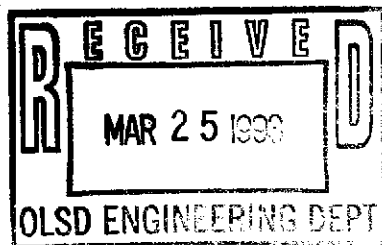




Report on a Soil and Ground-Water Quality
Investigation in the Vicinity of Two Aboveground
Diesel Fuel Storage Tanks at the Oro Loma
Sanitary District Treatment Plant
2600 Grant Avenue
San Lorenzo, California



March 23, 1993
2793

Prepared for
Oro Loma Sanitary District
2600 Grant Avenue
San Lorenzo, California



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ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

March 23, 1993

LF 2793

Mr. Doug Humphrey
Mr. Mike Riddiford
Oro Loma Sanitary District
2600 Grant Avenue
San Lorenzo, California 94580

Subject: Soil and Ground-Water Quality Investigative Report,
Oro Loma Sanitary District Treatment Plant,
2600 Grant Avenue, San Lorenzo, California

Dear Doug and Mike:

Levine-Fricke, Inc., has incorporated your comments into the draft version of the subject report; enclosed are two copies of the final report.

As requested in Mike Riddiford's letter dated March 19, 1993, we will provide a Work Order for the excavation of additional diesel-affected soils and recommendations for disposal methods. As Jo Ann Weber and Mike Riddiford agreed in a telephone conversation on March 22, 1993, Oro Loma will send installation plans for the diesel storage tanks.

If you have any questions or wish to discuss the results of the investigation further, please contact either of the undersigned.

Sincerely,

Mark D. Knox

Mark Knox, P.E.
Chief Engineer

Jo Ann Weber

Jo Ann Weber
Senior Project Hydrogeologist

Enclosures

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

All engineering information, conclusions, and recommendations have been prepared under the supervision of and reviewed by a Levine·Fricke California Professional Engineer.

Mark D. Knox

Mark D. Knox
Chief Engineer
California Professional Engineer (33194)

3/23/93
Date

March 23, 1993

LF 2793

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

1.0 INTRODUCTION

This report presents results of a soil and ground-water investigation at the Oro Loma Sanitary District Treatment Plant at 2600 Grant Avenue in San Lorenzo, California ("the Site"; Figure 1), performed by Levine-Fricke, Inc. ("Levine-Fricke") on behalf of the Oro Loma Sanitary District.

This site investigation was performed in accordance with Levine-Fricke's "Work Plan for 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," dated December 22, 1992, and its Addendum, dated January 19, 1993. This report was prepared at the request of and for submittal to the Alameda County Health Care Services (ACHCS).

1.1 Site History and Description

The Oro Loma sanitary sewage treatment facility has operated since the 1940s. No other businesses are known to have operated on the Site in the past. Facilities at the Site include two 2,500-gallon aboveground steel diesel fuel tanks, which are used to fuel standby diesel engines that drive sewage influent pumps. The underground piping that connected the storage tanks to the engines was temporarily removed in September 1992 and replaced by aboveground hose piping until excavation of soils was completed, after which the underground piping was replaced and reconnected. Analytical results from soil and ground-water samples collected from the excavation indicated that soil and ground water in the excavation was affected by petroleum hydrocarbons. Alameda County Health Care Services (ACHCS) in Oakland was informed of this evidence of a past petroleum release.

The depth to ground water at the Site is approximately 3 feet below ground surface (bgs). The direction of shallow ground-water flow is toward San Francisco Bay, which is within 0.5 mile of the Site. Because the Site is close to the Bay, ground-water flow may also be influenced by tidal changes.

1.2 Objectives

The objectives of the work undertaken were to assess whether ground water is affected by petroleum hydrocarbons and to evaluate the limits of affected soil near the tanks.

2.0 PREVIOUS INVESTIGATIONS

In the area adjacent to a leak in the underground piping that connected the tanks to the engines, soils were 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 has not yet been backfilled.

Testing and Technology, Inc. (T&T) collected three soil samples from the base of the excavation at a depth of approximately 6 feet bgs in September 1992 (Figure 2). One other soil sample (sample SS-4-5 in Figure 2) 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.

2.1 Soil

The highest concentration of TPHd (33,000 parts per million [ppm]) was detected in soil sample SS-3-6, collected along the western end of the excavation. That sample also contained toluene, ethylbenzene, and total xylenes. Soil samples collected from the center (SS-2-6) and eastern end (SS-1-6) of the excavation and from the western side of the tanks (SS-4-5) contained TPHd ranging from 110 ppm to 230 ppm.

Soil sample SS-1-6 also contained 0.34 ppm total xylenes; soil sample SS-4-5 contained 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 any of the samples analyzed.

2.2 Ground Water

Ground-water sample W-1-6, collected from the eastern end of the excavation, contained 540 ppm of TPHd, with lesser amounts of toluene, ethylbenzene, and total xylenes (2.1 ppm, 7.0 ppm,

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and 29.0 ppm, respectively). The ground-water sample taken from the western end of the excavation (W-6-6) contained 0.0075 ppm benzene, 0.019 ppm toluene, and 0.070 ppm total xylenes (this sample was not analyzed for TPHd).

3.0 ADDITIONAL SOIL AND GROUND-WATER INVESTIGATIONS

3.1 Methodology

Additional site investigations were conducted by Levine·Fricke on January 26 and 28, 1993. On January 26, a ground-water monitoring well, MW-1, was installed by Gregg Drilling Company of Concord, California, using the hollow-stem auger drilling method under the supervision of a Levine·Fricke geologist. One soil sample was collected from the boring for the monitoring well. On the same date, using the same method, soil samples were also collected from boring B-4 (three samples, at depths of 2.5, 4.0 and 5.5 feet bgs) and from boring B-5 (two samples, at depths of 2.5 and 6.0 feet bgs). One grab ground-water sample was also collected from the open excavation, beneath the former underground piping.

On January 28, 1993, one ground-water sample was collected from newly installed monitoring well MW-1.

The locations of the ground-water monitoring well, the grab ground-water samples, and the soil samples are shown in Figure 2. Appendix A describes procedures used for well installation and development and for ground-water and soil sampling.

Both soil and ground-water samples were analyzed for TPHd, using modified EPA Method 8015, and for BTEX, using EPA Method 8020, by Anamatrix, Inc. of San Jose, California, a state-certified laboratory. Laboratory analytical results for the samples are presented in Table 1. Appendix C contains analytical laboratory certificates.

3.2 Results of Soil Analysis

Two of the six soil samples contained TPHd: sample B-1-2.5 at 19 ppm and B-4-4.0 at 350 ppm. BTEX was not found in any sample above laboratory detection limits (<0.005 ppm).

3.3 Results of Ground-Water Analysis

Chemical analysis of the ground-water samples from the new monitoring well (MW-1) and from the open excavation (ESW-1)

detected TPHd at concentrations of 0.59 ppm and 75 ppm, respectively; BTEX was not reported in either sample above laboratory detection limits.

