Office of the State Architect
400 P Street, 5th Floor, Sacramento 95814
(916) 322-8994

90 MAR 29 PM 1:41

March 26, 1990

Mr. Scott Seery
County of Alameda
Dept. of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Dear Mr. Seery:

UST SITE EVALUATION
DEPARTMENT OF TRANSPORTATION
HAYWARD MAINTENANCE STATION

Enclosed for your review and comments is a report for the above referenced project. Please contact me if I can provide further information.

Sincerely,

Michael J. Golden

Michael J. Golden
Project Manager
Underground Storage Tank Program

MJG:amv

Enclosure

cc: Don Dalke, RWQCB Oakland, w/Enclosure
Carlos Lopez, CalTrans, w/Enclosure
George Wong, CalTrans, w/Enclosure
Facility Files
Chron File

Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS

CORPORATE HEADQUARTERS
651 HARRISON STREET
SAN FRANCISCO, CA 94107
TELEPHONE (415) 777-3177
FACSIMILE (415) 777-5623

REGIONAL OFFICES
SAN FRANCISCO
SEATTLE
TUCSON/PHOENIX
WASHINGTON, D.C.

March 14, 1990
1516-00-0

Mr. Mike Golden
OFFICE OF STATE ARCHITECT
400 P Street Fifth Floor
Sacramento, California 95814

RE: SUBMITTAL OF THE PRELIMINARY SITE ASSESSMENT FOR CALIFORNIA DEPARTMENT OF TRANSPORTATION, HAYWARD MAINTENANCE CENTER 2115 CENTER STREET CASTRO VALLEY, CALIFORNIA

Dear Mr. Golden,

Geo/Resource Consultants, Inc. (GRC) is pleased to submit this Preliminary Site Assessment report prepared for the California Department of Transportation, Hayward Maintenance Center in Castro Valley, California. Please be advised that soil cuttings from the field investigation are currently stored on-site in DOT 17H, 55-gallon drums.

Please feel free to contact this office with any comments or questions you might have regarding this project.

Sincerely,
GEO/RESOURCE CONSULTANTS, INC.

Eva E. Vanek
Project Hydrogeologist

Gregory T. Carbullido, R.E.A.
Principal, Environmental Programs Division

Alan D. Tryhorn, C.E.G. #1019
Senior Vice President

EEV/GTC/ADT:cdg

Enclosure: 5 copies of PSA report

cc: GRC Files

244W: 1516-3

PRELIMINARY ASSESSMENT REPORT

CALIFORNIA DEPARTMENT OF TRANSPORTATION

HAYWARD MAINTENANCE STATION

CASTRO VALLEY, CALIFORNIA

PREPARED FOR

OFFICE OF STATE ARCHITECT

400 P STREET, 5TH FLOOR

SACRAMENTO, CALIFORNIA

PREPARED BY

GEO/RESOURCE CONSULTANTS, INC.

851 HARRISON STREET

SAN FRANCISCO, CALIFORNIA

JOB NUMBER: 1516-00-0

MARCH, 1990

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

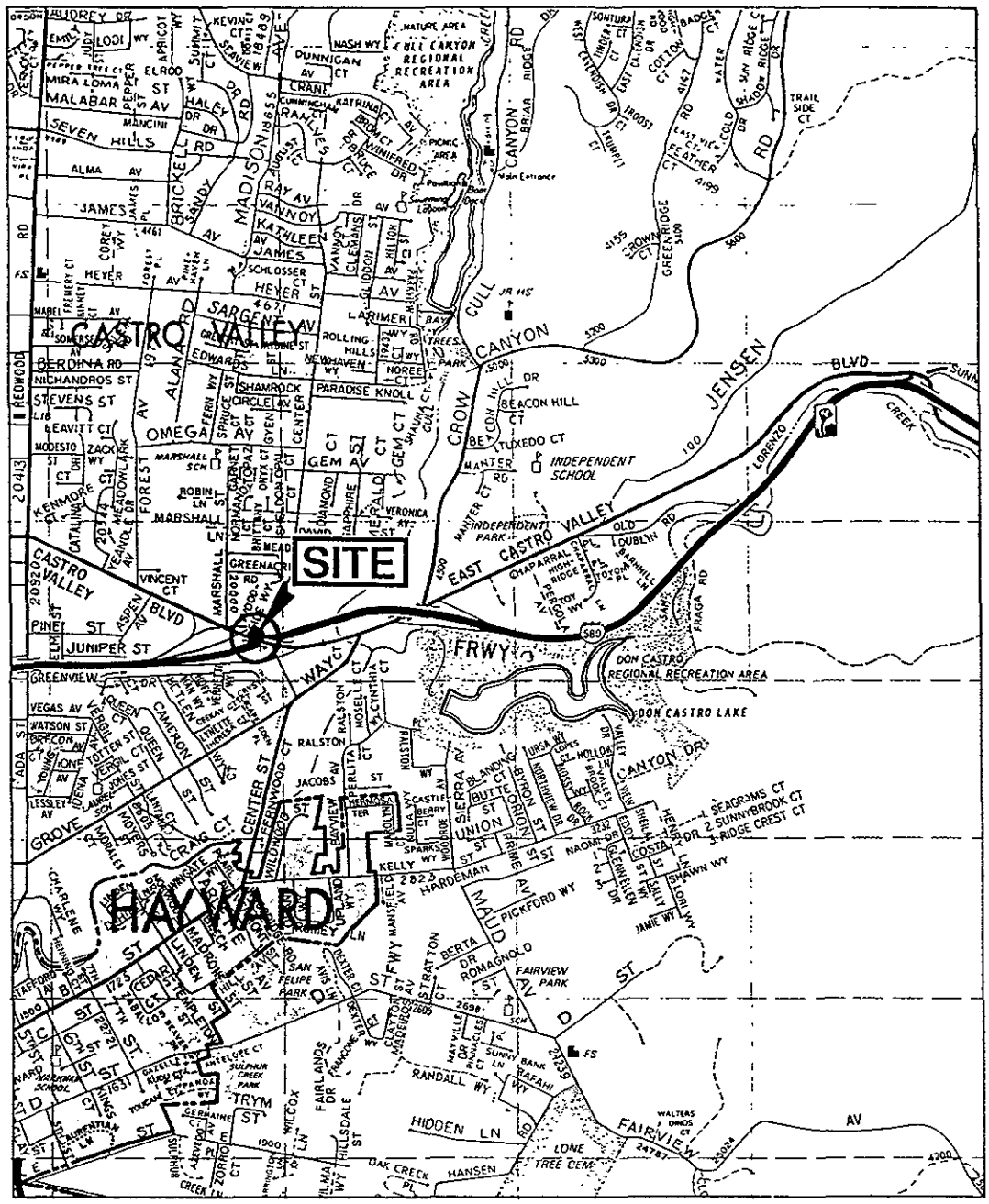
This report describes the results of the Preliminary Site Assessment (PSA) conducted at the California Department of Transportation (CALTRANS), Hayward Maintenance Station in Castro Valley, California (See Figure 1) by Geo/Resource Consultants, Inc. (GRC) in January, 1990 for the Office of the State Architect (OSA). The Hayward Maintenance Station is located at the northwest corner of Center Street and Castro Valley Boulevard.

The PSA consisted of a subsurface investigation of potentially contaminated soil in the vicinity of two previously existing underground storage tanks (USTs) and a pump service island (See Figure 2). These investigations were conducted in accordance with the Workplan and Addendum to the Workplan prepared by GRC in November, 1989 and January, 1990, respectively. These documents were approved by the OSA and Alameda County Department of Environmental Health (DEH) prior to initiating field studies.

1.1 Project Background

According to information submitted by the OSA to GRC, one 260-gallon diesel UST and one 1,000-gallon leaded gasoline UST were removed from adjoining excavations on January 18, 1989 (See Figure 2). During the tank removal, representatives of Placer Tractor Service, under the auspices of the DEH, collected three soil samples from the UST excavation for chemical testing. The laboratory testing was performed by Alpha Analytical Laboratories Inc, of Ukiah, California (See Appendix A).

The chemical test results indicated the presence of 2,100 micrograms per gram (ug/g) total petroleum hydrocarbons as diesel



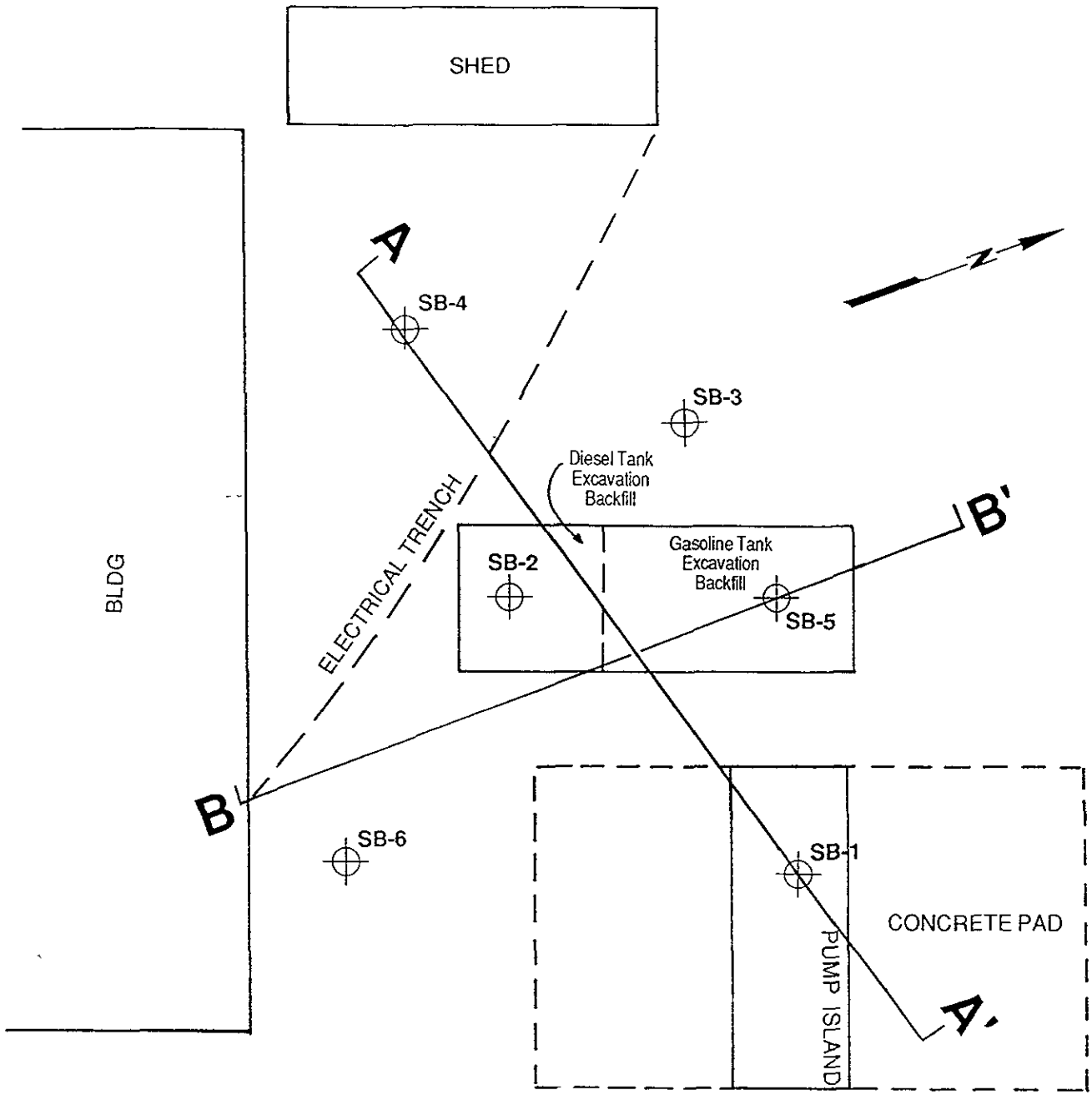
0 2200 ft.

Scale: 1 in.= 2200 ft.

Reference: Thomas Brothers Map, 1979.

Geo/ Resource Consultants, Inc. GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS 851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107	**SITE LOCATION MAP** HAYWARD MAINTENANCE STATION CASTRO VALLEY, CALIFORNIA	**FIGURE** **1**
Job No. 1516-000 Appr. ADT Date 3/9/90		

DATAPRINT N09994



EXPLANATION

SB-1 SOIL BORING

A A' LOCATION OF CROSS-SECTION (See Figure 3)

SCALE: 1"=10'

Reference: Site Sketch prepared by GRC, January, 1990.

Geo/ Resource Consultants, Inc. GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS 851 HARRISON STREET SAN FRANCISCO, CALIFORNIA 94107	**SITE PLAN** SHOWING BORING LOCATIONS HAYWARD MAINTENANCE STATION HAYWARD, CALIFORNIA	FIGURE 2
Job No. 1516-00 Appr. [illegible] Date 3/7/90		

DATAPRINT N39028

(TPH - diesel) in the one soil sample collected from the diesel tank excavation. Total petroleum hydrocarbons as gasoline (TPH - gasoline) were detected at 1.7 ug/g in one of the two soil samples collected from the gasoline tank excavation. The other sample did not contain gasoline above laboratory detection limits (0.3 ug/g). Benzene, toluene, xylene and ethylbenzene (BTXE) were not present above laboratory detection limits (0.3 ug/g) in either of the three soil samples submitted for analyses.

A letter addressed to Mr. Jack Giolitti of the California Department of Transportation (CalTrans) from Mr. Rafat Shahid of the DEH on February 28, 1989, indicated that the TPH level of 2,100 ppm had exceeded the action level of 100 ppm for a "confirmed release" (See Appendix A). The letter also states that "any soil containing greater than 1,000 parts/million-ppm (roughly converts to ug/g) must be excavated."

