TC 0637-05

STD 3980

PRELIMINARY REPORT

UNDERGROUND TANK REMOVAL AND SITE INVESTIGATION
ETTIE STREET MAINTENANCE FACILITY
3465 ETTIE STREET
OAKLAND, CALIFORNIA

Contract No. 56S067
Work Order No. 04-56S067-17

Prepared for

Caltrans
District 4
111 Grand Avenue
Oakland, CA 94623

November 1995

Prepared by

Tetra Tech
180 Howard Street, Suite 250
San Francisco, CA 94105

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1.0 INTRODUCTION

This preliminary report has been prepared to document an underground storage tank (UST) removal and disposal at the Ettie Street Maintenance Facility, 3465 Ettie Street, Oakland, Alameda County, California. The work was requested by Caltrans District 4 pursuant to Contract No. 56S067, Work Order No. 56S067-17

1.1 WORK COMPLETED

The work completed during this project, as presented in the work order and discussed during the pre-work site visit, included the following:

- Conducting an initial site visit, including file review, and preparing a work plan and health and safety plan for the tank removal;
- Removing one 4,000-gallon and one 7,500-gallon underground fuel tank and ancillary piping, vent lines, dispenser islands, and fill ports on October 19 and 20, 1995;
- Sampling the soil beneath the tanks and the ground water in the excavation; and
- Backfilling the excavation and bringing the ground surface up to grade with road base rock on November 11, 1995.

The following sections describe the historical background and environmental setting of the site and the procedures used in meeting the project objectives.

1.2 SITE DESCRIPTION

The site is located at the north end of Ettie Street, directly under the Interstate 580 structure (Figures 1-1 and 1-2). The site is in northwest Oakland, approximately one-half mile southeast of San Francisco Bay and one-quarter mile south of the Emeryville city limit.

The maintenance facility was built in 1959, and the property is owned and formerly operated by Caltrans; the site is presently unused. The property is about 240 feet (ft) wide and about 480 ft long and covers an area of about three acres.

The elevation of the site is approximately 10 ft above mean sea level (msl). The eastbound and westbound lanes of Interstate 580 are elevated on support structures about 40 to 50 ft above the ground level at the site.

1.2.1 Land Use

The site is located on the Oakland West 7.5 minute U.S. Geological Survey Quadrangle (1979). Topographic relief is about 50 ft within a radius of one mile of the site. The land use in the vicinity of the site is predominantly urban and is relatively densely populated. The East Bay Municipal Utility District sewage treatment plant is located one-third mile west-northwest of the facility, and the Oakland Army Base is located one-half mile to the west.

1.2.2 Geologic Setting

1.2.2.1 Soils

The surface soils at the site have been mapped as urban land (USDA, 1980), a miscellaneous area consisting of land improved with urban structures. The soil material is mostly heterogeneous fill. The Clear Lake complex soils may also underlie portions of the site. Typically, the surface layer of the Clear Lake soil is a very dark clay. The underlying material is dark gray and grayish brown calcareous clay and silty clay that extends to a depth of 60 inches or more. The Clear Lake soil is very deep, poorly drained, and has a low permeability.