4.0 RECOMMENDATIONS

Based on the results of this investigation, it is recommended that additional soil in the vicinity of boring B-4 be removed. In addition, approximately 2 to 3 feet of additional soils should be excavated from the bottom of the open excavation into the native clayey soils; however, a geotechnical engineer should first confirm that the additional excavation will not undermine the diesel tanks. These soils should be excavated to a cleanup level of approximately 100 ppm of TPHd (a cleanup guideline commonly used by the agencies in the absence of site-specific modeling) and placed in the soil stockpile at the Site. Confirmation soil samples should then be collected and analyzed, and a record of the soil removal and confirmation analysis should be sent to the ACHCS. Because the total volume of soils is anticipated to be relatively small, we recommend that the stockpiled soils be disposed of at a landfill that accepts petroleum-affected soils.

We additionally recommend the implementation of a quarterly ground-water sampling program for a period of one year, per ACHCS policy. For each quarter of the program, one ground-water sample from well MW-1 would be collected; the sample and one field blank would be analyzed for TPHd and BTEX; and the results of the analysis would be provided to the ACHCS. After one year of monitoring, the Oro Loma Sanitary District should evaluate the analytical results with the ACHCS to determine whether an extension of the ground-water monitoring program is necessary.

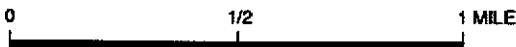
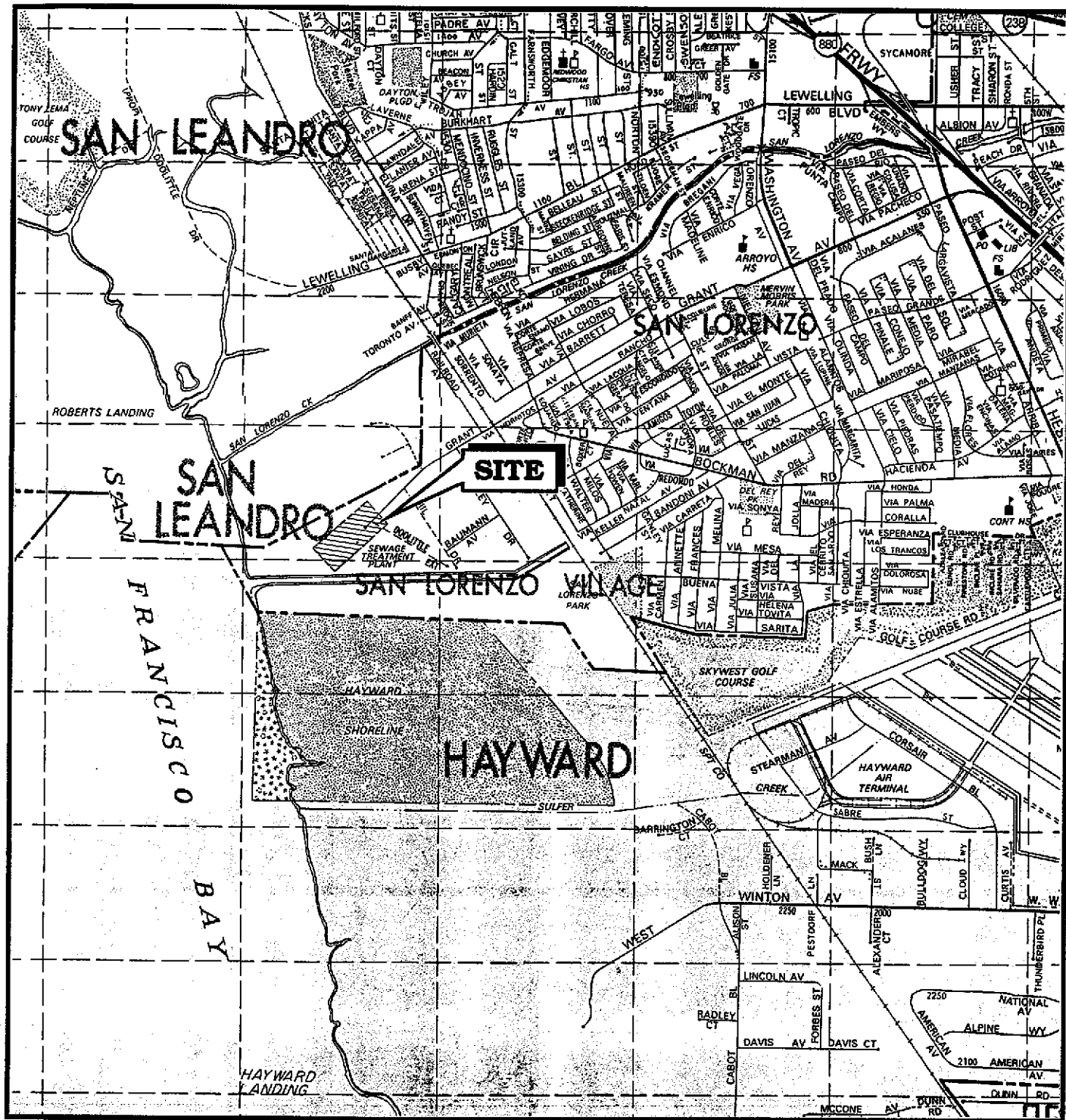
TABLE 1
 CHEMICALS DETECTED IN SOIL AND GROUND-WATER SAMPLES
 COLLECTED IN AREA OF EXCAVATION OF UNDERGROUND PIPING
 ORO LOMA SANITARY DISTRICT
 (concentrations reported in parts per million [ppm])

Sample Number	Sample Collector	Date Sampled	Depth (bgs)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHd
Soil Samples								
SS-1-6	TAT	17-Sep-92	6	<0.05	<0.05	<0.05	0.34	180
SS-2-6	TAT	17-Sep-92	6	<0.05	<0.05	<0.05	<0.05	230
SS-4-5	TAT	17-Sep-92	5	<0.05	0.15	0.09	0.40	110
SS-5	TAT	17-Sep-92	NA	<0.05	0.09	0.08	0.44	120
SS-3-6	TAT	17-Sep-92	6	<0.05	0.31	0.40	2.4	33,000
B-1-2.5	LF	26-Jan-93	2.5	<0.005	<0.005	<0.005	<0.005	19
B-4-2.5	LF	26-Jan-93	2.5	<0.005	<0.005	<0.005	<0.005	<10
B-4-4.0	LF	26-Jan-93	4	<0.005	<0.005	<0.005	<0.005	350
B-4-5.5	LF	26-Jan-93	5.5	<0.005	<0.005	<0.005	<0.005	<10
B-5-2.5	LF	26-Jan-93	2.5	<0.005	<0.005	<0.005	<0.005	<10
B-5-6.0	LF	26-Jan-93	6	<0.005	<0.005	<0.005	<0.005	<10
Groundwater Samples								
W-1-6	TAT	01-Oct-92	NA	<0.5	2.1	7.0	29.0	540
W-6-6	TAT	17-Sep-92	NA	0.0075	0.019	<0.0005	0.07	NR
ESW-1	LF	26-Jan-93	NA	<0.125	<0.125	<0.125	<0.125	75
MW-1	LF	28-Jan-93	NA	<0.0005	<0.0005	<0.0005	<0.0005	0.59

NOTES:

bgs below ground surface
 LF Levine-Fricke
 NA not applicable
 NR analyses not requested
 TAT TAT Testing and Technology
 TPHd total petroleum hydrocarbons as diesel

Sample SS-5 collected from soil stockpile.



