

Mr. Mike Whelan
ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

Subject: Work Plan for Initial Onsite Subsurface Investigation
ARCO Station 6002
6235 Seminary Avenue, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) has prepared this Work Plan to perform an initial onsite subsurface investigation at the above-referenced site. This initial investigation is in response to a suspected tank failure at the site. The location of the site is shown on the Site Vicinity Map, Plate 1. The project tasks proposed in this phase of work include: submitting a well permit application to the Alameda County Flood Control and Water Conservation District, Zone 7 (ACFCWCD); drilling three onsite soil borings (B-1 through B-3); installing one 4-inch diameter groundwater monitoring well (MW-1) and two 4-inch diameter vapor extraction wells (VW-1 and VW-2); developing groundwater monitoring well MW-1; collecting groundwater samples from MW-1; and preparing a report detailing our procedures and the results of this investigation.

Borings B-1 and B-2 will be located in the topographically inferred downgradient direction of the four existing 10,000 gallon gasoline underground storage tanks (USTs), and boring B-3 will be located in the inferred upgradient direction of the existing USTs. All borings will be drilled to evaluate whether soil in the vicinity of the existing USTs has been impacted by gasoline hydrocarbons. If groundwater is encountered at a depth of less than 50 feet below ground surface in boring B-1, groundwater monitoring well MW-1 will be installed to evaluate whether groundwater in the vicinity of the USTs has been impacted by gasoline hydrocarbons. If gasoline hydrocarbon impacted soil is encountered in borings B-2 or B-3 at a depth of less than 30 feet below ground surface, vapor extraction wells will be installed. The locations of boring/wells B-1/MW-1, B-2/VW-1, and B-3/VW-2 are shown on Plate 2, Proposed Boring/Well Locations.

PREVIOUS ENVIRONMENTAL WORK

Based on information provided by ARCO, no previous environmental work has been performed at the site.

PROPOSED WORK

RESNA recommends the following work at the site:

Step 1 Upon gaining regulatory approval of this work plan, obtain a drilling permit from ACFCWCD, Zone 7, to install groundwater monitoring well MW-1, and vapor extraction wells VW-1 and VW-2.

Step 2 After permit approval, drill and obtain soil samples for classification and possible laboratory analysis from three onsite soil borings (B-1, B-2, and B-3) shown on Plate 2. Drill boring B-1 to a depth of approximately 50 feet. If groundwater is encountered in the boring, install one 4-inch-diameter groundwater monitoring well. Drill borings B-2 and B-3 to depths of approximately 30 feet. If hydrocarbon impacted soil is encountered in the borings, install 4-inch-diameter vapor extraction wells.

Step 3 Submit selected soil samples from borings B-1 through B-3 to a State-Certified laboratory for analyses for total petroleum hydrocarbons as gasoline (TPHg), and the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using Environmental Protection Agency (EPA) Method 5030/8015/8020. Chain-of-custody protocol will be observed for all samples submitted for analysis.

Step 4 Develop monitoring well MW-1.

Step 5 Measure depth-to-water, purge, and collect groundwater samples from monitoring well MW-1. Submit groundwater samples from the well to a State-Certified laboratory for analysis for TPHg and BTEX using EPA Method 5030/8015/602. Chain-of-custody Protocol will be observed for all samples submitted for analysis.

Step 6 Prepare a report summarizing field and laboratory procedures, findings, interpretations, and conclusions.

SCHEDULE

A preliminary time schedule to perform the steps described above is included as Plate 3, Preliminary Time Schedule. This time schedule is an estimate and is subject to change should circumstances dictate. ARCO and the appropriate regulatory agencies will be informed should the estimated time for completion of the work proposed in this Work Plan be delayed beyond the estimated time of completion depicted in Plate 3. Time is estimated in weeks after gaining regulatory approval of the Work Plan and any changes which must be incorporated into this Work Plan due to regulatory request. RESNA can initiate work at the site within 1 to 2 weeks after receiving authorization to proceed. All field work will be performed according to RESNA' Field Protocol, Appendix A. **If ARCO has not received regulatory approval of this work plan within 21 days, they will begin work as stated in this work plan.**

DISTRIBUTION

It is recommended that a copy of this Work Plan be forwarded to:

Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

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If you should have any questions or comments about this Work Plan, please call us at (408) 264-7723.