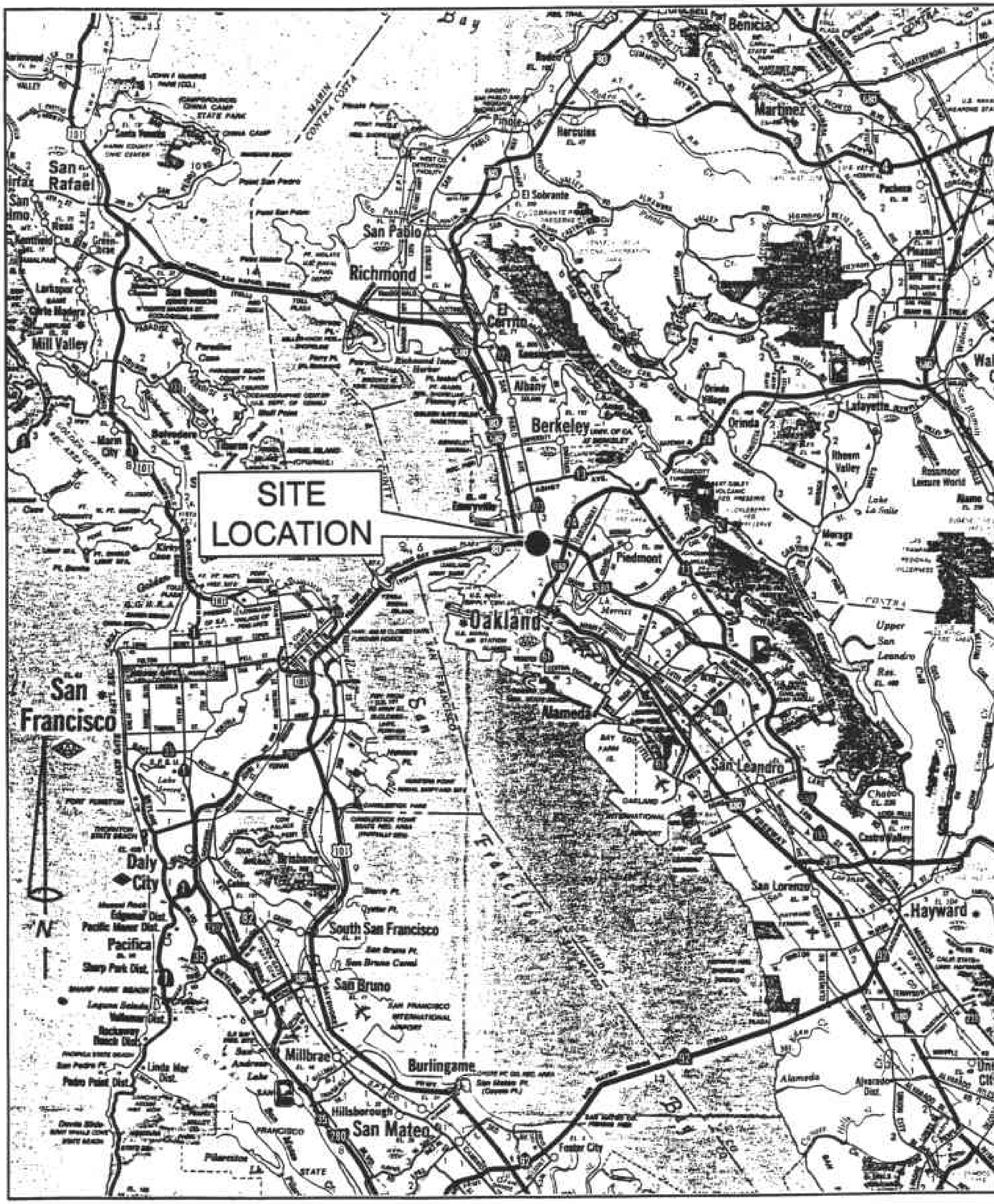


Figure 1-1 Regional Site Location

Scale: 1" = 4 miles

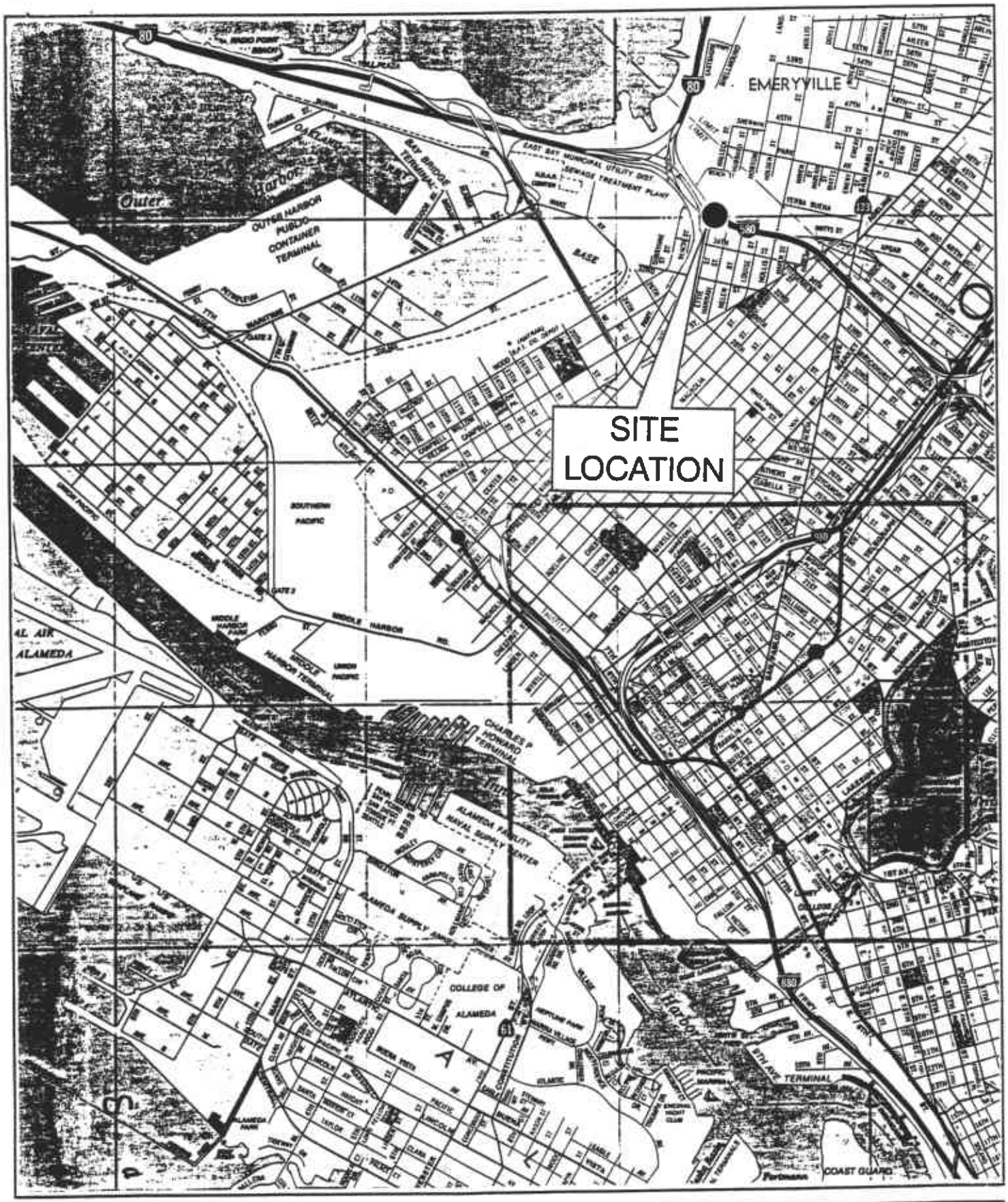


Figure 1-2 Site Location

N

Scale: 1" = 1/2 mile

1.2.2.2 Geology

The local geology in the area is primarily artificial fill and Quaternary Bay Mud (Radbruch 1957). Several potentially active faults have been identified in the area; the closest is the Hayward Fault, which follows a northwesterly trend at the foot of the Oakland and Berkeley Hills.

The site geology is interpreted as being composed of artificial fill and Bay Mud, similar to the geology of the local area. The artificial fill generally consists of miscellaneous refuse, or Bay Mud, or sand dredged from the bay. Its thickness is variable, and it typically lies above the Bay Mud. The Bay Mud is of Holocene age and consists of unconsolidated, water-saturated, dark plastic clay and silty clay rich in organic material. Its thickness in coastal lagoons and estuaries is estimated to be approximately 10 feet (Helley et al. 1979).

1.2.3 Hydrogeology

Ground water in the vicinity of the site is found at sea level near the shore and roughly follows the topography in higher areas. Recharge is primarily through rainfall and infiltration. Ground water levels may be tidally influenced due to the proximity to San Francisco Bay, located one- half mile to the northwest. Ground water closest to the surface is believed to be present in an unconfined water table aquifer, with ground water flow generally west and northwest towards the bay. During the tank removal ground water was encountered at a depth of approximately eight feet below ground surface in the excavations.

2.0 TANK REMOVAL

2.1 DESCRIPTION OF UNDERGROUND STORAGE TANKS

The underground storage tanks were reportedly installed in 1959 when the Ettie Street Maintenance Facility was built. One tank had a 7,500-gallon capacity, was constructed of single-walled steel, and was used to store gasoline. The second 4,000-gallon capacity tank was used to store diesel fuel and was constructed with single-walled fiberglass. No plans showing the construction details of the tanks were available. A site plan is presented as Figure 2-1.

