

PHASE I INVESTIGATION OF  
SUBSURFACE CONTAMINATION  
16109 ASHLAND AVENUE  
SAN LEANDRO, CALIFORNIA

PROJECT 4486

FOR

TERRASEARCH, INC.  
1580 N. FOURTH STREET  
SAN JOSE, CALIFORNIA 95112

BY

TERRATECH, INC.  
1365 VANDER WAY  
SAN JOSE, CALIFORNIA 95112

APRIL 1989



TERRATECH, INC.

SAN LEANDRO COUNTY  
HEALTH DEPARTMENT  
LABORATORY

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PHASE I GROUND WATER INVESTIGATION  
OKADA PROPERTY  
16109 ASHLAND AVENUE  
SAN LEANDRO, CALIFORNIA

INTRODUCTION

This report summarizes the work performed for and the findings of Terratech's Phase I ground water investigation at 16109 Ashland Avenue in San Leandro, California.

The primary objective of this investigation was to install a monitoring well next to a former underground fuel oil tank to evaluate and quantify ground water contamination resulting from past fuel leakage. A second monitoring well was installed to check for possible widespread contamination and to further the goal of triangulating a local ground water gradient direction. Evaluation of ground water conditions next to a former on-site gasoline tank was not included in this investigation.

SUMMARY OF WORK PERFORMED

1. Contracted a professional locator service to identify underground utilities at the selected locations for well placement. Monitoring well 1 (MW-1) was sited within 10 feet of the former fuel oil tank, on the western side. MW-2 was sited approximately 100 feet southwest of the fuel oil tank area (see Site Plan - Figure 1). Besides the existing obstructions to the drill rig (buildings, utilities and soft soils), considerations were given to the layout of the planned development.
2. Drilled two exploratory borings to provide the holes for the wells. Drilling was performed by Bay Land Drilling, a licensed contractor from Foster City, California. The hole for MW-1 was drilled to a total depth of 25 1/2 feet below ground surface in order to identify the subsurface hydrogeologic profile. The hole for MW-2 was advanced to 15 1/2 feet. Augers were steam-cleaned prior to use. Drilling spoils were drummed pending laboratory results.

Soil samples were collected in pre-cleaned brass liners at five-foot vertical intervals using a Modified California Sampler. A geologist from our environmental staff prepared logs describing the depths and types of soils encountered. The Unified Soil Classification System with visual-manual procedures (ASTM D2488-84) was used.

3. Installed two 2-inch diameter PVC monitoring wells in the first aquifer encountered below ground surface. The wells were constructed in accordance with standard Zone 7 Water District guidelines with the five-foot minimum surface seal.



4. Obtained well permits from the Zone 7 Water District and filed a Well Drillers Report with the State Department of Water Resources.
5. Developed the two monitoring wells the day following their installation using a PVC hand pump. Approximately 25 gallons of water were removed from each well during development.

Approximately 48 hours after well development, the wells were purged of 3 to 4 well volumes and sampled using a pre-cleaned Teflon bailer. Water samples were placed in 40 ml glass vials (VOA's) via a stop-cock built into the bailer until a positive meniscus was formed. A Teflon-lined screw cap was then used to seal each vial. After capping, each vial was inverted and tapped to verify that no air bubbles were present. The water samples were placed on ice immediately following collection.

Development and purging waters were drummed pending lab analysis.

6. Two ground water samples and six unsaturated soil samples were transported to Superior Analytical, a State-certified laboratory in San Francisco, using standard chain-of-custody procedures. Per State Regional Water Quality Control Board (RWQCB) guidelines, the samples were analyzed for total petroleum hydrocarbons (TPH) and benzene, toluene, ethylbenzene and xylenes (BTEX).
7. Evaluated the findings and prepared this report.

## FINDINGS

### Subsurface Conditions

The generalized subsurface profile to 25 feet in the area surrounding the former fuel oil tank primarily consists of interbedded strata of low to moderately plastic, sandy clays. A five-foot thick stratum of high plasticity clay exists from 13 to 18 feet below ground surface. Ground water was encountered during drilling at about 7 feet within a silty sand lense that extends to a depth of about 9 feet. This ground water appears to be under about one foot of hydrostatic head. No other ground water zone was encountered during our drilling.

Specific soil descriptions and sampling intervals are presented on the appended drill hole logs.

### Soil Contamination

No unusual odors or discolorations were noticed in the soils during the drilling and sampling of the monitoring well borings.

A summary of the laboratory results for soil sample analyses is presented in Table 1.



All TPH (gasoline and diesel range) concentrations were found to be below the laboratory's detection limit of 10 parts per million (ppm). However, when analyzed for BTEX hydrocarbons under conditions of a lower detection limit (0.003 ppm), trace amounts of contamination were found in samples from both bore holes at depths of 5.5 and 15.5 feet.

#### Ground Water Contamination

No odors or sheens were noticed during development, purging or sampling activities.