Sincerely,
RESNA Industries, Inc.

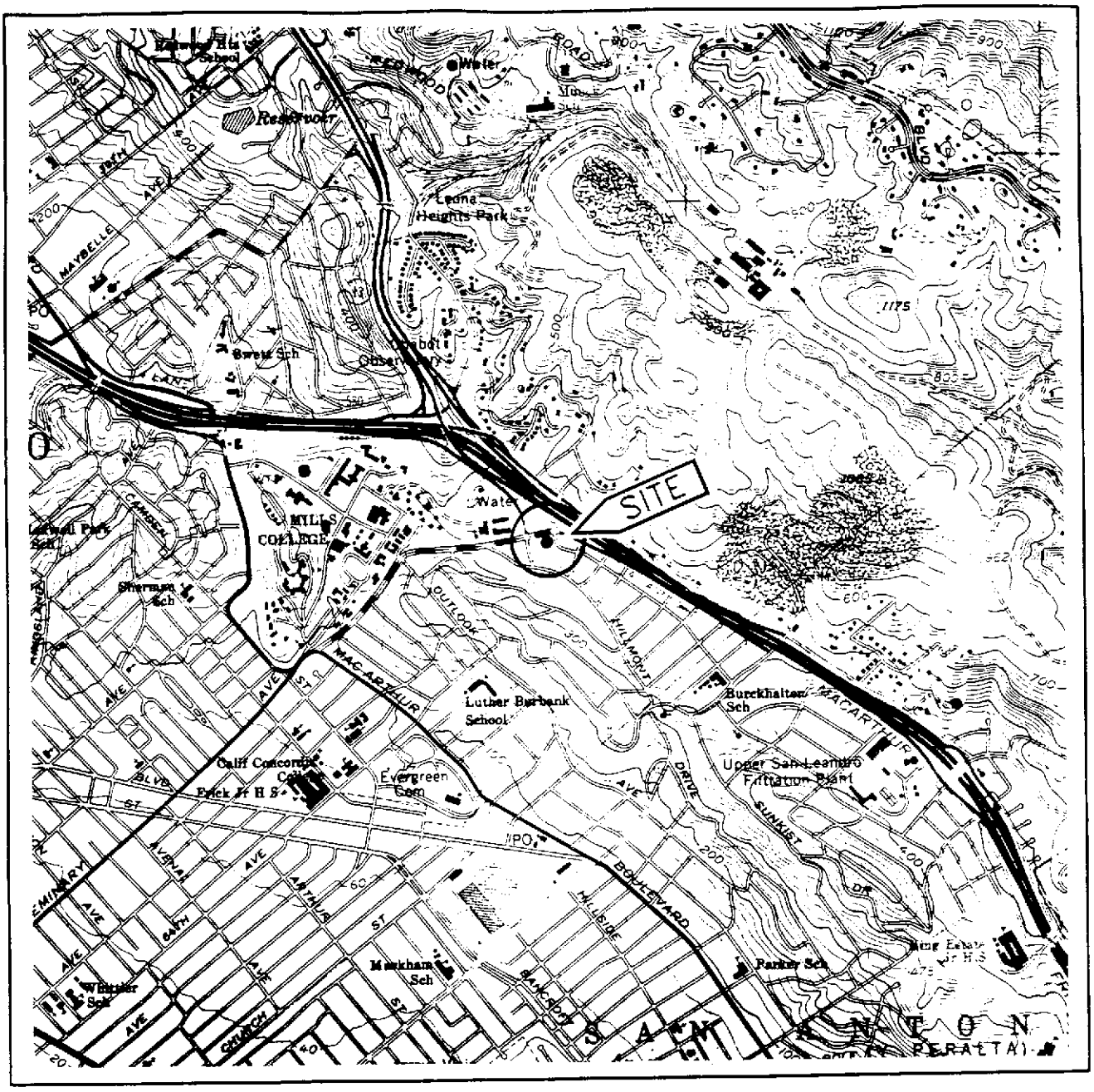
Erin D. Krueger
Staff Geologist

John C. Young
Project Manager

James L. Nelson
Certified Engineering
Geologist No. 1463

REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1463
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Enclosures:
Plate 1, Site Vicinity Map
Plate 2, Proposed Boring/Well Locations
Plate 3, Preliminary Time Schedule
Appendix A, Field Protocol



