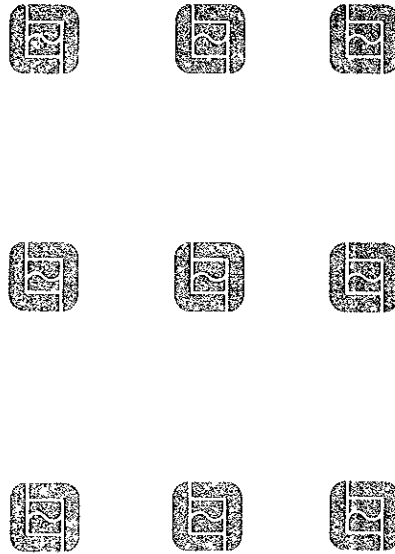


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STID 1667



Work Plan to Conduct Soil Remediation Activities in the  
Beach Street Area, Yerba Buena/East Baybridge Development  
Project Site, Emeryville, California

August 17, 1993  
1649.16

Prepared for  
Catellus Development Corporation  
201 Mission Street  
San Francisco, California 94105



**LEVINE·FRICKE**



*2UGTs (12000 gal found)  
(undiscovered)*

# LEVINE•FRICKE

ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

August 17, 1993

1649.16

Ms. Susan Hugo  
Senior Hazardous Materials Specialist  
Alameda County Health Care Services Agency  
80 Swan Way  
Oakland, California 94621

Subject: Work Plan to Conduct Soil Remediation Activities in the Beach Street Area, Yerba Buena/East Baybridge Development Project Site, Emeryville, California

Dear Ms. Hugo:

On behalf of Catellus Development Corporation, Levine-Fricke has prepared the enclosed work plan to conduct soil remediation activities at the Beach Street area of the Yerba Buena/East Baybridge Development Project Site ("the Site") in Emeryville, California.

The work plan proposes remediating accessible petroleum-affected soil in the Beach Street area in accordance with the cleanup criteria approved by the Alameda County Health Care Services Agency (ACHA) for the former Ransome Company property, located in Area B of the Site. These criteria are less than 10 parts per million (ppm) gasoline, 100 ppm diesel, 1,000 ppm oil and grease (O&G), and less than 1 ppm combined benzene, toluene, ethylbenzene, and xylene (BTEX). We propose to excavate petroleum-affected soils to a maximum depth of 12 feet below ground surface (approximately 5 feet below the ground-water surface). Petroleum-affected soils encountered beneath the 12-foot depth, if any, will be left in place. ✓

Upon completion, the excavation will be backfilled with on-site material meeting the backfill criteria approved for the Site and/or clean imported soil. The soil-quality criteria for backfill soils approved by the ACHA are less than 10 ppm for gasoline, 10 ppm for diesel, 500 ppm for O&G, and below laboratory detection limits for combined BTEX.

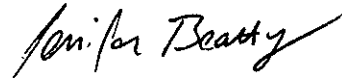
As we discussed in our meeting on August 4, 1993, soil excavated from the Beach Street area will be aerated on site to reduce possible concentrations of gasoline and BTEX to concentrations below the aeration criteria previously approved by the ACHA for the former Ransome Property.

1900 Powell Street, 12th Floor  
Emeryville, California 94608  
(510) 652-4500  
Fax (510) 652-2246

Also as we discussed, diesel- and oil-affected soil excavated from the Beach Street area (including successfully aerated soil) will be placed beneath building pads and/or parking lots during Phase I Development (to be conducted east of Hollis Street) in accordance with the regulatory-approved Containment Plan dated March 10, 1992, and as described in our work plan dated April 28, 1993.

If you have any questions or comments, please do not hesitate to call me.

Sincerely,



Jenifer J. Beatty  
Project Hydrogeologist

Enclosure

cc: Mr. Richard Hiett, RWQCB  
Kimberly Brandt, Catellus  
Pat Cashman, Catellus  
Dennis Wong, Catellus

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August 17, 1993

LF 1649.16

**WORK PLAN TO CONDUCT SOIL  
REMEDIATION ACTIVITIES IN THE BEACH STREET AREA  
YERBA BUENA/EAST BAYBRIDGE DEVELOPMENT PROJECT SITE  
EMERYVILLE, CALIFORNIA**

**INTRODUCTION**

In response to a request from the Catellus Development Corporation ("Catellus"), Levine·Fricke, Inc. ("Levine·Fricke") has prepared this work plan to conduct soil remediation activities in the Beach Street area ("the Site"), located in the northwestern corner of the Yerba Buena/East Baybridge Development Project Site in Emeryville, California (Figures 1 and 2).