2.2 SITE PREPARATION

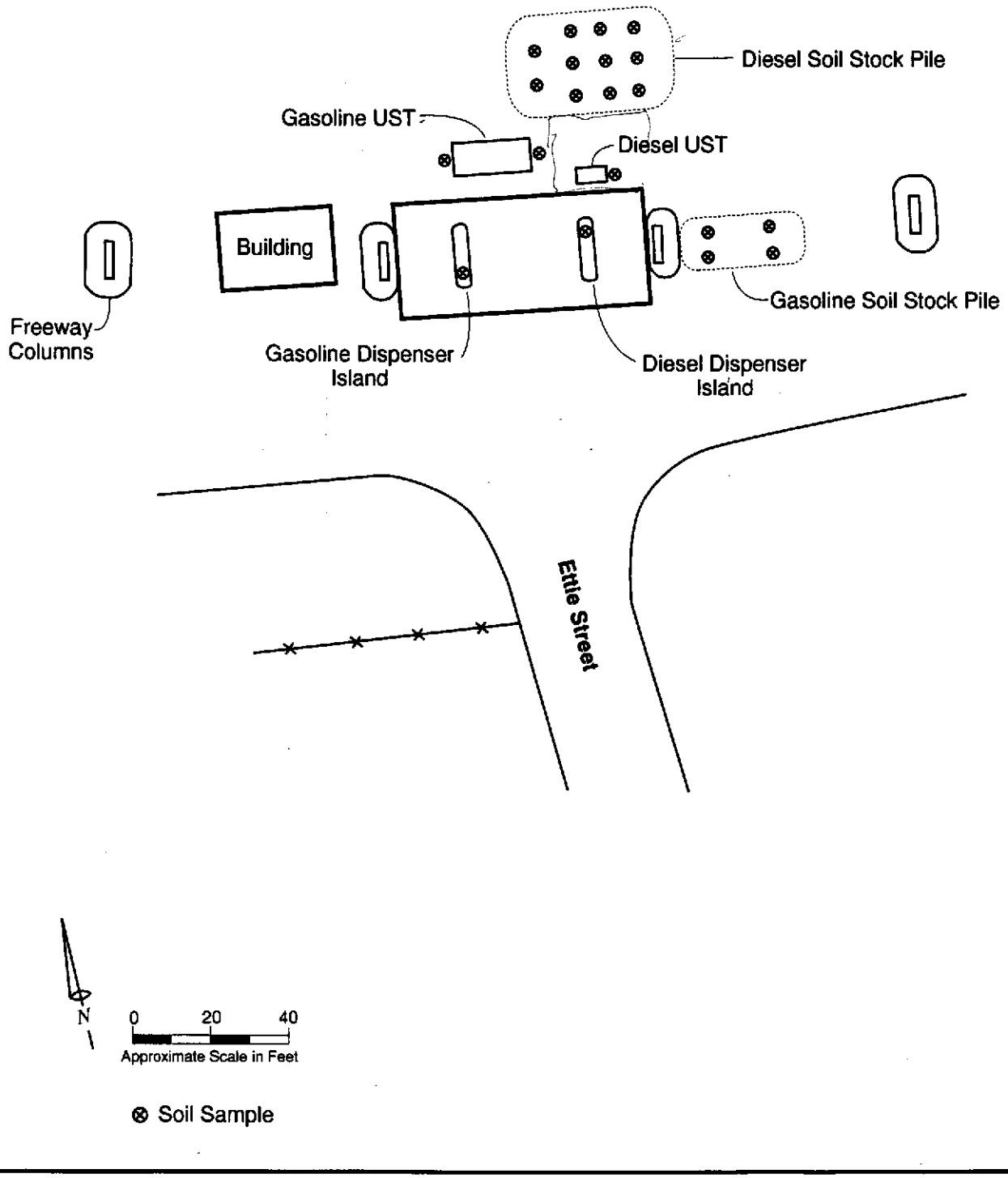
Site preparation activities included obtaining all applicable permits, notifying the county health department and fire department, and locating underground utilities. A staging area for excavated soil was prepared near the tank removal site. Pea gravel was staged near the excavation.

2.2.1 Permits

An underground storage tank removal permit was obtained from the Alameda County Department of Health for closure of the underground storage tanks. Permits were also obtained from the Oakland Fire Department and the Bay Area Air Quality Management District.

2.2.2 Utilities

Prior to beginning the excavation, utilities were located and marked by Underground Service Alert (USA).



r:\0437\05\fig2 - 11/21/95 - MY

Caption: Site is a closed Caltrans maintenance facility

TETRA TECH

Site Plan

Figure 2-1

2.3 TANK REMOVAL

The procedure for the tank removals was as follows:

- The electric power was shut off and no smoking signs and barricades were placed in conspicuous areas;
- Pumpable contents of the tanks were placed in 55-gallon drums;
- The concrete/asphalt surface was removed;
- The soil was excavated to expose the top of the tank;
- After removal of the liquids remaining in the dispenser piping; the piping, fixtures, the drop tube, and pump were removed from the tank;
- The tanks were purged with dry ice;
- Soil was excavated to the bottom of the tank to free the sides of the tank;
- The tanks were hoisted from the excavation; and
- The tanks were labeled, manifested, and hauled as hazardous waste to **xxx.**

2.3.1 Cleaning

X gallons of gasoline and **xx** gallons of diesel fuel were pumped out of the tanks. These liquids were removed from the site on October 24, 1995, and transported to **xxx**.

2.3.2 Excavation to Expose the Top of the Tank

The asphalt and concrete surfacing were cut using a jackhammer. After removing the concrete and asphalt, the top of each tank was uncovered by the backhoe operator, who took care not to disturb the external piping. The fill pipes were located directly over the tanks. The product lines from the valve boxes to the dispenser island were drained of remaining fuel, disconnected, and pulled from underneath the pad. Also, the vent lines from the tanks were cut at the bridge columns, the aboveground portion removed, and the underground portion pulled from the ground. The remaining external piping, the drop tube, and submersible pumps were removed. The two dispenser islands and crash bollards were broken up and removed.

2.3.3 Purging

The tanks were rendered inert in place by pouring crushed dry ice into each tank (20 lb./1000 gallons of tank volume), as required by the Alameda County Health Department. The atmosphere within the tanks was monitored by the excavation contractor using a combustible gas meter until it was maintained at less than 10 percent of the lower explosive limit, and the oxygen content was less than 10 percent. Susan Hugo of the Alameda County Health Department monitored this process and gave authorization to proceed after the proper atmosphere had been achieved. The tanks were then removed from the excavation.

2.3.4 Tank Removal

The soil along one side of the tanks was removed to the depth of the bottom of the tanks (approximately 11 ft below the ground surface) to a distance of approximately two feet from the wall of the gasoline tank. It was necessary to remove more sidewall soils from around the diesel tank since pea gravel that had been placed around the tank was sloughing against the tank. The soil from around the gasoline UST was placed in the staging area prepared for this purpose.

Approximately 50 to 70 cubic yards of soil were removed from the gasoline UST excavation and stockpiled. The soil removed from around the former diesel storage tank was composed almost entirely of pea gravel. Eleven soil samples were collected from the pea gravel, as directed by the Susan Hugo. Her approval to replace the soil into the diesel UST excavation is contained within the hazardous materials inspection form attached in Appendix A.

2.3.5 Removal of Underground Piping

Underground vent and product piping were removed by pulling them out from under the pavement. After inspection, the tank and lines were placed on a truck licensed to carry hazardous waste.

2.3.6 Tank Disposal

The tanks were inspected and labeled and properly manifested (Manifest #95592426) as hazardous waste. They were transported by Erickson, Inc., a state-licensed hazardous waste hauler, for disposal at Erickson's permitted facility in Richmond, California. The hazardous waste manifest was signed by a representative of Caltrans. Copies of all manifests for all wastes are attached as Appendix B.