Source: U.S. Geological Survey
7.5–Minute Quadrangle
Oakland East, California
Photorevised 1980

N

Approximate Scale

2000 1000 0 2000

feet

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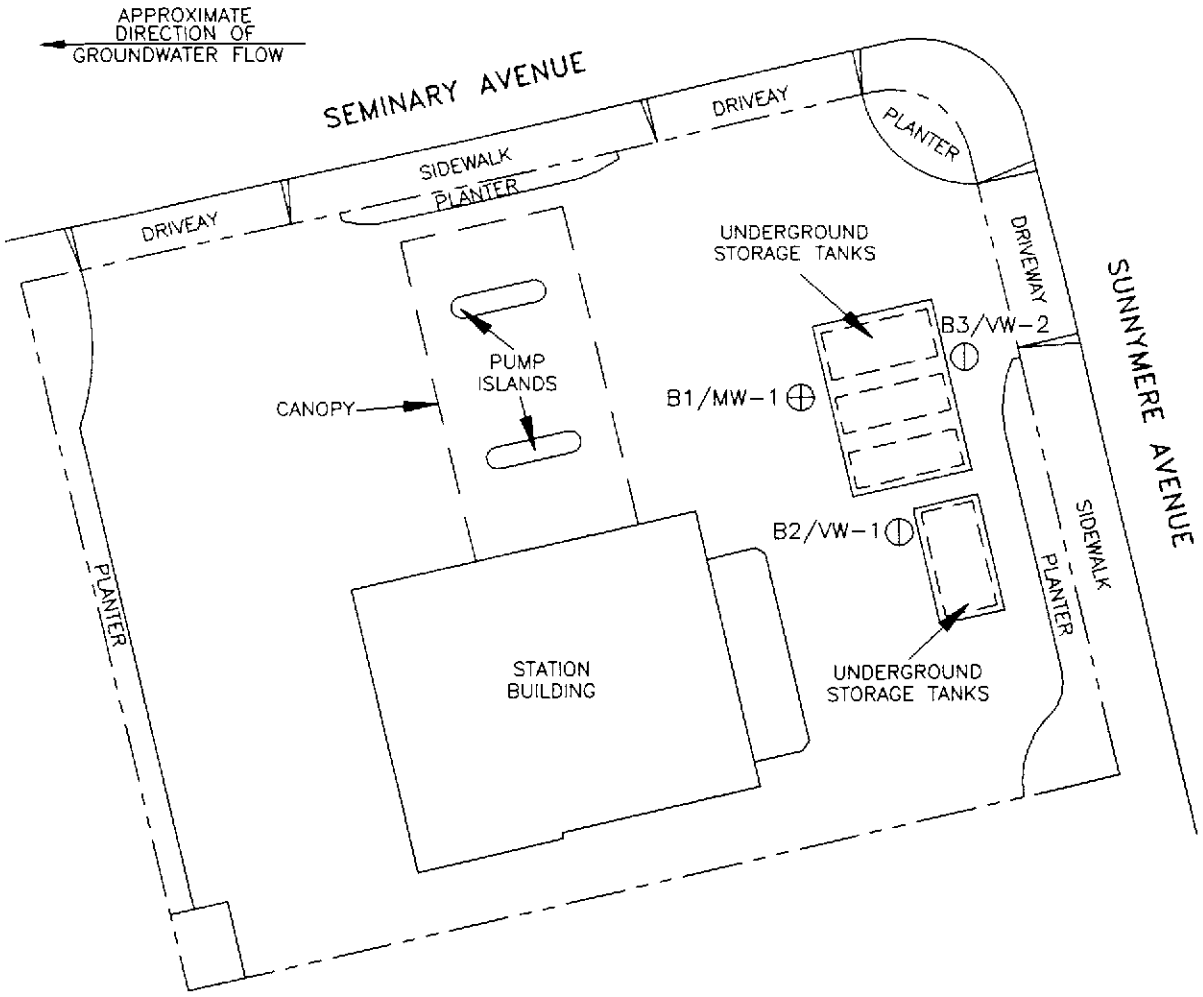
PROJECT 130063.01