1.2 Project Purpose

The purpose of this PSA is to 1) develop a preliminary characterization of the geologic and hydrogeologic conditions at the site, 2) to determine the presence of hydrocarbons in the soil and/or ground water within the tank excavation area, and 3) to provide recommendations for further activities, if necessary. The following tasks were implemented at the project site:

1. Drilling and soil sampling of six soil borings to characterize geologic conditions;

2. Installation and sampling of three monitoring wells to characterize hydrogeologic conditions;

2. Submittal of soil and groundwater samples for TPH as gasoline and diesel in accordance with EPA Method 8015 (modified), and BTXE in accordance with EPA Method 8020.

4. Report preparation that describes the field investigation methodology, findings, interpretations, and recommendations for additional activities and/or remedial alternative actions, if appropriate.

2.0 METHODOLOGY

2.1 Pre-Field Activities

Prior to the implementation of the field investigation portion of this project, a Workplan for the site investigation was prepared under the direction of a California Registered Geologist and subsequently approved by the OSA and DEH. The Workplan included proposed field investigation procedures, proposed laboratory analyses, and a site Health and Safety Plan.

Following Workplan approval, GRC personnel conducted a site visit to ascertain the presence of underground utilities in and around proposed boring locations. Mr. Terry Costa, of Caltrans, was interviewed regarding underground utilities and pertinent information regarding the removed USTs. Additionally, a Permit to drill soil borings and install monitoring wells was obtained (See Appendix B) from the Alameda County Flood Control and Water Conservation District - Zone 7 (Zone 7).

2.2 Soil Borings

A total of six, 6-inch to 10-inch-diameter soil borings were drilled in the vicinity of the previously existing USTs and the pump island area (See Figure 2). The borings were drilled with a hollow stem, continuous flight auger drill rig. The six borings ranged in depth from 31.5 feet to 40.5 feet below ground surface. With the exception of SB-6, which was drilled to 31.5 feet, all of the borings were drilled until bedrock was encountered.

The six soil borings were lithologically logged based on drill cuttings and recovered soil samples. The borings were logged by a professional geologist under the supervision of a California Registered Geologist in accordance with the Unified Soil Classification System. Soil cuttings are presently stored on-site in 55-gallon Department of Transportation (DOT), 17H drums. No ground water was encountered during the investigation, and all of the boreholes were grouted up to the ground surface following the soil sampling phase.

2.3 Soil Sampling

Soil samples were collected from each boring at approximate 5-foot intervals from approximately 5 feet to 35 feet below ground surface. The samples were collected in 6-inch-long brass tubes inserted within a modified California drive sampler (2.5-inch diameter I.D.). After obtaining the samples, the sample tubes were appropriately labeled, capped with aluminum foil and plastic caps, sealed, and placed in an ice chest for storage. The samples were logged on a Chain-of-Custody Record in accordance with United States Environmental Protection Agency (EPA) publication Test Methods for Evaluation of Solid Waste (SW-846) and transported to a certified analytical laboratory. Soil samples were qualitatively tested for hydrocarbons using a HnU photoionization detector.

2.4 Laboratory Analyses

A total of 35 soil samples were selected for chemical testing at American Environmental Laboratories Corporation (AEL), a State certified laboratory in Rancho Cordova, California. Based on the evidence of potential diesel and gasoline leakage, soil samples were submitted for the following laboratory analyses:

Total volatile hydrocarbons (gas?) (TVH), modified EPA Method 8015 (EPA extraction method 5030).

Total extractable hydrocarbons (TEH), modified EPA Method 8015 (EPA extraction method 5030).

Benzene, toluene, xylene, and ethylbenzene (BTXE), EPA Method 8020.

2.5 Decontamination Procedures

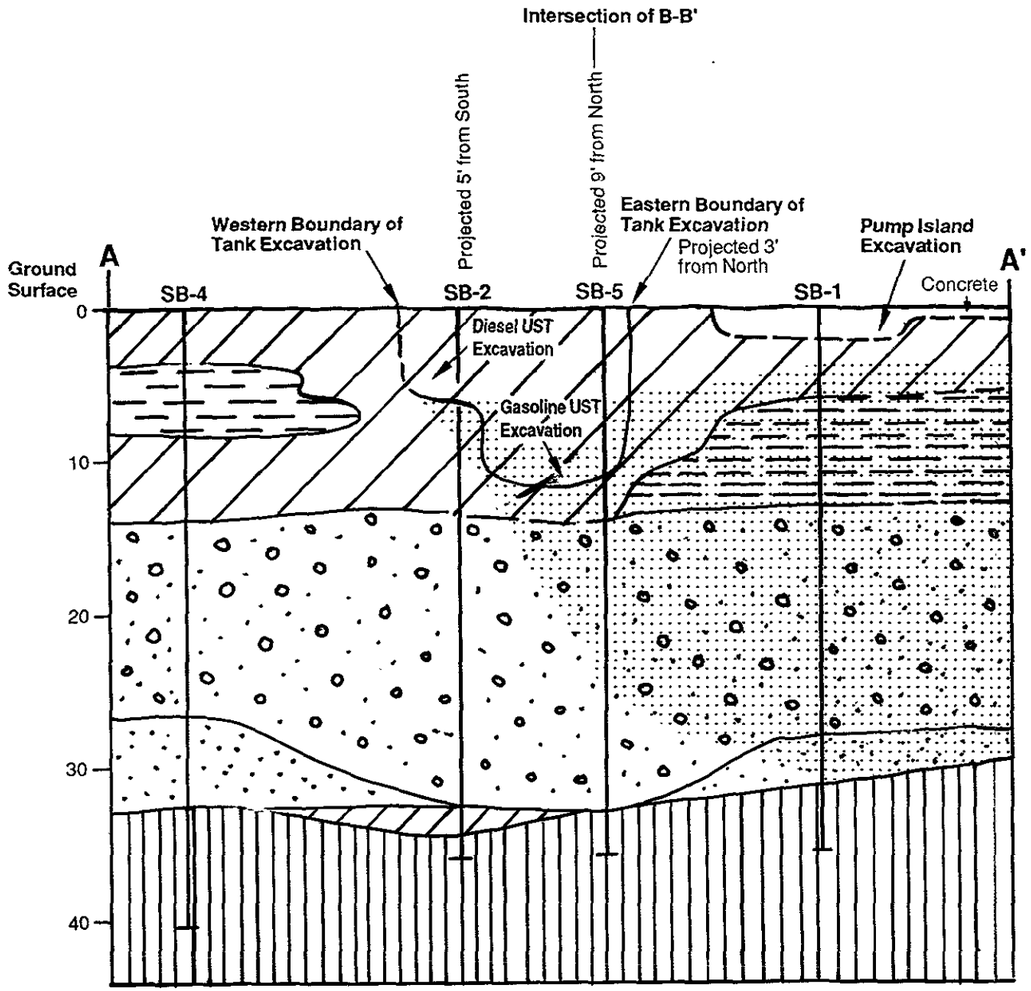
All hollow stem augers were steam cleaned prior to drilling each borehole to prevent potential cross-contamination between borings. Additionally, the soil sampling barrel and all sampling equipment and utensils were cleaned with Liquinox and rinsed with distilled water prior to obtaining each soil sample.

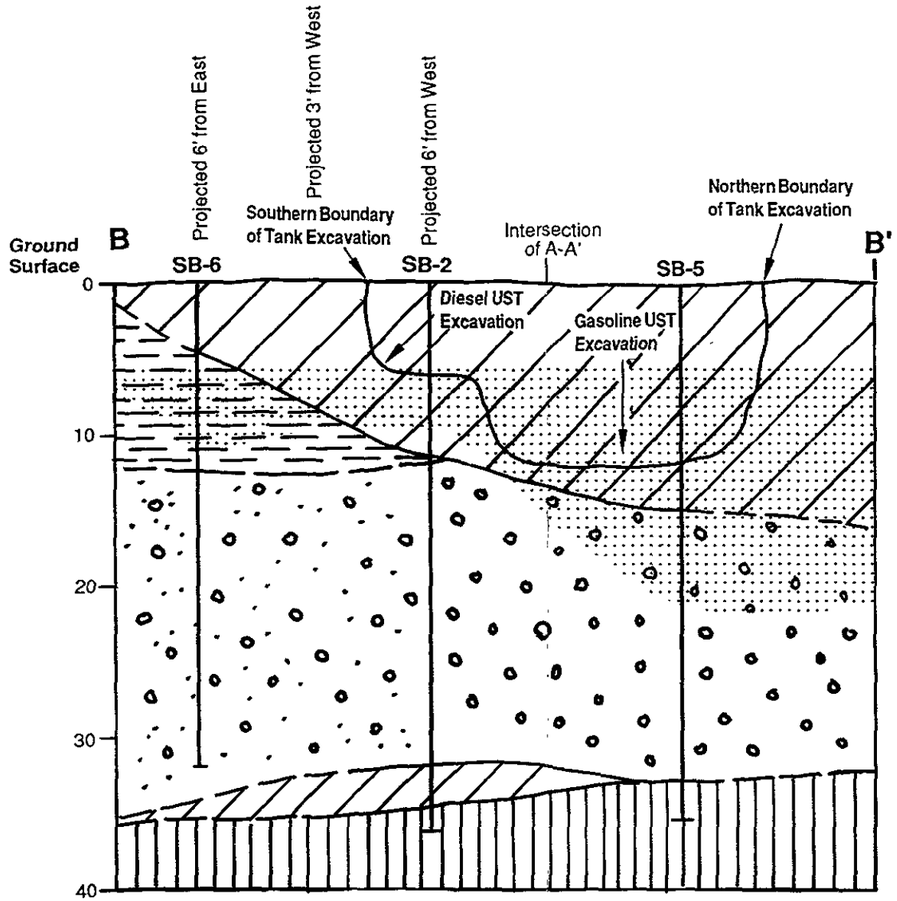
3.0 FINDINGS

3.1 Regional and Local Geology

Castro Valley is located within an "intermontane valley" formed by uplifting, faulting and folding of continental sedimentary rocks. The valley is bordered by hills of the Diablo Range to the north, east and south, and by the Hayward fault to the west. Based on regional studies, Castro Valley is underlain by "older alluvium" which is reported to be up to 80 feet thick (California Department of Water Resources, 1963, and Alameda County Flood Control District, June, 1988). In Castro Valley, older alluvium is underlain and surrounded by rocks of the undifferentiated Pliocene, Knoxville and/or Franciscan Formations (California DWR, 1963).

Local geologic conditions at the Hayward Maintenance Station were interpreted from lithologic logging during drilling (See Appendix C) and are depicted in Figure 3. These data indicate that the site is underlain by alluvial and/or colluvial deposits of clay,





EXPLANATION

- CLAY, silty to sandy, yellow brown to olive grey.
- SILT, clayey yellow brown.
- SAND & GRAVEL, clayey, yellow brown.
- SAND, clayey to gravelly, olive grey to blue grey.
- SILTSTONE, grey to yellow brown.
- Observed extent of hydrocarbons (TPH gasoline and TPH Diesel) in soil.

SCALE: 1' = 10'
No Vertical Exaggeration

Geo/ Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

Job No. 1516-00 Appr. A.T Date 3/9/90

GEOLOGIC CROSS-SECTIONS
A-A' & B-B'
HAYWARD MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE
3

silt, sand and gravel. The sediments probably represent slope-wash sediments (colluvium) from the Diablo Range and/or river sediments (alluvium) derived from the San Lorenzo Creek.

In general, subsurface materials at the Hayward Maintenance Station consist of 10 to 15 feet of yellow brown to olive grey silty, sandy clay overlying 15 to 20 feet of yellow brown clayey sand and gravel. Discontinuous lenses of yellow brown silt and olive to blue grey sand are also present. The hardness of the silt lenses located between 5 and 15 feet below ground surface and presence of associated caliche suggests that these deposits may represent a shallow, discontinuous hardpan layer across the site. Bedrock was generally encountered at depths of 32 to 35 feet below ground surface. In the site area, bedrock consists of siltstone, possibly of the Knoxville Formation.

The tank excavation backfill consists of surficial gravel (drain rock) and clay, silt and sand similar in composition to the natural materials described above. The backfill was primarily differentiated from the surrounding alluvial deposits by its mottled appearance.

With the exception of SB-6, the soil was generally moist at approximately 5 feet below ground surface to the bottom of the borings (30 to 40 feet below ground surface). In SB-6, soil between approximately 15 to 32 feet was moist to wet. Soil above five feet in most of the borings was generally wet, probably due to recent precipitation. Blowcounts generally increased with depth in all of the borings, reflecting an increase in density and/or stiffness with depth. Blowcounts indicated "refusal" conditions when bedrock was encountered.

3.2 Regional and Local Hydrogeology

The Hayward Maintenance Station is located within the Castro Valley Groundwater Basin, a sub-basin of the East Bay Plain (Zone 7, 1988). The older alluvial deposits within the Basin are known to contain some ground water and the few existing wells in Castro

Valley are principally domestic (California DWR, 1963). However, neither ground water nor significantly wet conditions were encountered at the site at the time of drilling.

Conversations with Mr. Scott Seery of Alameda DEH (March 2, 1990) and Mr. Andreas Godfrey of Zone 7 (March 2, 1990) confirmed that ground water is generally present in Castro Valley. For instance, driller's logs (on file at Zone 7) for three monitoring wells installed approximately 450 feet to the west of Hayward Maintenance Station indicate that ground water was measured at 21 to 23 feet below ground surface in alluvial soils (June, 1988). Bedrock was not encountered in any of the borings which were drilled to depths of 38 to 45 feet below ground surface. These data suggest that groundwater flow in the area of the Hayward Maintenance Station may be inhibited due to a bedrock high.

