

October 9, 2001

OCT 11 2001

**SOIL AND GROUNDWATER
INVESTIGATION**

924 Grand Street
Alameda, California

10/9/01

Project No. 4481

Prepared For

Mr. Matt Anderson
924 Grand Street
Alameda, CA 94501

Prepared By

AEI Consultants
3210 Old Tunnel Road, Suite B
Lafayette, CA 94549
(925) 283-6000

AEI

October 9, 2001

Mr. Matt Anderson
924 Grand Street
Alameda, CA 94501

Subject: Soil and Groundwater Investigation
924 Grand Street
Alameda, California
Project No. 4481

Dear Mr. Anderson:

The following letter report describes the activities and results of the subsurface investigation performed by AEI Consultants at the above referenced property (Figure 1: Site Location Map). The investigation included the collection and analyses of soil and groundwater samples from three soil borings. The investigation was designed and implemented under the direction of the Alameda County Health Care Services Agency (ACHCSA) to investigate the release of home heating oil from the former underground storage tank located on the property.

I Background

The property is located in a residential area of the City of Alameda, California, on the southern corner of Grand Avenue and San Jose Avenue. Refer to Figure 1 for a site location map.

AEI was contracted to remove a 250-gallon home heating oil tank from the property in July 1988. Based on the analytical results of a soil sample collected from beneath the tank, the Alameda County Health Care Services Agency (ACHCSA) requested the removal of impacted soil. AEI then removed 20 tons of soil from the excavation. The excavation was extended vertically to the water table [11 feet below ground surface (bgs)]. The lateral extent was limited on four sides by utilities and the structure. Refer to Figure 2.

Four soil samples were collected from the sidewalls of the excavation, as was a grab sample of groundwater in the excavation. Each of the four soil samples contained total petroleum hydrocarbons (TPH) as diesel, ranging from 370 mg/kg on the west side to 2,000 mg/kg on the north side. TPH as diesel was detected in the groundwater sample at 110,000 µg/l. Levels of BTEX were low or not detected in the soil and groundwater samples. The soil was transported, under manifest to an appropriate facility, and the excavation was backfilled with clean imported fill material.

At the request of the ACHCSA, AEI submitted a workplan on behalf of Mr. Anderson, dated August 14, 2001, that outlined a scope of work to assess whether the identified release had extensively impacted groundwater quality of the area. Following a revision of the proposed boring locations, Ms. Eva Chew of the ACHCSA approved the workplan. This report describes the activities and results of the implementation of that plan.

II Investigative Efforts

AEI performed a subsurface investigation at the property on September 17, 2001. A total of three (3) shallow soil borings (labeled SB-1 through SB-3) were advanced. The boring locations were chosen to step-out from the former tank location to assess the extent of impacted groundwater. The final boring locations were limited by utilities, trees, and fences. The locations of the soil borings are shown on Figure 2.

The near surface native soil encountered during the boring advancement consisted generally of fine to medium clean sands. Groundwater exists beneath the property at between 6 and 9 feet below ground surface (bgs). The water bearing deposits consisted of silty and clayey sand. Refer to Attachment A for detailed logs of the borings.

The site is located at approximately 25 feet above mean sea level. The property is flat; however, the regional topography of this portion of Alameda Island slopes very gently to the south/southwest. The nearest surface water is the lagoon, located approximately 1,000 feet to the southwest of the site. Based on local topography, the estimated groundwater flow direction is to the south/southwest.

Soil Sample Collection

The borings were advanced with a direct-push drilling rig to a depth of 12 feet bgs. Soil samples were collected at approximately 5 foot intervals from each boring. Following sample collection, each boring was backfilled with neat cement grout.

No hydrocarbon odor or staining was observed during the advancement of the soil borings. Soil samples were collected in 1 ½ inch acrylic liners, from which a six inch sample was chosen for possible chemical analysis. The soil samples were sealed with Teflon tape and plastic caps and placed in a cooler with wet ice to await transportation to the laboratory.

Groundwater Sample Collection

Groundwater was encountered at between 6 and 8.5 feet bgs during the advancement of the borings. A groundwater sample was collected using a plastic disposable bailer, and poured into 40-ml VOA vials and 1-liter amber bottles. The groundwater samples were capped so that no head space or air bubbles were visible within the containers, and then placed in the cooler.