SITE VICINITY MAP
ARCO Station 6002
6235 Seminary Avenue
Oakland, California

PLATE
1

P13131-1



EXPLANATION

B1/MW-1 ⊕ = Proposed boring/monitoring well

B3/VW-2 ⊕ = Proposed boring/vapor well

N

Approximate Scale

30 15 0 30

feet

RESNA Working to Restore Nature	PROPOSED BORING/WELL LOCATIONS ARCO Station 6002 6235 Seminary Avenue Oakland, California	PLATE 2
PROJECT 130063.01		

TASK 1
Obtain drilling permits from ACFCWCD.

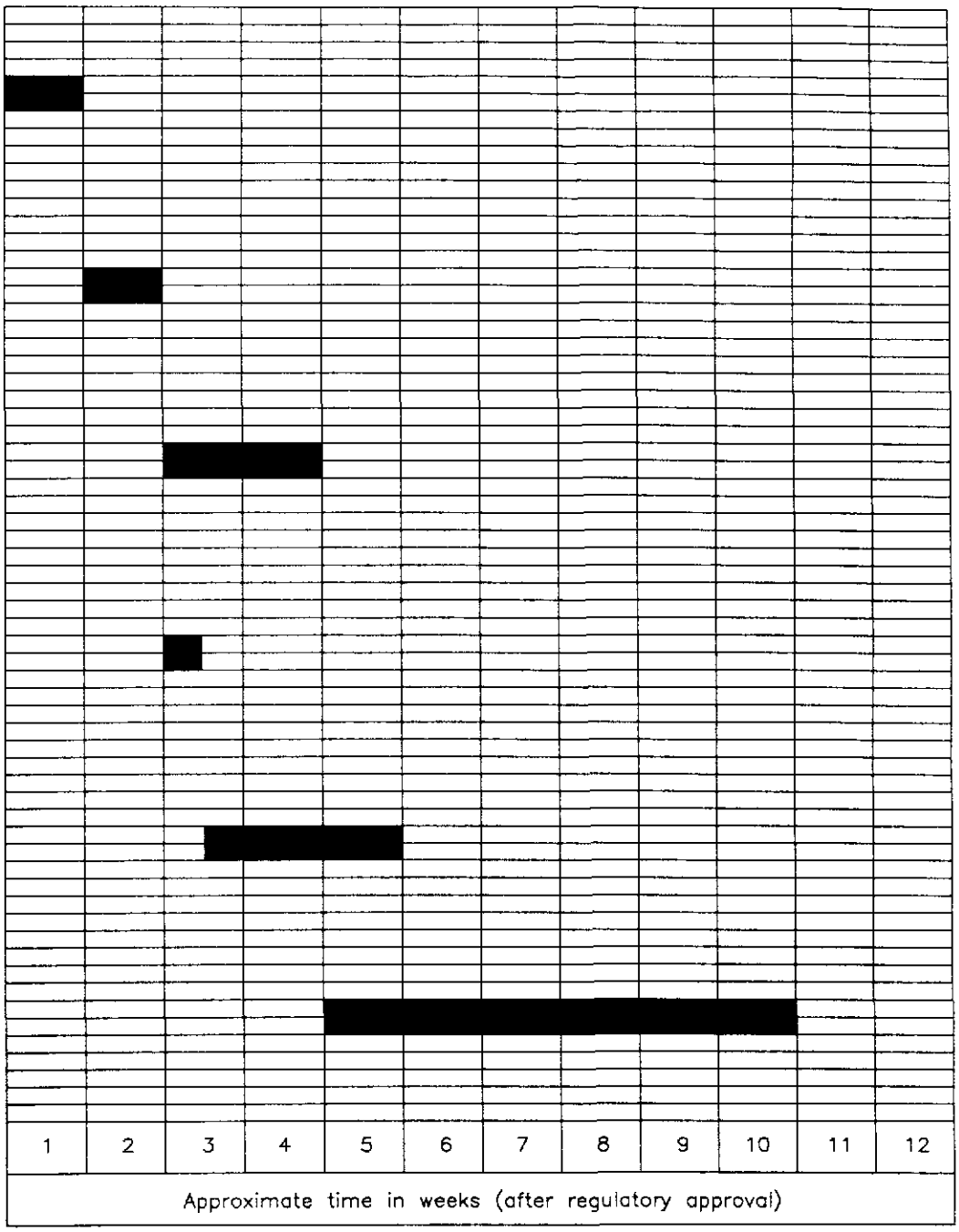
TASK 2
Drill and install two vapor extraction wells and one groundwater monitoring well.