A summary of the laboratory analysis for the ground water samples is presented in Table 2.

As was the case in the soil analyses, TPH contamination was not found to be above detection limits (1 ppm) but trace levels (less than 2 parts per billion) of BTEX were found.

#### CONCLUSIONS

Based on the findings from this Phase I ground water investigation, the residual petroleum hydrocarbon contamination in the vicinity of the fuel oil tank does not appear to be particularly significant.

The presence of elevated soil contamination below the water bearing stratum at MW-1 indicates that vertical migration of fuel (over and above the portion dissolved in the ground water) has occurred. At MW-2, the soil contamination levels are such that we believe them to be originating from the dissolved fuel migrating with the ground water.

Since the ground water contamination concentrations are slightly higher at MW-2 than at MW-1 (next to the former fuel oil tank), we are suspicious of a second source; possibly the former gasoline tank. The fact that BTEX compounds are more predominate in gasoline than in fuel oil heightens this suspicion.

#### RECOMMENDATIONS

Pending regulatory review and comment, we recommend the following actions:

1. Excavate remaining contaminated soils from the fuel oil tank pit and collect verification samples. Due to the high water table, we recommend using 100 ppm of TPH as a cleanup goal. After the adequacy of the soil removal has been verified, the excavation should be backfilled with clean, compacted fill. Fill material selection and surface grading should be such that future water infiltration is minimized.



2. Install a third monitoring well to provide for triangulation of the local ground water gradient direction. Based on the findings to date, we believe the best location for this third well would be next to the former gasoline tank.
3. Establish the top of casing elevations for the three wells based on a known local benchmark. These elevations should be correlated with depth to ground water measurements and used to calculate the local gradient direction.
4. Sample the ground water from all three wells and analyze the samples for total petroleum hydrocarbons and BTEX.


The information gained from the "Phase II" work described above will provide critical information for forming more conclusive opinions on source(s), severity and economic implications.

LIMITATIONS

This report and the work associated with it have been provided in accordance with the general principles and practices currently employed in the environmental consulting profession. This is in lieu of all other warranties, express or implied. Our conclusions are based on data obtained from subsurface sampling and testing that is necessarily limited.

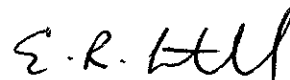
Report prepared by:

TERRATECH, INC.



Brian M. Kahl  
Project Geologist

Reviewed By:



Eric R. Lautenbach  
CE 42437

cc: Mr. Larry Sito, Alameda County Health Department  
California Regional Water Quality Control Board - Oakland



TABLE 1  
 SUMMARY OF SOIL SAMPLE ANALYSIS RESULTS  
 Okada Property  
 San Leandro, California

SAMPLE LOCATION	SAMPLE DEPTH (feet)	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (ppm)	BENZENE (ppm)	TOLUENE (ppm)	ETHYL-BENZENE (ppm)	XYLENES (ppm)	TOTAL PETROLEUM HYDROCARBONS AS DIESEL (ppm)
MW-1	5.5	N.D.	0.0036	0.0055	0.0047	N.D.	N.D.
	15.5	N.D.	N.D.	0.280	0.024	0.210	N.D.
	20.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
	25.5	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
MW-2	5.5	N.D.	N.D.	0.0032	0.004	N.D.	N.D.
	15.5	N.D.	N.D.	0.0031	N.D.	N.D.	N.D.
DETECTION LIMITS		10	0.003	0.003	0.003	0.003	10

NOTES: Soil samples were collected by Terratech on 3/28/89; analyses were performed by Superior Analytical Laboratory.