This work plan describes tasks to excavate petroleum-affected soil from the Site to reduce concentrations of petroleum hydrocarbons in soils to cleanup criteria previously approved by the Alameda Health Care Service Agency (ACHA) for the Yerba Buena/East Baybridge Development Project Site.

All aspects of this work plan, including cleanup criteria, characterization and management of excavated soil, and backfilling, have been verbally approved by Ms. Susan Hugo of the ACHA and Mr. Richard Hiett of the Regional Water Quality Board (RWQCB) in a meeting with representatives of Catellus and Levine·Fricke on August 4, 1993.

**Site Conditions**

Currently, the Site is vacant and supports sparse vegetation. The property was most recently leased and operated as a warehouse by the M&N Company. The warehouse was demolished in 1991 (Levine·Fricke 1990, 1991). Across the Site is a 3- to 5-foot-thick layer of sandy gravel fill overlying native lean silty clay.

**Previous Investigations**

Between September 1989 and May 1990, Levine·Fricke performed a Phase I and Phase II investigation at the Yerba Buena Project Site. As part of the investigation, ground-water monitoring well LF-12 was installed at the Site in the vicinity of a

suspected former oil underground storage tank (UST). The UST location was recorded on a 1911 Sanborne Fire Insurance ("Sanborne") map. The UST was not recorded on subsequent Sanborne maps and it was likely removed in the past.

Results of the soil sample collected at 4.5 feet below ground surface (bgs) during installation of well LF-12 indicated concentrations of total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH, and toluene of 0.8 parts per million (ppm), 620 ppm, and 0.068 ppm, respectively. No TPH as diesel (TPHd) or benzene, ethylbenzene, or xylenes were detected.

Results for ground-water samples collected from well LF-12 in 1990 indicated TPHd at a concentration of 0.5 ppm. No TPHg, TPH as oil (TPHo) or benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) were detected.

## Recent Investigations

In March 1992, a Levine-Fricke field engineer observed what appeared to be oil in soil samples collected from approximately 5 feet and 11 feet bgs during drilling conducted at the Site for geotechnical purposes. To assess the possible concentration of oil in the vicinity of the geotechnical boring, soil boring SB-1A was drilled at the Site in May 1993. Soil samples were collected from 2.5, 5, and 7.5 feet bgs and submitted for chemical analysis. No petroleum hydrocarbons were detected in the soil sample collected from 2.5 feet bgs. However, TPHd and oil and grease (O&G) were detected at concentrations up to 2,600 ppm and 8,500 ppm, respectively, in the samples collected at 5 and 7.5 feet bgs.

A grab ground-water sample was collected from soil boring SB-1A and submitted for laboratory analysis for TPHg, TPHd, O&G, and BTEX. None of these compounds were detected in the sample, with the exception of TPHd, which was detected at a concentration of 0.3 ppm.

In June 1993, Levine-Fricke drilled nine soil borings in the vicinity of boring SB-1A to assess the extent of petroleum-affected soil at the Site. Soil samples were selected for chemical analysis based on field observations and photoionization detector (PID) readings. Analytical results are presented on Figure 2. As shown in Figure 2, results of the soil samples collected from depths to 11 feet bgs indicated concentrations of petroleum hydrocarbons in soil

## LEVINE-FRICKE

that exceed the cleanup criteria established, and approved by the Alameda County Health Care Services Agency (ACHA), for the Yerba Buena/East Baybridge Development Project Site (Levine-Fricke 1992).

In July 1993, to characterize the petroleum in the affected soils, Levine-Fricke collected two samples of the petroleum-affected soil and submitted them to Friedman & Bruya, Inc., of Seattle, Washington. Friedman & Bruya characterized the petroleum to be crude oil. Levine-Fricke also collected ground-water samples from ground-water monitoring well LF-12. Analytical results of this sample did not indicate the presence of TPHg, TPHd, O&G, or BTEX above laboratory detection limits. TPHo was detected at a concentration of 0.170 ppm.

Based on these results and analytical results for the grab ground-water sample collected from soil boring SB-1A, it does not appear that petroleum-affected soil at the Site has affected shallow ground-water quality.

At this time, we believe that the petroleum-affected soil encountered at the Site is likely associated with the former UST.