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

Figure 1 : SITE VICINITY

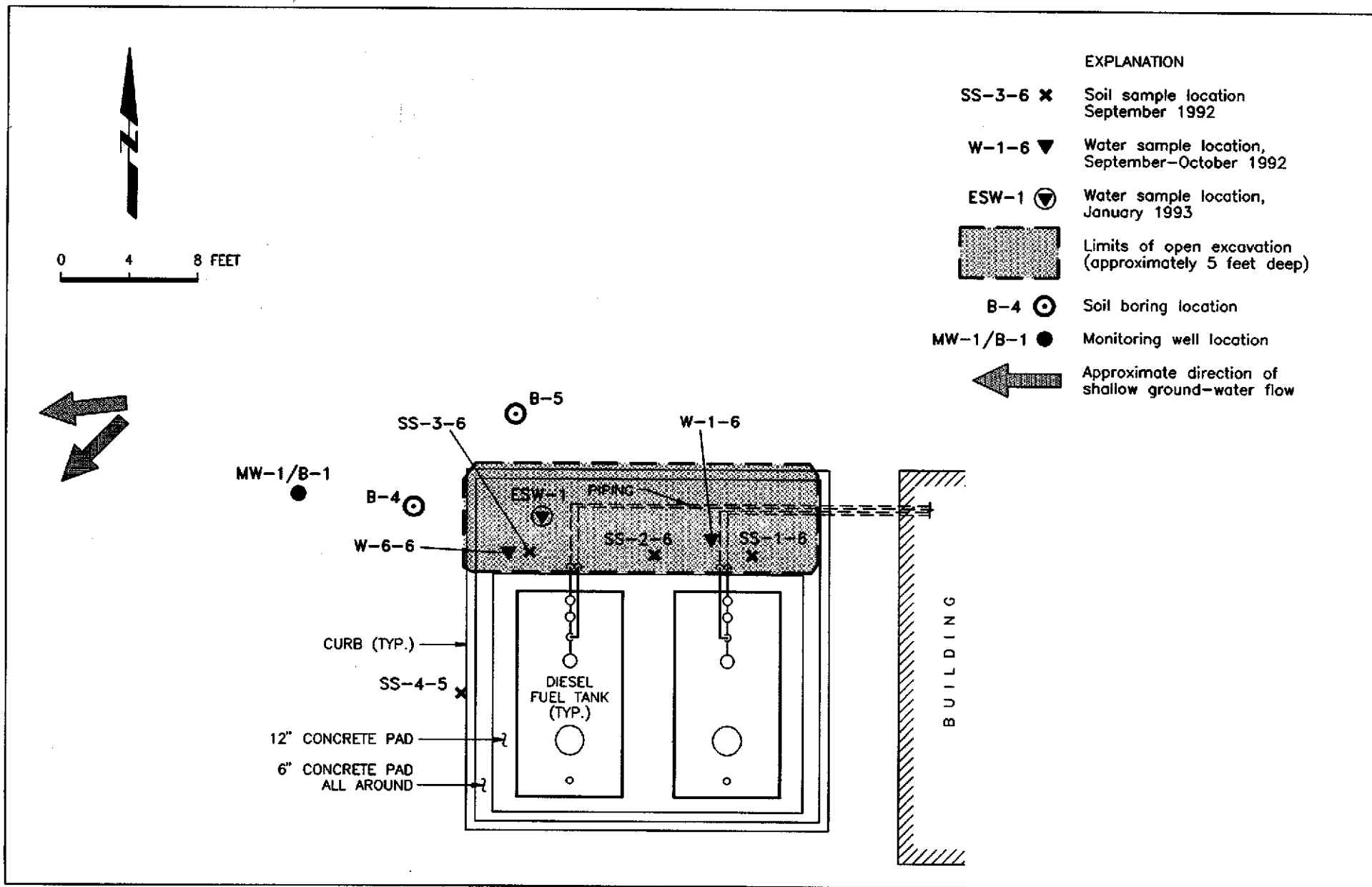


Figure 2 : TANK AND SAMPLE LOCATIONS

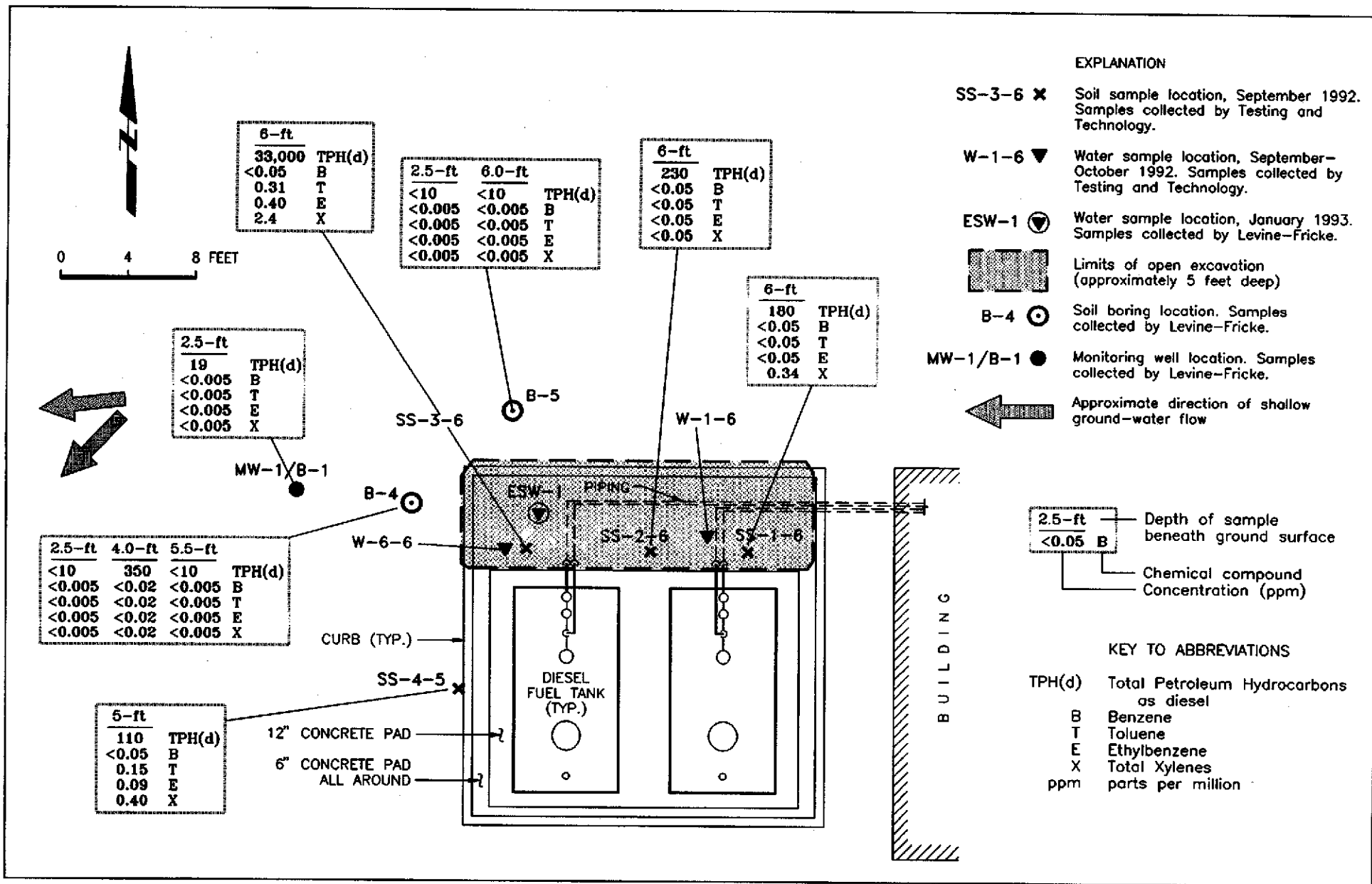


Figure 3 : CONCENTRATIONS OF TOTAL PETROLEUM HYDROCARBONS AS DIESEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES DETECTED IN SOILS (ppm), ORO LOMA SANITARY DISTRICT PLANT, SAN LORENZO, CALIFORNIA

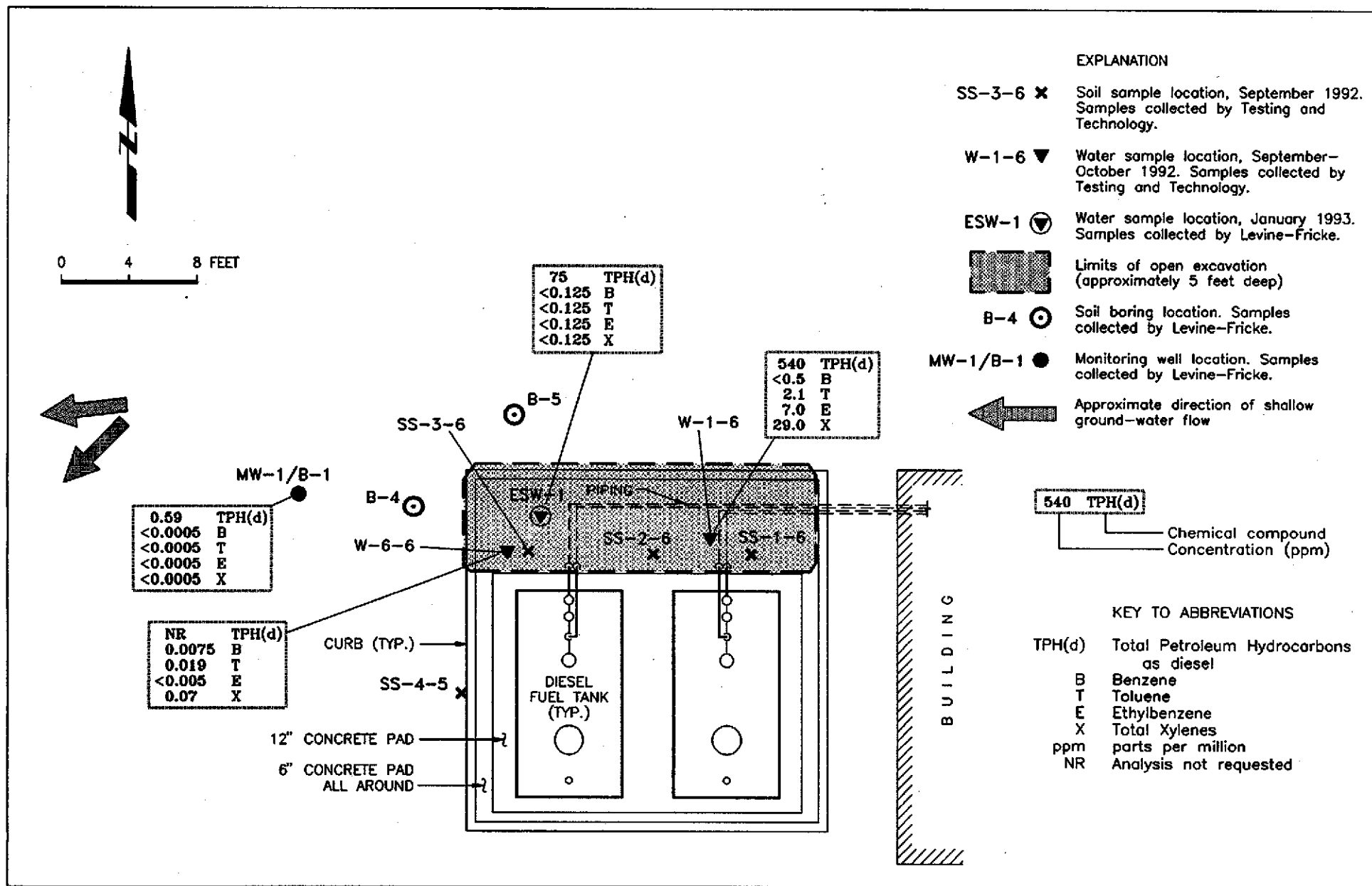


Figure 4 : CONCENTRATIONS OF TOTAL PETROLEUM HYDROCARBONS AS DIESEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES DETECTED IN GROUND WATER (ppm), ORO LOMA SANITARY DISTRICT PLANT, SAN LORENZO, CALIFORNIA

APPENDIX A

**SOIL SAMPLING, WELL INSTALLATION,
WELL DEVELOPMENT, AND GROUND-WATER SAMPLING PROCEDURES**

A-1.0 GROUND-WATER MONITORING WELL INSTALLATION PROCEDURES

On January 26, 1993, Gregg Drilling, of Concord, California, a licensed well drilling contractor, drilled soil borings and installed one ground-water monitoring well, MW-1, on site under the direction of a Levine-Fricke geologist. The locations of the borings and the monitoring well are shown in Figure 2. Soil borings were drilled to a depth of approximately 6 feet bgs, using a truck-mounted drilling rig equipped with 6-inch-outside-diameter hollow-stem augers. All drilling and sampling equipment was steam cleaned before being used at each drilling location. Soil cuttings from the boreholes were placed in the soil stockpile on site until an appropriate disposal method for the soils is determined, based on analytical results.