TABLE 2

## SUMMARY OF GROUND WATER SAMPLE ANALYSIS RESULTS

Okada Property  
San Leandro, California

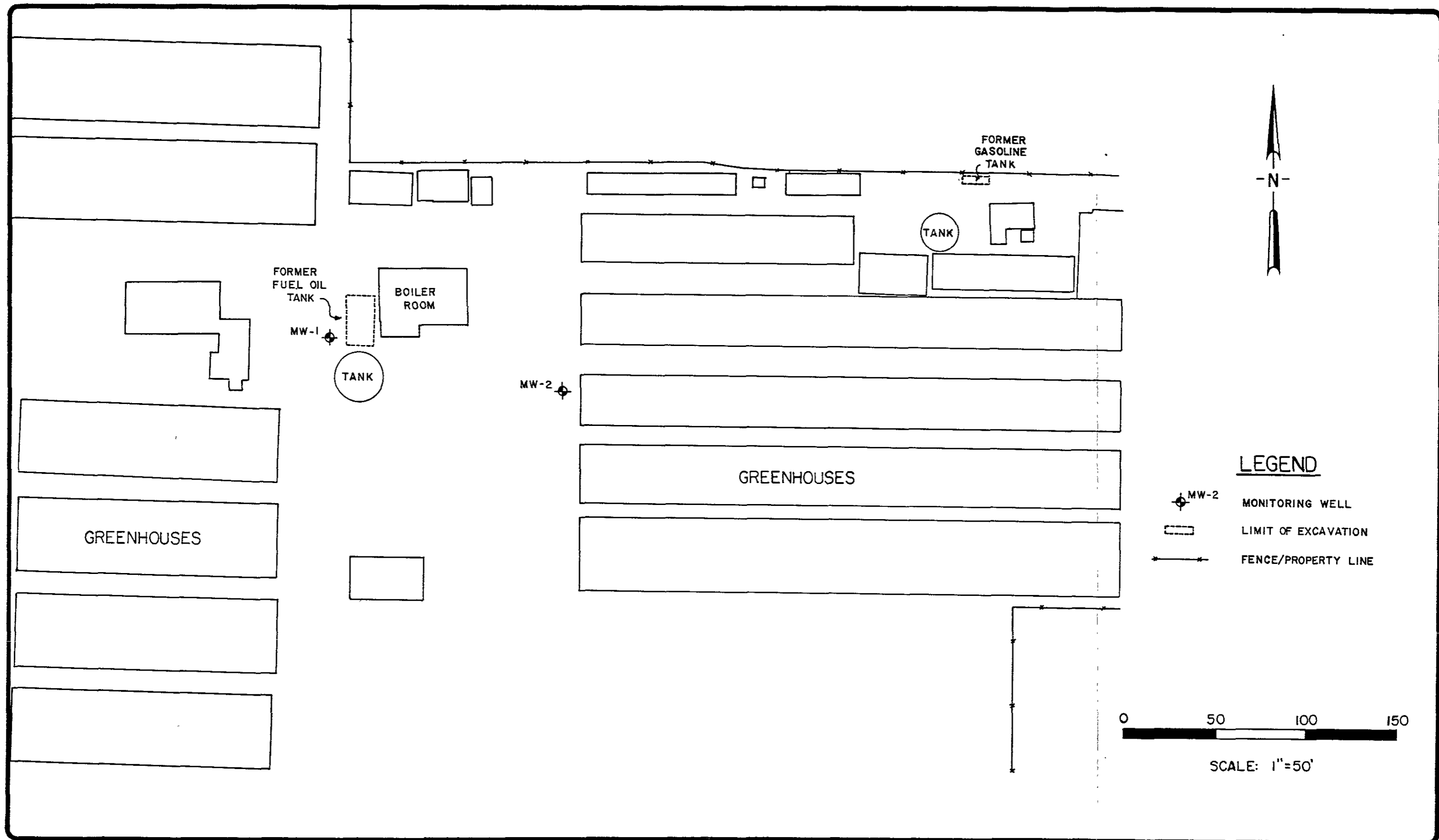
SAMPLE * LOCATION	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (ppb)	BENZENE (ppb)	TOLUENE (ppb)	ETHYL- BENZENE (ppb)	XYLENES (ppb)	TOTAL PETROLEUM HYDROCARBONS AS DIESEL (ppb)
MW-1	N.D.	0.4	1.8	N.D.	N.D.	N.D.
MW-2	N.D.	0.4	1.8	0.4	1.8	N.D.
ACTION LEVELS **	---	0.7	100	680	620	---
DETECTION LIMITS	1000	0.3	0.3	0.3	0.3	1000

NOTES: \* Ground water samples collected by Terratech on 3/31/89;  
analyses performed by Superior Analytical Laboratory.

\*\* Drinking water action levels as recommended by California  
Department of Health Services (October 1987); presented for  
relative comparison purposes only.







APPENDIX A

ZONE 7 WELL PERMIT,  
EXPLORATORY DRILL HOLE LOGS,  
AND AS-BUILT WELL DIAGRAMS



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

FOR OFFICE USE

(1) LOCATION OF PROJECT OKATA NURSERY
Ashland Ave and East 14th St.
San Leandro, Ca

PERMIT NUMBER 89169
LOCATION NUMBER

(2) CLIENT
Name TerraSearch Inc.
Address 1580 N. 4th Street Phone (408) 453-1180
City San Jose Zip 95112

Approved Wyman Hong Date 24 Mar 89
Wyman Hong

(3) APPLICANT
Name TERRATECH INC.
Address 1365 Vander Way Phone (408) 297-6969
City San Jose, Ca Zip 95112

PERMIT CONDITIONS

Circled Permit Requirements Apply

(4) DESCRIPTION OF PROJECT
Water Well Construction [X] Geotechnical
Cathodic Protection Well Destruction

(5) PROPOSED WATER WELL USE
Domestic Industrial Irrigation
Municipal Monitoring [X] Other

(6) PROPOSED CONSTRUCTION
Drilling Method:
Mud Rotary Air Rotary Auger [X]
Cable Other

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. Notify this office (484-2600) at least one day prior to starting work on permitted work and before placing well seals.
3. 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 bore hole logs and location sketch for geotechnical projects. Permitted work is completed when the last surface seal is placed or the last boring is completed.
4. 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, or equivalent.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic, irrigation, and monitoring wells unless a lesser depth is specially approved.

