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ENVIRONMENTAL
PROTECTION

Transmittal

98 NOV 17 AM 8:52

Date 16 November 1998
To Ms. Susan Hugo
Alameda County Health Services Agency
1131 Harbor Bay Parkway
Alameda City, CA 94502
Project Number Emerylofts
Project Name 3095

Transmitted Via

- Messenger
 U.S. Mail
 Overnight Mail

Tel. # _____

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Total Pages _____

Item	Description
1	Underground Storage Tank Removal Report

Remarks: Transmitted herewith is one copy of the Underground Storage Tank Removal Report for your review. Please contact me should you have any questions or if I can be of assistance in this matter.

From: Brad Job *BS*
cc: Mr. Dan McNevin (3 copies)



**UNDERGROUND STORAGE TANK REMOVAL
4226 Halleck Street, Emeryville, California**

Prepared by

**Geomatrix Consultants, Inc.
100 Pine Street, 10th Floor
San Francisco, California 94111**

**12 November 1998
Project No. 3095**

Geomatrix Consultants

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UNDERGROUND STORAGE TANK REMOVAL

4226 Halleck Street
Emeryville, California

1.0 INTRODUCTION

This report describes underground storage tank (UST) closure activities conducted from 18 through 22 December 1997 at 4226 Halleck Street, Emeryville, California (Figure 1). One 1500-gallon fuel oil UST and one 550-gallon mineral spirit UST were removed by Trumpp Brothers Company of San Jose, California, (Trumpp), a State-of-California licensed contractor retained by Emerylofts Development Company (Emerylofts). Geomatrix Consultants, Inc. (Geomatrix) provided technical oversight of UST removal and abandonment activities on behalf of the Emerylofts. UST removal, abandonment, and soil sampling activities were performed under the supervision of Ms. Susan Hugo of Alameda County Health Services Agency (ACHSA).

Tank removal, tank abandonment, soil sampling, and chemical analytical procedures were performed in accordance with applicable guidelines contained in the State of California Leaking Underground Fuel Tank Task Force, October 1989, field manual titled "Leaking Underground Fuel Tank Field Manual: Guidelines for Site Assessment, Cleanup, and Underground Storage Tank Closure" (LUFT Manual) and Alameda County guidelines. UST removal activities, soil sampling, laboratory analytical results, and conclusions are described below.

2.0 SITE CONDITIONS

The site is the former location of the Emeryville Warehouse Company and is in an industrial portion of Emeryville, California. The former warehouse is the only existing structure and is currently being renovated for use as multi-family residential. Two unpermitted USTs were located adjacent to the eastern wall of the building as shown on Figure 2. Based on available

information, the southern UST stored fuel oil and the northern UST stored mineral spirits. The USTs have reportedly not been used for at least 20 years.

3.0 UNDERGROUND STORAGE TANK REMOVAL AND ABANDONMENT

Trumpp completed excavation and removal of the mineral spirits UST on 18 December 1997 and of the fuel oil UST on 22 December 1997. A Geomatrix field engineer observed removal of the USTs and collected excavation and stockpile soil samples for chemical analysis, as directed by Ms. Susan Hugo of ACHSD. Prior to UST removal activities, Emerylofts submitted a UST Removal Permit Application to the ACHSA. UST stabilization and removal, excavation and soil stockpile sampling, and analytical results are discussed in the following sections.

3.1 MINERAL SPIRITS UST STABILIZATION AND REMOVAL

Soil overlying the mineral spirits UST was removed to access and prepare the UST for removal. The top of the mineral spirits UST was located at a depth of approximately 3 feet below ground surface (bgs). The UST was constructed of single-walled steel and appeared to be in poor condition. Prior to UST removal, Evergreen Environmental Services of Newark, California (Evergreen) evacuated approximately 550 gallons of product and water from the UST using a vacuum truck.

Trumpp inserted approximately 100 pounds of dry ice into the empty UST to inert the atmosphere inside the UST. Immediately prior to removal, Trumpp took explosive vapor meter readings through the fill-pipe opening in the top of the UST. The readings indicated that a safe atmosphere (less than 10% oxygen and less than 10% of the lower explosive limit) existed inside the tank. Mr. George Warren of the Emeryville Fire Department (EFD) was present on-site and approved removal of the mineral spirits UST. A Geomatrix field engineer and ACHSA visually examined the exposed portions of the UST. The UST had 2 large (approximately 1 foot in diameter) holes in the bottom.

Backfill material surrounding the UST had a petroleum odor and consisted primarily of dark brown clay with varying amounts of sand and gravel. Based upon ACHSA's recommendation,

approximately 3 cubic yards (cy) of soil was removed from the excavation sidewalls for disposal. The approximate horizontal extent of the excavation is shown on Figure 2.

Groundwater with a slight oily film recharged into the excavation and Evergreen removed approximately 800 gallons of accumulated water prior to backfilling of the excavation. The final UST excavation was roughly rectangular in shape and had a maximum length and width of 12 and 7 feet, respectively, and maximum depth of approximately 10 feet below ground surface (bgs).

3.2 FUEL OIL UST STABILIZATION AND REMOVAL

On 18 December 1997, soil overlying the UST was removed to access and prepare the USTs for removal. The top of the fuel oil UST was located approximately 6 feet bgs. The UST was constructed of single-walled steel and appeared to be in fair condition. The fuel oil UST contained approximately 1500 gallons of viscous black product that was removed and transported to by Evergreen to their facility in Newark for treatment or recycling. Removal of the product required approximately 8 hours due to high viscosity. Thus, removal of the fuel oil UST was postponed until 22 December 1997.

Upon standing for 4 days, the fuel oil UST had accumulated approximately 1500 gallons of water. Following removal of the accumulated water, Trumpp steam-cleaned the inside of the UST and Evergreen removed approximately 100 gallons of rinsate from the UST.

Following steam cleaning, Trumpp inserted approximately 100 pounds each of dry ice into the empty UST to inert the inside atmosphere. Immediately prior to removal, Trumpp took explosive vapor meter readings through the fill-pipe opening in the top of the UST. The readings indicated that a safe atmosphere (less than 10% oxygen and less than 10% of the lower explosive limit) existed inside the tank. EFD was not present on-site, but had provided verbal authorization to remove the fuel oil UST on 18 December 1997. The fuel oil UST had several dime-sized holes in the filler-port end.

Backfill material surrounding the UST had a petroleum odor and consisted of dark brown clay with varying amounts of sand and gravel. Based upon ACHSA's recommendation,

approximately 3 cubic yards (cy) of soil was removed from the sidewalls of the excavation for disposal. The final UST excavation was roughly rectangular in shape and had a maximum length and width of 13 and 9 feet, respectively, and maximum depth of approximately 10 feet bgs. Groundwater with small globules of fuel oil was encountered in the excavation. Evergreen removed approximately 150 gallons of water from the bottom of the excavation. The approximate horizontal extent of the excavation is shown on Figure 2.