### OBJECTIVES AND PROPOSED SCOPE OF WORK

The objectives of the proposed scope of work are to remediate accessible petroleum-affected soil to the cleanup criteria previously approved by the ACHA. Excavated soil will be aerated on site as needed to meet aeration criteria, and then contained on site in accordance with the Containment Plan for the Yerba Buena/East Baybridge Development Project Site (Levine-Fricke, 1992a).

The scope of work consists of the following tasks.

- Task 1: Soil Excavation
- Task 2: Soil Characterization and Management of Excavated Soil
- Task 3: Laboratory Analyses
- Task 4: Excavation Backfilling
- Task 5: Data Evaluation and Report Preparation

These tasks are described below.

**Task 1: Soil Excavation**

Before beginning soil excavation activities, the estimated excavation boundary will be marked in the field with wooden stakes (Figure 2) and Underground Service Alert will be contacted concerning the locations of underground utilities. A private utility locator will be retained to survey the Site and confirm that the UST has been removed.

Soil containing concentrations of petroleum hydrocarbons that exceed cleanup criteria will be excavated to a maximum depth of 12 feet bgs. Cleanup criteria approved by the ACHA are as follows: 10 ppm for TPHg, 100 ppm for TPHd, 1,000 ppm for O&G, and a combined 1 ppm concentration for BTEX compounds (Levine-Fricke 1992).

Based on analytical results and field observations made during previous soil investigations at the Site, it appears that surface soils to depths of approximately 3 feet bgs have not been affected by petroleum hydrocarbons. The upper 3 feet of soil will be removed and placed in 100 cubic yard (cy) stockpiles for subsequent sampling to confirm previous results. Analytical results indicate soil beneath 3 feet bgs may contain elevated concentrations of petroleum hydrocarbons. Affected soils will be excavated and placed directly onto aeration beds constructed on the site or into stockpiles adjacent to the aeration beds, as discussed in Task 2.

Because the excavation will be located near Beach Street and in the vicinity of utilities associated with the street, we propose to remain 3 feet from Beach Street and slope the excavation walls at approximately 0.75 horizontal to 1 vertical away from the property line. Recent ground-water elevation data from monitoring well LF-12 indicate that the static ground-water level is approximately 7 feet bgs. Therefore, we propose to cease excavation at a maximum depth of 12 feet bgs, approximately 5 feet beneath the static ground-water surface. Ground water encountered during excavation activities will be removed using pumps and/or vacuum trucks and stored on site in temporary water storage tanks, pending treatment or disposal.

**Confirmation Sampling and Analysis**

As excavation progresses, soil samples will be collected to document remaining TPH concentrations, if any. The ACHA will be notified at least 48-hours before confirmation soil samples are collected. We propose to collect one soil sample for every 20 to 25 linear feet along the excavation walls and one



soil sample for every 400 square feet from the excavation floor. Excavation floor samples will only be collected from locations where the ground-water conditions permit collection of a representative sample. Areas that are not adjacent to Beach Street will be further excavated if laboratory results indicate that chemical compounds are present above cleanup criteria. The process of excavation and resampling will be repeated (to a maximum excavation depth of approximately 12 feet bgs) until chemical analysis results indicate that residual petroleum concentrations are below cleanup criteria.

Soil samples collected from the excavation will be analyzed by a state-certified analytical laboratory on a rush turnaround time basis or by an on-site mobile analytical laboratory. Standard chain-of-custody protocol will be observed during all sample handling activities.

**Task 2: Characterization and Management of Excavated Soil**

Soil Excavation from 0 to 3 Feet BGS

As discussed previously, the upper 3 feet of fill does not appear to be affected by petroleum hydrocarbons. To verify this, the upper 3 feet of fill soil will be sampled at a rate of approximately one composite sample for every 100 cubic yards of stockpiled soil. Analytical results will be evaluated using the backfill criteria previously approved by the ACHA for the former Ransome Property of 10 ppm for TPHg, 10 ppm for TPHd, 500 ppm for O&G, and below laboratory detection limits for BTEX.

If soil samples indicate concentrations below backfill criteria, the soil will be used to backfill the excavation. If analytical results indicate concentrations exceeding the backfill criteria, the soil will be managed as discussed below.

Soil Excavated from Below 3 Feet BGS

Analytical results presented in Table 1 and on Figure 2 indicated that soil within the proposed excavation limits, at depths ranging between 3 feet and 11 feet bgs, contain elevated concentrations of petroleum hydrocarbons. As discussed in a meeting on August 4, 1993, among representatives of the ACHA, RWQCB, Catellus, and Levine-Fricke, petroleum-affected soil excavated from the

Beach Street area and suspected of containing gasoline and BTEX compounds (based on organic vapor meter readings and field observations) will be placed onto aeration beds constructed on site and aerated as discussed in Task 2A.