- C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material.
D. CATHODIC. Fill hole above anode zone with concrete placed by tremie, or equivalent.
E. WELL DESTRUCTION. See attached.

WELL PROJECTS
Drill Hole Diameter 8 in. Depth 35 ft.
Casing Diameter 2 in. Number MW-1
Surface Seal Depth ~20 ft. MW-2
Driller's License No. C57-374152

GEOTECHNICAL PROJECTS
Number
Diameter in. Maximum Depth ft.

(7) ESTIMATED STARTING DATE 3/28/89
ESTIMATED COMPLETION DATE 3/28/89

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

APPLICANT'S SIGNATURE Brian Kohl Date 3/23/89

# EXPLORATION DRILL HOLE LOG

HOLE No. **MW-1**

PROJECT **OKADA PROPERTY**

DATE **3-28-89**

LOGGED BY **BMK**

DRILL RIG **Hollow Stem; CME 75**

HOLE DIA. **8"**

SAMPLER **X = Modified Calif.**

GROUNDWATER DEPTH INITIAL **7'**

FINAL **5.5'**

HOLE ELEV. **---**

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN. (tsf)	TORVANE (tsf)	LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)
FILL -- SANDY LEAN CLAY W/GRAVEL; reddish-brown, damp, stiff; SANDY CLAY; black, moist, stiff; odorless.	CL	1										
	CI	2										
		3										
		4										
		5										
CLAY W/SAND; brown, moist, stiff; trace of silt; odorless.	CI	6	X	11		▼						
__ becomes very moist to wet @ 7'		7				▽						
SILTY SAND; brown, wet, soft; fine grained; odorless.	SM	8										
__ perched water in hole		9										
CLAY W/SAND; brown-gray, damp, firm; fine grained; odorless. (zones of CI)	CL	10										
		11	X	6								
		12										
		13										
FAT CLAY; gray-dark gray, moist, stiff; trace medium-grained sand; odorless.	CH	14										
		15										
		16	X	11								
		17										
		18										
CLAY; brown-gray, damp to moist, stiff; trace sand; odorless.	CI	19										
		20										

# EXPLORATION DRILL HOLE LOG

HOLE No. **MW-1**

PROJECT **OKADA PROPERTY**

DATE **3-28-89**

LOGGED BY **BMK**

DRILL RIG **Hollow Stem; CME 75**

HOLE DIA **8"**

SAMPLER **X = Modified Calif.**

GROUNDWATER DEPTH INITIAL **7'**

FINAL **5.5'**

HOLE ELEV **---**

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)
CLAY; brown-gray, damp to moist, stiff; trace sand; odorless.	CI	21	X	13								
		22										
SILTY CLAY; brown, damp, firm; trace fine sand; odorless.	CL-ML	23	X	8								
		24										
BOTTOM OF HOLE @ 25.5'		25										
		26										
		27										
		28										
		29										
		30										
		31										
		32										
		33										
		34										
		35										
		36										
		37										
		38										
		39										
		40										