3.3 SOIL AND WATER SAMPLING

The Geomatrix field engineer collected 3 soil samples from the sidewalls of each of the UST excavations (Figure 2) as directed by ACHSA. Geomatrix collected 4 soil samples (labeled SP-1 A & B and SP-2 A & B) from the approximately 6 cubic yards of soil removed from the UST excavations. Two samples of water accumulated in the excavations were collected in laboratory supplied containers. An additional 2 soil samples were collected from the approximately 10 cubic yards of soil removed from the fuel oil UST excavation. Samples were collected in 4-inch-long, 2-inch-diameter brass tubes. The ends of the tubes were sealed with Teflon sheets, plastic end-caps, and secured with tape. The soil samples were stored in an ice-cooled chest until delivered under Geomatrix chain-of-custody procedures, to American Environmental Network, a California-certified analytical laboratory.

4.0 ANALYTICAL METHODS AND RESULTS

The soil samples from the UST excavations and soil stockpile were analyzed according to LUFT Manual and ACHSA guidelines for total petroleum hydrocarbons quantified as mineral spirits (TPH-ms) using modified EPA Method 8015; and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8020. Sample extracts were treated with silica gel to remove interference caused by biogenic material. Soil sample results are summarized in Table 1 and results of excavation water analyses are summarized in Table 2.

Concentrations of TPHd and BTEX were below method reporting limits in all 3 sidewall samples collected from the fuel oil UST excavation. The sample of water from the fuel oil UST excavation contained low concentrations of toluene, ethylbenzene, xylenes, and TPH-d.

Concentrations of TPH-d and BTEX were below method reporting limits in 2 sidewall samples collected from the mineral spirits UST excavation. Sample MS-E, collected from the east wall of the mineral spirits UST excavation contained low concentrations of toluene, ethylbenzene, xylenes, and mineral spirits (Figure 2). The sample of water from the mineral spirits UST excavation contained low concentrations of BTEX and TPH-ms.

The 2 samples from each of the stockpiles were composited into one by the laboratory. Results of laboratory analysis of the composite sample collected from the mineral spirits soil stockpile indicate the presence of TPH-ms at a concentration of 2 mg/kg; BTEX constituents were near or below method reporting limits. Analytical results of the composite sample collected from the fuel oil soil stockpile indicated that TPH-d and BTEX were not present above method reporting limits. A copy of the laboratory analytical report and chain-of-custody records are included in Appendix A.

5.0 EXCAVATION BACKFILLING

Geomatrix observed backfilling of the excavation for the mineral spirits UST on 18 December 1997 and backfilling of the excavation for fuel oil UST on 22 December 1997. The UST excavations were backfilled with a combination of the clean UST overburden and imported aggregate backfill. The backfill was placed in lifts and compacted to grade using a backhoe mounted compaction tool.

6.0 RINSATE AND UST DISPOSAL

Evergreen transported the approximately 2942 gallons of fuel oil and water removed from the former USTs to their facility in Newark, California on 18 December 1997. On 22 December 1997, Evergreen transported an additional 1727 gallons of water to their Newark facility.

On 18 and 22 December 1997, the USTs and portions of the appurtenant piping were transported to Erickson, Inc. in Richmond, California, for destruction.

7.0 SOIL DISPOSAL

Approximately 6 cubic yards of excavated overburden and petroleum affected soil was transported to Forward Landfill in Manteca, California for disposal.

8.0 SUMMARY AND CONCLUSIONS

A summary of the UST removal activities is presented below:

- One 550-gallon mineral spirits UST and one 1500-gallon fuel oil UST were removed at the former Emeryville Warehouse Company in Emeryville, California on 18 and 22 December 1997, respectively. The tanks were removed in accordance with LUFT Manual and Alameda County guidelines and under the supervision of Ms. Susan Hugo of the ACHSA. The tanks were observed to be in fair to poor condition with several holes.
- A total of approximately 4700 gallons of product and accumulated water were transported under manifest to Evergreen in Newark, California. The tanks and appurtenant piping were transported to Erickson, Inc. in Richmond, California for destruction.
- Soil samples were collected at the base of each UST excavation. TPHd and BTEX constituents in these samples were low or below method detection limits.
- The UST excavations were backfilled to grade with a combination of unaffected excavated soil and clean, imported soil.
- Approximately 6 yards of excavated soil were transported to Forward Landfill for disposal.

Based on the information presented herein, it is Geomatrix's opinion that soil in the vicinity of the former USTs has not been significantly impacted by leakage from the USTs and does not pose a threat to human health or groundwater. Therefore, Geomatrix recommends no further action and on behalf of Emerylofts Development Company requests that ACHSA issue a determination that no further action is warranted at this site.

TABLE 1

RESULTS OF EXCAVATION SIDEWALL AND STOCKPILE SOIL ANALYSES

Tank	Location	Depth (feet)	Sample Number	TPHd (mg/kg)	TPHms (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
Mineral Spirits	north sidewall	6.5	MS-N-6.5	NA	ND	ND	ND	ND	ND
Mineral Spirits	south sidewall	6.5	MS-S-6.5	NA	ND	ND	ND	ND	ND
Mineral Spirits	east sidewall	6.5	MS-C-6.5	NA	100	ND	7	66	180
Mineral Spirits	stockpile	composite	SP-1A,B	NA	2	ND	ND	ND	7
Fuel Oil	north sidewall	5	FO-N-5	ND	NA	ND	ND	ND	ND
Fuel Oil	south sidewall	6	FO-S-6	ND	NA	ND	ND	ND	ND
Fuel Oil	east sidewall	6	FO-E-6	ND	NA	ND	ND	ND	ND
Fuel Oil	stockpile	composite	SP-2 A,B	ND	ND	ND	ND	ND	ND

Abbreviations:

TPHd = Total Petroleum Hydrocarbons Quantified as Diesel

TPHms = Total Petroleum Hydrocarbons Quantified as Mineral Sprits

TABLE 2

RESULTS OF EXCAVATION WATER ANALYSES

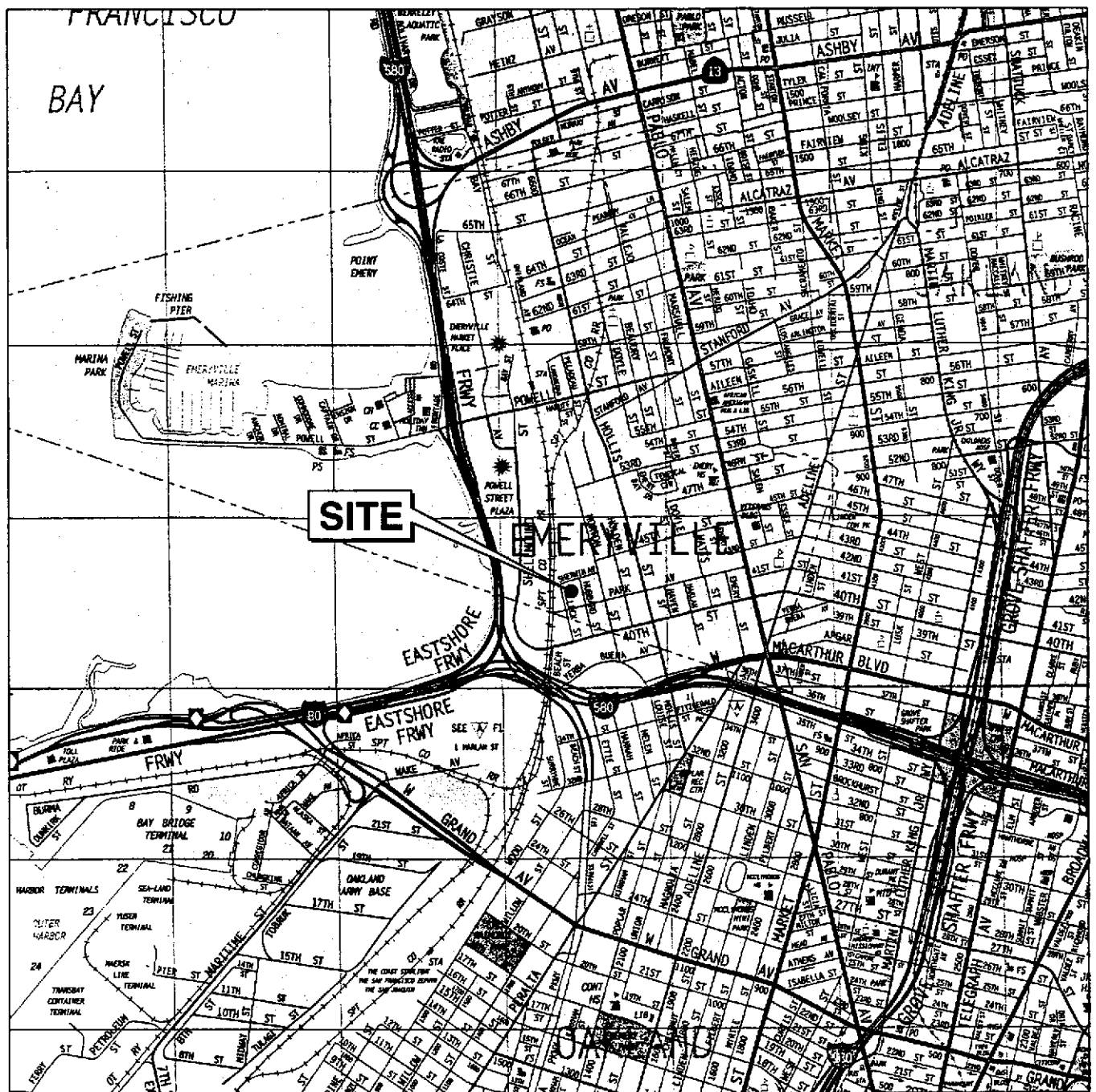
180 ppb from benzene
30 ppb

Tank	Sample Number	TPHd (mg/l)	<i>Injection</i> TPHms (mg/l)	<i>8 ppb</i> Benzene (µg/l)	Toluene (µg/l)	Ethyl- benzene (µg/l)	Xylenes (µg/l)
Mineral Spirit	MSW-1	NA	0.63	2.6	2	3.6	120
Fuel Oil	FO-1	0.53	NA	ND	0.8	0.5	2

Abbreviations:

TPHd = Total Petroleum Hydrocarbons Quantified as Diesel

TPHms = Total Petroleum Hydrocarbons Quantified as Mineral Sprits



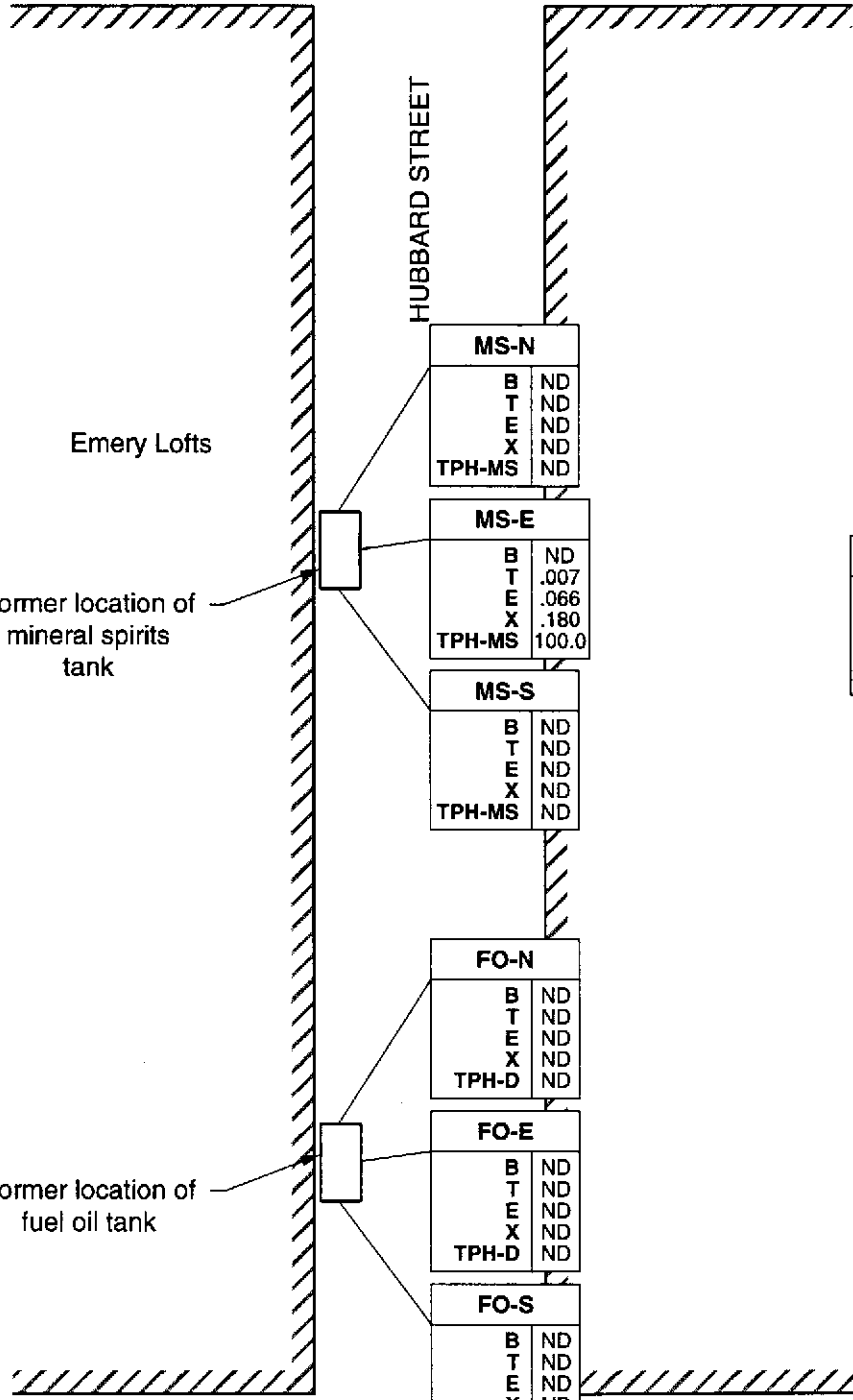
Base map from The Thomas Guide, 1997 Alameda/Contra Costa County Edition. Reproduced with permission granted by THOMAS BROS. MAPS. This map is copyrighted by THOMAS BROS. MAPS. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission. All rights reserved.