2.4 SAMPLE COLLECTION PROCEDURE

The following sections describe soil and ground water sample collection procedures.

2.4.1 Soil Samples from Tank Pits

Samples were collected of the soil around the tanks to confirm the presence or absence of contamination and to help identify the source(s) of the contamination, if present. LUFT Manual and Regional Water Quality Board guidelines require that a least two samples be collected from each tank pit, one from under each end of the tank, within two ft of the bottom of the tank. The underground piping from each tank was less than 20 feet in length; therefore one soil sample was collected from beneath each dispenser island.

Soil samples were collected in stainless steel sample liners. As directed by Susan Hugo, one soil sample was collected from each end of the gasoline excavation from a depth of approximately seven feet. This depth was chosen as there was ground water present in both tank

excavations at a depth of approximately eight feet. Samples were collected from the east and west end of the gasoline UST pit and from the east end of the diesel UST pit. No sample was collected from the west end of the diesel pit as this was a point common to the west end of the gasoline UST. The samples were collected by pushing a liner tube into soil excavated and removed to the surface with a backhoe bucket.

Each sample was prepared by placing Teflon film over the ends of the sample liner covering the film with plastic end caps, and then sealing the tube with cohesive silicon rubber tape. Each sample was labeled with the sample ID number, the date, and time collected, and stored on ice in a cooler under chain of custody until received by the laboratory.

All soil samples were analyzed by a state-certified laboratory, Entech Analytical Labs in Sunnyvale, California, using the methods specified in Section 3.0.

2.4.2 Ground Water Samples from Tank Pits

Ground water samples were collected from the water, which collected in the excavation pits, using a glass sample container. The water samples were then transferred to containers supplied by the laboratory. No sheen or odor was observed on the samples or the water in the excavations. Samples were labeled, stored, and shipped as described in the previous section and were analyzed by the methods specified in Section 3.0.

2.4.3 Soil Samples from Stockpiled Soil

Four discrete soil samples were collected from the stockpile of soil excavated from the gasoline pit. The purpose of these samples was to obtain a preliminary characterization of the stockpiled soil for evaluation of soil disposal options. The laboratory was instructed to composite the discrete samples. The samples were collected at selected representative locations by remaining about 1 foot of soil to expose fresh material and then pushing a sample liner into the fueling exposed soil. The sample liners were sealed and labeled as described in Section 2.4.1. A sketch of the sample points on the soil pile was recorded in the field log. The approximate

locations of the samples was shown on Figure 2-1. The 220 cubic yards of samples were analyzed as specified in Section 3.0.

Eleven discrete samples were collected from the soil removed from around the diesel UST. Susan Hugo of the Alameda County Health Department requested that one discrete sample be collected for every 20 cubic yards of soil removed. As an estimated 220 cubic yards of soil were removed, 11 samples were necessary (see Figure 2-1 for approximate locations). The sampling procedure was the same as described in the preceding paragraph. The 220 cubic yards of excavated pea gravel was then replaced into the diesel UST pit.

2.4.4 Soil Samples from under Dispenser Islands

Following removals of the dispenser islands, a single soil sample was collected from under each island at a location approved by Susan Hugo. Each sample was collected by first scraping away several inches of soil, then drilling a soil sample containing a 2 inch x 6 inch sample lines into the ground using a slide hammer. The sample lines was their retrieved and was sealed and labeled as described in Section 2.4.1.

2.5 BACKFILL AND COMPACTION

The remaining diesel tank excavation and the gasoline excavation were backfilled with clean pea gravel to within 15 inch of the ground surface. The excavation was then filled to grade with compacted road base. At the instruction of Caltrans, the ground surface was not paved with asphalt or concrete because additional excavation and/or drilling may be required.

3.0 LABORATORY ANALYSIS

Samples were analyzed by Entech Analytical Labs, a California-certified laboratory in Sunnyvale, California. Samples were shipped under chain of custody that identifies the samples, the date collected, and the analyses to be performed. The samples were analyzed by the following methods:

- Soil samples collected from the diesel tank excavation, underneath the diesel dispenser island, and from the stockpile were analyzed by EPA Method 8015/3550 modified, for total petroleum hydrocarbons as diesel (TPH-d); and by EPA Method 8020 for benzene, toluene, ethylbenzene, and total xylenes (BTEX);

- The ground water sample collected from the diesel tank excavation was analyzed by EPA Method 602 for BTEX and by EPA Method 8015/3550 modified, to determine TPH-d;

- Soil samples collected from the gasoline tank excavation, underneath the gasoline dispenser island and from the stockpile of soil from the gasoline UST pit were analyzed by EPA Method 8015/5030 modified, for total petroleum hydrocarbons as gasoline (TPH-g), by EPA Method 7420 for total lead, and by EPA Method 8020 to determine BTEX and methyl-tert-butyl ether (MTBE) concentrations;

- The ground water sample collected from the gasoline tank excavation was analyzed by EPA Method 602 for BTEX and MTBE, total lead by EPA Method 239.1 and by EPA Method 8015/5030 modified, to determine TPH-g; and

- Analysis for reactivity, corrosivity and ignitability were performed to characterize for disposal the soil stockpile from the gasoline UST pit.

4.0 ANALYTICAL RESULTS

The results of soil and ground water analyses are summarized on Tables 1 and 2.

4.1 SOIL SAMPLES

- The soil samples collected from the west and east end (G-7W and G-7E) of the gasoline UST tank pit contained no TPH-g above the method detection.

- The soil samples collected from the west and east end (G-7E and D-7W) of the diesel UST tank pit contained no TPH-d above the method detection limits. The samples did contain 23 and 13 mg/kg TPH as motor oil. The source and volume of the motor oil release is unknown.

- The sample collected from beneath the gasoline dispenser did not contain TPH-g above the method detection limit. The sample collected from beneath the diesel dispenser did contain TPH-d at a concentration of 64,000 mg/kg. This indicates that there was a release of diesel fuel in the vicinity of the sample collection point.

- The composite sample collected from soil excavated and stockpiled from around the gasoline UST contained no detectable concentration of TPH-g. Therefore this soil can be treated as ordinary clean fill material.

- Most of the soil samples collected from the pea gravel removed from around the diesel UST contained quantifiable concentrations of TPH as diesel and motor oil. The average concentration of TPH-d was 23.0 mg/kg, and the average concentration of TPH-oil was 91.3 mg/kg.