# EXPLORATION DRILL HOLE LOG

**HOLE No.** MW-2

**PROJECT** OKADA PROPERTY

**DATE** 3-28-89

**LOGGED BY** BMK

**DRILL RIG** Hollow Stem; CME 75

**HOLE DIA.** 8"

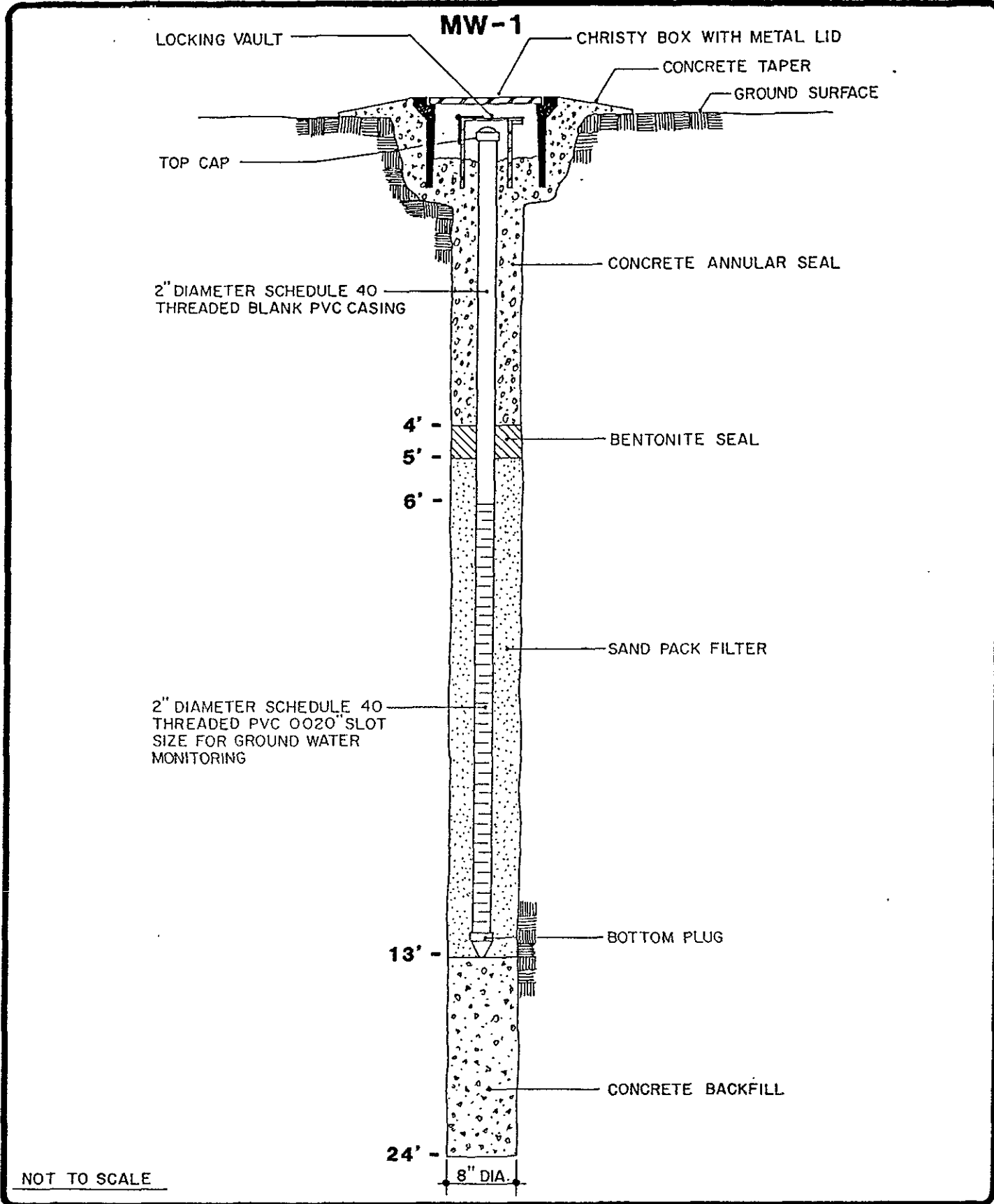
**SAMPLER** X = Modified Calif.

