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LF 2793

**SOIL AND GROUND-WATER INVESTIGATION IN THE VICINITY OF  
TWO ABOVEGROUND DIESEL FUEL STORAGE TANKS  
ORO LOMA SANITARY DISTRICT  
2600 GRANT AVENUE  
SAN LORENZO, CALIFORNIA**

**INTRODUCTION**

This work plan was prepared by Levine·Fricke, Inc., of Emeryville, California, on behalf of Oro Loma Sanitary District ("Oro Loma") of San Lorenzo, California. The purpose of the work presented is to investigate soil and ground-water quality in the vicinity of two aboveground diesel fuel storage tanks located at the Oro Loma facility, 2600 Grant Avenue, San Lorenzo, California ("the Site"; Figure 1).

Oro Loma is a sanitary sewage treatment facility that has operated since the 1940s. No other businesses are known to have operated on the Site in the past. Oro Loma has two 2,500-gallon-capacity aboveground steel diesel fuel tanks that are used to fuel standby diesel engines that drive sewage influent pumps. The belowground piping from the tanks to the engines was temporarily removed in September 1992 and replaced by aboveground hose piping until excavation was completed. The belowground piping was then reconnected. Based on soil and ground-water samples collected from the excavation during pipe removal, soil and ground water in the excavation were affected by petroleum hydrocarbons. Alameda County Health Care Services (ACHCS) in Oakland was informed of the petroleum release.

Two other permitted tanks are located at the Site: a 1,000-gallon-capacity steel underground tank that contains unleaded gasoline, and a 250-gallon-capacity aboveground tank that stores waste oil. These tanks are routinely manually gauged to reconcile product inventory. The underground gasoline tank is pressure tested annually. No spills or leaks associated with the gasoline and waste-oil tanks are known to have occurred at the Site.

**BACKGROUND**

The depth to ground water at the Site is approximately 5 feet below ground surface (bgs). The shallow ground-water flow direction is toward San Francisco Bay and may be influenced by

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the tidal changes in the Bay. No other environmental site investigations are known to be conducted in the immediate vicinity of the Site.

Because of the leaking underground pipe associated with the former dispenser pump underground piping connected to the aboveground diesel storage tanks, soil adjacent to the leaking pipe was excavated to depth of 5 to 6 feet bgs. A total of approximately 23.5 cubic yards of soil was excavated and stockpiled on site. The excavation remains open.

Testing and Technology, Inc. (T&T) collected three soil samples from the base of the excavation at a depth of approximately 6 feet bgs (Figure 2). One other soil sample (Figure 2, sample SS-4-5) was collected from a smaller area that was excavated adjacent to the tanks. These samples were submitted for the analysis of total petroleum hydrocarbons as diesel (TPHd), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). In addition, two ground-water samples were collected from the excavation in the vicinity of the leaking pipes, and were analyzed for TPHd and BTEX compounds. The analytical results are summarized in Table 1 and discussed in the following paragraphs.

Analytical results of the soil sample (SS-3-6) collected along the western end of the excavation contained 33,000 parts per million (ppm) of TPHd, with lesser amounts of toluene, ethylbenzene, and total xylenes (0.31 ppm, 0.40 ppm, and 2.4 ppm, respectively). The soil samples collected from the center (SS-2-6) and the east (SS-1-6) end of the excavation contained TPHd at 230 ppm and 180 ppm, respectively, and the soil sample collected from the east side of the excavation contained 0.34 ppm total xylenes. Other BTEX compounds were not present above detection limits in these samples.

The soil sample (SS-4-5) collected from the west side of the tanks contained 110 ppm of TPHd, with lesser amounts of toluene, ethylbenzene, and total xylenes (0.15 ppm, 0.09 ppm, and 0.40 ppm, respectively). Benzene was not present above detection limits in this sample.

Analytical results of the ground-water sample (W-1-6) collected from the east end of the excavation contained 540 ppm of TPHd, with lesser amounts of toluene, ethylbenzene, and total xylenes (2.1 ppm, 7.0 ppm, and 29.0 ppm, respectively). The ground-water sample (W-6-6) collected from the west end of the excavation contained 0.0075 ppm benzene, 0.019 ppm toluene, and 0.070 ppm total xylenes. This sample was not analyzed for TPHd.

## FIELD INVESTIGATION ACTIVITIES

The proposed scope of work is intended to fulfill the objectives of this work plan and will include the following tasks:

- Task 1: Borehole Drilling, Soil Sampling, and Ground-Water Sample Collection
- Task 2: Laboratory Analysis Program
- Task 3: Data Evaluation and Report Preparation

These tasks are described below.

### Task 1: Borehole Drilling, Soil Sampling, and Ground-Water Sample Collection

Five soil borings will be drilled at locations illustrated on Figure 2. Borings B-1 through B-3 are located approximately 10 feet west of the western edge of the excavation and diesel tank locations. Borings B-4 and B-5 are located approximately 3 feet west and north of the excavation. The objectives of this task are as follows:

- to collect soil samples (B-1 through B-5) to assess the lateral and vertical extent of petroleum-affected soil
- to collect ground-water samples from three of the boreholes (B-1 through B-3) to assess if ground water has been affected by petroleum hydrocarbons

Before boreholes are drilled, utilities at the Site will be identified by Oro Loma staff to clear the proposed drilling locations.