Other data indicate that a water well drilled at 4267 Veronica Street in 1982-1983 (approximately 1,800 feet to the north of the Hayward site) encountered bedrock at 32 feet and ground water at 28 feet below ground surface. The location of this well relative to the nearby hills is very similar to that of the Hayward site, suggesting that ground water may also occur at the Hayward site at approximately 28 feet below ground surface. However, recent water level data for the Veronica Street well are not available, thus it is not known whether water levels are currently as high as 28 feet.

Recharge to the Castro Valley Groundwater Basin occurs primarily from streams that flow from the adjacent foothills (California DWR, 1963). Because streams within the adjacent foothills are recharged primarily from precipitation, a decrease in precipitation would result in a decrease in recharge and groundwater storage in Castro Valley. Due to the drought conditions experienced in the last several years, it is probable that drainage waters have lessened, evidenced by limited, seasonal flow in San Lorenzo Creek, and that ground water is not currently as prevalent as it might have been.

Based on the discussions above, the absence of ground water at the Hayward Maintenance site may be related to the occurrence of a local, bedrock "high" and the decrease in precipitation over recent years.

3.3 Laboratory Results

As listed in Table 1 and included in Appendix D, soil analytical results indicate TPH (gasoline) at 860 milligram/kilogram (mg/kg) in the sample collected from SB-5 at 6 feet below ground surface (referred to as SB-5-6'). Samples collected from SB-1 also contained TPH (gasoline) at 310 mg/kg and 790 mg/kg at 4.0 and 21.5 feet below ground surface, respectively. Minor amounts (up to 15 mg/kg) of TPH (gasoline) were also detected in other samples collected from SB-1 and SB-5.

Gasoline constituents, benzene, toluene, xylene and ethylbenzene (BTXE) were also detected in samples collected from SB-1 and SB-5. BTXE concentrations were highest in the sample collected from SB-5-6'. In this sample, benzene was detected at 640 micrograms/kilogram (ug/kg), toluene was detected at 700 ug/kg, xylene was detected at 110,000 ug/kg and ethylbenzene was detected at 9,700 ug/kg. Xylene and ethylbenzene were also detected at 42,000 ug/kg and 5,300 ug/kg in SB-1-21.5'. Lesser amounts of BTXE were detected in other samples from SB-1.

TPH (diesel) was present in samples collected from SB-1, SB-2, SB-5 and SB-6. Diesel concentrations were highest in SB-1 where samples collected from 8.0, 16.5 and 31.0 feet were found to contain 260 mg/kg, 950 mg/kg and 2,400 mg/kg, respectively. Diesel was also detected at 1,300 mg/kg in SB-2-5.5', 400 mg/kg in SB-5-6.0', 100 mg/kg in SB-5-21.5', 400 mg/kg in SB-6-6.5' and at 19 mg/kg in SB-6-11.5' A correspondence from AEL indicate that the chromatograms for most of the samples containing diesel were "not consistent with the expected diesel Chromatographc pattern" (See Appendix D). Conversations with laboratory personnel indicate that the chromatograms may be suggestive of

TABLE 1
SOIL SAMPLING RESULTS
HAYWARD MAINTENANCE STATION, CASTRO VALLEY, CALIFORNIA
CASTRO VALLEY, CALIFORNIA

Sample (Depth)	TPH as Gasoline (mg/kg)	TPH as Diesel (mg/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl Benzene (ug/kg)	Total Xylenes (ug/kg)
SB-1 @ 4.0'	310	ND	210	360	5,100	8,100
SB-1 @ 8.0'	NT	260	NT	NT	NT	NT
SB-1 @ 11.5	3.7	ND	ND	ND	50	90
SB-1 @ 16.5'	NT	950	NT	NT	NT	NT
SB-1 @ 21.5'	790	ND	ND (100)	ND (100)	5,300	42,000
SB-1 @ 31.0'	NT	2,400	NT	NT	NT	NT
SB-2 @ 5.5'	ND (10)	1,300	ND	ND	40	150
SB-2 @ 10.5'	NT	ND	NT	NT	NT	NT
SB-2 @ 16.5'	ND	ND	ND	ND	ND	ND
SB-2 @ 26.0'	ND	ND	ND	ND	ND	ND
SB-2 @ 30.5'	NT	ND	NT	NT	NT	NT
SB-2 @ 36.5'	ND	ND	ND	ND	ND	ND
SB-3 @ 5.5'	ND	ND	ND	ND	ND	ND
SB-3 @ 11.5'	NT	ND	NT	NT	NT	NT
SB-3 @ 16.5'	ND	ND	ND	ND	ND	ND
SB-3 @ 21.5'	NT	ND	NT	NT	NT	NT
SB-3 @ 25.5'	ND	ND	ND	ND	ND	ND
SB-3 @ 36.2'	NT	ND	NT	NT	NT	NT
SB-4 @ 6.0'	ND	ND	ND	ND	ND	ND
SB-4 @ 11.0'	NT	ND	NT	NT	NT	NT
SB-4 @ 16.0'	ND	ND	ND	ND	ND	ND
SB-4 @ 21.0'	NT	ND	NT	NT	NT	NT
SB-4 @ 26.0'	ND	ND	ND	ND	ND	ND
SB-4 @ 36.0'	NT	ND	NT	NT	NT	NT
SB-5 @ 6.0'	860	400	640	700	9,700	110,000
SB-5 @ 11.0'	NT	ND	NT	NT	NT	NT
SB-5 @ 16.5'	15	ND	ND	20	150	360
SB-5 @ 21.5'	NT	100	NT	NT	NT	NT
SB-5 @ 26.5'	1.0	ND	ND	ND	ND	110
SB-5 @ 36.0'	NT	ND	NT	NT	NT	NT
SB-6 @ 6.5'	ND (2.0)	400	ND	ND	ND	ND
SB-6 @ 11.5'	NT	19	NT	NT	NT	NT
SB-6 @ 16.0'	ND	ND	ND	ND	ND	ND
SB-6 @ 21.5'	NT	ND	NT	NT	NT	NT
SB-6 @ 31.5'	ND	ND	ND	ND	ND	ND
Reporting Limit	(1.0)	(10)	(10)	(10)	(10)	(20)

ND = Not Detected at or above indicated Reporting Limit.
NT = Not Submitted to a Laboratory for Chemical Testing.

Note: SB-4, SB-5 and SB-6 are referred to as MW-1, MW-2 and MW-3, respectively in original laboratory data included in Appendix C.

244w : 1516-4.wk1

"aged" diesel, suggesting that the diesel has been in the subsurface for a long time (Personal communication, Mr. John Arnt, AEL, March, 1990).

The known vertical extent of hydrocarbons present in soil is depicted in the cross-sections presented in Figure 3. Due to the wide variations in hydrocarbon concentrations at different depths, the lateral extent of hydrocarbons in soil is not depicted in this report. In general, the most extensive hydrocarbon concentrations are found in soil in the area of SB-1, SB-2 and SB-5.

4.0 REGULATORY FRAMEWORK

The California Regional Water Quality Control Board (RWQCB) has set forth guidelines that pertain to underground storage tank investigations in Tri-Regional Guidelines - "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks", June 2, 1988, and "Leaking Underground Fuel Tank Field Manual (LUFT)", May, 1988. These guidelines present worksheets to derive risk appraisals and leaching potential of gasoline, diesel and BTXE in soil. The purpose of these worksheets is to provide a means to evaluate the impact of hydrocarbon contamination in soil on underlying ground water. In response to the Porter Cologne Water Quality Control Act (Water Code), it is the State Regional Water Quality Board's policy to "protect the high quality of waters, set the goal of the removal of all contamination from the soil, surface water, and groundwater affiliated with the site where feasible" (Leaking Underground Fuel Tank Field Manual, May, 1988).

5.0 CONCLUSIONS AND RECOMMENDATIONS

Conversations with Hayward Maintenance Station personnel indicate that the previously existing fuel lines extending from the pump island to the USTs had leaked (Personal communication, Mr. Ted Costa of Hayward Maintenance Station, January, 1990). Based on findings presented in the Sections above, hydrocarbon in soil is most extensive in the area of the pump island (SB-1). Thus, it appears that hydrocarbons may have leaked from the pump island fuel lines and have migrated vertically downward. High concentrations of diesel at the bottom of the boring in SB-1 suggest that diesel may have "ponded" above the bedrock surface. TPH (gasoline) data available for SB-1 also suggest that hydrocarbons may have migrated downward. The presence of samples collected from SB-1 that do not contain diesel above detection limits interspersed with samples containing hydrocarbons, suggests that diesel may have also migrated laterally, resulting from variations in soil permeability, as it moved downward.

The presence of hydrocarbons within the shallow soil at SB-1, SB-2 and SB-5 suggests that previous hydrocarbon leakage or overspillage from tanks may have occurred and that the soil containing hydrocarbons was used to backfill the excavations following tank removal. Some leakage of hydrocarbons into the underlying native material is suggested by the presence of diesel at 100 mg/kg in SB-5-21.5′ and gasoline at 15 mg/kg in SB-5-16.5′. There does not appear to be evidence of hydrocarbon leakage into the underlying native soil in SB-2.

Hydrocarbons were not detected in soil samples collected from SB-3 and SB-4, suggesting that hydrocarbon leakage has not reached soil west of the UST excavation and pump island. However, the presence of diesel in shallow soil at SB-6 suggests that fuel line leakage from the general area of the pump island has impacted soil to the south of the pump island. The extent of hydrocarbons in soil to the south and east of SB-6, to the north and east of SB-1 and to the north of SB-5 is not currently known.

At Hayward Maintenance Station, ground water was not encountered at the time of the investigation and there are no specific guidelines addressing allowable hydrocarbon concentrations in soil when ground water is not present (See Tri-Regional Guidelines and LUFT Manual). However, based on regional and local studies, ground water has been reported in the general site area. Thus, the possibility exists that ground water could be present in the future within the site area, thus presenting a potential for hydrocarbon migration off-site. Additionally, hydrocarbon vapor migration within man-made conduits, such as utility trenches, may pose a threat of explosion or fire if concentrations reach explosive levels and an ignition source is present.

Based on the presence of hydrocarbons in the soil, and the potential for groundwater flow through the soil, GRC recommends that the soil be remediated. Possible remedial measures may include one, or a combination of the following methods:

- excavation and removal,
- excavation and aeration,
- bio-remediation, or
- soil venting.

If an in-situ method of remediation is selected, GRC recommends that further soil investigations be implemented to define that lateral and vertical extent of contamination to the north and east of the tank excavation and pump island areas. If remediation is accomplished by excavation, it may be possible to determine the extent of contamination during the excavation process.

6.0 REFERENCES

Alameda County Flood Control and Water Conservation District-Zone 7, 1988, "Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California".

Arnt, John, American Environmental Laboratories, Personal Communication, March 7, 1990.

California Regional Water Quality Control Board, June 2, 1988, "Tri-Regional Guidelines - Regional Board Staff Recommendations for initial Evaluation and Investigation of Underground Tanks.

California Regional Water Quality Control Board, May, 1988, "Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure".

California Department of Water Resources, 1963, "Alameda County Investigation", Bulletin No. 13.

Costa, Terry, California Department of Transportation, Personal Communication, Jan., 1990.

Godfrey, Andreas, Alameda County Flood Control and Water Conservation District-Zone 7, Personal Communication, March, 1990.

Seery, Scott, ALAMEDA Department Environmental Health, Personal Communication, March 1990.

Shahid, Rafat, ALAMEDA Department Environmental Health, Letter to Mr. Jack Giolitti dated February 28, 1989.

APPENDIX A

UST REMOVAL BACKGROUND DATA

Laboratory Director

Date Printed: 01/25/89

ALPHA ANALYTICAL LABS

Alpha Analytical Laboratories Inc. • 860 Waugh Lane H-1, Ukiah, California 95482 (707) 468-0401

CHEMICAL EXAMINATION REPORT

Page 2

Tractor Service
Wells Ave.
CA 95450
Lori Thomas

Date Sampled: 01/18/89
Time Sampled: 14:19
Sampled By: Lori Thomas
Date in Lab: 01/20/89
Sample Type: Soil

consisted of 4 Samples and 15 Tests

Sample 2 21195 Center Street - Castro Valley
Tank # 1 12'5" - West

	Method	Results	Units	DL
TPH - Gasoline	LUFT	ND	ug/g	1
Benzene	EPA 8020	ND	ug/g	.
Toluene	EPA 8020	ND	ug/g	.1
Xylenes	EPA 8020	ND	ug/g	.
Ethylbenzene	EPA 8020	ND	ug/g	.