Laboratory Analysis

On September 17, 2001, the samples were transported to McCampbell Analytical Inc. (DOHS Certification Number 1644) under chain of custody protocol for analysis. Analytical results and chain of custody documents are included as Attachment B.

One soil sample from each boring from above the apparent soil/water interface and the three groundwater samples were selected for analysis. The six samples were analyzed for total petroleum hydrocarbons as diesel (TPH-d) by EPA method 3550/8015M, and for benzene, toluene, ethyl-benzene, and xylenes (BTEX) and methyl tert-butyl ether (MTBE) by EPA method 602/8020.

Any remaining soil samples were placed on hold at the laboratory.

III Findings

No concentrations of TPH-d, BTEX, or MTBE were detected in any of the soil samples. TPH-d was detected in one groundwater sample (SB-2) at 77 µg/l, and toluene was detected in two groundwater samples (SB-1 and SB-3) at 0.62 µg/l and 0.64 µg/l, respectively. No other target hydrocarbons were detected.

A summary of the analytical results is presented in Tables 1 and 2.

IV Conclusions and Recommendations

Based on the distance of the borings from the former tank location, it is apparent that the fuel release identified during the tank removal activities has not significantly migrated from that location in over two years. The source for the hydrocarbon release (the tank) has been removed, along with impacted soil immediately surrounding the tank. Any remaining hydrocarbons in this immediate area should continue to degrade with time.

No significant concentrations of any potential contaminants of concern were identified. The concentrations of toluene detected were just above laboratory detection limits and, although groundwater in this area is not used for drinking water, the toluene detected is well below the most stringent drinking water standard.

No further investigation is warranted at this time, and AEI is recommending that the site be considered for immediate case closure.

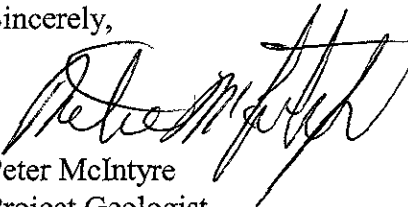
V Report Limitation

This report presents a summary of work completed by AEI Consultants. The completed work includes observations and descriptions of site conditions encountered. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide the required information, but it cannot be assumed that they are representative of areas not sampled. All conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.


These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work.

If you have any questions regarding our investigation, please do not hesitate to contact me at (925) 283-6000.