**GROUNDWATER DEPTH INITIAL** 7'

**FINAL** 5.5'

**HOLE ELEV.** —

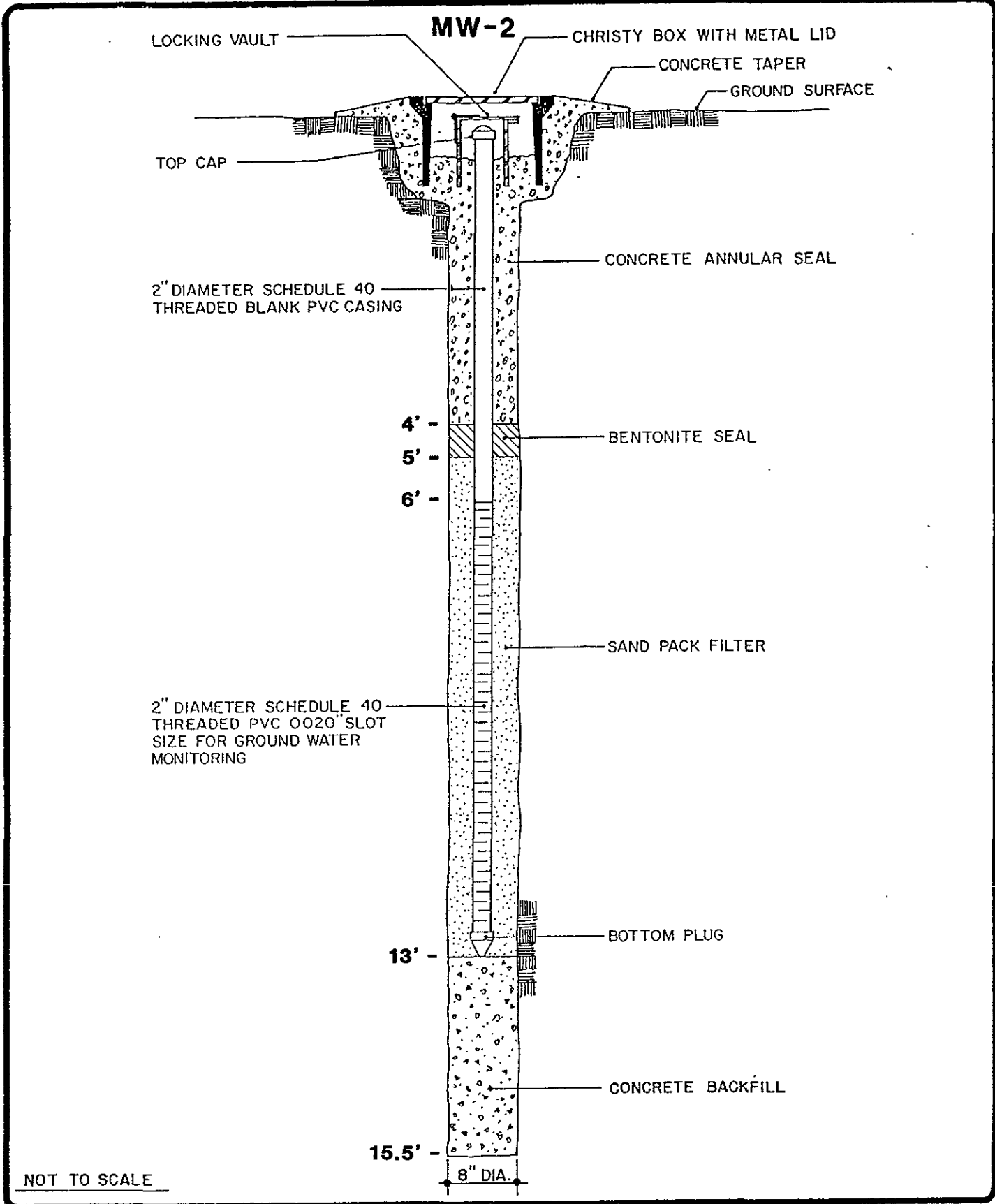
DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	POCKET PEN (tsf)	TORVANE (tsf)	LIQUID LIMIT	WATER CONTENT	PLASTIC LIMIT	DRY DENSITY (pcf)	FAILURE STRAIN (%)	UNCONFINED SHEAR STRENGTH (psf)	
SANDY CLAY; black, dry, stiff; odorless.	CI	1											
		2											
		3											
		4											
CLAY W/SAND; brown, moist, firm; odorless.	CI	5	X	6			▼						
SILTY SAND; tan, wet, soft, fine grained; odorless.	SM	6											
		7					▼						
SANDY LEAN CLAY; brown, wet, soft, odorless.	CL	8											
		9											
		10	X		5								
		11											
FAT CLAY; black-dark gray, moist, stiff; odorless.	CH	12											
		13											
BOTTOM OF HOLE @ 15.5'		14											
		15	X		9								
		16											
		17											
		18											
		19											
		20											



**AS-BUILT WELL DIAGRAM**

OKADA PROPERTY  
SAN LEANDRO, CALIFORNIA

FIGURE  
1  
PROJECT  
4486



**AS-BUILT WELL DIAGRAM**

OKADA PROPERTY  
SAN LEANDRO, CALIFORNIA

FIGURE  
2  
PROJECT  
4486



APPENDIX B  
CHAIN-OF-CUSTODY RECORDS  
AND  
ANALYTICAL LABORATORY REPORTS



(408) 297-6969  
SAN JOSE OFFICE

**TERRATECH**

CHAIN OF CUSTODY RECORD

"NORMAL TURNAROUND"

PROJECT NAME: #4486						Number of Containers	Analysis Required TPH-DIESEL (3550) BTEX	REMARKS		
SAMPLERS (signature): B. Kahl										
Station Number	Date	Time	Comp.	Grab	Station Location			DEPTH		
MW-1	3/28	AM		X		1 BRASS LINER	X	5.5'		
MW-1	3/28	AM		X		1 BRASS LINER	X	15.5'		
MW-2	3/28	AM		X		1 BRASS LINER	X	5.5'		
MW-2	3/28	PM		X		1 BRASS LINER	X	15.5'		
Relinquished by(signature): B. Kahl Company or Agency: Terratech						Date / Time 3/29/89 0935	Received by (signature): RZ (X447) Company or Agency: EXPRESSIT	Relinquished by(signature): Company or Agency:	Date / Time	Received by (signature): Company or Agency:
Relinquished by(signature): Company or Agency:						Date / Time	Received by (signature): Company or Agency:	Relinquished by: Company or Agency:	Date / Time	Received by (signature): Company or Agency:
Relinquished by(signature): Company or Agency: TERRATECH, INC.						Date / Time	Received for Laboratory by: (signature)	Date / Time	Remarks/Shipping Information Send reports to: Eric Lautenbach 1365 VANDER WAY, SAN JOSE 95112	



(408) 297-6969  
SAN JOSE OFFICE

TERRATECH

CHAIN OF CUSTODY RECORD

"24-HR RUSH"