Table 1: Analytical results for petroleum hydrocarbons in soil samples collected October 19 and 20, 1995, at Caltrans Ettie Street maintenance facility

Sample Number	Date Collected	TPH-oil (8015 mod) (mg/kg)	TPH-d (8015 mod) (mg/kg)	TPH-gas (8015 mod) (mg/kg)	Lead (239.1) (mg/kg)	Benzene (8020) (mg/kg)	Toluene (8020) (mg/kg)	Ethylbenzene (8020) (mg/kg)	Xylenes (8020) (mg/kg)	MTBE (8020) (mg/kg)
Samples collected from beneath USTs										
G-7W	10/19/95	na	na	ND	6.5	ND	ND	ND	ND	ND
G-7E	10/19/95	23	ND	ND	11	ND	ND	ND	ND	ND
D-7E	10/19/95	13	ND	na	na	ND	ND	ND	ND	na
Samples collected from beneath dispensers										
W-DISP	10/20/95	na	na	ND	18	ND	ND	ND	ND	ND
E-DISP	10/20/95	na	64000	na	na	ND	ND	ND	ND	na
Sample composited from soil from gasoline UST excavation										
COMP	10/20/95	na	na	ND	26	ND	ND	ND	ND	ND
Samples collected from pea gravel removed from around diesel UST										
DS-1	10/19/95	ND	35	na	na	ND	ND	ND	ND	ND
DS-2	10/19/95	ND	71	na	na	ND	ND	ND	ND	ND
DS-3	10/19/95	ND	31	na	na	ND	ND	ND	ND	ND
DS-4	10/19/95	110	39	na	na	ND	ND	ND	ND	ND
DS-5	10/19/95	62	39	na	na	ND	ND	ND	ND	ND
DS-6	10/19/95	29	12	na	na	ND	ND	ND	ND	ND
DS-7	10/19/95	72	ND	na	na	ND	ND	ND	ND	ND
DS-8	10/19/95	560	ND	na	na	ND	ND	ND	ND	ND
DS-9	10/19/95	91	24	na	na	ND	ND	ND	ND	ND
DS-10	10/19/95	49	ND	na	na	ND	ND	ND	ND	ND
DS-11	10/19/95	30	ND	na	na	ND	ND	ND	ND	ND
Method Detection Limit		1.0	1.0	1.0	0.5	0.005	0.005	0.005	0.005	0.05

→ aprox 60 cu yd use on site ?

→ check w/ Kevin Krane if need to remove, or leave in place monitor for 1 time (or 4 times a year)

NOTES:

ug/kg	milligrams per kilogram
TPH-d	Total Petroleum Hydrocarbons quantified as diesel
TPH-g	Total Petroleum Hydrocarbons quantified as gasoline
na	Not applicable, analysis was not performed
ND	Analyte not detected (ND) at or above the laboratory reporting limits
Oil	Motor oil
COMP	Composite of four samples collected from the soil removed from the gasoline UST excavatioin

Table 2: Analytical results for petroleum hydrocarbons in grab ground water samples collected on October 19, 1995, at Caltrans Ettie Street maintenance facility

Sample Number	Date Collected	TPH-d (8015 mod) (ug/L)	TPH-g (8015 mod) (ug/L)	Lead (239.1) (mg/L)	Benzene (8020) (ug/L)	Toluene (8020) (ug/L)	Ethylbenzene (8020) (ug/L)	Xylenes (8020) (ug/L)	MTBE (8020) (ug/L)
Gas	10/19/95	NA	ND	ND	ND	ND	ND	36	260
Diesel	10/19/95	2000	NA	NA	ND	ND	ND	ND	NA
Method Detection Limit		50	50	0.05	0.5	0.5	0.5	0.5	5

NOTES:

ug/L	micrograms per liter
mg/L	milligrams per liter
TPH-g	Total Petroleum Hydrocarbons quantified as gasoline
TPH-d	Total Petroleum Hydrocarbons quantified as diesel
NA	Not applicable, analysis was not performed
ND	Analyte not detected (ND) at or above the laboratory reporting limits

4.2 GROUND WATER SAMPLES

- The ground water sample collected from the gasoline UST tank pit contained no TPH as gasoline above the method detection limits. The analyses did detect 36 µg/L xylenes and 260 µg/L methyl-tert-butyl ether. The California Department of Public Services Primary Maximum Contaminant Level (MCL, also known as the drinking water standard) for xylenes is 1,750 µg/L, well above the level found in the Ettie Street sample; therefore it should not be an issue of concern. There is no primary or secondary MCL for MTBE; therefore it is not an issue of concern.

- The water sample collected from the diesel pit contained 2,000 µg/l TPH-d. This concentration could trigger a requirement for additional ground water assessment by the lead regulatory agency. All other analytes were below the method detection limits.

5.0 REFERENCES CITED

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Radbruch, D.G. 1957. Areal and Engineering Geology of the Oakland West Quadrangle, California. USC Geological Survey Miscellaneous Investigations. Map I-239

Tri-Regional Board Staff. 1990. Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites. Prepared by Staff of North Coast Regional Water Quality Control Board, San Francisco Regional Water Quality Control Board, Central Valley Regional Water Quality Control Board. August 10, 1990, with Clarification Letter to Underground Tank Owners and Regulators issued October 2, 1990, by Thomas J. Callaghan, Toxics Cleanup Division.

United States Department of Agriculture, Soil Conservation Service. 1980. Soil Survey of Alameda County, California, Western Part.

white -env.health
yellow -facility
pink -files

ALAMEDA COUNTY, DEPARTMENT OF ENVIRONMENTAL HEALTH

Hazardous Materials Inspection Form

1131 Harbor Bay Pkwy
Alameda CA 94502
510/567-6700

II, III

Site ID # 3980 Site Name CAL TRANS Today's Date 10/19/95

Site Address 3465 ETTIE STREET

City OAKLAND Zip 94608 Phone _____

_____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

Inspection Categories:

____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER
____ II. Hazardous Materials Business Plan, Acutely Hazardous Materials
✓ III. Underground Storage Tanks

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

Comments:
On Site: 2 UGTs Removed
Oakland Fire Dept requested ACDH to oversee tanks removal due to shortage of staff (per Gary Collins).
Tanks Hauler — Erickson # 616584 exp. 5/96
Tanks manifests - 9559426

# Tank 1 7500 gal gasoline - steel tank; coated with tar.
LEL = 0% O2 = 9%; tank appeared to be in good shape.
3 Soil samples collected; one from each end of the tank with the 3rd sample collected @ the common end for both tanks since the tanks lie end to end.
# Tank 2 4000 gal diesel - fiberglass Corning
LEL = 0% & O2 = 8%
Water present in the excavation - 6 grid Hand Sample collected Hole on the side due to backhoe. The fiberglass tank appeared to be in good shape.
Stockpiled soil must be characterized for disposal; one sample per 20 yds for on site use to backfill the excavation & must have prior approval by the county.
All piping associated with the tanks must be removed
Samples must be collected (1 per 20 lineal ft.)