All field activities will be conducted by 40-hour OSHA-certified personnel as required under Levine·Fricke's health and safety plan. All downhole drilling and sampling equipment will be steam cleaned before use at each drilling location. Steam cleaning of drilling equipment will be conducted off site by the drilling contractor. If steam-cleaning services are required on site, the rinsate water will be discharged to the headworks of the sewage treatment plant adjacent to the diesel tanks.

### Borehole Drilling

Each boring will be drilled to an appropriate depth below ground surface using the hollow-stem auger drilling method. Gregg Drilling of Concord, California, a California

state-licensed subcontractor, will be retained to perform drilling services. The expected total depths of the borings are approximately 10 to 15 feet bgs for borings B-1 through B-3 and 5 to 10 feet bgs for borings B-4 and B-5. Upon completion, the borings will be backfilled with cement to the ground surface.

## Soil Samples

While the borings are being drilled, soil samples will be collected on a continuous basis for lithologic description using a 5-foot-long core barrel. Lithologic logs will be prepared using the Unified Soil Classification System and standard geologic nomenclature. Soil samples for lithologic description and chemical analysis will be collected using the methodologies described below. Lithologic logging of the borings will be conducted by a qualified Levine·Fricke soil scientist, geologist, or engineer under the supervision of either a Registered Geologist or Certified Engineering Geologist.

Soil samples also will be collected for potential chemical analysis at a maximum of 5-foot intervals from the surface down to the top of the water table by driving a brass-tube-lined split-spoon sampler ahead of the auger into undisturbed soil. The lowermost samples from the split-spoon sampler will be preserved for possible chemical analysis by placing aluminum foil-lined plastic caps over the ends of the brass tubes and storing the samples in an ice-chilled cooler.

The adjacent soil sample from the split-spoon sampler will be used for lithologic description using the Unified Soil Classification System, and screened for organic vapors using a PID (photoionization detector). Lithologic descriptions and results from the field screening will be recorded in the field on borehole log forms.

Based on the results of the PID screening, at least one soil sample each from boring locations B-1 through B-5 will be submitted for laboratory analysis (a total of five samples).

## Ground-Water Sample Collection

Ground-water samples will be collected from boring locations B-1 through B-3 using a Teflon bailer. After the borehole has been drilled to its total depth, the hollow-stem augers will be raised 5 to 7 feet to allow ground water to enter the boring. Samples will be collected from the borings after 3 to 5 well volumes of water are purged from the boring. Purging

water from the boring will allow representative ground water to enter the borehole for sampling.

Samples will be collected in laboratory-supplied sample containers, labeled with the borehole identification number, the time and date of sample collection, the analysis requested, and the name of the sampler. The samples will be stored in a chilled ice chest, and maintained under standard chain-of-custody procedures until submittal to the analytical laboratory.

## Waste Management

Wastewater generated from sampling activities will be pumped to the treatment plant headworks. Drill cuttings produced during soil boring and sampling activities conducted as part of this work plan will be placed in the soil stockpile temporarily stored on site. After analytical results are received, disposal or treatment options will be identified.

## **Task 2: Laboratory Analysis Program**

Soil and ground-water samples will be analyzed for TPHd using modified EPA Method 8015, and for BTEX using EPA Method 8020. Analytical services will be performed by a California-certified laboratory. A normal two-week turnaround time for receipt of analytical data from the laboratory is anticipated.

## Soil Samples

At least one soil sample per soil boring (a total of five samples) will be submitted for chemical analysis. Samples to be analyzed will be selected based on depth interval, observations made during borehole drilling, and results of PID screening.

## Ground-Water Samples

One ground-water sample collected from each of the deeper borings (B-1 through B-3) will be submitted for chemical analysis. Additionally, a trip blank and a bailer rinsate blank will be collected and submitted "on hold" pending the results of the ground-water samples collected from the boreholes.

## **Task 3: Data Evaluation and Report Preparation**

Following completion of the field work and receipt of the analytical results from the laboratory, the data will be

reviewed for accuracy and completeness. The data evaluation will assess concentrations of petroleum hydrocarbons in the soil and ground water.

After evaluating the data, a report will be prepared that describes the field activities and presents the sampling results, conclusions, and recommendations for additional investigation or remedial work, if necessary, at the Site.

**SCHEDULE**

Field work is tentatively scheduled for January 7, 1992. Barring subcontractor and weather-related delays or other conditions beyond Oro Loma's control, the report is scheduled to be submitted to ACHCS by February 18, 1992.