Sincerely,



Peter McIntyre
Project Geologist

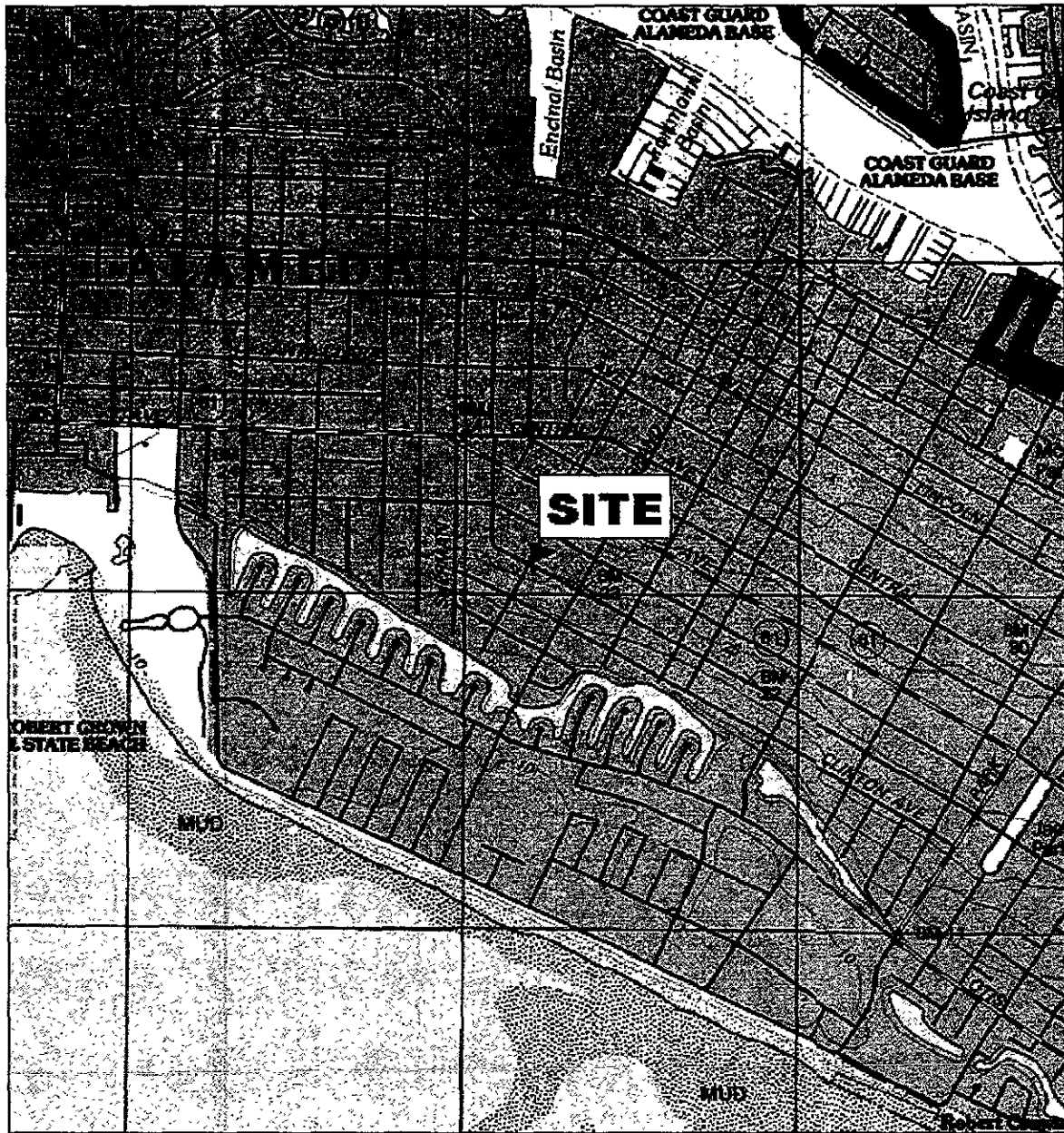


Joseph P. Derhake, PE
Principal

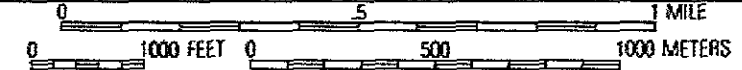


- Figures
- Tables
- Attachment A: Soil Boring Logs
- Attachment B: Sample Analytical Documentation

FIGURES



TN + MN
15 1/2°



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<p>AEI CONSULTANTS 3210 OLD TUNNEL RD. STE B. LAFAYETTE, CA</p>	
<p>SITE LOCATION MAP</p>	
<p>924 GRAND AVENUE ALAMEDA, CALIFORNIA</p>	<p>FIGURE 1 PROJECT NO. 4481</p>

SAN JOSE AVENUE

FORMER TANK
LOCATION AND EXCAVATION SIDEWALK

SB-2 ⊗

SB-1 ⊗

SIDEWALK

PORCH

SIDEWALK

FENCE

SIDEWALK

LAWN

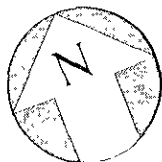
RESIDENCE
924 GRAND STREET

GARDEN AND
YARD

SB-3 ⊗

FENCE

PROPERTY BOUNDARY



⊗ LOCATION OF SOIL BORINGS ADVANCED
BY AEI, SEPTEMBER 17, 2001

SCALE: 1in = 15ft
(redrawn after field work)

AEI CONSULTANTS
3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SITE PLAN

924 GRAND AVENUE
ALAMEDA, CALIFORNIA

FIGURE 2
PROJECT NO 4481

TABLES

Table 1
Soil Sample Analytical Data

Sample ID	TPH-d (mg/kg)	MTBE (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- benzene (mg/kg)	Xylenes (mg/kg)
SB-1 6'	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
SB-2 5'	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
SB-3 5'	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005
MDL	1.0	0.05	0.005	0.005	0.005	0.005