A-2.0 SOIL SAMPLE COLLECTION

During drilling, soil samples for lithologic description and possible chemical analysis were collected by driving a 2-inch-diameter, 18-inch-long split spoon sampler ahead of the hollow stem auger into undisturbed soil. The sampler was lined with three clean, 2-inch-diameter, 6-inch-long brass tubes. The sample in the bottom-most brass tube was retained for possible chemical analysis. Soils in the upper two brass tubes were described using the Unified Soil Classification System, and were field-screened for the presence of volatile organic compounds (VOCs) as follows:

- The soil was sealed in a plastic bag, disaggregated, and allowed to equilibrate in the bag for approximately 5 minutes.
- A hole was punched in the bag using the tip of an organic vapor analyzer (OVA). The OVA tip was inserted into the bag, and a reading was taken.
- The highest OVA reading was recorded on the drilling log.

The OVA was calibrated using a 100 ppm isobutylene calibration gas prior to each day's drilling activities. Lithologic logs are presented in Appendix B.

Samples were selected from the bottom-most brass tubes from each boring, based on OVA readings and lithology. The ends of the tubes were wrapped with aluminum foil, covered with plastic caps, sealed with tape, and placed in an ice-chilled cooler. The samples were then submitted for analysis under

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strict chain-of-custody protocols to Anametrix, Inc. of San Jose, California, a state-certified laboratory.

A-3.0 GROUND-WATER MONITORING WELL INSTALLATION

The ground-water monitoring well was installed in boring B-1 by inserting 2-inch-diameter, flush-threaded, solid and 0.02-inch slotted well casing through the hollow-stem auger. The well was installed to 13 feet bgs and the screened interval extends from 3 to 13 feet bgs. Depth to ground water during drilling of the well was approximately 2 feet bgs.

A filter pack consisting of No. 3 Monterey sand was poured into the annular space between the hollow-stem auger and the slotted polyvinyl chloride (PVC) well casing as the auger was gradually removed from the borehole. The filter pack was installed to approximately 1 foot above the top of the slotted casing. A 1-foot-thick layer of bentonite was placed on top of the filter pack and wetted, with the remainder of the annular space sealed with neat cement grout containing approximately 3% bentonite. At the ground surface, a 10-inch-deep, 8-inch-diameter, road-rated, cylindrical well box was installed flush to grade to protect well integrity. Well construction details are presented on the lithologic logs in Appendix B.

A-4.0 WELL DEVELOPMENT AND GROUND-WATER SAMPLING

The monitoring well was developed to remove fine particles near the slotted casing and improve hydraulic communication between the slotted casing and the surrounding geologic formation.

Before well development and sample collection, depth to static water was measured and the volume of water in the casing was calculated. The well was developed by pumping using a centrifugal pump. During well purging, pH, specific conductance, and water temperature were monitored using portable field instruments, and recorded on water quality sampling forms. The well was purged until 5 well volumes were removed and/or the parameters stabilized to within 10% of the previous measurement. The hose for the centrifugal pump was steam cleaned prior to being used in the well.

After the well was been purged and had recovered to approximately 80% of its original static water level, water samples were collected, using a clean Teflon bailer fitted with a new length of rope and precleaned, laboratory-supplied,

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40-ml glass volatile organic analysis vials. Each sample vial was gently filled to capacity and checked for trapped air by inverting and tapping the vial. If an air bubble was observed, the sample was discarded and a new vial was filled with fresh water from the well. Samples were stored in an ice-chilled cooler and submitted to a state-certified analytical laboratory under chain-of-custody protocols.

The purged ground water from well-development and ground-water sampling activities was pumped to the treatment plant headworks.

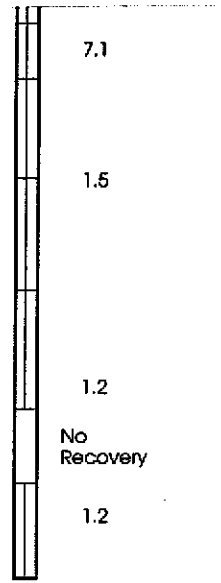
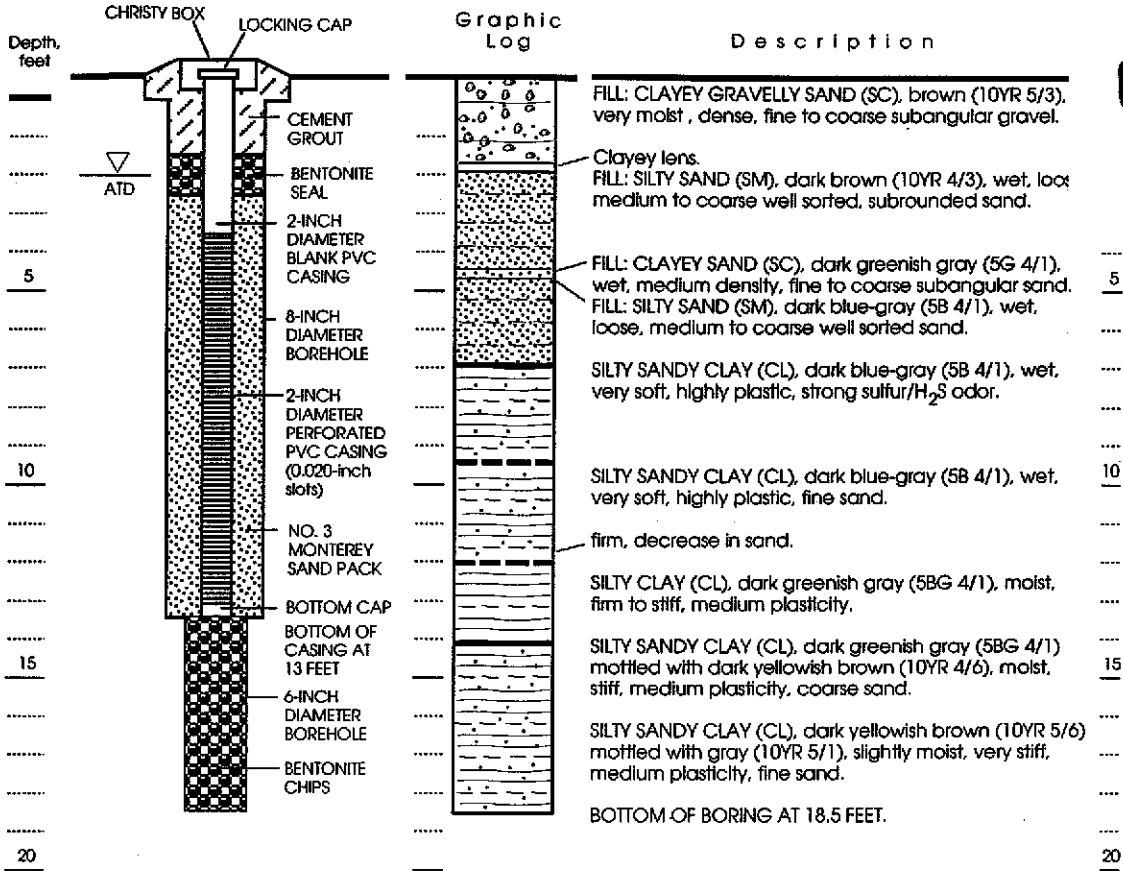
APPENDIX B