TASK 3
Submit selected soil samples for laboratory analyses, receive results.

TASK 4
Develop monitoring well MW-1.

TASK 5
Monitor and sample monitoring well MW-1. Submit water samples for laboratory analyses, receive results.

TASK 6
Prepare a report of findings.



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PROJECT 130063.01

PRELIMINARY TIME SCHEDULE
ARCO Station 6002
6235 Seminary Avenue
Oakland, California

PLATE
3

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APPENDIX A

FIELD PROTOCOL

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FIELD PROTOCOL

The following presents RESNA's protocol for a typical site investigation involving gasoline hydrocarbon-impacted soil and/or groundwater.

Site Safety Plan

The Site Safety Plan describes the safety requirements for the evaluation of gasoline hydrocarbons in soil, groundwater, and the vadose-zone at the site. The Site Safety Plan is applicable to personnel of RESNA and its subcontractors. RESNA personnel and subcontractors of RESNA scheduled to perform the work at the site are to be briefed on the contents of the Site Safety Plan before work begins. A copy of the Site Safety Plan is available for reference by appropriate parties during the work. A site Safety Officer is assigned to the project.

Sampling of Stockpiled Soil

One composite soil sample is collected for each 50 cubic yards of stockpiled soil, and for each individual stockpile composed of less than 50 cubic yards. Composite soil samples are obtained by first evaluating relatively high, average, and low areas of hydrocarbon concentration by digging approximately one to two feet into the stockpile and placing the intake probe of a field calibrated OVM against the surface of the soil; and then collecting one sample from the "high" reading area, and three samples from the "average" areas. Samples are collected by removing the top one to two feet of soil, then driving laboratory-cleaned brass sleeves into the soil. The samples are sealed in the sleeves using aluminum foil, plastic caps, and aluminized duct tape; labeled; and promptly placed in iced storage for transport to the laboratory, where compositing will be performed.

Soil Borings

Prior to the drilling of borings and construction of monitoring wells, permits are acquired from the appropriate regulatory agency. In addition to the above-mentioned permits, encroachment permits from the City or State are acquired if drilling of borings offsite in the City or State streets is necessary. Copies of the permits are included in the appendix of the project report. Prior to drilling, Underground Services Alert is notified of our intent to drill, and known underground utility lines and structures are approximately marked.

The borings are drilled by a truck-mounted drill rig equipped with 8- or 12-inch-diameter, hollow-stem augers. The augers are steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. After drilling the borings, monitoring wells are constructed in the borings, or neat-cement grout with bentonite is used to backfill the borings to the ground surface.

Borings for groundwater monitoring wells are drilled to a depth of no more than 20 feet below the depth at which a saturated zone is first encountered, or a short distance into a stratum beneath the saturated zone which is of sufficient moisture and consistency to be judged as a perching layer by the field geologist, whichever is shallower. Drilling into a deeper aquifer below the shallowest aquifer can begin only after a conductor casing is properly installed and allowed to set, to seal the shallow aquifer.