Alpha

Alpha Analytical Laboratories Inc. • 860 Waugh Lane, H-1, Ukiah, California 95482
(707) 468-0401

CHEMICAL EXAMINATION REPORT

Page

[illegible] Tractor Service
[illegible] Ave.
[illegible] 95650
Attn. [illegible] Thomas

Date Sampled: 01/18/89
Time Sampled: 14:35
Sampled By: Tori Thomas
Date in Lab: 01/20/89
Sample Type: Soil

	Method	Results	Units	[illegible]
[illegible] consisted of 4 Samples and 15 Tests				
[illegible] 3 21195 Center Street - [illegible] Valley Tank # 2 6'11" - East				
[illegible] - Diesel	LUFT	6100	ug/g	10
Benzene	EPA 8020	ND	ug/g	[illegible]
Toluene	EPA 8020	ND	ug/g	[illegible]
Xylenes	EPA 8020	ND	ug/g	
Ethylbenzene	EPA 8020	ND	ug/g	[illegible]

[illegible] Detection Limit ND = None Detected

[illegible]

Bruce L. Gove
Laboratory Director

Bruce L. Gove
Date [illegible] 01/26/89

Alpha Analytical Laboratories Inc • [illegible] (707) 468 [illegible]

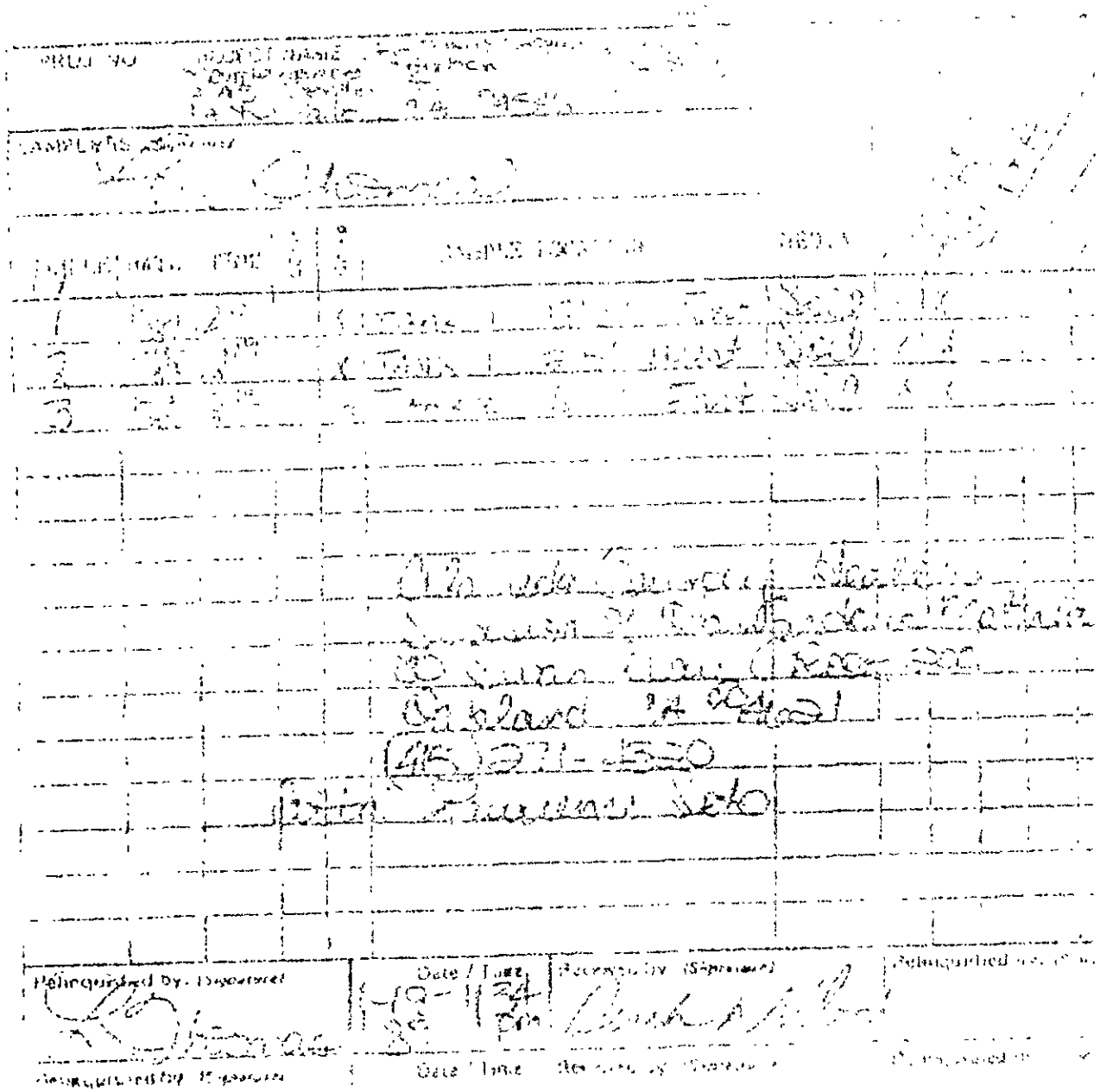
CHEMICAL EXAMINATION REPORT

[illegible] Tractor Service	Date Sampled: [illegible]
[illegible] Wells Ave.	Time Sampled: [illegible]
[illegible], CA 95650	Sampled By: Lori Thomas
Attn: Lori Thomas	Date In Lab: [illegible]/20/89
	Sample Type: Soil

[illegible] 4 Samples and 15 Tests

[illegible] [illegible]95 Center Street - [illegible]
Tank # 1 [illegible] - East

	Method	Results	Units	MDL
TPH - Gasoline	LUFT	1.[illegible]	ug/g	1
Benzene	EPA 8020	ND	ug/g	[illegible]
Toluene	EPA 8020	ND	ug/g	[illegible]
Xylenes	EPA 8020	ND	ug/g	.3
Ethylbenzene	EPA 8020	ND	ug/g	[illegible]



PROJ NO	PROJECT NAME [illegible] 18-89 [illegible] Castro Valley CA 94546												
SAMPLERS (Signature)	L. Thomas												
SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	MEDIA	TPH	BTX+E			DETECTION LIMIT	TURN-AROUND TIME	SUSPECTED CONTAMINANT
1	[illegible]	[illegible]		X	TANK 1 12'5" East	Soil	X	X			Gas	5 day	yes
2		[illegible]		X	TANK 1 6'5" West	Soil	X	X			Gas	5 day	yes
3		[illegible]		X	TANK 2 6'1" East	Soil	X	X			Diesel		

Alameda County Health
Division of Hazardous Materials
80 Swan Way Room 200
Oakland CA 94621
(415) 271-4320
Attn: Lawrence Soto

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
L. Thomas	1-19-89 / 1:34 PM	Derek Nelson			
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)

Relinquished by: (Signature)	Date / Time	Received for Laboratory by (Signature)	Date / Time	Remarks
Derek Nelson [illegible]		[illegible]		

TO Hurley George - Tanker

State of California

Business, Transportation and Housing Agency

Memorandum

To: Ken McClellan, Chief
Special Programs Section
Office of State Architect
400 P Street - Lincoln Plaza
Sacramento, CA 95814

Date: March 10, 1989

File No.: W.O. BDH 720

Attention Hurley George
Mike Golden

From: **DEPARTMENT OF TRANSPORTATION**
DIVISION OF HIGHWAY MAINTENANCE

Subject: Site Investigation- Hayward Maintenance Station
21195 Center Street, Castro Valley, CA 94546

As indicated in the attached memo dated February 28, 1989, the County of Alameda has notified us of the need to conduct a site assessment at our Hayward Maintenance Station. This is the result of soil contamination indicated following removal of two underground fuel tanks by your office.

Please complete any site investigation work required for this location. As soon as this site can be rendered free of contamination, we will proceed with the installation of a new fuel facility. Ken Fitzpatrick is the OSA design contact for this project.

Please send us copies of all site investigation correspondence for our files.

If you have specific questions regarding the site location, you may contact Ging Chin of our San Francisco office at ATSS 597-3744; or you may contact Phil Jones at ATSS 485-4030 regarding this memo.

J.E. HELLMER, Chief
Office of Special Services
And Support

Attachment

PJ:lfo
cc: Rafat A. Shahid- Chief, Hazardous Materials Division-County of Alameda
GChin-4 Maint.
LWells-Hq. Maint.
KFitzpatrick-OSA

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Director

Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

Telephone Number: (415) 271-4320

February 28, 1989

RECEIVED
MAR 6 1989
Dept. of Transportation
Special Assignment Crews

Mr. Jack Giolitti
Department of Transportation
1112 - 29th Avenue
Oakland, CA 94601

SUBJECT: RESULTS OF SOIL SAMPLE ANALYSES FOLLOWING TANK CLOSURES AT 21195 CENTER STREET, CASTRO VALLEY, CA 94546

Dear Mr. Giolitti:

Our office is in receipt of the report of analytical results submitted by Alpha Analytical Laboratories, Inc. following soil sampling performed at the referenced facility during the removal of two (2) underground storage tanks (UST) on January 18, 1989. These laboratory results indicate that soil is contaminated at this site, denoted by concentrations of total petroleum hydrocarbon as diesel (TPH-D) up to 2100 parts per million (ppm).

According to the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB) "Guidelines for Addressing Fuel Leaks," any soil containing greater that 100 ppm is considered a "confirmed release." Any soil containing greater than 1000 ppm must be excavated. Such soil may be aerated on-site to remove the contamination and then put back into the tank pit. The Bay Area Air Quality Management District (BAAQMD) must be contacted at (415) 771-6000 for specific permit requirements of such soil aeration. The soil may alternatively be removed and disposed of properly at an approved Class I disposal site.

Attached for your records is a copy of an "Underground Storage Tank Unauthorized Release Report Form" prepared by this department. Additional copies have been distributed to the required reporting agencies.

Due to the presence of TPH contamination above 100 ppm and consequent "confirmed release" status, a preliminary site assessment must be conducted at this site to determine the extent of soil and/or ground water contamination. The information gathered by this investigation will be used to determine whether additional actions are necessary at this site. The preliminary site assessment should be conducted in accordance with the RWQCB Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks. The elements of such an

investigation are summarized in the attached Appendix A.

In order to proceed with a preliminary site investigation, you should obtain professional services from a reputable engineering/geotechnical consulting firm. The responsibility of your consultant is to submit for review a proposal outlining planned activities pertinent to meeting criteria outlined in Appendix A, as they apply to the site. Once the preliminary assessment has been completed, a technical report summarizing site related activities and conclusions must be submitted to this office and the RWQCB. All reports and proposals must be submitted under seal of a California-Certified Engineering Geologist, California-Registered Geologist, or California-Registered Civil Engineer.

This office will oversee the preliminary site assessment for the referenced site. This oversight will include the review and comment on work proposals, and technical guidance on appropriate investigative approaches. However, the issuance of monitoring well installation permits will be through Zone 7. The RWQCB will take over as lead agency if it is determined following the preliminary assessment that there has been an impact on groundwater.

Please submit a Preliminary Site Assessment proposal within 30 days of the receipt of this letter. A copy of this proposal should also be sent to the RWQCB (Attn: Lisa McCann) for their review. Also, please submit a completed copy of the manifest used for transport of the USTs off-site following closure.

If you have any questions, please call Scott Seery, Hazardous Materials Specialist, at 415/271-4320.

Sincerely,

Rafat A. Shahid, Chief
Hazardous Materials Division

RAS:SOS:mam

cc: Cody Begley, OSA
Howard Hatayama, Department of Health Services
Lisa McCann, RWQCB
Bob Bohman, Castro Valley Fire Department
Gil Jensen, Alameda County District Attorney, Consumer and Environmental Protection Division
Scott Seery, Alameda County Hazardous Materials Division
Files

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY ☐ YES ☑ NO — HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED ? ☐ YES ☑ NO

FOR LOCAL AGENCY USE ONLY
I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFETY CODE.
SIGNED _____ DATE _____

REPORT DATE 02/28/89 — CASE # _____

REPORTED BY
NAME OF INDIVIDUAL FILING REPORT: Scott Seery — PHONE: (415) 271-4320 — SIGNATURE
REPRESENTING ☑ LOCAL AGENCY ☐ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ OTHER
COMPANY OR AGENCY NAME: Ala Co. Environmental Health Dept.
ADDRESS: 80 Swan Way, Rm 200 — Oakland — CA — 94621 (STREET / CITY / STATE / ZIP)

RESPONSIBLE PARTY
NAME: Caltrans Maintenance ☐ UNKNOWN — CONTACT PERSON: Jack Griolitti — PHONE: ( )
ADDRESS: 21195 Center Street — Castro Valley — CA — 94546 (STREET / CITY / STATE / ZIP)

SITE LOCATION
FACILITY NAME (IF APPLICABLE) — OPERATOR — PHONE: ( )
ADDRESS (STREET)
CROSS STREET: unknown — CITY — COUNTY — ZIP
TYPE OF AREA ☐ COMMERCIAL ☐ INDUSTRIAL ☐ RURAL ☐ RESIDENTIAL ☐ OTHER
TYPE OF BUSINESS ☐ RETAIL FUEL STATION ☐ FARM ☑ OTHER Maint. Yd.