TABLE 1  
 CHEMICALS DETECTED IN SOIL AND GROUND-WATER SAMPLES  
 COLLECTED BY TAT TESTING AND TECHNOLOGY  
 IN EXCAVATION OF UNDERGROUND PIPING  
 ORO LOMA SANITARY DISTRICT  
 (concentrations reported in parts per million [ppm])

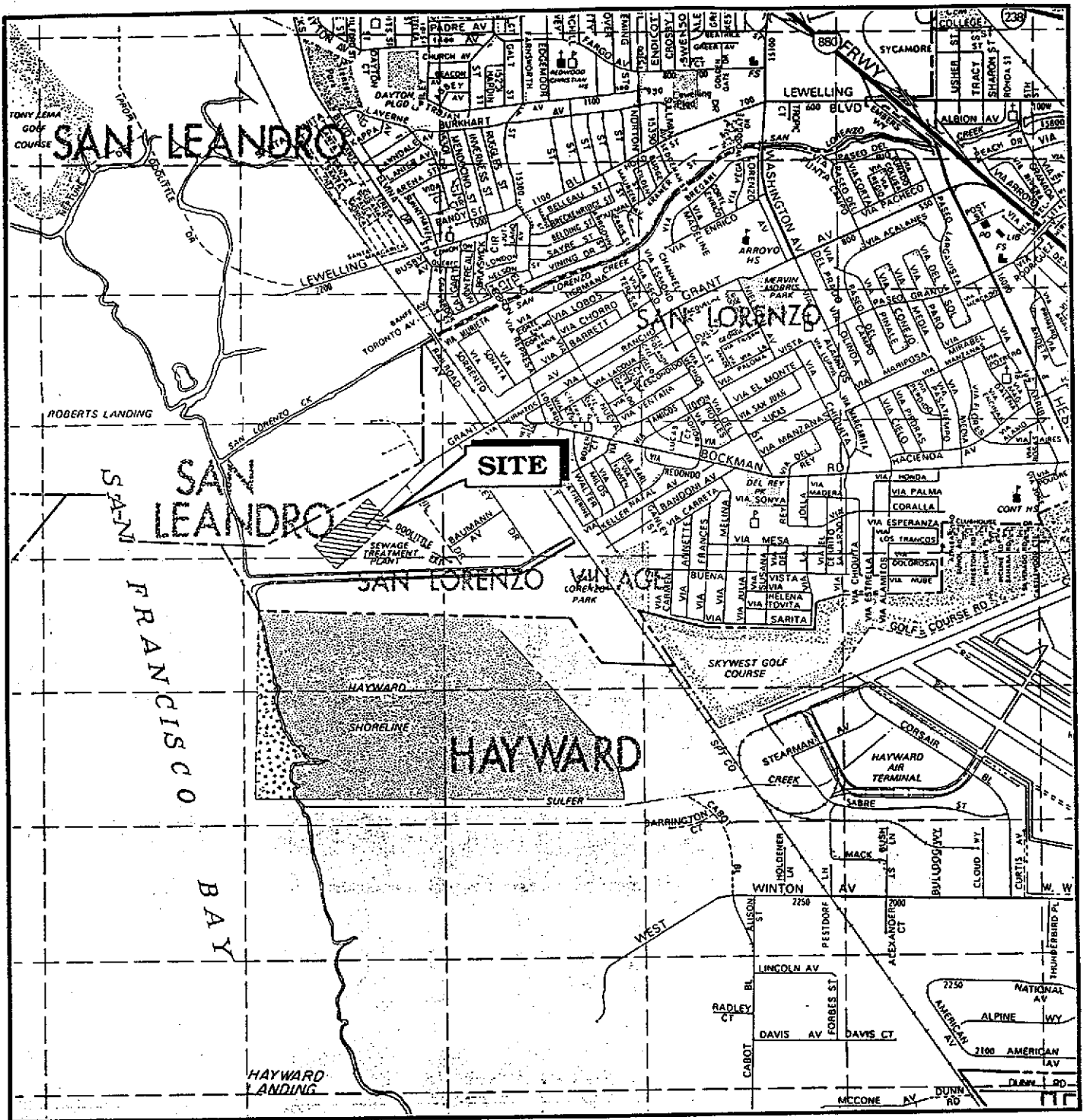
Sample Number*	Date Sampled	Depth	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHd
SS-1-6	17-Sep-92	6	<0.05	<0.05	<0.05	0.34	180
SS-2-6	17-Sep-92	6	<0.05	<0.05	<0.05	<0.05	230
SS-4-5	17-Sep-92	5	<0.05	0.15	0.09	0.40	110
SS-5	17-Sep-92	NA	<0.05	0.09	0.08	0.44	120
SS-3-6	17-Sep-92	6	<0.05	0.31	0.40	2.4	33,000
W-1-6	01-Oct-92	NA	<0.5	2.1	7.0	29.0	540
W-6-6	17-Sep-92	NA	0.0075	0.019	<0.0005	0.07	NR

\* Sample numbers beginning with an "S" are soil samples, those beginning with a "W" are water samples. Sample SS-5 collected from soil stockpile.

NA - not applicable

NR - analyses not requested

TPHd - total petroleum hydrocarbons as diesel



MAP SOURCE:  
 Thomas Bros. Map  
 Alameda and Contra Costa Counties, 1991

Figure 1 : SITE VICINITY