Drill Cuttings

Drill cuttings subjectively evaluated as having hydrocarbon contamination at levels greater than 100 parts per million (ppm) are separated from those subjectively evaluated as having hydrocarbon contamination levels less than 100 ppm. Evaluation is based either on subjective evidence of soil discoloration, or on measurements made using a field calibrated OVM. Readings are taken by placing a soil sample into a ziplock type plastic bag and allowing volatilization to occur. The intake probe of the OVM is then inserted into the headspace created in the plastic bag immediately after opening it. The drill cuttings from the borings are placed in labeled 55-gallon drums approved by the Department of Transportation; or on plastic at the site, and covered with plastic. The cuttings remain the responsibility of the client.

Soil Sampling in Borings

Soil samples are collected at no greater than 5-foot intervals from the ground surface to the total depth of the borings. The soil samples are collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. The sampler and brass sleeves are laboratory-cleaned, steam-cleaned, or washed thoroughly with Alconox® and water, prior to each use. The sampler is driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive six inches are counted and recorded to evaluate the relative consistency of the soil.

The samples selected for laboratory analyses are removed from the sampler and quickly sealed in their brass sleeves with aluminum foil, plastic caps, and aluminized duct tape. The samples are then be labeled, promptly placed in iced storage, and delivered to a laboratory certified by the State of California to perform the analyses requested.

One of the samples in brass sleeves not selected for laboratory analyses at each sampling interval is tested in the field using an OVM that is field calibrated at the beginning of each day it is used. This testing is performed by inserting the intake probe of the OVM into the headspace created in the plastic bag containing the soil sample as described in the Drill Cuttings section above. The OVM readings are presented in Logs of Borings included in the project report.

development prior to sampling. Water generated by well development will be stored in 17E Department of Transportation (DOT) 55-gallon drums on site and will remain the responsibility of the client.

Groundwater Sampling

The static water level in each well is measured to the nearest 0.01-foot using a Solinst® electric water-level sounder or oil/water interface probe (if the wells contain floating product) cleaned with Alconox® and water before use in each well. The liquid in the onsite wells is examined for visual evidence of hydrocarbons by gently lowering approximately half the length of a Teflon® bailer (cleaned with Alconox® and water) past the air/water interface. The sample is then retrieved and inspected for floating product, sheen, emulsion, color, and clarity. The thickness of floating product detected is recorded to the nearest 1/8-inch.

Wells which do not contain floating product are purged using a submersible pump. The pump, cables, and hoses are cleaned with Alconox® and water prior to use in each well. The wells are purged until withdrawal is of sufficient duration to result in stabilized Ph, temperature, and electrical conductivity of the water, as measured using portable meters calibrated to a standard buffer and conductivity standard. If the well becomes dewatered, the water level is allowed to recover to at least 80 percent of the initial water level. Prior to the collection of each groundwater sample, the Teflon® bailer is cleaned with Alconox® and rinsed with tap water and deionized water, and the latex gloves worn by the sampler changed. Hydrochloric acid is added to the sample vials as a preservative (when applicable). A sample method blank is collected by pouring distilled water into the bailer and then into sample vials. A sample of the formation water is then collected from the surface of the water in each of the wells using the Teflon® bailer. The water samples are then gently poured into laboratory-cleaned, 40-milliliter (ml) glass vials, 500 ml plastic bottles or 1-liter glass bottles (as required for specific laboratory analysis) and sealed with Teflon®-lined caps, and inspected for air bubbles to check for headspace, which would allow volatilization to occur. The samples are then labeled and promptly placed in iced storage. A field log of well evacuation procedures and parameter monitoring is maintained. Water generated by the purging of wells is stored in 17E DOT 55-gallon drums onsite and remains the responsibility of the client.

Sample Labeling and Handling

Sample containers are labeled in the field with the job number, sample location and depth, and date, and promptly placed in iced storage for transport to the laboratory. A Chain of Custody Record is initiated by the field geologist and updated throughout handling of the samples, and accompanies the samples to a laboratory certified by the State of California for the analyses requested. Samples are transported to the laboratory promptly to help ensure that recommended sample holding times are not exceeded. Samples are properly disposed of after their useful life has expired.