IMPLEMENTING AGENCIES
LOCAL AGENCY: Ala Co. Dept of Env. Health, Hazmat Div — AGENCY NAME — CONTACT PERSON: Rafat A. Shahid — PHONE: (415) 271-4320
REGIONAL BOARD: SF - Regional Water Quality Control Bd — CONTACT PERSON: Lisa McCann — PHONE: (415) 464-1255

SUBSTANCES INVOLVED
(1) NAME: diesel fuel — QUANTITY LOST (GALLONS) _____ ☑ UNKNOWN
(2) NAME: gasoline _____ ☑ UNKNOWN

DISCOVERY/ABATEMENT
DATE DISCOVERED: 01/18/89 — HOW DISCOVERED ☐ TANK TEST ☐ INVENTORY CONTROL ☑ TANK REMOVAL ☐ SUBSURFACE MONITORING ☐ NUISANCE CONDITIONS ☐ OTHER
DATE DISCHARGE BEGAN ☑ UNKNOWN
HAS DISCHARGE BEEN STOPPED ? ☑ YES ☐ NO IF YES, DATE
METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY) ☐ REMOVE CONTENTS ☐ REPLACE TANK ☑ CLOSE TANK ☐ REPAIR TANK ☐ REPAIR PIPING ☐ CHANGE PROCEDURE ☐ OTHER

SOURCE/CAUSE
SOURCE OF DISCHARGE ☐ TANK LEAK ☑ UNKNOWN ☐ PIPING LEAK ☐ OTHER
TANK(S) ONLY/CAPACITY 2500 / 2500 GAL. — AGE 20+ YRS ☐ UNKNOWN
MATERIAL ☐ FIBERGLASS ☑ STEEL ☐ OTHER
CAUSE(S) ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ CORROSION ☑ UNKNOWN ☐ SPILL ☐ OTHER

CASE TYPE
CHECK ONE ONLY ☑ UNDETERMINED ☐ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

CURRENT STATUS
CHECK ONE ONLY ☐ SITE INVESTIGATION IN PROGRESS (DEFINING EXTENT OF PROBLEM) ☐ CLEANUP IN PROGRESS ☐ SIGNED OFF (CLEANUP COMPLETED OR UNNECESSARY) ☐ NO ACTION TAKEN ☐ POST CLEANUP MONITORING IN PROGRESS ☐ NO FUNDS AVAILABLE TO PROCEED ☑ EVALUATING CLEANUP ALTERNATIVES

REMEDIAL ACTION
CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS)
☐ CAP SITE (CO) ☐ EXCAVATE & DISPOSE (ED) ☐ REMOVE FREE PRODUCT (FP) ☐ ENHANCED BIO DEGRADATION (IT)
☐ CONTAINMENT BARRIER (CB) ☐ EXCAVATE & TREAT (ET) ☐ PUMP & TREAT GROUNDWATER (GT) ☐ REPLACE SUPPLY (RS)
☐ TREATMENT AT HOOKUP (HU) ☐ NO ACTION REQUIRED (NA) ☑ OTHER (OT)

COMMENTS
Laboratory results indicate TPH-D as high as 2100 ppm in soil. Requesting a submittal of a Preliminary Site Assessment from CalTrans to evaluate extent of contamination. No remediation yet decided upon.

Appendix A

Workplan for Initial Subsurface Investigation

There are a large number of initial site investigations related to unauthorized releases of fuel products. The number of workplans and reports to be reviewed and approved require that these documents have uniform organization and content. The purpose of this appendix is to present an outline to be followed by professional engineering or geologic consultants in preparing workplans to be submitted for approval to the Regional Board and local agencies.

A statement of qualifications and registration number for the California registered engineer and/or registered geologist responsible for the project will need to be included with the submitted workplan and reports.

This appendix should be referred to in context with the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks".

PROPOSAL FORMAT

I. Introduction

A. Statement of Scope of Work

B. Site location

C. Background

D. Site History

1. Brief description of the type of business and associated activities that take place at the site, including the number and capacity of operating tanks.

2. Description of previous businesses at the site.

3. Complete description of tank activities, tank contents, and tank removal.

a. Number of underground tanks, uses, etc. (include the volume of each tank, construction material, and tank condition)

b. Date of tank removal and condition of tank.

c. Description of all waste removal, including copies of all manifests.

d. Filing status and copy of unauthorized release form, if not previously submitted.

e. Previous tank testing results and date. Include discussion of inventory reconciliation methods and results for previous three years.

f. Estimate of the total quantity of product lost.

4. Other spill, leak and accident history at the site, including any previously removed tanks.

5. Describe any previous subsurface work at the site or adjacent sites.

II. Site Description

A. Vicinity description and hydrogeologic setting.

B. Vicinity map (including wells located on-site or on adjoining lots, as well as any nearby streams).

C. Site map to include:

1. Adjacent streets.

2. Site building locations.

3. Tank locations.

4. Island locations and piping to pumps from tanks.

5. Any known subsurface conduits, underground utilities, etc.

D. Existing soil contamination and excavation results.

1. Provide sampling procedures used.

2. Indicate depth to groundwater, if encountered.

3. Describe soil strata encountered in excavation.

4. Provide results in tabular form and location of all soil sampling (and water sampling, if appropriate). The date sampled, the identity of the sampler, and signed laboratory data sheets need to be included.

5. Identify underground utilities

6. Describe any unusual problems encountered.

7. Completely describe methods for storing and disposal of all contaminated soil.

8. Reference all required permits, including those issued by the Air Quality Management District and local underground tank permitting agency.

III. Plan for determining extent of soil contamination on site.

A. Describe method/technique for determining extent of contamination within the excavation.

B. Describe sampling methods and procedures to be used.

1. If a soil gas survey is planned, then:

a. Identify number of boreholes, location, sampling depth, etc.

b. Identify subcontractors, if any

c. Identify methods or techniques used for analysis

d. Provide quality assurance plan for field testing

2. If soil borings are to be used to determine the extent of soil contamination, then:

a. Identify number and location (mapped) of proposed borings.

b. Describe depth of borings

c. Describe soil classification system, soil sampling method and rationale

d. Describe boring drilling method, including decontamination procedures.

e. Describe boring abandonment method

C. Describe method and criteria for screening clean versus contaminated soil, including a complete description of procedures to be used for storing and disposal of any excavated soil. If on-site soil aeration is to be utilized, then a complete description of the treatment method is required:

1. Volume and rate of aeration/turning.

2. Method of containment and cover

3. Wet weather contingency plans.

Other on-site treatments (such as bioremediation) requires permits issued by the Regional Board. Off-site storage or treatment also requires permits issued bY the Regional Board.

D. Security measures planned for excavated hole and contaminated soil (i.e., six foot fence around hole, ripped up piping,m spoil piles, etc.)

IV. Plan for determining groundwater contamination.

Construction and placement of wells should adhere to the requirements of the "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks". If the verified down gradient location has been established, then a complete description of the rationale must be provided. — 15%

A. Placement and rationale for location of monitoring wells, including a map to scale.

B. Drilling method for construction of monitoring wells, including decontamination procedures.

1. Expected depth and diameter of monitoring wells

2. Date of expected drilling.

3. Method and location of soil sampling of borings.

4. Casing type, diameter, screen interval, and pack and slot sizing technique.

5. Depth and type of seal.

6. Construction diagram for wells.

7. Development method and criteria for determination of adequacy of development.

8. Plans for disposal of cuttings and development water.

9. Surveying plans for wells (requirements include surveying to established benchmark to 0.01 foot)

C. Groundwater sampling plans (include plans for sampling and on-site domestic wells)

1. Water level measurement procedure

2. Methods for free product measurement, observation of sheen and odor.

3. Well purging procedures.

4. Well purge water disposal plans.

5. Sample collection procedures.

6. Sample analyses to be used

7. Quality assurance plan

8. Chain of custody procedures

V. Include a site safety plan

A report will need to be submitted following collection of the information proposed and approved in the workplan. The report should set out the collected information in an orderly fashion and include any recommendations for additional needed work.

APPENDIX B

BORING PERMIT

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

11 January 1990

Geo Resource Consultants
851 Harrison Street
San Francisco, CA 94107

Gentlemen:

Enclosed is a Groundwater Protection Ordinance permit application to be completed and returned to our office. Oral authorization was given on 9 January 1990 to proceed with a monitoring well construction project at 2115 Center Street in Castro Valley for the Office of State Architect.

Please submit the required application so that it is received within ten days of the date of this letter and future applications so that they are received five days prior to your proposed start of work.

If your application for the Center Street project is not received within the ten-day period, your project will not be in compliance with Alameda County Ordinance 73-68, and we may restrict the issuance of future permits to your firm.

If you have any questions, please contact Wyman Hong or Craig Mayfield at 484-2600.

Very truly yours,

Mun J. Mar
General Manager

By J. Killingstad
J. Killingstad, Chief
Water Resources Engineering

WH:mm
Enc.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94566 ♦ (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Hayward Maintenance Station
21195 Center Street, Castro Valley, Calif.

CLIENT
Name Office of the State Architect
Address 400 P Street Phone (916) 322-8994
City Sacramento, CA Zip 95801

APPLICANT
Name Geo/Resource Consultants, Inc.
Address 851 Harrison St. Phone 777-3177
City S.F., CA Zip 94107

TYPE OF PROJECT - Soil Contamination

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	x	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger x
Cable ___ Other ___

DRILLER'S LICENSE NO. Hew Drilling Comapany State License #384167

WELL PROJECTS
Drill Hole Diameter ___ in. Maximum
Casing Diameter ___ in. Depth ___ ft.
Surface Seal Depth ___ ft. Number ___

~~GEOTECHNICAL PROJECTS~~
Number of Borings 6 Maximum
Hole Diameter 8 in. Depth 40 ft.

ESTIMATED STARTING DATE January 15
ESTIMATED COMPLETION DATE January 19

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Eva Vanek Date 1-19-90
Eva Vanek, Project Hydrogeologist

FOR OFFICE USE

PERMIT NUMBER 90013
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

A. GENERAL
(1.) A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
(3.) Permit is void if project not begun within 90 days of approval date.

B. WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

(C.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 15 Jan 90
Wyman Hong

121989

APPENDIX C

LITHOLOGIC LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS					SOIL DESCRIPTION
COARSE GRAINED SOILS over 50% coarser than #200 sieve	GRAVELS over half of coarse fraction larger than No. 4 sieve	clean gravels with little or no fines	GW		Well Graded Gravels, Gravel - Sand Mixtures
			GP		Poorly Graded Gravels, Gravel - Sand Mixtures
		gravels with over 12% fines	GM		Silty Gravels, Poorly Graded Gravel - Sand - Silt Mixtures
			GC		Clayey Gravels, Poorly Graded Gravel-Sand-Clay Mixtures
	SANDS over half of coarse fraction finer than No. 4 sieve	clean sands with little or no fines	SW		Well Graded Sands, Gravelly Sands
			SP		Poorly Graded Sands, Gravelly Sands
		sands with over 12% fines	SM		Silty Sands, Poorly Graded Sand - Silt Mixtures
			SC		Clayey Sands, Poorly Graded Sand - Clay Mixtures
FINE GRAINED SOILS over 50% is finer than #200 sieve	SILTS AND CLAYS liquid limit less than 50		ML		Silts, Very Fine Sands, Silty or Clayey Fine Sands
			CL		Low Plasticity Clays, Sandy or Silty Clays
			OL		Low Plasticity Organic Silts and Clays
	SILTS AND CLAYS liquid limit greater than 50		MH		Micaceous or Diatomaceous Silts, Volcanic Ash, Elastic Silts
			CH		High Plasticity Clays - Fat Clays
			OH		High Plasticity Organic Silts and Clays
	HIGHLY ORGANIC SOILS		Pt		Peat and Other Fibrous Organic Soils

KEY TO SAMPLES

"Undisturbed" 2.5" sample

Disturbed Sample

Indicates depth of sampling with no recovery

Indicates depth and location of coring run

Indicates depth of Standard Penetration Test and 2"sample

KEY TO TEST DATA

Shear Strength, psf

Confining Pressure or Normal Load, psf

TxUU	750	(2600)	Unconsolidated Undrained Triaxial
TxCU	540	(2600)	Conslidated Undrained Triaxial
TxCD	800	(2600)	Consolidated Drained Triaxial
DS	500	(2000)	Direct Shear
UC	400		Unconfined Compression
FVS	470		Field Vane Shear
FP	500		Field Penetrometer

PI = Plasticity Index
C = Consolidation Test

Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

SOIL CLASSIFICATION CHART
AND
KEY TO TEST DATA

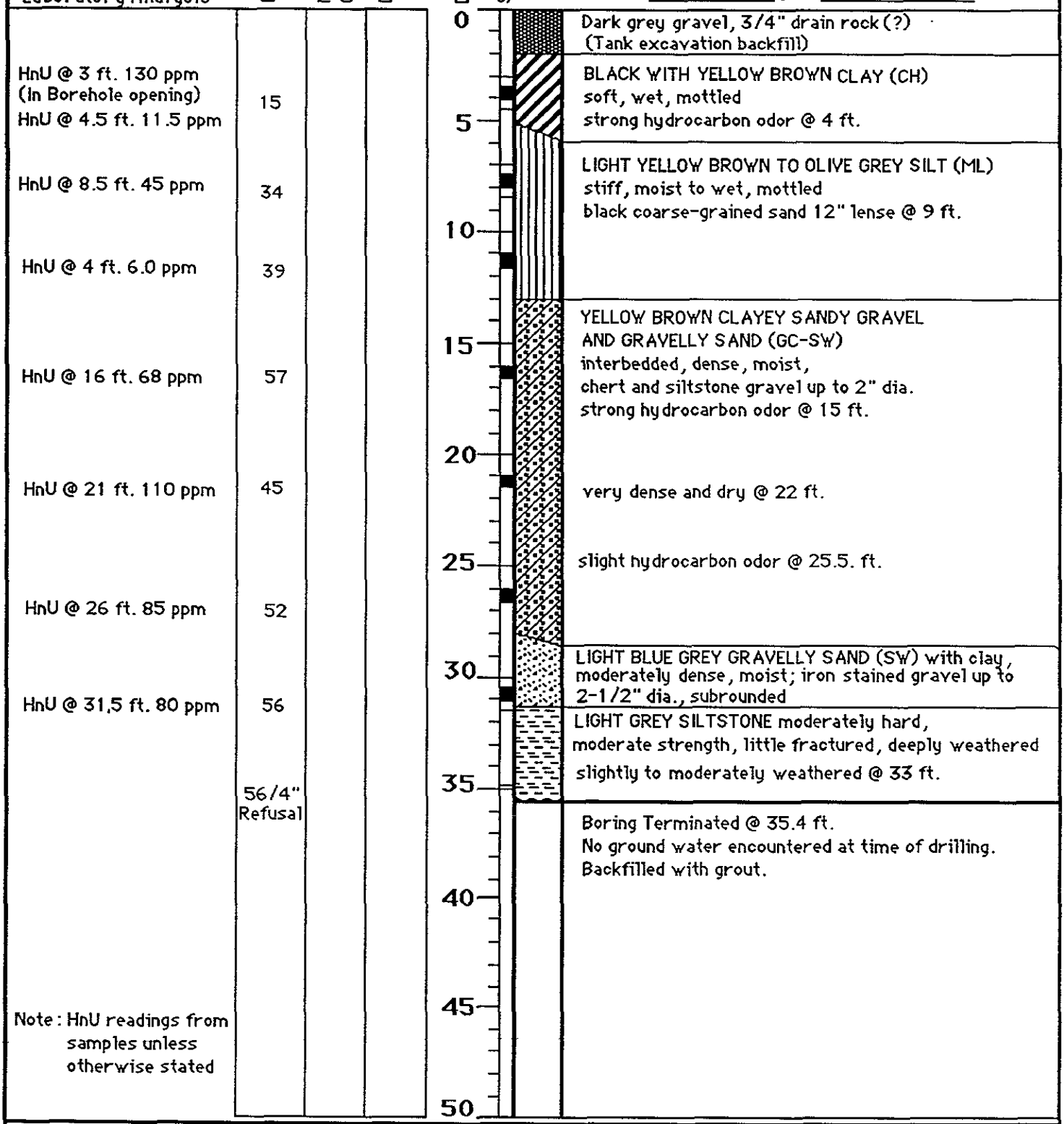
FIGURE
C

Job No. 1516-00-0 Appr. AWI Date 3/13/90

LOG OF BORING SB-1

Equipment 6" Hollow Stem Auger

Elevation ~220' Date 1/17/90



GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1516-00-0 Appr: AWT Date 3/7/90