SITE LOCATION MAP
 Emeryville Warehouse
 Emeryville, California

Figure
 1
 Project No.
 3095.04

SHERWIN AVENUE



*180 ppb +
nd*

Emery Lofts

Former location of mineral spirits tank

Former location of fuel oil tank

HUBBARD STREET

PARK AVENUE

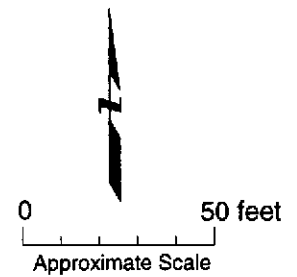
Explanation

MS-E ← Sample	
B	ND
T	.007
E	.066
X	.180
TPH-MS	100.0

Concentration in milligrams per kilogram (mg/kg)
Constituent

Abbreviations

- B Benzene
- T Toluene
- E Ethylbenzene
- X Total Xylenes
- TPH-MS Total Petroleum Hydrocarbons as Mineral Spirits
- TPH-D Total Petroleum Hydrocarbons as Diesel
- ND Not detected



FORMER UST LOCATIONS
Emeryville Warehouse
Emeryville, California

Figure
2
Project No.
3095.04

APPENDIX A

**Chain-of-Custody Records and
Analytical Laboratory Results**

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

GEOMATRIX CONSULTANTS
100 PINE ST., SUITE 1000
SAN FRANCISCO, CA 94111

ATTN: BRAD JOB
CLIENT PROJ. ID: 3095.01

C.O.C. NUMBER: 9598

REPORT DATE: 01/15/98

DATE(S) SAMPLED: 12/22/97

DATE RECEIVED: 12/22/97

AEN WORK ORDER: 9712355

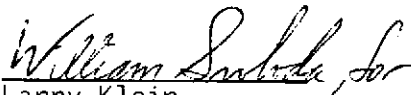
PROJECT SUMMARY:

On December 22, 1997, this laboratory received 4 (3 soils and 1 water) sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Director

GEOMATRIX CONSULTANTS

SAMPLE ID: FO-N-5
 AEN LAB NO: 9712355-01
 AEN WORK ORDER: 9712355
 CLIENT PROJ. ID: 3095.01

DATE SAMPLED: 12/22/97
 DATE RECEIVED: 12/22/97
 REPORT DATE: 01/15/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		01/03/98
Toluene	108-88-3	ND	5 ug/kg		01/03/98
Ethylbenzene	100-41-4	ND	5 ug/kg		01/03/98
Xylenes, Total	1330-20-7	ND	5 ug/kg		01/03/98
#Extraction for TPH	EPA 3550	-	Extrn Date		12/31/97
TPH as Diesel	GC-FID	ND	1 mg/kg		01/05/98

ND = Not detected at or above the reporting limit

* = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: F0-S-6
 AEN LAB NO: 9712355-02
 AEN WORK ORDER: 9712355
 CLIENT PROJ. ID: 3095.01

DATE SAMPLED: 12/22/97
 DATE RECEIVED: 12/22/97
 REPORT DATE: 01/15/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		01/03/98
Toluene	108-88-3	ND	5 ug/kg		01/03/98
Ethylbenzene	100-41-4	ND	5 ug/kg		01/03/98
Xylenes, Total	1330-20-7	ND	5 ug/kg		01/03/98
#Extraction for TPH	EPA 3550	-	Extrn Date		12/31/97
TPH as Diesel	GC-FID	ND	1 mg/kg		01/05/98

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: F0-E-6
 AEN LAB NO: 9712355-03
 AEN WORK ORDER: 9712355
 CLIENT PROJ. ID: 3095.01

DATE SAMPLED: 12/22/97
 DATE RECEIVED: 12/22/97
 REPORT DATE: 01/15/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		01/03/98
Toluene	108-88-3	ND	5 ug/kg		01/03/98
Ethylbenzene	100-41-4	ND	5 ug/kg		01/03/98
Xylenes, Total	1330-20-7	ND	5 ug/kg		01/03/98
#Extraction for TPH	EPA 3550	-	Extrn Date		12/31/97
TPH as Diesel	GC-FID	ND	1 mg/kg		01/05/98

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: F0-1
 AEN LAB NO: 9712355-04
 AEN WORK ORDER: 9712355
 CLIENT PROJ. ID: 3095.01

DATE SAMPLED: 12/22/97
 DATE RECEIVED: 12/22/97
 REPORT DATE: 01/15/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	0.5 ug/L		12/30/97
Toluene	108-88-3	0.8 *	0.5 ug/L		12/30/97
Ethylbenzene	100-41-4	0.5 *	0.5 ug/L		12/30/97
Xylenes, Total	1330-20-7	2 *	2 ug/L		12/30/97
#Extraction for TPH	EPA 3510	-		Extrn Date	12/30/97
TPH as Diesel	GC-FID	0.53 *	0.05 mg/L		01/05/98

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9712355
CLIENT PROJECT ID: 3095.01

Quality-Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

WORK ORDER: 9712355

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: TPH as Diesel

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank			LAB ID: BLNK-1230-1			INSTR RUN: GC C:\971230000000/1/		
INSTRUMENT: HP 5890			PREPARED: 12/30/97			BATCH ID: DSEW123097-1		
UNITS: mg/L			ANALYZED: 01/01/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
Diesel	ND		0.05			LOW	HIGH	RPD (%)
Motor Oil	ND		0.2					
n-Pentacosane (surr)	112			100		65	125	

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike			LAB ID: LCDW-1230-1			INSTR RUN: GC C:\971230000000/3/1		
INSTRUMENT: HP 5890			PREPARED: 12/30/97			BATCH ID: DSEW123097-1		
UNITS: mg/L			ANALYZED: 01/01/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
Diesel	2.00	ND	0.05	2.00	100	LOW	HIGH	RPD (%)
n-Pentacosane (surr)	108	112		100	108	60	110	
						65	125	

SAMPLE TYPE: Laboratory Control Spike			LAB ID: LCSW-1230-1			INSTR RUN: GC C:\971230000000/2/1		
INSTRUMENT: HP 5890			PREPARED: 12/30/97			BATCH ID: DSEW123097-1		
UNITS: mg/L			ANALYZED: 01/01/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
Diesel	2.12	ND	0.05	2.00	106	LOW	HIGH	RPD (%)
n-Pentacosane (surr)	106	112		100	106	60	110	
						65	125	

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Laboratory Control Sample Duplicate			LAB ID: LCRW-1230-1			INSTR RUN: GC C:\971230000000/4/2		
INSTRUMENT: HP 5890			PREPARED: 12/30/97			BATCH ID: DSEW123097-1		
UNITS: mg/L			ANALYZED: 01/01/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
Diesel	2.00	2.12	0.05	2030		LOW	HIGH	RPD (%)
Motor Oil	ND	ND	0.2	200				5.83
n-Pentacosane (surr)	108	106			1.87	65	125	0