Soil suspected of containing only oil or diesel will be placed in stockpiles on visquine adjacent to the aeration beds. Characterization soil samples will be collected from the stockpiled soil at a rate of one sample per 100 to 150 cubic yards and submitted for chemical analysis of TPHg and BTEX. If analytical results for stockpile soil samples indicate concentrations of these compounds, the soil will be moved onto aeration beds and treated as discussed below. If concentrations of gasoline and BTEX in soil are below aeration criteria, the soil will be contained on site as discussed in Task 2B.

#### TASK 2A: SOIL AERATION

Aeration beds will be constructed on site by preparing a smooth surface upon which two layers of 6-milliliter visquine will be placed. It is anticipated that two aeration beds, each approximately 150 feet by 100 feet, will be constructed in the western portion of the Yerba Buena/East Baybridge Development Project Site, west of Hollis Street. The edges of the aeration bed will be bermed to prevent movement of liquids onto or off of soil being aerated.

It is anticipated that approximately 2,000 to 3,200 cubic yards of gasoline-affected soil may be aerated. Soils will be placed onto aeration beds to a uniform depth of 2 to 3 feet and covered until ready for aeration. During aeration, soils will be exposed at a rate consistent with Bay Area Air Quality Management District (BAAQMD) Regulation 8, Rule 40. After soils are exposed for aeration, they will remain uncovered until treatment is concluded. It is anticipated that exposed soil will be turned on the aeration beds two to three times per week to increase chemical removal rates.

Before initiating aeration, four to six soil samples will be collected from each aeration bed and analyzed to assess baseline concentrations of TPHg and BTEX. Thereafter, soil samples will be collected and analyzed periodically to evaluate the degree of treatment achieved to date. Approximately one confirmatory sample per 50 cubic yards of treated soil will be collected to assess whether

## LEVINE·FRICKE

concentrations have been reduced to levels below 10 ppm TPHg and 1 ppm BTEX. Confirmatory sampling results will be evaluated using EPA SW846 to assess whether additional sampling and analysis should be conducted.

EPA SW846 provides guidelines to statistically evaluate the number of additional samples, if any, needed to adequately characterize stockpiled soil. Based on results of this evaluation, additional soil samples, if necessary, will be collected for chemical analysis to confirm that soil has been successfully aerated.

### TASK 2B: CONTAINMENT OF DIESEL- AND OIL-AFFECTED SOIL

Diesel- and oil-affected soil (including successfully aerated soil) will be contained on site in accordance with the regulatory-approved Containment Plan, dated March 10, 1992 (Levine·Fricke 1992), and as described in the Levine·Fricke work plan dated April 28, 1993 (Levine·Fricke 1993).

In accordance with the Containment Plan, diesel- and oil-affected soil will be placed beneath proposed building pads and/or in areas to be covered with asphalt or concrete (parking lots) during Phase I Development activities to be conducted east of Hollis Street. Before aerated soil is placed for containment, analytical results for aerated soil will be submitted to the ACHA for review and approval. Additional soil samples will be collected for chemical analysis following placement of soil to document concentrations of diesel and oil in soil contained on site.

Placement of the soils beneath proposed building pads, asphalt, and/or concrete will minimize possible exposure to the affected soils and mitigate future effects to shallow ground water by reducing surface infiltration through soil. To monitor future effects of TPH-affected soil on ground water beneath the Site, ground-water samples collected from selected ground-water monitoring wells during monitoring activities will be analyzed for TPHo and TPHd on a periodic basis in accordance with the Levine·Fricke work plan dated April 28, 1993 (Levine·Fricke 1993).

### Task 3: Laboratory Analyses

All soil samples will be submitted to a state-certified, off-site analytical laboratory or on-site mobile laboratory.

Excavation Confirmation Samples

Confirmation soil samples collected from the excavation floor and sidewalls will be analyzed for TPHg, TPHd, and TPHo using Modified EPA Method 8015, O&G using Standard method 5520 E,F, and BTEX using EPA Method 8020.

Aerated Soil

Soil samples collected from aeration beds will be analyzed for TPHg and BTEX using EPA Method 8015/8020. It is anticipated that 10% to 20% of the samples collected may additionally be analyzed for TPHd and TPHo using Modified EPA Method 8015.