LOG OF BORING SB-1

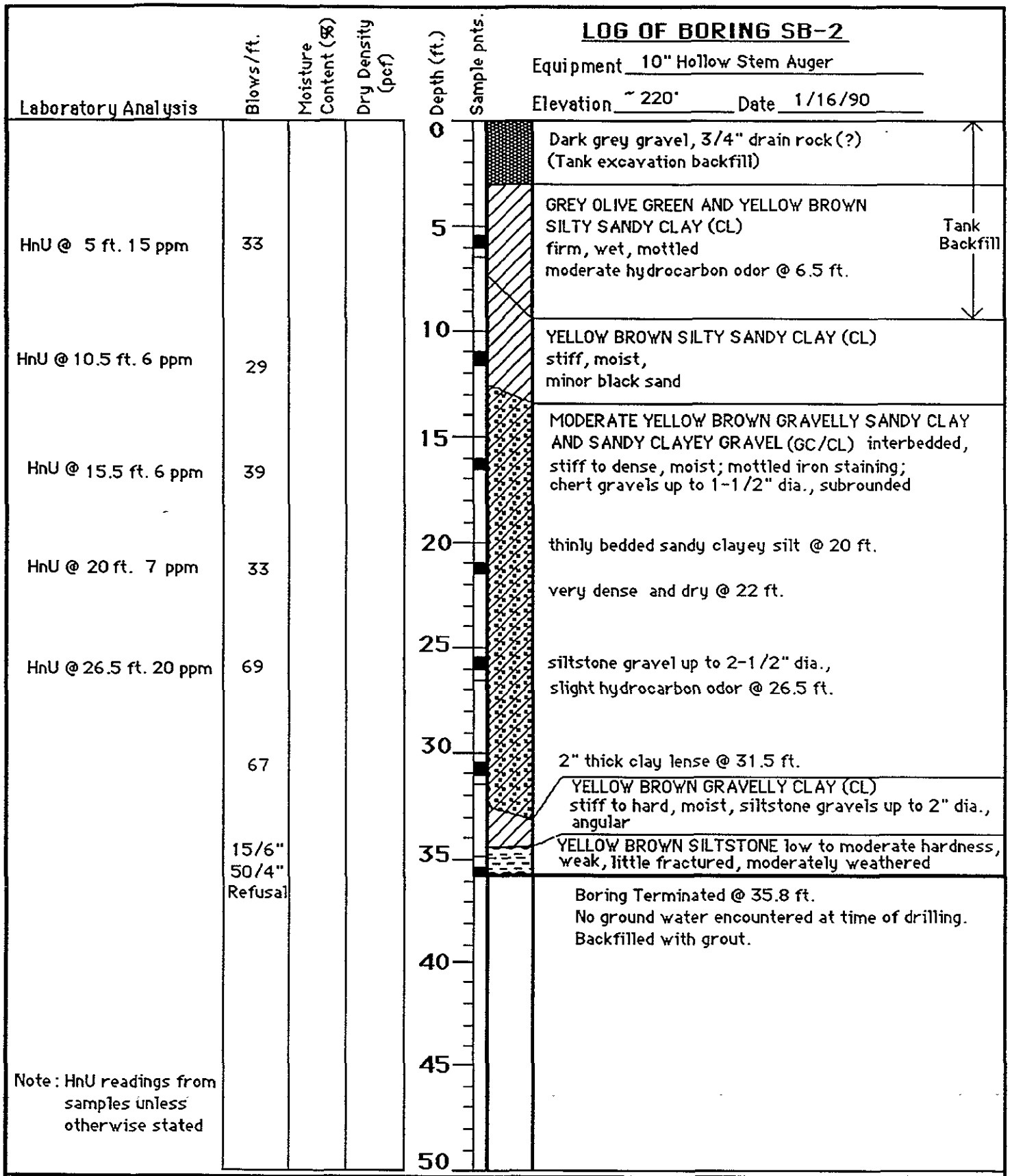
HAYWARD
MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE
C-1

LOG OF BORING SB-2

Equipment 10" Hollow Stem Auger

Elevation ~220' Date 1/16/90



GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1516-00-0 Appr: AMT Date 3/7/90

LOG OF BORING SB-2

HAYWARD
MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE

C-2

LOG OF BORING SB-3

Equipment 6" Hollow Stem Auger

Elevation ~ 220 ft. Date 1/17/90

Laboratory Analysis	Blows/ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft.)	Sample pnts.	
				0		Asphalt 4"
						Class II Baserock 8"
						YELLOW BROWN SANDY CLAY (CL) firm, wet
HnU @ 5.5 ft. 3.5 ppm	33			5		LIGHT YELLOW BROWN SANDY SILT (ML) with clay, firm to stiff, moist caliche vein @ 5.5 ft. clayey silt from 6.4 ft to 7.5 ft.
HnU @ 11 ft. 1 ppm	59			10		hard @ 10 ft.
				15		firm @ 14.5 ft.
HnU @ 16 ft. 4.5 ppm	25					YELLOW BROWN SANDY CLAYEY GRAVEL AND GRAVELLY SAND (GC-SW) interbedded, moderately dense to dense, moist; iron stained gravel up to 2" dia., rounded to subangular
	40			20		
	62			25		10" lense of black clay with sand; strong hydrocarbon odor @ 25 ft. 6" lense of chert and siltstone gravel with clay, very dense @ 27 ft.
HnU @ 30.5 ft. 1.1 ppm	81			30		
HnU @ 35 ft 1.2 ppm	29/6" 50/3" Refusal			35		YELLOW BROWN TO LIGHT GREY SILTSTONE low to moderate hardness, weak, little fractured, moderately weathered; moderately hard @ 36.0'
						Boring Terminated @ 36.3 ft. No ground water encountered at time of drilling. Backfilled with grout.
				40		
				45		
Note: HnU readings from samples unless otherwise stated				50		

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1516-00-0 Appr: AJT Date 3/7/90

LOG OF BORING SB-3

HAYWARD
MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE

C-3

LOG OF BORING SB-4

Equipment 10" Hollow Stem Auger

Elevation ~ 220 ft. Date 1/16/90

Laboratory Analysis	Blows/ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft.)	Sample pnts.	
				0		Asphalt 4"
						Class II Baserock 8"
						DARK YELLOW BROWN CLAY (CH) firm, wet
HnU @ 5.5 ft. ND	41			5		DARK YELLOW BROWN CLAYEY SILT (ML) with minor black grains (organic?) stiff, moist caliche vein @ 5.5 ft.
HnU @ 10.5 ft. 1 ppm	33			10		LIGHT YELLOW BROWN SILTY CLAY (CL) stiff, moist dry @ 13.5 ft.
HnU @ 15.5 ft. 1 ppm	41			15		YELLOW BROWN GRAVELLY SAND AND SANDY CLAYEY GRAVEL (SW-GC) interbedded, moderately dense to dense, moist to dry; chert & siltstone gravel up to 1" dia. rounded, iron stained
	45			20		dense @ 19 ft.
	53			25		moderately dense @ 24 ft.
	49			30		LIGHT OLIVE GREY TO LIGHT BROWN GRAVELLY CLAYEY SAND (SC) dense, moist, mottled; chert gravel up to 1" dia., rounded
	78			35		LIGHT GREY SILTSTONE low to moderate hardness, weak, little fractured, moderately to deeply weathered
	60/6 Refusal			40		moderately hard and moderately weathered @ 40 ft.
						Boring Terminated @ 40.5 ft. No ground water encountered at time of drilling. Backfilled with grout.
				45		
				50		

Note: HnU readings from samples unless otherwise stated

Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1516-00-0 Appr: AOL Date 3/7/90

LOG OF BORING SB-4
HAYWARD
MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE
C-4

LOG OF BORING SB-5

Equipment 10" Hollow Stem Auger

Elevation ~ 220 ft. Date 1/16/90

Laboratory Analysis	Blows/ft.	Moisture Content (%)	Dry Density (pcf)	Depth (ft.)	Sample pnts.	
				0		DARK GREY GRAVEL, 3/4" drain rock (?) loose, wet (Fill)
						DARK GREY AND BLACK SANDY CLAY (CL) with gravel; soft, wet, mottled; very strong hydrocarbon odor @ 3.5 ft.
				5		OLIVE GREY CLAYEY GRAVELLY SAND (SC) loose, moist; gravel stained black — tank backfill
HnU @ 5.5 ft. 280 ppm	14					
				10		GREY SILTY CLAY (CL) stiff, moist, minor gravel, caliche
HnU @ 11.5 ft. 108 ppm	22					
HnU @ 16 ft. 32 ppm	28			15		YELLOW BROWN GRAVELLY SAND WITH CLAY AND SANDY CLAYEY GRAVEL (SW-GC) interbedded, medium dense, moist; quartz and siltstone gravel up to 2" diameter, subangular to rounded
				20		dense @ 19 ft.
HnU @ 21 ft. 102 ppm	39					strong hydrocarbon odor @ 20.5 ft.
						dry @ 22 ft.
				25		
	49					
				30		very dense @ 30 ft.
HnU @ 31.5 ft. 1.6 ppm	68					
	45/6" 20/1" Refusal			35		LIGHT GREY SILTSTONE moderately hard, weak, little fractured, moderately to deeply weathered
						Boring Terminated @ 35.6 ft. No ground water encountered at time of drilling. Backfilled with grout.
				40		
				45		
				50		

Note: HnU readings from samples unless otherwise stated

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1516-00-0 Appr: AOT Date 3/7/90

LOG OF BORING SB-5

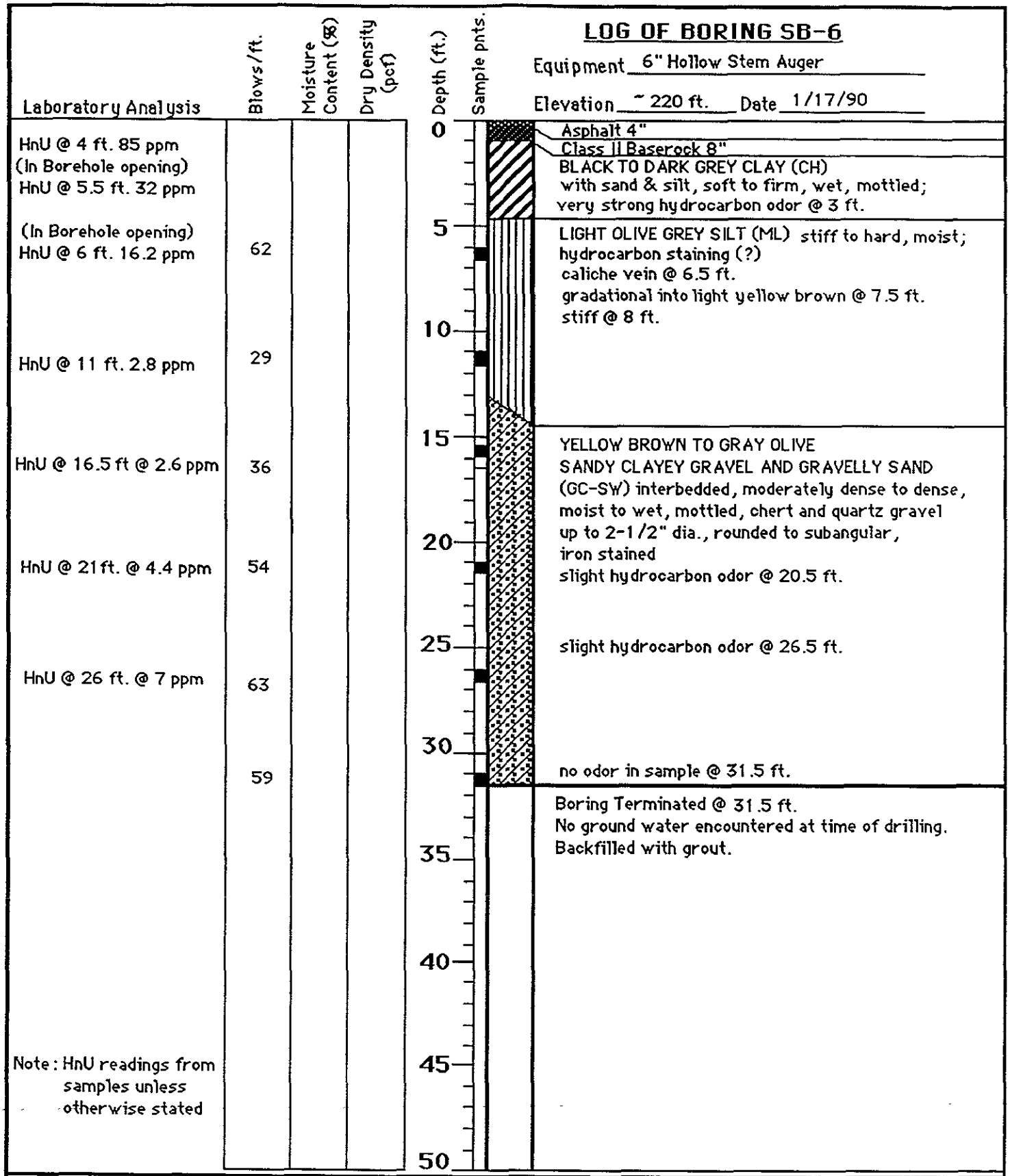
HAYWARD MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE C-5