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client			LAB ID: 9712355-04D			INSTR RUN: GC C:\971230000000/17/		
INSTRUMENT: HP 5890			PREPARED: 12/30/97			BATCH ID: DSEW123097-1		
UNITS: mg/L			ANALYZED: 01/05/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
n-Pentacosane (surr)	101			100	101	LOW	HIGH	RPD (%)
						65	125	

ANALYSIS: TPH as Diesel

MATRIX: Soil/Bulk

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank			LAB ID: BLNK-1231-1			INSTR RUN: GC CS\971231000000/1/		
INSTRUMENT: HP 5890			PREPARED: 12/31/97			BATCH ID: DSES123197-1		
UNITS: mg/kg			ANALYZED: 01/05/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
Diesel	ND		1			LOW	HIGH	
Motor Oil	ND		5					
n-Pentacosane (surr)	94.3			100		55	115	

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike			LAB ID: LCSS-1231-1			INSTR RUN: GC CS\971231000000/2/1		
INSTRUMENT: HP 5890			PREPARED: 12/31/97			BATCH ID: DSES123197-1		
UNITS: mg/kg			ANALYZED: 01/05/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
Diesel	41.2	ND	1	40.0	103	55	110	
n-Pentacosane (surr)	97.0	94.3		100	97.0	55	115	

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client			LAB ID: 9712355-01A			INSTR RUN: GC CS\971231000000/19/		
INSTRUMENT: HP 5890			PREPARED: 12/31/97			BATCH ID: DSES123197-1		
UNITS: mg/kg			ANALYZED: 01/05/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
n-Pentacosane (surr)	96.8			100	96.8	55	115	

SAMPLE TYPE: Sample-Client			LAB ID: 9712355-02A			INSTR RUN: GC CS\971231000000/20/		
INSTRUMENT: HP 5890			PREPARED: 12/31/97			BATCH ID: DSES123197-1		
UNITS: mg/kg			ANALYZED: 01/05/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
n-Pentacosane (surr)	97.6			100	97.6	55	115	

SAMPLE TYPE: Sample-Client			LAB ID: 9712355-03A			INSTR RUN: GC CS\971231000000/21/		
INSTRUMENT: HP 5890			PREPARED: 12/31/97			BATCH ID: DSES123197-1		
UNITS: mg/kg			ANALYZED: 01/05/98			DILUTION: 1.000000		
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
n-Pentacosane (surr)	99.4			100	99.4	55	115	

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712355
 AEN LAB NO: E010306
 DATE ANALYZED: 01/03/98
 INSTRUMENT: E
 MATRIX: SOIL

Method Blank

	CAS #	Result (ug/kg)	Reporting Limit (ug/kg)
Benzene	71-43-2	ND	5
Toluene	108-88-3	ND	5
Ethylbenzene	100-41-4	ND	5
Xylenes, Total	1330-20-7	ND	5
HCs as Gasoline		ND mg/kg	0.2 mg/kg

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712355
 INSTRUMENT: E
 MATRIX: SOIL

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery
			Fluorobenzene
01/03/98	FO-N-5	01	102
01/03/98	FO-S-6	02	105
01/03/98	FO-E-6	03	104
QC Limits:			70-130

DATE ANALYZED: 01/03/98
 SAMPLE SPIKED: LCS
 INSTRUMENT: E

Laboratory Control Sample

Analyte	Spike Added (ug/kg)	LCS Result (ug/kg)	LCS/D Result (ug/kg)	LCS Percent Recovery	RPD	QC Limits	
						Percent Recovery	RPD
Benzene	100	78	81	78	4	70-130	20
Toluene	100	86	88	86	3	70-130	20
Ethylbenzene	100	88	91	88	3	70-130	20
Xylenes, Total	300	252	262	84	4	70-130	20

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712355
AEN LAB NO: F123004
DATE ANALYZED: 12/30/97
INSTRUMENT: F
MATRIX: WATER

Method Blank

	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Benzene	71-43-2	ND	0.5
Toluene	108-88-3	ND	0.5
Ethylbenzene	100-41-4	ND	0.5
Xylenes, Total	1330-20-7	ND	2
HCs as Gasoline		ND mg/L	0.05 mg/L
Methyl t-Butyl Ether	1634-04-4	ND	5

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712355
 INSTRUMENT: F
 MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
12/30/97	FO-1	04	94
QC Limits:			70-130

DATE ANALYZED: 12/30/97
 SAMPLE SPIKED: LCS
 INSTRUMENT: F
 MATRIX: WATER

Laboratory Control Sample

Analyte	Spike Added (ug/L)	LCS Result (ug/L)	LCSD Result (ug/L)	LCS Percent Recovery	RPD	QC Limits	
						Percent Recovery	RPD
Benzene	100	88	86	88	2	70-130	20
Toluene	100	99	98	99	1	70-130	20
Ethylbenzene	100	103	101	103	2	70-130	20
Xylenes, Total	300	324	317	108	2	70-130	20

*** END OF REPORT ***

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

GEOMATRIX CONSULTANTS
100 PINE ST., SUITE 1000
SAN FRANCISCO, CA 94111

ATTN: BRAD JOB
CLIENT PROJ. ID: 3095.05

C.O.C. NUMBER: 10996

REPORT DATE: 01/06/98

DATE(S) SAMPLED: 12/18/97

DATE RECEIVED: 12/18/97

AEN WORK ORDER: 9712315

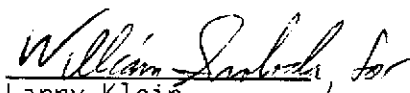
PROJECT SUMMARY:

On December 18, 1997, this laboratory received 4 (3 soil and 1 water) sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Director

GEOMATRIX CONSULTANTS

SAMPLE ID: MS-N-6.5
 AEN LAB NO: 9712315-01
 AEN WORK ORDER: 9712315
 CLIENT PROJ. ID: 3095.05

DATE SAMPLED: 12/18/97
 DATE RECEIVED: 12/18/97
 REPORT DATE: 01/06/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		12/22/97
Toluene	108-88-3	ND	5 ug/kg		12/22/97
Ethylbenzene	100-41-4	ND	5 ug/kg		12/22/97
Xylenes, Total	1330-20-7	ND	5 ug/kg		12/22/97
#Silica gel Cleanup	EPA 3630M	-	Cleanup		12/29/97
#Extraction for TPH	EPA 3550	-	Extrn Date		12/19/97
TPH as Mineral Spirits	GC-FID	ND	1 mg/kg		12/31/97

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: MS-S-6.5
 AEN LAB NO: 9712315-02
 AEN WORK ORDER: 9712315
 CLIENT PROJ. ID: 3095.05

DATE SAMPLED: 12/18/97
 DATE RECEIVED: 12/18/97
 REPORT DATE: 01/06/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	50 ug/kg		12/23/97
Toluene	108-88-3	ND	50 ug/kg		12/23/97
Ethylbenzene	100-41-4	ND	50 ug/kg		12/23/97
Xylenes, Total	1330-20-7	ND	50 ug/kg		12/23/97
#Silica gel Cleanup	EPA 3630M	-	Cleanup		12/29/97
#Extraction for TPH	EPA 3550	-	Extrn Date		12/19/97
TPH as Mineral Spirits	GC-FID	ND	1 mg/kg		12/31/97