ND not detected

mg/kg milligrams per kilogram

TPHd total petroleum hydrocarbons as diesel

MTBE methy tertiary butyl ether

Table 2
Groundwater Sample Analytical Data

Sample ID	TPH-d (µg/L)	MTBE (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl- benzene (µg/L)	Xylenes (µg/L)
SB-1	<50	<5.0	<0.5	0.62	<0.5	<0.5
SB-2	77	<5.0	<0.5	<0.5	<0.5	<0.5
SB-3	<50	<5.0	<0.5	0.64	<0.5	<0.5
	50	5.0	0.5	0.5	0.5	0.5

ND not detected

µg/L micrograms per liter

TPHd total petroleum hydrocarbons as diesel

MTBE methyl tertiary butyl ether

ATTACHMENT A
SOIL BORING LOGS

Project No: 4481

Sheet: 1 of 1

Project Name: ANDERSON

Log of Borehole: SB-1

Client: M. ANDERSON

Location:

Depth	USCS		Subsurface Description	Sample Data				Well Data	Remarks
	Symbol	Label		Sample Label	Type	Blow/ft	Recovery		
0			Ground Surface						
2	[Dotted Pattern]	SW	SAND Fine to medium sand, few fines	SB-1 6'	SS		85		No hydrocarbon (HC) odor
4									
6									
8									
10		SC	Clayey sands	SB-1 12'	SS		40		Slotted PVC inserted to TD Water slow to generate
12									
14			End of Borehole						
16									
18									
20									

Dril. Date 9-17-01

Reviewed by EW JPD

AEI Consultants
3210 Old Tunnel Road Suite B
Lafayette, CA 94549
(925) 283-6000

Drill Method DIRECT PUSH

Logged by PJM

Total Depth 12

Depth to Water 8.5

Project No: 4481

Sheet: 1 of 1

Project Name: ANDERSON

Log of Borehole: SB-2

Client: M. ANDERSON

Location:

Depth	USCS		Subsurface Description	Sample Data				Well Data	Remarks
	Symbol	Label		Sample Label	Type	Blow/ft	Recovery		
0			Ground Surface						
2	●	SM	SAND Fine to medium sand, some fines present, dry	SB-2 5'	SS		80	M	No HC odor
4									
6	●	SC	Sand with clay, saturated						PVC inserted to 12'
8									
10				SB-2 10'	SS		90		No HC odor
12			End of Borehole						
14									
16									
18									
20									

Drill Date 9/17/01

Reviewed by EW: JPD

AEI Consultants
3210 Old Turner Road, Suite B
Lafayette, CA 94549
(925) 283-6000

Drill Method: DIRECT PUSH

Logged by: PJM

Total Depth: 12

Depth to Water: 7.5

Project No: 4481

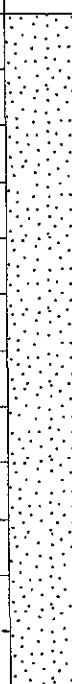
Sheet: 1 of 1

Project Name: ANDERSON

Log of Borehole: SB-3

Client: M. ANDERSON

Location:

Depth	USCS		Subsurface Description	Sample Data				Well Data	Remarks	
	Symbol	Label		Sample Label	Type	Blow/ft	Recovery			
0		SW	Ground Surface							
2										
4										
6					SAND Fine to medium sand, few fines, shoe wet, dry above	SB-3 5'	SS		60	No HC odor Water slow to generated
8										PVC inserted to 10'
10						SB-3 9'	SS		70	No HC odor
12				SC	Sand with clay, saturated					
14					End of Borehole					
16										
18										
20										

Drill Date 9 17 01	Reviewed by EW JPD	AEI Consultants
Drill Method DIRECT PUSH	Logged by PJM	3210 Old Tunnel Road, Suite B
Total Depth 12		Lafayette CA 94549
Depth to Water 5.8?		(925) 283-6000

ATTACHMENT B

SAMPLE ANALYTICAL DOCUMENTATION



McCAMPBELL ANALYTICAL INC.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4484; Anderson	Date Sampled: 09/17/01
		Date Received: 09/17/01
	Client Contact: Peter McIntyre	Date Extracted: 09/17/01
	Client P.O:	Date Analyzed: 09/17/01

09/24/01

Dear Peter:

Enclosed are:

- 1). the results of 6 samples from your #4484; Anderson project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director



McCAMPBELL ANALYTICAL INC.