LOG OF BORING SB-6

Equipment 6" Hollow Stem Auger

Elevation ~ 220 ft. Date 1/17/90



Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1516-00-0 Appr: APT Date 3/7/90

LOG OF BORING SB-6

HAYWARD
MAINTENANCE STATION
CASTRO VALLEY, CALIFORNIA

FIGURE

C-6

APPENDIX D

LABORATORY RESULTS

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

Geo Resource Consultants, Inc.
851 Harrison Street
San Francisco CA 94107

2/2/90

ATTN: E. Vanek

Re: Project: Hayward Maintenance Station
AEMC Lab Reference No.: L4263 Job No.: 794263
Date Samples Received: 01/17/90
No. Samples Received: 42 Soil samples

These samples were received by AEMC in a chilled state, intact, and accompanied by chain-of-custody documentation.

The above referenced samples were analyzed as follows:

No. of Samples	Analysis
19	TPH as Gas & BTXE
35	TPH as Diesel

Although samples MW-2, 21.5; MW-3, 6.5; MW-3, 11.5, SB-1 8.0; SB-1, 16.5; and SB-1, 31.0 were found to contain hydrocarbons in the molecular weight range generally associated with diesel fuel, the chromatograms for these samples were not consistent with the expected diesel chromatographic pattern, or "fingerprint". However, the reported concentrations are based on diesel calibration.

Additionally, although sample MW-2, 6.0 contains what appear to be higher molecular weight hydrocarbons than those typically present in diesel fuel, the reported concentration is based on diesel calibration.

Due to the presence of significant concentrations of petroleum hydrocarbons in various samples, Method 8020 surrogate standard recovery data could not be calculated/reported for all samples.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

Michael Jaeq — for GH

George Hampton
Laboratory Director

3249 Fitzgerald Road • Rancho Cordova, CA 95742 • Fax (916) 638-4510 • (916) 638-7301

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons, EPA Method 8015

CLIENT: Geo Resources Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: E. Vanek
Phone:

Project: Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled: 1/6/90
Date Received: 1/17/90
Date Extracted: 1/22/90
Date Analyzed: 1/25/90

Job No.: 794263
COC Log No.: None

AEMC I.D.: L4263

Matrix: Soil

Sample I.D. Client	AEMC	Batch #	TPH as Diesel (mg/kg)
MW-1, 6.0'	L4263-1	5034	ND
MW-1, 11.0'	L4263-2	5034	ND
MW-1, 16.0'	L4263-3	5034	ND
MW-1, 21.0'	L4263-4	5034	ND
MW-1, 26.0'	L4263-5	5034	ND
MW-1, 36.0	L4263-7	5034	ND
SB-2, 5.5	L4263-8	5034	1300
SB-2, 10.5	L4263-9	5034	ND
SB-2, 16.5	L4263-10	5034	ND
SB-2, 26.0	L4263-12	5034	ND
SB-2, 30.5	L4263-13	5034	ND
SB-2, 36.5	L4263-14	5034	ND
MW-2, 6.0	L4263-15	5035	400
MW-2, 11.0	L4263-16	5035	ND
MW-2, 16.5	L4263-17	5035	ND
MW-2, 21.5	L4263-18	5035	100
MW-2, 26.5	L4263-19	5035	ND
MW-2, 36.0	L4263-21	5035	ND
SB-3, 5.5	L4263-22	5035	ND
SB-3, 11.5	L4263-23	5035	ND
SB-3, 16.5	L4263-24	5036	ND
SB-3, 21.5	L4263-25	5035	ND
SB-3, 25.5	L4263-26	5035	ND
SB-3, 36.2'	L4263-29	5035	ND
MW-3, 6.5	L4263-30	5035	400
MW-3, 11.5	L4263-31	5036	19
MW-3, 16.0	L4263-32	5036	ND
MW-3, 21.5	L4263-33	5036	ND
MW-3, 31.5	L4263-35	5036	ND
SB-1, 4.0	L4263-36	5036	ND
SB-1, 8.0	L4263-37	5036	260
SB-1, 11.5	L4263-38	5036	ND
SB-1, 16.5	L4263-39	5036	950
SB-1, 21.5	L4263-40	5036	ND
SB-1, 31.0	L4263-42	5036	2400
Method Blank	L4263-MB	5034	ND
Method Blank	L4263-MB	5035	ND
Method Blank	L4263-MB	5036	ND
REPORTING LIMIT*			10

*Unless otherwise indicated in parentheses

ND = Not Detected at or above indicated Reporting Limit.

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons, EPA Method 8015

CLIENT: Geo Resources Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: E. Vanek
Phone:

Project: Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled: 1/6/90
Date Received: 1/17/90
Date Extracted: 1/22/90
Date Analyzed: 1/25/90

Job No.: 794263
COC Log No.: None

AEMC I.D.: L4263
Batch No.: 5034
Matrix: Soil

ANALYTE	Spike Conc. (mg/kg)	MS %Rec	MSD %Rec	Duplicate RPD
TPH as Diesel	100	91%	90%	1.1%

MS = Matrix Spike
MSD = Matrix Spike Duplicate
% Rec = Percent Recovery
RPD = Relative Percent Difference

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons, EPA Method 8015

CLIENT: Geo Resources Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: E. Vanek
Phone:

Project: Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled: 1/6/90
Date Received: 1/17/90
Date Extracted: 1/22/90
Date Analyzed: 1/25/90

Job No.: 794263
COC Log No.: None

AEMC I.D.: L4263
Batch No.: 5035
Matrix: Soil

ANALYTE	Spike Conc. (mg/kg)	MS %Rec	MSD %Rec	Duplicate RPD
TPH as Diesel	100	87%	91%	4.5%

MS = Matrix Spike
MSD = Matrix Spike Duplicate
% Rec = Percent Recovery
RPD = Relative Percent Difference

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons, EPA Method 8015

CLIENT: Geo Resources Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: E. Vanek
Phone:

Project: Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled: 1/6/90
Date Received: 1/17/90
Date Extracted: 1/22/90
Date Analyzed: 1/25/90

Job No.: 794263
COC Log No.: None

AEMC I.D.: L4263
Batch No.: 5036
Matrix: Soil

ANALYTE	Spike Conc. (mg/kg)	MS %Rec	MSD %Rec	Duplicate RPD
TPH as Diesel	100	88%	99%	12%

MS = Matrix Spike
MSD = Matrix Spike Duplicate
% Rec = Percent Recovery
RPD = Relative Percent Difference

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons/BTXE, EPA Method 8015/8020

CLIENT: Geo Resource Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: Eva Vanek
Phone:(415)777-3177

Project:Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled:1/16/90
Date Received:1/17/90
Date Extracted:1/22/90
Date Analyzed:1/26/90

Job No.: 794263
COC Log No.:

AEMC I.D.:L4263

Matrix:Soil

Sample I.D. Client	AEMC	Batch #	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl-benzene (ug/kg)	Xylenes, total (ug/kg)	TPH as Gasoline (mg/kg)
MW-1 6.0	L4263-1	5032	ND	ND	ND	ND	ND
MW-1 16.0	L4263-3	5032	ND	ND	ND	ND	ND
MW-1 26.0	L4263-5	5032	ND	ND	ND	ND	ND
SB-2 5.5	L4263-8	5032	ND	ND	40	150	ND(10)
SB-2 16.5	L4263-10	5032	ND	ND	ND	ND	ND
SB-2 26.0	L4263-12	5032	ND	ND	ND	ND	ND
SB-2 36.5	L4263-14	5032	ND	ND	ND	ND	ND
MW-2 6.0	L4263-15	5032	640	700	9,700	110,000	860
MW-2 16.5	L4263-17	5032	ND	20	150	360	15
MW-2 26.5	L4263-19	5032	ND	ND	ND	110	1.0
SB-3 5.5	L4263-22	5033	ND	ND	ND	ND	ND
SB-3 16.5	L4263-24	5033	ND	ND	ND	ND	ND
SB-3 25.5	L4263-26	5033	ND	ND	ND	ND	ND
MW-3 6.5	L4263-30	5033	ND	ND	ND	ND	ND(2.0)
MW-3 16.0	L4263-32	5033	ND	ND	ND	ND	ND
MW-3 31.5	L4263-35	5033	ND	ND	ND	ND	ND
SB-1 4.0	L4263-36	5033	210	360	5,100	8,100	310
SB-1 11.5	L4263-38	5033	ND	ND	50	90	3.7
SB-1 21.5	L4263-40	5033	ND(100)	ND(100)	5,300	42,000	790
Method Blank	L4263-MB1	5032	ND	ND	ND	ND	ND
Method Blank	L4263-MB2	5033	ND	ND	ND	ND	ND
REPORTING LIMIT*			10	10	10	20	1.0

*Unless otherwise indicated in parentheses

ND = Not Detected at or above indicated Reporting Limit.

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons/BTXE, EPA Method 8015/8020

CLIENT: Geo Resource Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: Eva Vanek
Phone:(415)777-3177

Project:Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled:1/16/90
Date Received:1/17/90
Date Extracted:1/22/90
Date Analyzed:1/26/90

Job No.: 794263
COC Log No.:

AEMC I.D.:L4263
Batch: 5032
Matrix:Soil

SURROGATE	Spike Conc. (ug/kg)	MS %Rec	MSD %Rec
o-chlorotoluene	100	87%	81%

ANALYTE	Spike Conc. (ug/kg)	MS %Rec	MSD %Rec	Duplicate RPD
Benzene	100	86%	84%	2.4%
Toulene	100	90%	96%	6.4%
Ethylbenzene	100	86%	86%	0%
Xylenes, Total	200	88%	99%	12.0%

MS = Matrix Spike
MSD = Matrix Spike Duplicate
% Rec = Percent Recovery
RPD = Relative Percent Difference

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons/BTXE, EPA Method 8015/8020

CLIENT: Geo Resource Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: Eva Vanek
Phone:(415)777-3177

Project:Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled:1/16/90
Date Received:1/17/90
Date Extracted:1/22/90
Date Analyzed:1/26/90

Job No.: 794263
COC Log No.:

AEMC I.D.:L4263
Batch: 5032
Matrix:Soil

Sample I.D. Client	AEMC	o-chlorotoluene Surrogate Recovery CONC. (ug/kg)	% Recovery
MW-1 6.0	L4263-1	100	83%
MW-1 16.0	L4263-3	100	70%
MW-1 26.0	L4263-5	100	83%
SB-2 5.5	L4263-8	100	NR
SB-2 16.5	L4263-10	100	93%
SB-2 26.0	L4263-12	100	83%
SB-2 36.5	L4263-14	100	92%
MW-2 6.0	L4263-15	100	NR
MW-2 16.5	L4263-17	100	NR
MW-2 26.5	L4263-19	100	NR
Method Blank	L4263-MB1	100	95%

NR = Not Reported

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons/BTXE, EPA Method 8015/8020

CLIENT: Geo Resource Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: Eva Vanek
Phone:(415)777-3177

Project:Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled:1/16/90
Date Received:1/17/90
Date Extracted:1/22/90
Date Analyzed:1/26/90

Job No.: 794263
COC Log No.:

AEMC I.D.:L4263
Batch: 5033
Matrix:Soil

SURROGATE	Spike Conc. (ug/kg)	MS %Rec	MSD %Rec
o-chlorotoluene	100	98%	98%

ANALYTE	Spike Conc. (ug/kg)	MS %Rec	MSD %Rec	Duplicate RPD
Gasoline	4000	99%	106%	6.8%

MS = Matrix Spike
MSD = Matrix Spike Duplicate
% Rec = Percent Recovery
RPD = Relative Percent Difference

AMERICAN
ENVIRONMENTAL LABORATORIES CORP.