Reporting limits for BTEX elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: MS-C-6.5
 AEN LAB NO: 9712315-03
 AEN WORK ORDER: 9712315
 CLIENT PROJ. ID: 3095.05

DATE SAMPLED: 12/18/97
 DATE RECEIVED: 12/18/97
 REPORT DATE: 01/06/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		12/23/97
Toluene	108-88-3	7 *	5 ug/kg		12/23/97
Ethylbenzene	100-41-4	66 *	5 ug/kg		12/23/97
Xylenes, Total	1330-20-7	180 *	5 ug/kg		12/23/97
#Silica gel Cleanup	EPA 3630M	-	Cleanup		12/29/97
#Extraction for TPH	EPA 3550	-	Extrn Date		12/19/97
TPH as Mineral Spirits	GC-FID	100 *	1 mg/kg		12/31/97

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: MSW-1
 AEN LAB NO: 9712315-04
 AEN WORK ORDER: 9712315
 CLIENT PROJ. ID: 3095.05

DATE SAMPLED: 12/18/97
 DATE RECEIVED: 12/18/97
 REPORT DATE: 01/06/98

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	2.6 *	0.5 ug/L		12/24/97
Toluene	108-88-3	2.0 *	0.5 ug/L		12/24/97
Ethylbenzene	100-41-4	3.6 *	0.5 ug/L		12/24/97
Xylenes, Total	1330-20-7	120 *	2 ug/L		12/24/97
#Silica gel Cleanup	EPA 3630M	-	Cleanup		12/29/97
#Extraction for TPH	EPA 3510	-	Extrn Date		12/24/97
TPH as Mineral Spirits	GC-FID	0.63 *	0.05 mg/L		12/31/97

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9712315
CLIENT PROJECT ID: 3095.05

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

WORK ORDER: 9712315

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: TPH as Diesel

MATRIX: Water

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: BLNK-1224-2		INSTR RUN: GC C\971224000000/24/				
INSTRUMENT: HP 5890		PREPARED: 12/24/97		BATCH ID: DSEW122497-2				
UNITS: mg/L		ANALYZED: 12/31/97		DILUTION: 1.000000				
METHOD: GC-FID								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
Diesel	ND		0.05					
Motor Oil	ND		0.2					
n-Pentacosane (surr)	108			100		65 125		

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCDW-1224-2		INSTR RUN: GC C\971224000000/26/24				
INSTRUMENT: HP 5890		PREPARED: 12/24/97		BATCH ID: DSEW122497-2				
UNITS: mg/L		ANALYZED: 12/31/97		DILUTION: 1.000000				
METHOD: GC-FID								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
Diesel	1.93	ND	0.05	2.00	96.5	60 110		
n-Pentacosane (surr)	108	108		100	108	65 125		

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCSW-1224-2		INSTR RUN: GC C\971224000000/25/24				
INSTRUMENT: HP 5890		PREPARED: 12/24/97		BATCH ID: DSEW122497-2				
UNITS: mg/L		ANALYZED: 12/31/97		DILUTION: 1.000000				
METHOD: GC-FID								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
Diesel	2.18	ND	0.05	2.00	109	60 110		
n-Pentacosane (surr)	113	108		100	113	65 125		

LABORATORY CONTROL DUPLICATES

SAMPLE TYPE: Laboratory Control Sample Duplicate		LAB ID: LCRW-1224-2		INSTR RUN: GC C\971224000000/27/25				
INSTRUMENT: HP 5890		PREPARED: 12/24/97		BATCH ID: DSEW122497-2				
UNITS: mg/L		ANALYZED: 12/31/97		DILUTION: 1.000000				
METHOD: GC-FID								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
Diesel	1.93	2.18	0.05	2030			12.2	15
Motor Oil	ND	ND	0.2	200			0	
n-Pentacosane (surr)	108	113			4.52	65 125		

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client		LAB ID: 9712315-04D		INSTR RUN: GC C\971224000000/22/				
INSTRUMENT: HP 5890		PREPARED: 12/24/97		BATCH ID: DSEW122497-2				
UNITS: mg/L		ANALYZED: 12/31/97		DILUTION: 1.000000				
METHOD: GC-FID								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
						LOW HIGH		
n-Pentacosane (surr)	102.5			100	103	65 125		

WORK ORDER: 9712315

QUALITY CONTROL REPORT

PAGE QR-3

ANALYSIS: TPH as Diesel

MATRIX: Soil/Bulk

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: BLNK-1219-1		INSTR RUN: GC CS\971219000000/1/				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/20/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Diesel	ND		1			LOW HIGH		
Motor Oil	ND		5					
n-Pentacosane (surr)	87.7			100	87.7	55 115		

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: SCBL-1229-1		INSTR RUN: GC CS\971219000000/14/				
INSTRUMENT: HP 5890		PREPARED: 12/29/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/30/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Diesel	ND		1			LOW HIGH		
Motor Oil	ND		5					
n-Pentacosane (surr)	102.4			100	102	55 115		

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCSW-1219-1		INSTR RUN: GC CS\971219000000/2/1				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/20/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Diesel	33.1	ND	1	40.0	82.8	55 110		
n-Pentacosane (surr)	81.1	87.7		100	81.1	55 115		

SAMPLE TYPE: Laboratory Control Spike		LAB ID: SCLC-1229-1		INSTR RUN: GC CS\971219000000/15/14				
INSTRUMENT: HP 5890		PREPARED: 12/29/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/30/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Diesel	43.6	ND	1	40.0	109	55 110		
n-Pentacosane (surr)	106.1	102.4		100	106	55 115		

MATRIX SPIKE SAMPLES

SAMPLE TYPE: Spike-Sample/Matrix		LAB ID: MD12315-01A		INSTR RUN: GC CS\971219000000/5/3				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/20/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Diesel	36.8	ND	1	40.0	92.0	50 115		
n-Pentacosane (surr)	79.8	73.0		100	79.8	55 115		

SAMPLE TYPE: Spike-Sample/Matrix		LAB ID: MS12315-01A		INSTR RUN: GC CS\971219000000/4/3				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/20/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)	RPD (%)	RPD LIMIT (%)
Diesel	36.3	ND	1	40.0	90.8	50 115		
n-Pentacosane (surr)	76.0	73.0		100	76.0	55 115		

WORK ORDER: 9712315

QUALITY CONTROL REPORT

ANALYSIS: TPH as Diesel

MATRIX: Soil/Bulk

MATRIX SPIKE DUPLICATES

SAMPLE TYPE: Spiked Sample Duplicate			LAB ID: MR12315-01A			INSTR RUN: GC CS\971219000000/6/4			
INSTRUMENT: HP 5890			PREPARED: 12/19/97			BATCH ID: DSCS121997-1			
UNITS: mg/kg			ANALYZED: 12/20/97			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
Diesel	36.8	36.3	1	40.0				1.37	20
Motor Oil	ND	ND	5					0	
n-Pentacosane (surr)	79.8	76.0		100	79.8	55	115		