II, III

Contact Mr Robert Cotton
Title Senior Engineer
Signature Mr Robert Cotton

Inspector SUSAN L. HUGO
Signature _____

* Soil samples must be collected underneath the dispenser

APPENDIX B

WASTE MANIFESTS

APPENDIX C

LABORATORY ANALYTICAL REPORTS

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*W-DISP*	*E-DISP*	*Comp of SP-SW,SE,NW&NE*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil			
Sample Date	10/20/95	10/20/95	10/20/95			
Sample Time	1052	1100	1019-1130			
Lab #	B11229	B11230	B11231			
Lead	**18**	**na**	**26**	mg/kg	0.50 mg/kg	7420
DF-Diesel		37.5				
TPH-Diesel	**na**	**64,000**	**na**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1		1			
MTBE	**ND**	**na**	**ND**	mg/kg	0.05 mg/kg	8020
DF-Gas/BTEX	1	1	1			
TPH-Gas	**ND**	**na**	**ND**	mg/kg	1.0 mg/kg	8015M
Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	See Report
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*Comp of SP-SW,SE,NW&NE*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil			
Sample Date	10/20/95			
Sample Time	1019-1130			
Lab #	B11231			
pH	**8.43**	Units		9045
Sulfide	**ND**	mg/kg	0.5 mg/kg	9030
Cyanide	**ND**	mg/kg	0.5 mg/kg	9010
Flash Point	**>200**	°F	0.1 °F	1010

Reactivity, Corrosivity, and Ignitability analyses performed by Advanced Technology Labs (CAELAP #1838); see attached reports for analysis details.

Michael N. Golden, Lab Director

MDL=Method Detection Limit

ND=None Detected at or above MDL

Advanced Technology Laboratories

October 26, 1995 ELAP No.: 1838

Hull Development Labs, Inc.
525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

ATTN: Mr. Mike Golden

Client's Project: Ettie Street
Lab No.: 8386-001

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (310) 989 - 4045 if I can be of further assistance to your company.

Sincerely,

Edgar P. Caballero
Laboratory Director
EPC/cb

Enclosures

This cover letter is an integral part of this analytical report.

Mailing Address: P.O. Box 9108 Newport Beach, CA 92658
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 310 989-4045 Fax: 310 989-4040

Client: Hull Development Labs, Inc.
Attn: Mr. Mike Golden

Client's Project: Ettie Street

Date Received: 10/24/95
Date Sampled: 10/20/95

Lab No.	Sample I.D.	Analysis	Date Analyzed	Results,	Matrix, Units	MDL	DLR	Analyst Initials
8386-001	B11231	EPA 9010 (Reactive Cyanide)	10/26/95	ND	Soil, mg/kg	0.2	0.2	JD
8386-001	B11231	EPA 9030 (Reactive Sulfide)	10/25/95	ND	Soil, mg/kg	0.5	0.5	IG
8386-001	B11231	EPA 1010 (Flashpoint)	10/25/95	>200	Soil, deg. F	—	—	LP
8386-001	B11231	EPA 9045 (pH)	10/25/95	8.43	Soil, pH units	—	—	OL

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DF = Dilution Factor (DLR/MDL)

Reviewed/Approved By: Cheryl de los r Date: 10/26/95
Cheryl De Los Reyes
Department Supervisor

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 310 989-4045 Fax: 310 989-4040

Spike Recovery and RPD Summary Report

Method: 9010
Analyst: JD
Data File: 5299-1S

Date: 10/26/95
Sample ID: 8386-001
Matrix: SOIL

ANALYTE	UNITS	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	DLR
Reac. Cyanide	mg/Kg	ND	ND	0.4	0.16	0.20	40	50	40-150	22	50	0.5

Approved by: Cheryl De Los Reyes
Inorganics Supervisor

Date: 10/26/95

Advanced Technology Laboratories

Spike Recovery and RPD Summary Report

Method: 9030
Analyst: IG
Data File: 5298-1S

Date: 10/25/95
Sample ID: BLANK
Matrix: SOIL

ANALYTE	UNITS	LCS Conc	LCS Res	% Rec	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	DLR
SULFIDE	mg/kg	10	9.3	93	ND	ND	10	9.3	9.2	93	92	70 - 120	1	20	0.50

Approved by: Cheryl de los R
Cheryl De Los Reyes
Inorganics Supervisor

Date: 10/26/95

Advanced Technology Laboratories

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Subcontract Chain of Custody

Subcontract Lab: ATL		Date Sent: 10/23/95	Project Name: Ettie Street		Due Date: 10-27-95	
Sample ID and Source	Matrix	Required Analysis	Date Taken	Time Taken	Containers	Pres?
B11231 SP-SW, SE NW, NE	soil	RCI	10-20-95	1019-1130	4oz jar	No

Relinquished By:	Received By:	Date:	Time:
Shellie Hoyt	California Overnight	10-23 95	1545
California Overnight	Tri Nguyen	10/24/95	12:10 pm
Relinquished By:	Received By:	Date:	Time:

Notes: _____

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR DIESEL ANALYSIS

DIESEL
QC sample No.: BLANK SPIKE & DUP
Date analyzed: 10-16-95
Date extracted: 10-13-95
QC batch: DS109503

Matrix: SOIL

Units: mg/Kg
Dilution factor: 1

COMPOUND	SA mg/Kg	SR mg/Kg	MS mg/Kg	MS PR	MSD mg/Kg	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
DIESEL	25	0	19	76	20	80	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR GASOLINE ANALYSIS

GASOLINE
QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	PR
GASOLINE	235	0	257	109	248	106	3	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
BTEX

QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
BENZENE	20	0	22	110	23	115	4	25	50-150
TOLUENE	20	0	21	105	20	100	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: 95102
Matrix: Soil
Units: mg/kg

Date Analyzed: 10/18/95
Extraction Method: TTLC

PARAMETER	Method #	SA mg/kg	SR mg/kg	MS mg/kg	MS %R	MSD mg/kg	MSD %R	QC LIMITS %R
Antimony	7040	7.4	3.2	9.9	89%	10.7	101%	50- 150
Barium	7080	19.7	18.5	27.9	48%	31.3	65%	50- 150
Beryllium	7090	9.1	0.0	6.6	72%	6.4	70%	50- 150
Cadmium	7130	12.3	0.2	10.8	86%	10.7	85%	50- 150
Chromium	7190	7.8	28.5	38.8	132%	34.5	77%	50- 150
Cobalt	7200	14.1	0.0	17.2	122%	16.4	116%	50- 150
Copper	7210	10.6	59.4	66.5	67%	67.0	72%	50- 150
Lead	7420	18.2	30.9	41.4	58%	41.5	58%	50- 150
Molybdenum	7480	12.4	0.0	9.8	79%	9.7	78%	50- 150
Nickel	7520	7.0	20.0	27.8	111%	24.7	68%	50- 150
Silver	7760	11.7	0.2	10.3	86%	9.9	83%	50- 150
Thallium	7840	8.7	0.0	9.6	110%	10.2	117%	50- 150
Vanadium	7910	18.3	0.0	16.8	92%	17.2	94%	50- 150
Zinc	7950	26.5	232.8	266.3	126%	248.4	59%	50- 150

Note: Recoveries of Zinc above QC Limits due to sample concentration > Matrix Spike (confirmed by duplicate analysis)

Definition of Terms:

- na: Not Analyzed in QC batch
- SA: Spike Added
- SR: Sample Result
- MS: Matrix Spike Result
- MS (%R) Matrix Spike % Recovery
- MSD Matrix Spike Duplicate Result
- MSD (%R) Matrix Spike Duplicate % Recovery

LAB DIRECTOR: M. Golden

Hull Development Labs

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech

Address: 180 Howard St, Suite 250
San Francisco, CA 94105

Contact: Bob Cotton or Mike Wagat

Telephone #: (415) 974-1221

Date Received:

Turn Around: Std.