ANALYSIS REPORT: Total Petroleum Hydrocarbons/BTXE, EPA Method 8015/8020

CLIENT: Geo Resource Consultants
851 Harrison Court
San Francisco, CA 94107

P.O/Contract No.:
Contact: Eva Vanek
Phone:(415)777-3177

Project:Hayward Maintenance Station

AEMC Contact: M. Jaeger

Date Sampled:1/16/90
Date Received:1/17/90
Date Extracted:1/22/90
Date Analyzed:1/26/90

Job No.: 794263
COC Log No.:

AEMC I.D.:L4263
Batch: 5033
Matrix:Soil

Sample I.D. Client	AEMC	o-chlorotoluene Surrogate Recovery CONC. (ug/kg)	% Recovery
SB-3 5.5	L4263-22	100	65%
SB-3 16.5	L4263-24	100	80%
SB-3 25.5	L4263-26	100	74%
MW-3 6.5	L4263-30	100	NR
MW-3 16.0	L4263-32	100	81%
MW-3 31.5	L4263-35	100	85%
SB-1 4.0	L4263-36	100	NR
SB-1 11.5	L4263-38	100	NR
SB-1 21.5	L4263-40	100	NR
Method Blank	L4263-MB2	100	76%

NR = Not Reported

Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

CHAIN OF CUSTODY RECORD

PROJECT NO. 15-16-000
DATE 1-16-22 PAGE 1 OF 5

PROJECT NAME Hayward Maintenance Station
Client OSA
Address
SAMPLERS (SIGNATURE) Keith B Craig
LABORATORY

SAMPLE NO.	DATE	TIME	LOCATION	EPA NO. 8015 TPH gasoline	EPA NO. 8015 TPH Diesel	EPA NO. 8020 BTXE	EPA NO.	EPA NO.	NO. OF CONTAINERS	COMMENTS/ CONTAINER TYPE
MW-1, 6.0'	1-16-90	8:37	MW-1	✓	✓	✓			1	Brass Liner
MW-1 - 11.0'	1-16-90	8:58	MW-1	✓	✓	✓			1	" "
MW-1, 16.0'	1-16-90	9:03	MW-1	✓	✓	✓			1	" "
MW-1, 21.0'	1-16-90	9:22	MW-1	✓	✓	✓			1	" "
MW-1, 26.0'	1-16-90	9:43	MW-1	✓	✓	✓			1	" "
MW-1 31.5	1-16-90	10:00	MW-1	✓	✓	✓			1	" "
MW-1 36.0'	1-16-90	10:23	MW-1	✓	✓	✓			1	" "
SB-2, 5.5	1-16-90	12:15	SB-2		✓				1	" "
SB-2, 10.5	1-16-90	12:31	SB-2		✓				1	" "
SB-2, 16.5	1-16-90	12:46	SB-2		✓				1	" "

ANALYSIS REQUESTED

10	TOTAL NUMBER OF CONTAINERS		

1 RELINQUISHED BY:
Signature: Keith B Craig
Printed Name: Keith B Craig
Company: Geo Resource Consultants
DATE: 1-17-90
TIME: 16:21

2 RECEIVED BY:
Signature: Elbert Hallmark
Printed Name: Elbert Hallmark
Company: American ENV. Lab
DATE: 1/17/90
TIME: 16:21

3 RELINQUISHED BY:
Signature:
Printed Name:
Company:
DATE:
TIME:

4 RECEIVED BY:
Signature:
Printed Name:
Company:
DATE:
TIME:

5 RELINQUISHED BY:
Signature:
Printed Name:
Company:
DATE:
TIME:

6 RECEIVED BY (LAB):
Signature:
Printed Name:
Company:
DATE:
TIME:

SAMPLE CONDITIONS
SEALED (YES) NO
RECEIVED ON ICE (YES) NO

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:
On Ice

SHIPPING TICKET NO.:

GRC–WHITE AND GREEN LAB–YELLOW TRANSPORTER–PINK SAMPLER–GOLD

Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

CHAIN OF CUSTODY RECORD

PROJECT NO. 2516-00-0
DATE 1-16-90 PAGE 2 OF 5

PROJECT NAME Hayward Maintenance Station
Client OSA
Address
SAMPLERS (SIGNATURE) Keith B Craig
LABORATORY

SAMPLE NO.	DATE	TIME	LOCATION	EPA NO. 8015 TVH gasoline	EPA NO. 8015 TEH diesel	EPA NO. 8020 BTX&E	EPA NO.	EPA NO.	NO. OF CONTAINERS	COMMENTS/ CONTAINER TYPE
SB-2, 21.5	1-16-90	1252	SB-2		✓				1	Brass Liner
SB-2, 26.0	1-16-90	1313	SB-2		✓				1	" "
SB-2, 30.5	1-16-90	1333	SB-2		✓				1	" "
SB-2, 36.5	1-16-90	1355	SB-2		✓				1	" "
MW-2, 6.0	1-16-90	1424	MW-2	✓	✓	✓			1	" "
MW-2 11.0	1-16-90	1438	MW-2	✓	✓	✓			1	" "
MW-2, 16.5	1-16-90	1450	MW-2	✓	✓	✓			1	" "
MW-2, 21.5	1-16-90	1458	MW-2	✓	✓	✓			1	" "
MW-2, 26.5	1-16-90	1511	MW-2	✓	✓	✓			1	" "
MW-2 30.5	1-16-90	1529	MW-2	✓	✓	✓			1	" "

ANALYSIS REQUESTED

1 RELINQUISHED BY: Keith B Craig	DATE January 17, 1990	3 RELINQUISHED BY:	DATE
Signature: Keith B. Craig	TIME 1643	Signature	TIME
Printed Name: Geo Resource Consultant		Printed Name	
Company		Company	
2 RECEIVED BY: Elbert C Hallmark	DATE 1/17/90	4 RECEIVED BY:	DATE
Signature: Elbert C Hallmark	TIME 1643	Signature	TIME
Printed Name: American Env. Lab		Printed Name	
Company		Company	

5 RELINQUISHED BY:	DATE	6 RECEIVED BY (LAB):	DATE
Signature	TIME	Signature	TIME
Printed Name		Printed Name	
Company		Company	

10 TOTAL NUMBER OF CONTAINERS

SAMPLE CONDITIONS
SEALED (YES/NO)
RECEIVED ON ICE (YES/NO)

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:
on ice

SHIPPING TICKET NO.:

SAMPLER–GOLD TRANSPORTER–PINK LAB–YELLOW GRC–WHITE AND GREEN

Geo/ Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

CHAIN OF CUSTODY RECORD

PROJECT NO. 1516-000-0
DATE 1-16-90 PAGE 3 OF 5

PROJECT NAME Hayward Maintenance
Client OSA
Address
SAMPLERS (SIGNATURE) Keith B Craig
LABORATORY

ANALYSIS REQUESTED 1-1790

SAMPLE NO.	DATE	TIME	LOCATION	EPA NO. 8015 TVH/BTEX	EPA NO. 8015 TEH	EPA NO. 8020 BTEX	EPA NO.	EPA NO.	NO. OF CONTAINERS	COMMENTS/ CONTAINER TYPE
MW-2 36.0	1-16-90	15:49	MW-2	✓	✓	✓			1	Brass Liner
SB-3 5.5	1-17-90	8:52	SB3	✓	✓	✓			1	" "
SB-3 11.5	1-17-90	9:03	SB-3	✓	✓	✓			1	" "
SB-3 16.5	1-17-90	9:09	SB-3	✓	✓	✓			1	" "
SB-3 21.5	1-17-90	9:21	SB-3	✓	✓	✓			1	" "
SB-3 25.5	1-17-90	9:36	SB-3	✓	✓	✓			1	" "
SB-3 26.5	1-17-90	9:30	SB-3	✓	✓	✓			1	" "
SB-3 31.0	1-17-90	9:43	SB-3	✓	✓	✓			1	" "
SB-3 36.2'	1-17-90	10:10	SB-3	✓	✓	✓			1	" "
MW-3 6.5	1-17-90	10:36	MW-3		✓				1	" "
									10	TOTAL NUMBER OF CONTAINERS

	DATE		DATE		DATE
1 RELINQUISHED BY: Keith B Craig	1-17-90	**3** RELINQUISHED BY:		**5** RELINQUISHED BY:	
Signature: Keith B. Craig	TIME 16:15	Signature	TIME	Signature	TIME
Printed Name: Geo Resource Consultants		Printed Name		Printed Name	
Company		Company		Company	
2 RECEIVED BY: Elbert Hallmark	1/17/90	**4** RECEIVED BY:		**6** RECEIVED BY (LAB):	
Signature: Elbert Hallmark	TIME 16:15	Signature	TIME	Signature	TIME
Printed Name: American Enviab		Printed Name		Printed Name	
Company		Company		Company	

SAMPLE CONDITIONS
SEALED (YES) NO
RECEIVED ON ICE (YES) NO

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:

SHIPPING TICKET NO.:

SAMPLER–GOLD
TRANSPORTER–PINK
LAB–YELLOW
GRC–WHITE AND GREEN

Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

CHAIN OF CUSTODY RECORD

PROJECT NO. 1516-00-0
DATE 1-17-90 PAGE 1 OF

PROJECT NAME Hayward Maintenance station
Client OSA
Address
SAMPLERS (SIGNATURE) Keith B Craig
LABORATORY

ANALYSIS REQUESTED

SAMPLE NO.	DATE	TIME	LOCATION	EPA NO. 8015 TVH (Gasoline)	EPA NO. 8015 TEH Diesel	EPA NO. 8020 BTXE	EPA NO.	EPA NO.	NO. OF CONTAINERS	COMMENTS/ CONTAINER TYPE
MW3 11.5	1-17-90	10:45	MW-3		✓				1	Brass Liner
MW-3 16.0	1-17-90	10:54	MW-3		✓				1	" "
MW-3 21.5	1-17-90	1101	MW-3		✓				1	" "
MW-3 26.5	1-17-90	1110	MW-3		✓				1	" "
MW3 31.5	1-17-90	1123	MW-3		✓				1	" "
SB-1 4.0	1-17-90	1222	~~MW~~ SB-1	✓	✓	✓			1	" "
SB-1 8.0	1-17-90	1229	SB-1	✓	✓	✓			1	" "
SB-1 11.5	1-17-90	1234	SB-1	✓	✓	✓			1	" "
SB-1 16.5	1-17-90	1242	SB-1	✓	✓	✓			1	" "
SB-1 21.5	1-17-90	1256	SB-1	✓	✓	✓			1	" "

1 RELINQUISHED BY: Keith B Craig Signature: Keith B. Craig Printed Name: Geo Resource Consult. Company	DATE 1-17-90 TIME 16:17	**3** RELINQUISHED BY: Signature Printed Name Company	DATE TIME	**5** RELINQUISHED BY: Signature Printed Name Company	DATE TIME
2 RECEIVED BY: Elbert Hallmark Signature: Elbert Hallmark Printed Name: American Env. Lab Company	DATE 1/17/90 TIME 16:17	**4** RECEIVED BY: Signature Printed Name Company	DATE TIME	**6** RECEIVED BY (LAB): Signature Printed Name Company	DATE TIME

10 TOTAL NUMBER OF CONTAINERS

SAMPLE CONDITIONS
SEALED (YES/NO)
RECEIVED ON ICE (YES/NO)

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:
on ice

SHIPPING TICKET NO.:

SAMPLER-GOLD
TRANSPORTER-PINK
LAB-YELLOW
GRC-WHITE AND GREEN

Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

CHAIN OF CUSTODY RECORD

PROJECT NO. 1516-000-0
DATE 1-17-90 PAGE 5 OF 5

PROJECT NAME Hayward Maintenance Station
Client CSA
Address
SAMPLERS (SIGNATURE) Keith B Craig
LABORATORY

SAMPLE NO.	DATE	TIME	LOCATION	EPA NO. 8015 TUH Gasoline	EPA NO. 8015 TEH Diesel	EPA NO. 8020 BTX's	EPA NO.	EPA NO.	NO. OF CONTAINERS	COMMENTS/ CONTAINER TYPE
SB-1 26.5	1-17-90	1308	SB-1	✓	✓	✓			1	Brass Liner
SB-1 31.0	1-17-90	1318	SB-1	✓	✓	✓			1	Brass Liner

ANALYSIS REQUESTED

1 RELINQUISHED BY: Keith B Craig Signature: Keith B Craig Printed Name: Geo Resource Consult Company	DATE: 1-17-90 TIME: 16:19	**3** RELINQUISHED BY: Signature Printed Name Company	DATE TIME	**5** RELINQUISHED BY: Signature Printed Name Company	DATE TIME
2 RECEIVED BY: Elbert Hallmark Signature: Elbert Hallmark Printed Name: American Env. Lab Company	DATE: 1-17-90 TIME: 16:19	**4** RECEIVED BY: Signature Printed Name Company	DATE TIME	**6** RECEIVED BY (LAB): Signature Printed Name Company	DATE TIME

3/42 TOTAL NUMBER OF CONTAINERS

SAMPLE CONDITIONS
SEALED (YES/NO)
RECEIVED ON ICE (YES/NO)

SPECIAL SHIPMENT/HANDLING OR STORAGE REQUIREMENTS:
on Ice

SHIPPING TICKET NO.:

SAMPLER-GOLD
TRANSPORTER-PINK
LAB-YELLOW
GRC-WHITE AND GREEN

Revised sample analyses for American
1/19/90 - to replace chain of custody record

	(Diesel) TEH Sample no.	(Gasoline) TVH/BTXE Sample no.
MW 1	6, 11, 16, 21, 26, 36	6, 16, 26
MW 2	(1) 6, 11, 16.5, 21.5, 26.5 36	6, 16.5, 26.5
MW 3	(3) 6.5, 11.5, 16.0, 21.5 31.5	6.5, 16.0, 31.5
SB 1	(2) 4, 8, 11.5, 16.5, 21.5, 31.0	4, 11.5, 21.5
SB 2	5.5, 10.5, 16.5, 26.0 30.5, 36.5	5.5, 16.5, 26.5, 36.5
SB 3	5.5, 11.5, 16.5, 21.5 26.5, 36	5.5, 16.5, 26.5

1 Test black clay

2 Test black clay

3 Test black clay if present