PROJECT NAME: # 4486						Number of Containers	Analysis Required METHOD 8015 BTEX	REMARKS									
SAMPLERS (signature): B. Kuhl																	
Station Number	Date 1989	Time	Comp.	Grab	Station Location												
MU-1	3/31	AM		X		1 Brass Liner	X	X								DEPTH 70.5'	
MW-1	3/31	AM		X		1 Brass Liner	X	X									25.5'
Relinquished by(signature):		Date / Time		Received by (signature):		Relinquished by(signature):		Date / Time		Received by (signature):							
Company or Agency:				Company or Agency:		Company or Agency:				Company or Agency:							
Relinquished by(signature):		Date / Time		Received by (signature):		Relinquished by:		Date / Time		Received by (signature):							
Company or Agency:				Company or Agency:		Company or Agency:				Company or Agency:							
Relinquished by(signature):		Date / Time		Received for Laboratory by:		Date / Time		Remarks/Shipping Information									
<i>Eric Lautenbach</i> Company or Agency: TERRATECH, INC.		4/5/89 8:50am		(signature) <i>Ed Gomez 325</i>				Send reports to: Eric Lautenbach 1365 VANDER WAY, SAN JOSE 95112									



(408) 297-6969  
SAN JOSE OFFICE

**TERRATECH**

CHAIN OF CUSTODY RECORD

PROJECT NAME: 4486						Number of Containers	Analysis Required TPH-D (3590) BTEX	REMARKS													
SAMPLERS (signature):																					
Station Number	Date	Time	Comp.	Grab	Station Location													DEPTH			
MW-1	3/31	4M		X			2 VOAS	X	X												
MW-2	3/31	AM		X			2 VOAS	X	X												
Relinquished by(signature):						Date / Time	Received by (signature):			Relinquished by(signature):			Date / Time	Received by (signature):							
Company or Agency:							Company or Agency:			Company or Agency:				Company or Agency:							
Relinquished by(signature):						Date / Time	Received by (signature):			Relinquished by:			Date / Time	Received by (signature):							
Company or Agency:							Company or Agency:			Company or Agency:				Company or Agency:							
Relinquished by(signature):						Date / Time	Received for Laboratory by: (signature)			Date / Time	Remarks/Shipping Information										
Company or Agency: TERRATECH, INC.						3/31/08 1:25pm	<i>[Signature]</i>				Send reports to: Eric Lautenbach 1365 VANDER WAY, SAN JOSE 95112										

TERRATECH

APR - 7 1989

RECEIVED

**SUPERIOR ANALYTICAL LABORATORY, INC.**

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E   O F   A N A L Y S I S

LABORATORY NO.: 50736  
CLIENT: Terratech, Inc.  
CLIENT ID: Four Soil Samples

DATE RECEIVED: 3/29/89  
DATE REPORTED: 4/4/89  
JOB NO.: 4486

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS  
by Modified EPA SW-846 Method 8015

LAB#	Client Identification	Concentration (mg/kg)	
		Gasoline Range	Diesel Range
1	MW-1 5.5' 3/28/89 AM	ND <10	ND <10
2	MW-1 15.5' 3/28/89 AM	ND <10	ND <10
3	MW-2 5.5' 3/28/89 AM	ND <10	ND <10
4	MW-2 15.5' 3/28/89 PM	ND <10	ND <10

mg/kg = part per million (ppm)

Minimum Detection Limit for Gasoline and Diesel in Soil: 10mg/kg.

QA/QC SUMMARY:

Daily Standards run at 200 mg/L; RPD Gasoline= 8, Diesel= 7.  
MS/MSD: Average Gasoline Recovery = 91%; Duplicate RPD <12.

Les Partridge, Ph.D.

  
Laboratory Manager

OUTSTANDING QUALITY AND SERVICE

**SUPERIOR ANALYTICAL LABORATORY, INC.**

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E   O F   A N A L Y S I S

LABORATORY NO.: 50761  
CLIENT: Terratech, Inc.  
CLIENT ID:

DATE RECEIVED: 4/5/89  
DATE REPORTED: 4/6/89  
JOB NO.: 4486

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS  
by Modified EPA SW-846 Method 8015

LAB#	Client Identification	Concentration (mg/kg)	
		Gasoline Range	Diesel Range
1	MW-1 20.5 3/31 AM	ND <10	ND <10
2	MW-1 25.5 3/31 AM	ND <10	ND <10

mg/kg = part per million (ppm)

Minimum Detection Limit for Gasoline and Diesel in Soil: 10mg/kg.

QA/QC SUMMARY:

Daily Standards run at 200 mg/L; RPD Gasoline= 7, Diesel<11.  
MS/MSD: Average Gasoline Recovery = 100%; Duplicate RPD <5.

Les Partridge, Ph.D.