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 Telephone: 925-798-1620 Fax: 925-798-1622
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All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4484; Anderson	Date Sampled: 09/17/01
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	Client P.O:	Date Extracted: 09/17-09/24/01
		Date Analyzed: 09/17-09/24/01

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g) ⁺	MTBE	Benzene	Toluene	Ethyl-benzene	Xylenes	% Recovery Surrogate
78708	SB-1 6'	S	---	---	ND	ND	ND	ND	107
78710	SB-2 5'	S	---	---	ND	ND	ND	ND	107
78712	SB-3 5'	S	---	---	ND	ND	ND	ND	104
78714	SB-1	W	---	---	ND	0.62	ND	ND	100
78715	SB-2	W	---	---	ND	ND	ND	ND	100
78716	SB-3	W	---	---	ND	0.64	ND	ND	100
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/L, wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

⁺ integrated chromatogram, sample peak coelutes with surrogate peak

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for the interpretation of unmodified or weakly modified gasoline is significant, b) heavier gasoline range compounds are significant aged gasoline? c) lighter gasoline range compounds (the most mobile fraction) are significant, d) gasoline range compounds having broad chromatographic peaks are significant, biologically altered gasoline? e) TPH pattern that does not appear to be derived from gasoline (?), f) one or a few isolated peaks present, g) strongly aged gasoline or diesel range compounds are significant, h) lighter than water immiscible stream is present, i) liquid sample that contains greater than ~5 vol % sediment, j) no recognizable pattern.

Edward Hamilton Edward Hamilton, Lab Director

	McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone: 925-798-1620 Fax: 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com
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All Environmental, Inc. 3210 Old Tunnel Road, Suite B Lafayette, CA 94549-4157	Client Project ID: #4484; Anderson	Date Sampled: 09/17/01
		Date Received: 09/17/01
	Client Contact: Peter McIntyre	Date Extracted: 09/17-09/24/01
	Client P.O.:	Date Analyzed: 09/17-09/24/01

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	% Recovery Surrogate
78708	SB-1 6'	S	---	ND	ND	ND	ND	ND	107
78710	SB-2 5'	S	---	ND	ND	ND	ND	ND	107
78712	SB-3 5'	S	---	ND	ND	ND	ND	ND	104
78714	SB-1	W	---	ND	ND	0.62	ND	ND	100
78715	SB-2	W	---	ND	ND	ND	ND	ND	100
78716	SB-3	W	---	ND	ND	0.64	ND	ND	100
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit		W	50 ug/L	5.0	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* Water and sludge samples are reported in ug/L. (SLUG samples in ug/kg, soil and sludge samples in mg/kg and all TPH and SPH extracts in ug/L)

Collected, stored and analyzed in accordance with standard procedures.

The following were detected in the TPH chromatogram are not shown in table and McCampbell Analytical is not responsible for their identification. The table of results, modified gasoline significant hydrocarbons, gasoline range compounds and significant aged gasoline (lighter or gasoline range compounds) the maximum fraction of significant part of gasoline range compounds having greater than 10% of the total significant hydrocarbons and aged gasoline (lighter or gasoline range compounds) having greater than 10% of the total significant hydrocarbons. (Significant hydrocarbons are defined as those with a concentration greater than 0.05 mg/kg in soil or sludge or 0.5 ug/L in water.) (Significant hydrocarbons are defined as those with a concentration greater than 0.05 mg/kg in soil or sludge or 0.5 ug/L in water.)



McCAMPBELL ANALYTICAL INC.