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client			LAB ID: 9712315-01A			INSTR RUN: GC CS\971219000000/16/			
INSTRUMENT: HP 5890			PREPARED: 12/19/97			BATCH ID: DSCS121997-1			
UNITS: mg/kg			ANALYZED: 12/31/97			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	84.4			100	84.4	55	115		

SAMPLE TYPE: Sample-Client			LAB ID: 9712315-02A			INSTR RUN: GC CS\971219000000/17/			
INSTRUMENT: HP 5890			PREPARED: 12/19/97			BATCH ID: DSCS121997-1			
UNITS: mg/kg			ANALYZED: 12/31/97			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	76.1			100	76.1	55	115		

SAMPLE TYPE: Sample-Client			LAB ID: 9712315-03A			INSTR RUN: GC CS\971219000000/18/			
INSTRUMENT: HP 5890			PREPARED: 12/19/97			BATCH ID: DSCS121997-1			
UNITS: mg/kg			ANALYZED: 12/31/97			DILUTION: 1.000000			
METHOD:									
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD (%)	RPD LIMIT (%)
						LOW	HIGH		
n-Pentacosane (surr)	82.0			100	82.0	55	115		

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712315
 AEN LAB NO: H122204
 DATE ANALYZED: 12/22/97
 INSTRUMENT: H
 MATRIX: SOIL

Method Blank

	CAS #	Result (ug/kg)	Reporting Limit (ug/kg)
Benzene	71-43-2	ND	5
Toluene	108-88-3	ND	5
Ethylbenzene	100-41-4	ND	5
Xylenes, Total	1330-20-7	ND	5
HCs as Gasoline		ND mg/kg	0.2 mg/kg

AEN LAB NO: H122304
 DATE ANALYZED: 12/23/97
 INSTRUMENT: H
 MATRIX: SOIL

Method Blank

	CAS #	Result (ug/kg)	Reporting Limit (ug/kg)
Benzene	71-43-2	ND	5
Toluene	108-88-3	ND	5
Ethylbenzene	100-41-4	ND	5
Xylenes, Total	1330-20-7	ND	5
HCs as Gasoline		ND mg/kg	0.2 mg/kg

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712315
INSTRUMENT: H
MATRIX: SOIL

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
12/22/97	MS-N-6.5	01	99
12/23/97	MS-S-6.5	02	99
12/23/97	MS-C-6.5	03	102
QC Limits:			70-130

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712315
 DATE ANALYZED: 12/22/97
 SAMPLE SPIKED: 9712315-03
 INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/kg)	MS Result (ug/kg)	MSD Result (ug/kg)	MS Percent Recovery	RPD	QC Limits	
						Percent Recovery	RPD
Benzene	100	99	92	99	7	70-130	20
Toluene	100	109	100	109	9	70-130	20
Ethylbenzene	100	116	104	116	11	70-130	20
Xylenes, Total	300	341	312	114	9	70-130	20

DATE ANALYZED: 12/22/97
 SAMPLE SPIKED: LCS
 INSTRUMENT: H

Laboratory Control Sample

Analyte	Spike Added (ug/kg)	LCS Result (ug/kg)	LCSD Result (ug/kg)	LCS Percent Recovery	RPD	QC Limits	
						Percent Recovery	RPD
Benzene	100	85	84	85	1	70-130	20
Toluene	100	95	92	95	3	70-130	20
Ethylbenzene	100	98	96	98	2	70-130	20
Xylenes, Total	300	298	290	99	3	70-130	20

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712315
AEN LAB NO: F122407
DATE ANALYZED: 12/24/97
INSTRUMENT: F
MATRIX: WATER

Method Blank

	CAS #	Result (ug/L)	Reporting Limit (ug/L)
Benzene	71-43-2	ND	0.5
Toluene	108-88-3	ND	0.5
Ethylbenzene	100-41-4	ND	0.5
Xylenes, Total	1330-20-7	ND	2
HCs as Gasoline		ND mg/L	0.05 mg/L
Methyl t-Butyl Ether	1634-04-4	ND	5

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712315
 INSTRUMENT: F
 MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
12/24/97	MSW-1	04	97
QC Limits:			70-130

DATE ANALYZED: 12/24/97
 SAMPLE SPIKED: LCS
 INSTRUMENT: F
 MATRIX: WATER

Laboratory Control Sample

Analyte	Spike Added (ug/L)	LCS Result (ug/L)	LCSD Result (ug/L)	LCS Percent Recovery	RPD	QC Limits	
						Percent Recovery	RPD
Benzene	100	88	90	88	2	70-130	20
Toluene	100	98	99	98	1	70-130	20
Ethylbenzene	100	102	104	102	2	70-130	20
Xylenes, Total	300	317	326	106	3	70-130	20

*** END OF REPORT ***

CHAIN-OF-CUSTODY RECORD

Project No.: 3095.05

Samplers (Signatures): *JL Post*

Date: 12/12
Time: 12:12

Sample Number

MS-N-6.5
MS-S-6.5
MS-C-6.5
MSW-1

Analysis	MS-N-6.5	MS-S-6.5	MS-C-6.5	MSW-1
EPA Method 8010				
EPA Method 8020				
EPA Method 8020 (BTEX only)	X	X	X	X
EPA Method 8240				
EPA Method 8270				
TPH as gasoline				
TPH as diesel				
TPH as mineral spirits	X	X	X	X

ANALYSES

No 10996

Date: 12/18/97

REMARKS

Additional Comments

Please analyze for BTEX (8020) and TPH as mineral spirits (8015 M)

Per Brad Job please run TPH with silica gel cleanup. re 12/2/97

Turnaround time: 5 days
Results to: Bivalve Job

Total No. of containers: 8

Relinquished by (signature):		Received by (signature):		Company:	
Date: 11/18/97	Time: 15:50	Date: 12-18	Time: 2:00	Company: AEN	Company: Geomatrix
Printed Name: JL Post	Printed Name: Jennifer L. Patterson	Printed Name: Greg Glasser	Printed Name: Greg Glasser	Company: Geomatrix	Company: Geomatrix
Relinquished by (signature):	Relinquished by (signature):	Received by (signature):	Received by (signature):	Company:	Company:
Date:	Time:	Date:	Time:	Company:	Company:
Printed Name:	Printed Name:	Printed Name:	Printed Name:	Company:	Company:

Method of Shipment: Lab Pick up
Laboratory Comments and Log No.:

Geomatrix Consultants
100 Pine Street, 10th Floor
San Francisco, California 94111
415 434 9400

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

PAGE 1

GEOMATRIX CONSULTANTS
100 PINE ST., SUITE 1000
SAN FRANCISCO, CA 94111

ATTN: BRAD JOB
CLIENT PROJ. ID: 3095.05

C.O.C. NUMBER: 10998

REPORT DATE: 12/29/97

DATE(S) SAMPLED: 12/18/97

DATE RECEIVED: 12/18/97

AEN WORK ORDER: 9712313

PROJECT SUMMARY:

On December 18, 1997, this laboratory received 2 soil sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Director

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9712313
CLIENT PROJECT ID: 3095.05

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spikes(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analyses.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behaviour, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrument performance.