  
Laboratory Manager

OUTSTANDING QUALITY AND SERVICE

**SUPERIOR ANALYTICAL LABORATORY, INC.**

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E   O F   A N A L Y S I S

LABORATORY NO.: 50736  
CLIENT: Terratech, Inc.  
JOB NO.: 4486

DATE SAMPLED: 3/28/89  
DATE ANALYZED: 4/3/89  
DATE REPORTED: 4/4/89

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES  
by EPA SW-846 Methods 5030 and 8020

Concentration (ug/kg)

LAB#	CLIENT ID	Benzene	Toluene	Ethyl Benzene	Xylenes
1	MW-1 5.5' 3/28 AM	3.6	5.5	4.7	ND <3
2	MW-1 15.5' 3/28 AM	ND <3	280	24	210
3	MW-2 5.5' 3/28 AM	ND <3	3.2	4.0	ND <3
4	MW-2 15.5' 3/28 PM	ND <3	3.1	ND <3	ND <3

ug/kg = part per billion (ppb)

Minimum Detection Limit in Soil: 3ug/kg.

QA/QC SUMMARY:

Daily Standard run at 20 ug/kg: RPD < 15.  
MS/MSD: Average Recovery = 71%: Duplicate RPD < 5.  
Average Surrogate Recovery = 82%.

Les Partridge, Ph.D.

  
Laboratory Manager

OUTSTANDING QUALITY AND SERVICE

**SUPERIOR ANALYTICAL LABORATORY, INC.**

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E   O F   A N A L Y S I S

LABORATORY NO.: 50761  
CLIENT: Terratech, Inc.  
JOB NO.: 4486

DATE SAMPLED: 3/31/89  
DATE ANALYZED: 4/6/89  
DATE REPORTED: 4/6/89

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES  
by EPA SW-846 Methods 5030 and 8020

Concentration (ug/kg)

LAB#	CLIENT ID	Benzene	Toluene	Ethyl Benzene	Xylenes
1	MW-1 20.5' 3/31	ND<0.3	ND<0.3	ND<0.3	ND<0.3
2	MW-1 25.5' 3/31	ND<0.3	ND<0.3	ND<0.3	ND<0.3

ug/kg = part per billion (ppb)

Mimumum Detection Limit in Soil: 3ug/kg.

QA/QC SUMMARY:

Daily Standard run at 20 ug/kg: RPD < 15.  
MS/MSD: Average Recovery = 108%: Duplicate RPD < 7.  
Average Surrogate Recovery = 99%.

Les Partridge, Ph.D.

  
Laboratory Manager

OUTSTANDING QUALITY AND SERVICE



**SUPERIOR ANALYTICAL LABORATORY, INC.**

1385 FAIRFAX ST., STE D • SAN FRANCISCO, CA 94124 • PHONE (415) 647-2081

C E R T I F I C A T E   O F   A N A L Y S I S

LABORATORY NO.: 50751  
CLIENT: Terratech, Inc.  
CLIENT JOB NO.: 4-486

DATE RECEIVED: 03/31/89  
DATE REPORTED: 04/04/89

ANALYSIS FOR TOTAL PERTROLEUM HYDROCARBONS  
by Modified EPA SW-846 Method 8015

LAB #	Sample Identification	Concentration (mg/L )	
		Gasoline Range	Diesel Range
1	MW-1; 3/31/89; AM	ND<1	ND<1
2	MW-2; 3/31/89; AM	ND<1	ND<1

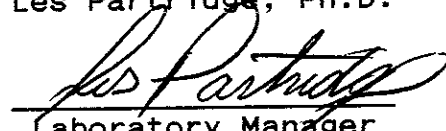
mg/L - parts per million (ppm)

Minimum Detection Limit for Gasoline and Diesel in Water: 1mg/L

QAQC Summary:

Daily Standard run at 200mg/L: RPD Gasoline = <1  
RPD Diesel = <9  
MS/MSD Average Recovery = 91%: Duplicate RPD = 12

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C E R T I F I C A T E   O F   A N A L Y S I S

LABORATORY NO.: 50751  
CLIENT: Terratech, Inc.  
JOB NO.: 4-486

DATE SAMPLED: 3/31/89  
DATE ANALYZED: 3/31/89  
DATE REPORTED: 4/3/89

ANALYSIS FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES  
by EPA SW-846 Methods 5030 and 8020

LAB#	CLIENT ID	Concentration (ug/L)			
		Benzene	Toluene	Ethyl Benzene	Xylenes
1	MW-1 3/31/89 AM	0.4	1.8	ND<0.3	ND<0.3
2	MW-2 3/31/89 AM	0.4	1.8	0.4	1.8

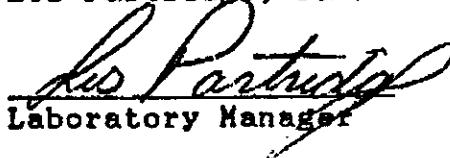
ug/L = part per billion (ppb)

Minimum Detection Limit in Water: 0.3 ug/L.

QA/QC SUMMARY:

Daily Standard run at 20 ug/L: RPD < 15.  
MS/MSD: Average Recovery = 71%; Duplicate RPD < 5.  
Average Surrogate Recovery = 87%.

Les Partridge, Ph.D.

  
Laboratory Manager

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