Stockpile Characterization for Backfill Material

Soil samples collected from stockpiles will be analyzed for TPHg, TPHd, and TPHo using Modified EPA Method 8015, O&G using Standard Method 5520 E,F, and BTEX using EPA Method 8020.

**Task 4: Excavation Backfilling**

After excavation and sampling activities have been completed and analytical results have been obtained and reviewed, completed excavations will be backfilled. Areas along the property boundaries will be backfilled more quickly to reduce the time that the excavation along the street is open. The excavations will be backfilled with on-site material or imported soil that meets backfill criteria.

If ground water is present at the bottom of the excavation or if the excavation bottom is unsuitable for support of construction equipment, a layer of 3/4-inch crushed concrete will be placed to stabilize the fill area. A nonwoven geotextile filter fabric will then be placed over the crushed rock prior to the placement of fill soils.

Fill soils will be placed in loose lifts not exceeding 8 inches in thickness. Fill soils beneath 5 feet bgs will be compacted to at least 90 percent relative compaction. Fill soils above 5 feet bgs will be compacted to at least 95 percent relative compaction.

A Levine·Fricke field engineer will monitor backfill placement and compaction. Field density tests will be taken using a nuclear density gauge to measure the level of compaction being achieved by the contractor.

**Task 5: Data Evaluation and Report Preparation**

A report summarizing the remediation activities conducted at the Site will be prepared and submitted to the ACHA and Regional Water Quality Control Board. The report will describe field activities and present analytical results for final verification soil samples collected from the excavation and from aeration beds. The report will include recommendations for future ground-water monitoring at the Site, if warranted.

**SCHEDULE**

The estimated schedule outlined below is based on the assumption that approximately 4,500 cy of soil will be excavated, of which approximately 2,200 to 3,200 cy may contain concentrations exceeding cleanup criteria.

Task	Estimated Time to Complete
Task 1: Soil Excavation	4 weeks
Task 2: Soil Characterization and Management of Excavated Soil	concurrent with Task 1
Task 3: Laboratory Analyses	concurrent with Task 1
Task 4: Excavation Backfilling	concurrent with Task 1
Task 5: Data Evaluation and Report Preparation	3 to 5 weeks following receipt of analytical results

Changes to this schedule may result from circumstances beyond Levine·Fricke's control, such as work delays due to adverse weather conditions, contractor or laboratory availability, and/or unfavorable or unanticipated site conditions.

REFERENCES

- Levine·Fricke, Inc. 1990. Phase I and phase II environmental investigation, Yerba Buena Project Site, Emeryville and Oakland, California. August 15 (REVISED October 26, 1990).
- . 1991. Phase III environmental investigation, Yerba Buena Project Site, Emeryville and Oakland, California. February 6.
- . 1992a. Containment Plan for Total Petroleum Hydrocarbon-Affected Soils, Yerba Buena Project Site, Emeryville, California. March 10. Volumes I and II.
- . 1992b. Soil remediation activities report, Former Ransome Property, Yerba Buena Project Site, Emeryville, California. December 21. Volumes I and II.
- . 1993. Work Plan for Site Characterization and Remediation Activities to be Conducted in Conjunction with Proposed Site Development, Yerba Buena Project Site, Emeryville and Oakland, California. April 28.