Project ID: Ellie Ethics 50.

Purchase Order #: TC-0637-03

Sampler/Company: Mike Wagat TT — Telephone #:

Special Instructions/Comments
FAX (415) 974-5914
Results, phone

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-G	BTEX + MTBE	TPH-D	Pb	BTEX			
B11229	W-DISP	Grab	Soil	10/20/95	1052	NJ	SS Sleeve	X	X		X				
B11230	E-DISP				1100					X		X			
B11231	SP-SW				1019										
	SP-SE				1036										
	SP-NW				1135										
	SP-NE				1130										

Composite, Analyze for TPH-D, BTEX, RCI, MTBE & Pb

Relinq. By: Mike Wagat	Received By: Joan Chrestos	Date 10/20/95	Time 1428
Relinq. By: Joan Chrestos	Received By: Phillip Hoyt	Date 10-20-95	Time 1655
Relinq/ By:	Received By:	Date	Time

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/25/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Water Sample Analysis:

Test	*Gas*	*Diesel*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Water	Water			
Sample Date	10/19/95	10/19/95			
Sample Time	1500	1530			
Lab #	B11197	B11198			
Lead, Dissolved	**ND**[3]	**na**	mg/liter	0.05 mg/l	239.1
DF-Diesel		1			
TPH-Diesel	**na**	**2,000**	µg/liter	50.0 µg/l	8015M
DF-MTBE	1	1			
MTBE	**260**	**na**	µg/liter	5.0 µg/l	8020
DF-Gas/BTEX	1	1			
TPH-Gas	**ND**	**na**	µg/liter	50.0 µg/l	8015M
Benzene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Toluene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Ethyl Benzene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Xylenes	**36**	**ND**	µg/liter	0.5 µg/l	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Sample filtered prior to analysis
4. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

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Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-1*	*DS-2*	*DS-3*	*DS-4*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95	10/19/95			
Sample Time	1600	1601	1602	1603			
Lab #	B11199	B11200	B11201	B11202			
DF-Diesel/M.O.	1	1	1	1			
TPH-Diesel	**35**	**71**	**31**	**39**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**ND**	**ND**	**ND**	**110**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1	1			
MTBE	**ND**	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1	1			
Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-5*	*DS-6*	*DS-7*	*DS-8*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95	10/19/95			
Sample Time	1604	1605	1606	1607			
Lab #	B11203	B11204	B11205	B11206			
DF-Diesel/M.O.	1	1	1	10			
TPH-Diesel	**39**	**12**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**62**	**29**	**72**	**560**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1	1			
MTBE	**ND**	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1	1			
Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-9*	*DS-10*	*DS-11*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95			
Sample Time	1608	1609	1610			
Lab #	B11207	B11208	B11209			
DF-Diesel/M.O.	1	1	1			
TPH-Diesel	**24**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**91**	**49**	**30**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1			
MTBE	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1			
Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

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Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-5*	*DS-6*	*DS-7*	*DS-8*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95	10/19/95			
Sample Time	1604	1605	1606	1607			
Lab #	B11203	B11204	B11205	B11206			
DF-Diesel/M.O.	1	1	1	10			
TPH-Diesel	**39**	**12**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**62**	**29**	**72**	**560**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1	1			
MTBE	**ND**	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1	1			
Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

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Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/30/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*G7-W*	*G-7E*	*D-7E*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95			
Sample Time	1615	1620	1625			
Lab #	B11210	B11211	B11212			
Lead	**6.5**	**11**	**na**	mg/kg	0.50 mg/kg	7420
DF-MTBE	1	1	1			
MTBE	**ND**	**ND**	**na**	mg/kg	0.05 mg/kg	8020
DF-Diesel/M.O.		1	1			
TPH-Diesel	**na**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**na**	**23**	**13**	mg/kg	1.0 mg/kg	8015M
DF-Gas/BTEX	1	1	1			
TPH-Gas	**ND**	**ND**	**na**	mg/kg	1.0 mg/kg	8015M
Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

HULL DEVELOPMENT LABS INC.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR DIESEL ANALYSIS

DIESEL
QC sample No.: BLANK SPIKE & DUP

Date analyzed: 10-16-95
Date extracted: 10-13-95
QC batch: DW109503

Matrix: WATER

Units: ug/L

Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
DIESEL	950	0	840	88	1100	116	28	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR DIESEL ANALYSIS

DIESEL
QC sample No.: BLANK SPIKE & DUP
Date analyzed: 10-16-95
Date extracted: 10-13-95
QC batch: DS109503

Matrix: SOIL

Units: mg/Kg
Dilution factor: 1

COMPOUND	SA mg/Kg	SR mg/Kg	MS mg/Kg	MS PR	MSD mg/Kg	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	PR
DIESEL	25	0	19	76	20	80	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR GASOLINE ANALYSIS

GASOLINE
QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
GASOLINE	235	0	257	109	248	106	3	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
BTEX

QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
BENZENE	20	0	22	110	23	115	4	25	50-150
TOLUENE	20	0	21	105	20	100	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: 95102
Matrix: Soil
Units: mg/kg

Date Analyzed: 10/18/95
Extraction Method: TTLC

PARAMETER	Method #	SA mg/kg	SR mg/kg	MS mg/kg	MS %R	MSD mg/kg	MSD %R	QC LIMITS %R
Antimony	7040	7.4	3.2	9.9	89%	10.7	101%	50- 150
Barium	7080	19.7	18.5	27.9	48%	31.3	65%	50- 150
Beryllium	7090	9.1	0.0	6.6	72%	6.4	70%	50- 150
Cadmium	7130	12.3	0.2	10.8	86%	10.7	85%	50- 150
Chromium	7190	7.8	28.5	38.8	132%	34.5	77%	50- 150
Cobalt	7200	14.1	0.0	17.2	122%	16.4	116%	50- 150
Copper	7210	10.6	59.4	66.5	67%	67.0	72%	50- 150
Lead	7420	18.2	30.9	41.4	58%	41.5	58%	50- 150
Molybdenum	7480	12.4	0.0	9.8	79%	9.7	78%	50- 150
Nickel	7520	7.0	20.0	27.8	111%	24.7	68%	50- 150
Silver	7760	11.7	0.2	10.3	86%	9.9	83%	50- 150
Thallium	7840	8.7	0.0	9.6	110%	10.2	117%	50- 150
Vanadium	7910	18.3	0.0	16.8	92%	17.2	94%	50- 150
Zinc	7950	26.5	232.8	266.3	126%	248.4	59%	50- 150