BORING LOGS

WELL CONSTRUCTION

LITHOLOGY

ORIGINAL



EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Date well drilled: January 26, 1993
 Drilling method: Hollow-stem auger
 LF Geologist: Kenton Gee

- Split Spoon Sample
- Sample retained for analysis
- Water level at time of drilling
ATD
- OVM Organic Vapor Meter reading
(ppm) In parts per million

Approved by: *Katala Orsaw-RG #5106*

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-1/B-1

LITHOLOGY

SAMPLE DATA

Depth, feet	Graphic Log	Description	Sample No. and Interval	OVM Reading (ppm)		
.....		FILL: CLAYEY GRAVELLY SAND (SC), dark grayish brown (10YR 4/1), moist, medium density, fine to coarse gravel up to 1/2-inch diameter.	.....	.....
.....				
.....				
5			Color change to dark blue-gray (5BG 4/1) mottled with dark grayish brown (10YR 4/1).
.....			
.....			
.....		FILL: SILTY SAND (SM), dark gray (10YR 4/1), wet, loose, medium to coarse sand.	.....	.....
.....				
.....				
.....	BOTTOM OF BORING AT 8.5 FEET.	.....	.....
10	10	.....	

EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Date boring drilled: January 26, 1993
 Drilling method: Hollow-stem auger
 LF Geologist: Kenton Gee

- Split Spoon Sample
- Sample retained for analysis
- Water level at time of drilling
- OVM Organic Vapor Meter reading in parts per million

Approved by: *Katul Baum RG # 5106*

LITHOLOGY AND SAMPLE DATA FOR SOIL BORING B-4

LITHOLOGY

SAMPLE DATA

Depth, feet	Graphic Log	Description	Sample No. and Interval	OVM Reading (ppm)
.....		FILL: CLAYEY GRAVELLY SAND (SC), dark yellowish brown (10YR 4/4), moist, medium density, fine to coarse gravel up to 1/2-inch diameter.	..... B-5-2.5 .....	..... 1.2
5		FILL: GRAVELLY SAND (SP), dark greenish gray (5GY 4/1), wet, loose, fine to coarse gravel up to 1/2-inch diameter.	..... B-5-6.0 .....	..... 1.5
10		FILL: SANDY GRAVEL (GP), very dark gray (2.5Y N3/), wet, loose, angular, pebbles from 0.5-1.5-inch diameter.	..... .....	..... 1.0
10		BOTTOM OF BORING AT 8.5 FEET.	10	

EXPLANATION

- Clay
- Silt
- Sand
- Gravel

Date well drilled: January 26, 1993
 Drilling method: Hollow-stem auger
 LF Geologist: Kenton Gee

- Split Spoon Sample
- Sample retained for analysis
- Water level at time of drilling
ATD
- OVM Organic Vapor Meter reading in parts per million

Approved by: *Katub. Danner R6 # 5106*

LITHOLOGY AND SAMPLE DATA FOR SOIL BORING B-5

APPENDIX C
LABORATORY DATA SHEETS



MS. JOANN WEBER
LEVINE-FRICKE
1900 POWELL STREET 12TH FLOOR
EMERYVILLE, CA 94608

Workorder # : 9301298
Date Received : 01/27/93
Project ID : 2793
Purchase Order: N/A

The following samples were received at Anamatrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9301298- 1	B-1-2.5
9301298- 2	B-5-2.5
9301298- 3	B-5-6.0
9301298- 4	B-4-2.5
9301298- 5	B-4-4.0
9301298- 6	B-4-5.5
9301298- 7	B-4-8.0
9301298- 8	ESW-1

This report consists of 11 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anamatrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anamatrix.

Sarah Schoen, Ph.D.
Laboratory Director

02-10-93
Date

COPY

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FEB 11 1993
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REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. JOANN WEBER
LEVINE-FRICKE
1900 POWELL STREET 12TH FLOOR
EMERYVILLE, CA 94608

Workorder # : 9301298
Date Received : 01/27/93
Project ID : 2793
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9301298- 1	B-1-2.5	SOIL	01/26/93	BTEX
9301298- 2	B-5-2.5	SOIL	01/26/93	BTEX
9301298- 3	B-5-6.0	SOIL	01/26/93	BTEX
9301298- 4	B-4-2.5	SOIL	01/26/93	BTEX
9301298- 5	B-4-4.0	SOIL	01/26/93	BTEX
9301298- 6	B-4-5.5	SOIL	01/26/93	BTEX
9301298- 8	ESW-1	WATER	01/26/93	BTEX
9301298- 1	B-1-2.5	SOIL	01/26/93	TPHd
9301298- 2	B-5-2.5	SOIL	01/26/93	TPHd
9301298- 3	B-5-6.0	SOIL	01/26/93	TPHd
9301298- 4	B-4-2.5	SOIL	01/26/93	TPHd
9301298- 5	B-4-4.0	SOIL	01/26/93	TPHd
9301298- 6	B-4-5.5	SOIL	01/26/93	TPHd
9301298- 8	ESW-1	WATER	01/26/93	TPHd

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MS. JOANN WEBER
LEVINE-FRICKE
1900 POWELL STREET 12TH FLOOR
EMERYVILLE, CA 94608

Workorder # : 9301298
Date Received : 01/27/93
Project ID : 2793
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- Sample ESW-1 was diluted for BTEX analysis due to matrix interference.

Joanna Shor 2/10/93
Department Supervisor Date

Joanna Shor 02/10/93
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(BTEX)

ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9301298
Matrix : SOIL
Date Sampled : 01/26/93

Project Number : 2793
Date Released : 02/10/93

Reporting Limit	Sample I.D.# B-1-2.5	Sample I.D.# B-5-2.5	Sample I.D.# B-5-6.0	Sample I.D.# B-4-2.5	Sample I.D.# B-4-4.0
COMPOUNDS (mg/Kg)	-01	-02	-03	-04	-05
Benzene	0.005	ND	ND	ND	ND
Toluene	0.005	ND	ND	ND	ND
Ethylbenzene	0.005	ND	ND	ND	ND
Total Xylenes	0.005	ND	ND	ND	ND
% Surrogate Recovery	72%	63%	66%	80%	108%
Instrument I.D.	HP21	HP21	HP21	HP21	HP21
Date Analyzed	01/30/93	01/30/93	01/30/93	01/30/93	02/03/93
RLMF	1	1	1	1	2.5

ND - Not detected at or above the practical quantitation limit for the method.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.

RLMF - Reporting Limit Multiplication Factor.

Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Charles M. Birch 2.10.93
Analyst Date

Lina Sher 2/10/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(BTEX)

ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9301298
Matrix : SOIL
Date Sampled : 01/26/93

Project Number : 2793
Date Released : 02/10/93

Reporting Limit	Sample I.D.#	Sample I.D.#	Sample I.D.#
	B-4-5.5	BJ3003E3	BF0203E3
COMPOUNDS (mg/Kg)	-06	BLANK	BLANK
Benzene	0.005	ND	ND
Toluene	0.005	ND	ND
Ethylbenzene	0.005	ND	ND
Total Xylenes	0.005	ND	ND
% Surrogate Recovery	69%	100%	110%
Instrument I.D.	HP21	HP21	HP21
Date Analyzed	01/30/93	01/30/93	02/02/93
RLMF	1	1	1

ND - Not detected at or above the practical quantitation limit for the method.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.