110 2nd Ave. South, #D7, Pacheco, CA 94553-5560
 Telephone : 925-798-1620 Fax : 925-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

QC REPORT

EPA 8015m + 8020

Date: 09/16/01-09/17/01

Matrix: Soil

Compound	Concentration: mg/kg				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	

SampleID: 90401

Extraction: EPA 5030

Instrument: GC-12

Surrogate1	ND	100.000	98.000	100.00	100	98	2.0
Xylenes	ND	0.314	0.309	0.30	105	103	1.6
Ethylbenzene	ND	0.106	0.105	0.10	106	105	0.9
Toluene	ND	0.105	0.101	0.10	105	101	3.9
Benzene	ND	0.099	0.096	0.10	99	96	3.1
MTBE	ND	0.086	0.085	0.10	86	85	1.2
TPH (gas)	ND	0.828	0.829	1.00	83	83	0.1

SampleID: 90401

Extraction: EPA 3550

Instrument: GC-11 A

Surrogate1	ND	109.000	106.000	100.00	109	106	2.8
TPH (diesel)	ND	143.000	140.000	150.00	95	93	2.1

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \cdot 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \cdot 2100$$

RPD means Relative Percent Deviation



McCAMPBELL ANALYTICAL INC.

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 Telephone : 925-798-1620 Fax : 925-798-1622
<http://www.mccampbell.com> E-mail: main@mccampbell.com

QC REPORT

EPA 8015m + 8020

Date: 09/16/01-09/17/01

Matrix: Water

Compound	Concentration: ug/L				%Recovery		RPD
	Sample	MS	MSD	Amount Spiked	MS	MSD	

SampleID: 91801

Extraction: EPA 5030

Instrument: GC-3

Surrogate1	ND	102.0	100.0	100.00	102	100	2.0
Xylenes	ND	33.1	33.5	30.00	110	112	1.2
Ethylbenzene	ND	10.9	11.0	10.00	109	110	0.9
Toluene	ND	10.7	10.8	10.00	107	108	0.9
Benzene	ND	10.6	10.3	10.00	106	103	2.9
MTBE	ND	10.3	10.7	10.00	103	107	3.8
TPH (gas)	ND	85.2	85.4	100.00	85	85	0.3

SampleID: 91301

Extraction: EPA 3510

Instrument: GC-2 A

Surrogate1	ND	102.0	103.0	100.00	102	103	1.0
TPH (diesel)	ND	6675.0	6950.0	7500.00	89	93	4.0

$$\% \text{ Recovery} = \frac{(MS - \text{Sample})}{\text{Amount Spiked}} \times 100$$

$$RPD = \frac{(MS - MSD)}{(MS + MSD)} \times 2100$$

RPD means Relative Percent Deviation

27807 Zale 436

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553

Telephone (925) 798-1620

Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME

RUSH 24 HOUR 48 HOUR 5 DAY

Report To: Peter McIntyre
Company: All Environmental
3210 Old Tunnel Road, Suite B
Lafayette, CA 94549 4157
Tele: (925) 283 6000
Project #: 448.1
Project Location: G. gravel / San Jose
Sampler Signature: *[Signature]*

Bill To:

Analysis Request

Other

Comments

SAMPLE ID	LOCATION	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED		BTEX & TPH as Gas (602/8020 + 8015) MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI	Other	Comments		
		Date	Time			Water	Soil	Air	Sludge	Other	Ice	HCl																		HNO ₃	Other
SB-1 6'		9/17/01		1	Linea		X						X																		78708
SB-1 12'				1			X						X																		78709 H
SB-2 5'				1			X						X																		78710
SB-2 10'				1			X						X																		78711 H
SB-3 5'				1			X						X																		78712
SB-3 9'				1			X						X																		78713 H
SB-1 w				3	4/10a	X							X																		Hold
SB-2 w				3	"	X							X																		78714
SB-3 w				3	"	X							X																		78715

VOAST O&G METALS OTHER

WEL®
GOOD CONDITION
HEAD SPACE ABSENT
PRESERVATION APPROPRIATE
CONTAINERS

Relinquished By: *[Signature]* Date: 9/17/01 Time: 2:40 PM Received By: *[Signature]* Date: 9/17/01 Time: 3:00 PM
Relinquished By: *[Signature]* Date: 9/17/01 Time: 3:00 PM Received By: *[Signature]* Date: 9/17/01 Time: 3:15 PM
Relinquished By: *[Signature]* Date: 9/17/01 Time: 3:15 PM Received By: *[Signature]* Date: 9/17/01 Time: 3:30 PM

Remarks: Silica-gel clean-up ~~for~~ for Diesel runs