TABLE 1

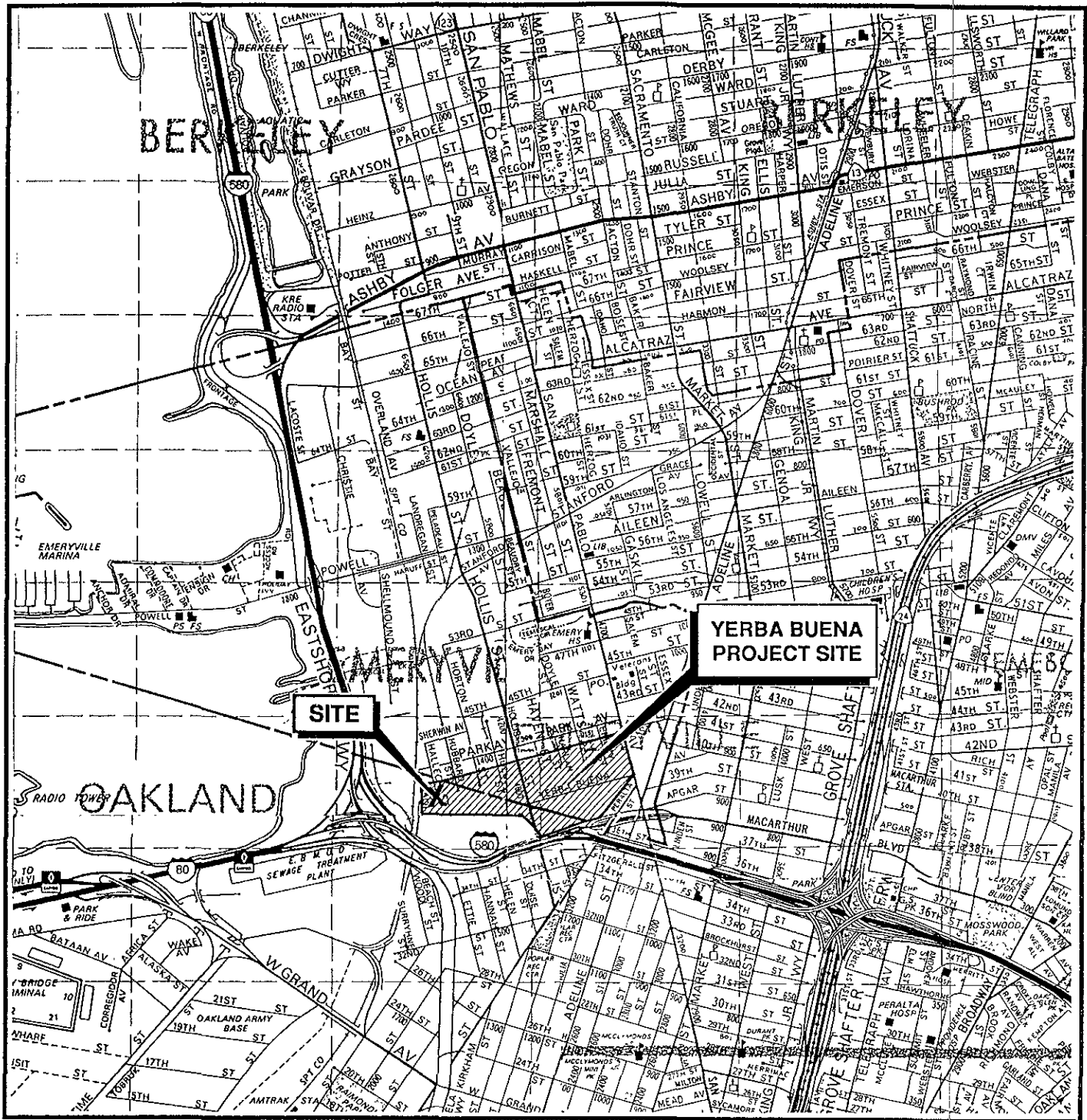
SOIL ANALYSIS RESULTS

Sample Number	Sample Date	Sample Depth	TPHg	TPHd	TRPH	TPHo	Total BTEX
SB-1A	June 1993	2.5	ND	ND	ND	ND	ND
	June 1993	5	ND*	2,600**	5,600	NA	ND*
	June 1993	7.5	ND*	400**	850	NA	ND*
SB-2	June 1993	4.5	NA	ND*	8,300	1,400	NA
	June 1993	11	26	200	1,500	450	1.34
SB-3	June 1993	7.5	NA	ND	110	ND	NA
SB-5	June 1993	4.5	NA	ND*	6,200	1,100	NA
	June 1993	7.5	NA	300	3,300	900	NA
	June 1993	10	NA	40	270	96	NA
SB-6	June 1993	4.5	NA	250	12,000	2,000	NA
	June 1993	7.5	110	250	1,600	850	4.54
SB-7	June 1993	4.5	NA	12	610	66	NA
	June 1993	7.5	NA	ND	680	32	NA
SB-8	June 1993	7.5	NA	ND	140	ND	NA
SB-9	June 1993	4.5	NA	22	350	48	NA
	June 1993	7.5	240	340	2,800	850	12.55
SB-10	June 1993	7.5	NA	35	1,700	97	NA

TPHg = total petroleum hydrocarbons as gasoline  
 TPHd = total petroleum hydrocarbons as diesel  
 TRPH = total recoverable petroleum hydrocarbons  
 TPHo = total petroleum hydrocarbons as oil  
 Total BTEX = combine benzene, toluene, ethylbenzene, and xylenes

\* Elevated detection limit.

\*\* Concentration of diesel reported includes motor oil component (C22-C36).



MAP SOURCE:  
 Thomas Bros. Map  
 Alameda and Contra Costa Counties  
 1992 EDITION

Figure 1: SITE LOCATION MAP