RLMF - Reporting Limit Multiplication Factor.

Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 53-147%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Charles M. Burch 2.10.93
Analyst Date

Luca Stor 2/10/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9301298
Matrix : WATER
Date Sampled : 01/26/93

Project Number : 2793
Date Released : 02/10/93

Reporting Limit	Sample I.D.# ESW-1	Sample I.D.# BF0203E3
COMPOUNDS (ug/L)	-08	BLANK
Benzene	ND	ND
Toluene	ND	ND
Ethylbenzene	ND	ND
Total Xylenes	ND	ND
% Surrogate Recovery	99%	110%
Instrument I.D.	HP21	HP21
Date Analyzed	02/03/93	02/02/93
RLMF	250	1

- ND - Not detected at or above the practical quantitation limit for the method.
 BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
 RLMF - Reporting Limit Multiplication Factor.

Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Charles M. Burch 2.10.93
Analyst Date

Laura Skov 2/10/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL
ANAMETRIX, INC. (408) 432-8192

Anametrix W.O.: 9301298
Matrix : SOIL
Date Sampled : 01/26/93
Date Extracted: 02/04/93

Project Number : 2793
Date Released : 02/10/93
Instrument I.D.: HP23

Anametrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (mg/Kg)	Amount Found (mg/Kg)
9301298-01	B-1-2.5	02/06/93	10	19
9301298-02	B-5-2.5	02/06/93	10	ND
9301298-03	B-5-6.0	02/06/93	10	ND
9301298-04	B-4-2.5	02/06/93	10	ND
9301298-05	B-4-4.0	02/06/93	10	350
9301298-06	B-4-5.5	02/06/93	10	ND
DSBL020493	METHOD BLANK	02/06/93	10	ND

Note : Reporting limit is obtained by multiplying the dilution factor times 10 mg/Kg.
 ND - Not detected at or above the practical quantitation limit for the method.
 TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following sample extraction by EPA Method 3550.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Charles Burt 2.10.93
Analyst Date

Luna Shor 2/10/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL
ANAMETRIX, INC. (408) 432-8192

Anametrix W.O.: 9301298
Matrix : WATER
Date Sampled : 01/26/93
Date Extracted: 02/01/93

Project Number : 2793
Date Released : 02/10/93
Instrument I.D.: HP23

Anametrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (ug/L)	Amount Found (ug/L)
9301298-08	ESW-1	02/04/93	50	75000
DWBL020193	METHOD BLANK	02/03/93	50	ND

Note : Reporting limit is obtained by multiplying the dilution factor times 50 ug/L.

ND - Not detected at or above the practical quantitation limit for the method.

TPHD - Total Petroleum Hydrocarbons as diesel is determined by GCFID following sample extraction by EPA Method 3510.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Charles M Burch 2.10.93
Analyst Date

Luna Sher 2/10/93
Supervisor Date

TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT
 EPA METHOD 5030 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 2793 B-4-5.5
 Matrix : SOIL
 Date Sampled : 01/26/93
 Date Analyzed : 01/31/93

Anamatrix I.D. : 9301298-06
 Analyst : *CMB*
 Supervisor : *IS*
 Date Released : 02/10/93
 Instrument ID : HP21

COMPOUND	SPIKE AMT (mg/Kg)	SAMPLE CONC (mg/Kg)	REC MS (mg/Kg)	% REC MS	REC MD (mg/Kg)	% REC MD	RPD	% REC LIMITS
GASOLINE	0.375	0.000	0.309	82%	0.313	83%	1%	48-149
P-BFB				64%		63%		53-147

* Limits established by Anamatrix, Inc.

TOTAL VOLATILE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
 EPA METHOD 5030 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE
 Matrix : SOIL
 Date Sampled : N/A
 Date Analyzed : 01/31/93

Anamatrix I.D. : LCSS0131
 Analyst : *CMB*
 Supervisor : IS
 Date Released : 02/10/93
 Instrument I.D.: HP21

COMPOUND	SPIKE AMT. (mg/Kg)	REC LCS (mg/Kg)	%REC LCS	% REC LIMITS
GASOLINE	0.375	0.385	103%	58-130
SURROGATE			79%	53-147

* Quality control established by Anamatrix, Inc.

TOTAL EXTRACTABLE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
 EPA METHOD 3550 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE
 Matrix : SOIL
 Date Sampled : N/A
 Date Extracted: 02/04/93
 Date Analyzed : 02/05/93

Anamatrix I.D. : LCSS0204
 Analyst : *Chris*
 Supervisor : *IS*
 Date Released : 02/10/93
 Instrument I.D.: HP23

COMPOUND	SPIKE AMT (mg/Kg)	REC LCS (mg/Kg)	% REC LCS	% REC LIMITS
Diesel	125	94	75%	72-143

*Limits established by Anamatrix, Inc.

TOTAL EXTRACTABLE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
 EPA METHOD 3510 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE
 Matrix : WATER
 Date Sampled : N/A
 Date Extracted: 02/01/93
 Date Analyzed : 02/03/93

Anamatrix I.D. : LCSW0201
 Analyst : *CMB*
 Supervisor : *IS*
 Date Released : 02/10/93
 Instrument I.D.: HP23

COMPOUND	SPIKE AMT (ug/L)	LCS REC (ug/L)	% REC LCS	LCSD REC (ug/L)	% REC LCSD	RPD	% REC LIMITS
DIESEL	1250	710	57%	930	74%	27%	47-130

*Quality control established by Anamatrix, Inc.

9301298 (10/4) (18) (2)

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

Project No.: Oro Loma Sanitary	Field Logbook No.:	Date: 01-26-93	Serial No.: 9822
Project Name: 2781*2793 JM 2-1-93	Project Location: San Lorenzo, Ca.		

SAMPLER (Signature):						ANALYSES						SAMPLERS: KAG	
SAMPLES						EPA 601	EPA 624	TPH (D)	8020	HOLD	RUSH	REMARKS	
SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CON-TAINERS	SAMPLE TYPE								
1	B-1-2.5	01-26-93	900	1	Soil			X	X				
2	B-5-2.5		1400										
3	B-5-6.0		1415										normal TAT
4	B-4-2.5		1500										
5	B-4-4.0		1505										send results to
6	B-4-5.5		1515										Joe Ann Weber
7	B-4-8.0		1530							X			
8	ESW-1	01-26-93	1545	5	H ₂ O			X	X				ANALYSIS: TPH (d) USING MODIFIED EPA 8015
													ANALYSIS 8020 WATER
													FOR BTX ONLY
													*Project # changed as per instruction from K. See on 2-1-93 JM.