D: Surrogates diluted out.

I: Interference.

!: Indicates result outside of established laboratory QC limits.

WORK ORDER: 9712313

QUALITY CONTROL REPORT

PAGE QR-2

ANALYSIS: TPH as Diesel

MATRIX: Soil/Bulk

METHOD BLANK SAMPLES

SAMPLE TYPE: Blank-Method/Media blank		LAB ID: BLNK-1219-1		INSTR RUN: GC CS\971219000000/1/				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/20/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
						LOW	HIGH	
Diesel	ND		1					
Motor Oil	ND		5					
n-Pentacosane (surr)	87.7		--	100	87.7	55	115	

LABORATORY CONTROL SAMPLES

SAMPLE TYPE: Laboratory Control Spike		LAB ID: LCSW-1219-1		INSTR RUN: GC CS\971219000000/2/1				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/20/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
						LOW	HIGH	
Diesel	33.1	ND	1	40.0	82.8	55	110	
n-Pentacosane (surr)	81.1	87.7		100	81.1	55	115	

SAMPLE SURROGATES

SAMPLE TYPE: Sample-Client		LAB ID: 9712313-01A		INSTR RUN: GC CS\971219000000/11/				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/21/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
						LOW	HIGH	
n-Pentacosane (surr)	73.8			100	73.8	55	115	

SAMPLE TYPE: Sample-Client		LAB ID: 9712313-02A		INSTR RUN: GC CS\971219000000/12/				
INSTRUMENT: HP 5890		PREPARED: 12/19/97		BATCH ID: DSCS121997-1				
UNITS: mg/kg		ANALYZED: 12/21/97		DILUTION: 1.000000				
METHOD:								
ANALYTE	RESULT	REF RESULT	REPORTING LIMIT	SPIKE VALUE	RECOVERY (%)	REC LIMITS (%)		RPD LIMIT (%)
						LOW	HIGH	
n-Pentacosane (surr)	87.0			100	87.0	55	115	

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712313
AEN LAB NO: H121910
DATE ANALYZED: 12/19/97
INSTRUMENT: H
MATRIX: SOIL

Method Blank

		Result (ug/kg)	Reporting Limit (ug/kg)
Benzene	71-43-2	ND	5
Toluene	108-88-3	ND	5
Ethylbenzene	100-41-4	ND	5
Xylenes, Total	1330-20-7	ND	0.2 mg/kg

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9712313
 INSTRUMENT: H
 MATRIX: SOIL

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery	
			Fluorobenzene	
12/19/97	SP-1A,B	01	101	
12/19/97	SP-2A,B	02	101	
QC Limits:			70-130	

DATE ANALYZED: 12/19/97
 SAMPLE SPIKED: LCS
 INSTRUMENT: H

Laboratory Control Sample

Analyte	Spike Conc. (ug/kg)	LCS Result (ug/kg)	LCS/D Result (ug/kg)	LCS Percent Recovery	RPD	QC Limits	
						Percent Recovery	RPD
Benzene	100	87.4	85.6	87	2	70-130	20
Toluene	100	96.4	94.2	96	2	70-130	20
Ethylbenzene	100	99.3	97.0	99	2	70-130	20
Total Xylenes	300	303	296	101	2	70-130	20

*** END OF REPORT ***

GEOMATRIX CONSULTANTS

SAMPLE ID: SP-1A,B
 AEN LAB NO: 9712313-01
 AEN WORK ORDER: 9712313
 CLIENT PROJ. ID: 3095.05

DATE SAMPLED: 12/18/97
 DATE RECEIVED: 12/18/97
 REPORT DATE: 12/29/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		12/19/97
Toluene	108-88-3	ND	5 ug/kg		12/19/97
Ethylbenzene	100-41-4	ND	5 ug/kg		12/19/97
Xylenes, Total	1330-20-7	7 *	5 ug/kg		12/19/97
Methyl t-Butyl Ether	1634-04-4	ND	50 ug/kg		12/19/97
#Extraction for TPH	EPA 3550	-		Extrn Date	12/19/97
TPH as Mineral Spirits	GC-FID	2 *	1 mg/kg		12/21/97

ND = Not detected at or above the reporting limit

* = Value at or above reporting limit

GEOMATRIX CONSULTANTS

SAMPLE ID: SP-2A,B
 AEN LAB NO: 9712313-02
 AEN WORK ORDER: 9712313
 CLIENT PROJ. ID: 3095.05

DATE SAMPLED: 12/18/97
 DATE RECEIVED: 12/18/97
 REPORT DATE: 12/29/97

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
EPA 8020 for BTEX	EPA 8020				
Benzene	71-43-2	ND	5 ug/kg		12/19/97
Toluene	108-88-3	ND	5 ug/kg		12/19/97
Ethylbenzene	100-41-4	ND	5 ug/kg		12/19/97
Xylenes, Total	1330-20-7	ND	5 ug/kg		12/19/97
Methyl t-Butyl Ether	1634-04-4	ND	50 ug/kg		12/19/97
#Extraction for TPH	EPA 3550	-	Extrn Date		12/19/97
TPH as Diesel	GC-FID	ND	1 mg/kg		12/21/97

ND = Not detected at or above the reporting limit
 * = Value at or above reporting limit

R-4S-D

9712313

CHAIN-OF-CUSTODY RECORD

N^o 10998

Date: 12/18/97

Page 1 of 1

Project No.: 3095.05

ANALYSES

REMARKS

Samplers (Signatures):

JL Patterson

EPA Method 8010

EPA Method 8020

EPA Method 8020 (BTEX only)

EPA Method 8240

EPA Method 8270

TPH as gasoline

TPH as diesel

X TPH as mineral spirits

Cooled

Soil (S), Water (W), or Vapor (V)

Acidified

Number of containers

Additional Comments

Composite SP-1a and SP-1b and analyze for BTEX (B020) and TPH as mineral spirits.

Composite SP-2a and SP-2b and analyze for BTEX (B020) and TPH as diesel.

Fax results to Jennifer Patterson (415) 434-9122

Date Time Sample Number

12/18 13:55 SP-1a,b

12/18 14:10 SP-2a,b

Turnaround time: 24-hr

Results to: Brad Job

Total No. of containers: 4

Relinquished by (signature):

JL Patterson

Printed Name:

Jennifer L. Patterson

Company:

Geomatrix

Date: 12/18/97

Time: 15:49

Relinquished by (signature):

Printed Name:

Company:

Date:

Time:

Relinquished by (signature):

Printed Name:

Company:

Date:

Time:

Method of Shipment:

Lab pick-up

Laboratory Comments and Log No.:

Received by (signature):

PAOLO CUSTODIO

Printed Name:

PAOLO CUSTODIO

Company:

AEN

Date: 12/18/97

Time: 18:20

Received by (signature):

Printed Name:

Company:

Date:

Time:

Received by (signature):

Printed Name:

Company:

Date:

Time:



Geomatrix Consultants
100 Pine Street, 10th Floor
San Francisco, California 94111
415 434 9400