Note: Recoveries of Zinc above QC Limits due to sample concentration > Matrix Spike (confirmed by duplicate analysis)

Definition of Terms:

- na: Not Analyzed in QC batch
- SA: Spike Added
- SR: Sample Result
- MS: Matrix Spike Result
- MS (%R) Matrix Spike % Recovery
- MSD Matrix Spike Duplicate Result
- MSD (%R) Matrix Spike Duplicate % Recovery

LAB DIRECTOR: M. Golden

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: WM-9548
Matrix: Water
Units: mg/l

Date Analyzed: 10/24/95

PARAMETER	Method #	SA mg/l	SR mg/l	MS mg/l	MS %R	MSD mg/l	MSD %	QC LIMITS %R	QC LIMITS RPD
Antimony	204.1	na	na	na	na	na	na	70- 130	20.00
Barium	208.1	na	na	na	na	na	na	70- 130	20.00
Beryllium	210.1	na	na	na	na	na	na	70- 130	20.00
Cadmium	213.1	1.00	0.02	1.03	101	1.03	101	70- 130	20.00
Chromium	218.1	1.00	0.18	1.19	101	1.20	102	70- 130	20.00
Cobalt	219.1	na	na	na	na	na	na	70- 130	20.00
Copper	220.1	1.00	0.68	1.66	99	1.68	101	70- 130	20.00
Lead	239.1	1.00	0.04	1.05	101	1.03	99	70- 130	20.00
Molybdenum	246.1	na	na	na	na	na	na	70- 130	20.00
Nickel	249.1	1.00	0.13	1.14	101	1.12	99	70- 130	20.00
Silver	270.1	1.00	0.02	1.03	101	1.02	100	70- 130	20.00
Thallium	279.1	na	na	na	na	na	na	70- 130	20.00
Vanadium	286.1	na	na	na	na	na	na	70- 130	20.00
Zinc	289.1	1.00	0.28	1.30	101	1.30	101	70- 130	20.00
Iron	236.1	na	na	na	na	na	na	70- 130	20.00
Magnesium	242.1	1.00	0.00	0.94	94	0.93	93	70- 130	20.00

Definition of Terms:

na: Not analyzed in QC batch
SA: Spike Added
SR: Sample Result
MS: Matrix Spike Result
MS (%R) Matrix Spike % Recovery
MSD Matrix Spike Duplicate Result
MSD (%R) Matrix Spike % Recovery

LAB DIRECTOR: M. Golden

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Chain of Custody/Analysis Work Order

Client: Tetra Tech

Address: 180 Howard St, Ste 250

S.F., CA 94105

Contact: Bob Cotton / Mike Wogel

Telephone #: (415) 974-1221

Date Received:

Turn Around: std

Project ID: TC-0637-03

Purchase Order #:

Sampler/Company: Bob Cotton / Tetra Tech

Telephone #:

Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

Sample Information								Requested Analysis								
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	BTEX/MTBE Gas	Pb	TPH-D	TPH-G	Gas	BTEX			
B11197	Gas	Grab	H_2O	10/19/95	1500	No	2 VOA's	X			X	X				
B11198	Diesel	Grab	H_2O	10/19/95	1530	No	2 VOA's	X					X			
B11197	Gas	Grab	H_2O	10/19/95	1500	HNO_3	1		X	hold						
B11197	Gas	Grab	H_2O	10/19/95	1500	No	1 Liter		X	X	filter first					
B11198	Diesel	Grab	H_2O	10/19/95	1530	No	1 Liter			X	X					
B11199	DS-1	Grab	Soil	10/19/95	1600	NO	Brass Sleeve	X		X			X			
B11200	DS-2	↓	↓	↓	1601	↓	↓	X		X			X			
B11201	DS-3	↓	↓	↓	1602	↓	↓	X		X			X			

Relinq. By: L. Robert Cotton	Received By: Mike Wogel	Date 10/19/95	Time 1800
Relinq. By: Mike Wogel	Received By: Don Gentua	Date 10/20/95	Time 845
Relinq. By: Don Gentua	Received By: Brenda Daly	Date 10-20-95	Time 1200

Hull Development Labs

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525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech
Address: 160 Howard St, Ste 250
SF. CA 94105
Contact: B. Cotton / M. Wyatt
Telephone #: (415) 974-1221
Date Received:
Turn Around: std.

Project ID: TC 0637-01
Purchase Order #:

Sampler/Company: Bob Cotton / Tetra Tech
Telephone #: same

Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact:
Yes No
Notes:

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-D	BTEX						
B11202	DS-4	Grab	Soil	10/19/95	1603	None	Brass Sleeve								
B11203	DS-5				1604										
B11204	DS-6				1605										
B11205	DS-7				1606										
B11206	DS-8				1607										
B11207	DS-9				1608										
B11208	DS-10				1609										
B11209	DS-11				1610										

Relinq. By: W. Matt Cotton	Received By: Mike Wyatt	Date 10/19/95	Time 1800
Relinq. By: Mike Wyatt	Received By: Don Gentner	Date 10/20/95	Time 845
Relinq. By: Don Gentner	Received By: Brenda Ohl	Date 10-20-95	Time 1:00 pm

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Chain of Custody/Analysis Work Order

Client: TetraTech

Address: 180 Howard, Suite 250
S.F. CA 94105

Contact: Bob Cotton / Mike Wyatt

Telephone #: (415) 974-1221

Date Received:

Turn Around: Std.

Project ID: 0637

Purchase Order #: ↓

Sampler/Company: Mike Wyatt, TT Telephone #: Same.

Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact:

Yes No

Notes:

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-G	BTEX/ MTBE	PB	TPH-D	BTEX			
B11210	G-7W	Grab	Soil	10/19/95	1615	No	Steel Sleeve	X	X	X					
B11211	G-7E	↓	↓	↓	1620	↓		X	X	X	X				
B11212	D-7E	↓	↓	↓	1625	↓			X		X	X			

Relinq. By: Mike Wyatt	Received By: Don Gentner	Date 10/20/95	Time 845
Relinq. By: Don Gentner	Received By: Brenda Bailey	Date 10-20-95	Time 1:00 PM
Relinq/ By:	Received By:	Date	Time