RELINQUISHED BY: (Signature) <i>[Signature]</i>	DATE	TIME	RECEIVED BY: (Signature) <i>[Signature]</i>	DATE	TIME
RELINQUISHED BY: (Signature) <i>[Signature]</i>	1/27/93	17:00	RECEIVED BY: (Signature) <i>[Signature]</i>	1/27/93	17:00
RELINQUISHED BY: (Signature) <i>[Signature]</i>	1/27/93	19:25	RECEIVED BY: (Signature) <i>[Signature]</i>	1/27/93	19:25
RELINQUISHED BY: (Signature)	DATE	TIME	RECEIVED BY: (Signature)	DATE	TIME
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE 1900 Powell Street, 12th Floor Emeryville, Ca 94608 (415) 652-4500	Analytical Laboratory: ANAMETRIX REF # Z006J
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MR. KENTON GEE
LEVINE-FRICKE
1900 POWELL STREET 12TH FLOOR
EMERYVILLE, CA 94608

Workorder # : 9301335
Date Received : 01/29/93
Project ID : 2793
Purchase Order: N/A

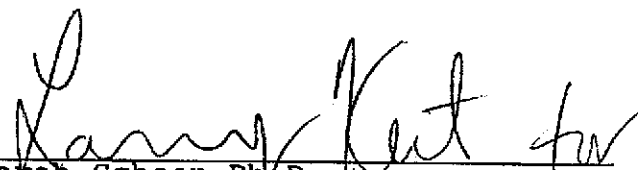
The following samples were received at Anamatrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9301335- 1	MW-1
9301335- 2	MW-1 FB
9301335- 3	T. BLANK

This report consists of 6 pages not including the cover letter, and is organized in sections according to the specific Anamatrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anamatrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anamatrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anamatrix.


Sarah Schoen, Ph.D.
Laboratory Director

2-12-93
Date

COPY

RECEIVED
FEB 16 1993

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. KENTON GEE
LEVINE-FRICKE
1900 POWELL STREET 12TH FLOOR
EMERYVILLE, CA 94608

Workorder # : 9301335
Date Received : 01/29/93
Project ID : 2793
Purchase Order: N/A
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9301335- 1	MW-1	WATER	01/28/93	BTEX
9301335- 1	MW-1	WATER	01/28/93	TPHd

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. KENTON GEE
LEVINE-FRICKE
1900 POWELL STREET 12TH FLOOR
EMERYVILLE, CA 94608

Workorder # : 9301335
Date Received : 01/29/93
Project ID : 2793
Purchase Order: N/A
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- The concentration reported as diesel for sample MW-1 is primarily due to the presence of a heavier petroleum product, possibly motor oil.

Cheryl Balmer 2/12/93
Department Supervisor Date

Luna Shar 2/12/93
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(BTEX)

ANAMETRIX, INC. - (408) 432-8192

Anamatrix W.O.: 9301335
Matrix : WATER
Date Sampled : 01/28/93

Project Number : 2793
Date Released : 02/12/93

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# MW-1	Sample I.D.# FB0302E3
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
% Surrogate Recovery		99%	109%
Instrument I.D.		HP4	HP4
Date Analyzed		02/03/93	02/03/93
RLMF		1	1

- ND - Not detected at or above the practical quantitation limit for the method.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anamatrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Laura Shor 2/12/93
Analyst Date

Cheryl Bolmer 2/12/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS AS DIESEL
ANAMETRIX, INC. (408) 432-8192

Anametrix W.O.: 9301335
 Matrix : WATER
 Date Sampled : 01/28/93
 Date Extracted: 02/01/93

Project Number : 2793
 Date Released : 02/12/93
 Instrument I.D.: HP23

Anametrix I.D.	Client I.D.	Date Analyzed	Reporting Limit (ug/L)	Amount Found (ug/L)
9301335-01	MW-1	02/03/93	50	590
DWBL020193	METHOD BLANK	02/03/93	50	ND

Note : Reporting limit is obtained by multiplying the dilution factor times 50 ug/L.

ND - Not detected at or above the practical quantitation limit for the method.

TPHd - Total Petroleum Hydrocarbons as diesel is determined by GCFID following sample extraction by EPA Method 3510.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Laura Shor 2/12/93
 Analyst Date

Cheryl Balmer 2/12/93
 Supervisor Date

TOTAL VOLATILE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
 EPA METHOD 5030 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE
 Matrix : WATER
 Date Sampled : N/A
 Date Analyzed : 02/04/93

Anamatrix I.D. : LCSW0204
 Analyst : IS
 Supervisor : OB
 Date Released : 02/11/93
 Instrument I.D.: HP4

COMPOUND	SPIKE AMT. (ug/L)	REC LCS (ug/L)	%REC LCS	% REC LIMITS
GASOLINE	500	415	83%	67-127
SURROGATE			72%	61-139

* Quality control established by Anamatrix, Inc.

TOTAL EXTRACTABLE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
 EPA METHOD 3510 WITH GC/FID
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : LAB CONTROL SAMPLE
 Matrix : WATER
 Date Sampled : N/A
 Date Extracted: 02/01/93
 Date Analyzed : 02/03/93

Anamatrix I.D. : LCSW0201
 Analyst : IS
 Supervisor : CB
 Date Released : 02/12/93
 Instrument I.D.: HP23

COMPOUND	SPIKE AMT (ug/L)	LCS REC (ug/L)	% REC LCS	LCS REC (ug/L)	% REC LCS	RPD	% REC LIMITS
DIESEL	1250	710	57%	930	74%	27%	47-130

*Quality control established by Anamatrix, Inc.

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

7001355 (10/10) 18

9M2-1-93

Project No.: 2781 2793 Field Logbook No.: _____ Date: 01-28-93 Serial No.: 9894
 Project Name: Oro Loma Sanitary District Project Location: San Lorenzo, Ca.

Sampler (Signature): [Signature] ANALYSES
 Hold RUSH Samplers: KAG

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CON-TAINERS	SAMPLE TYPE	ANALYSES					HOLD	RUSH	REMARKS
						EPA 601	EPA 624	TRNG	POB	BOIS			
① MW-1	01-28-93	1730		5	H ₂ O		X	X					
② MW-1-FB	↓	1725		3	↓			X			X		
③ Trip Blank	↓	1720		2	↓			X			X		normal turnaround
													send results to
													[Signature]

RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE <u>1/29/93</u>	TIME <u>14:00</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE <u>1/29/93</u>	TIME <u>14:00</u>
RELINQUISHED BY: (Signature) <u>[Signature]</u>	DATE <u>1/29/93</u>	TIME <u>16:35</u>	RECEIVED BY: (Signature) <u>[Signature]</u>	DATE <u>1/29/93</u>	TIME <u>16:35</u>
RELINQUISHED BY: (Signature) _____	DATE _____	TIME _____	RECEIVED BY: (Signature) _____	DATE _____	TIME _____
METHOD OF SHIPMENT:	DATE	TIME	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE
 1900 Powell Street, 12th Floor
 Emeryville, Ca 94608
 (415) 652-4500

Analytical Laboratory:
Anamatrix