

97 JUN -3 PM 3:02

Project No.  
3174-F9

May 6, 1997

Mr. Dick Alford  
Livermore Valley Joint Unified School District  
685 East Jack London Boulevard  
Livermore, CA 94550

*Recommend Risk Analysis  
with risk management plan.  
See Pgt. insert.*

Subject: Maintenance Yard  
2900 Ladd Avenue  
Livermore, California

## REPORT ON GROUND-WATER SAMPLING

Reference: ENGEO Inc.; Proposed Ground-Water Monitoring Well Sampling Program,  
2900 Ladd Avenue, Livermore, California, dated October 1, 1996.

Dear Mr. Alford:

ENGEO is pleased to provide the results from the most recent sampling and laboratory testing of the ground water monitoring wells located at 2900 Ladd Avenue in Livermore, California. This report presents the results of the April 1997 sampling event as recommended in the referenced report. The scope of services included the following:

- Purging of the three groundwater monitoring wells with the recovery of a ground-water sample from each of the wells.
- Laboratory analysis of the groundwater samples for TPH as gasoline; benzene, toluene, ethyl benzene and xylenes (BTEX); and methyl t-butyl ether (MTBE).
- Preparation of this letter report.

### Ground-Water Sampling

Field work was conducted on April 29, 1997. The depth to the top of the ground water was verified and the wells were checked for the presence of free product or petroleum sheen. No free product or sheen was observed. Prior to sampling, approximately four casing volumes of water were removed from the wells using a submersible electric pump. Water quality parameters including, temperature, pH, and conductivity were monitored to allow for adequate purging. The ground-water samples were collected for laboratory testing using a disposable polyethylene bailer. The samples were then decanted into precleaned laboratory glassware and cooled in an ice chest until delivery under a documented chain-of-custody to Chromalab, Inc. in Pleasanton, California. The well sampling information forms and the chain-of-custody are provided as attachments.

Laboratory Analysis

The ground-water samples were tested for total petroleum hydrocarbons as gasoline TPH (g); benzene, toluene, ethyl benzene and xylenes (BTEX); and methyl t-butyl ether (MTBE). A copy of the laboratory test report is provided as an attachment. Table I provides a summary of the laboratory test results.

**TABLE I**  
 Laboratory Analysis Summary  
 (Concentrations reported in parts per billion)

	DTW	Elevation	TPHg	B	T	E	X	MTBE
<b>MW2</b> 32 to 57' screen interval								
4/20/93	30.81	100.00	4,500	340	110	8.0	630	NT
5/12/94	31.12	100.00	7,000	520	220	35	410	NT
2/8/95	28.04	100.00	170	8.9	4.5	2.1	17	NT
5/23/95	17.77	100.00	<50	<0.5	<0.5	<0.5	<0.5	NT
9/20/95	25.55	100.00	8,400	2,500	1,200	180	940	NT
12/29/95	20.91	100.00	640	0.7	<0.5	1.9	4.7	NT
11/01/96	22.63	100.00	1600	390	140	25	120	NT
4/29/97	20.39	100.00	4900	640	240	83	200	<250
<b>MW3</b> 28 to 53'								
7/12/94	38.76	98.85	<50	<0.5	<0.5	<0.5	<0.5	NT
2/8/95	27.08	98.85	<50	<0.5	<0.5	<0.5	<0.5	NT
5/23/95	17.28	98.85	<50	<0.5	<0.5	<0.5	<0.5	NT
9/20/95	25.06	98.85	<50	1.4	<0.5	<0.5	<0.5	NT
12/29/95	20.25	98.85	50	1.8	<0.5	<0.5	<0.5	NT
11/01/96	22.22	98.85	<50	<0.5	<0.5	<0.5	<0.5	NT
4/29/97	20.05	98.85	<50	1.7	<0.5	<0.5	<0.5	<5.0
<b>MW4</b> 28-53'								
7/12/94	39.50	99.22	<50	<0.5	<0.5	<0.5	<0.5	NT
2/8/95	27.66	99.22	<50	<0.5	<0.5	<0.5	<0.5	NT
5/23/95	17.68	99.22	60	<0.5	<0.5	<0.5	<0.5	NT
9/20/95	25.81	99.22	<50	<0.5	<0.5	<0.5	<0.5	NT
12/29/95	20.90	99.22	<50	<0.5	<0.5	<0.5	<0.5	NT
11/01/96	22.84	99.22	<50	2.7	<0.5	<0.5	<0.5	NT
4/29/97	20.57	99.22	<50	2.6	<0.5	<0.5	<0.5	9.2

DTW: Depth to water (ft.)  
 Elevation: Relative casing elevation (ft.)  
 NT: Not Tested

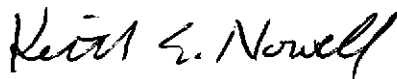
Detectable concentrations of benzene were reported in the three wells (Table 1). Detectable concentrations of MTBE were observed in MW-4. Concentrations of TPH (g) and BTEX were reported in MW-2.

There are no further sampling episodes scheduled for the three wells. With your authorization, a copy of this report will be provided to Ms. Eva Chu with the Alameda County Department of Environmental Health. We appreciate the opportunity to be of continued service to you on this project. If you have any questions, please contact our office.

Very truly yours,

ENGEO INCORPORATED

Reviewed by:



Keith Nowell  
Environmental Geologist



Brian Flaherty  
Vice President



Shawn Munger  
Environmental Services Manager  
RG 5810

sm/lb:gws  
Attachments

cc: 1 - Alameda County Department of Environmental Health, Ms. Eva Chu

**LIST OF ATTACHMENTS**

Figure 1 - Monitoring Well Locations

Three Ground-Water Sampling Information Forms

Chromalab, Inc. Report

Chain-of-Custody

**ENGEO INCORPORATED  
GROUND-WATER SAMPLING INFORMATION**

Job Name: 2900 Ladd Avenue

Job Number: 3174-F9

Location: Livermore, California

Date: April 29, 1997

Client: L.V.J.U.S.D.

By: Keith Nowell

**WELL INFORMATION**

Well Number: MW-2

Diameter (in): 2

Total Depth (ft): 56.78 (toc)

Screen Length: 25'

Depth to Water (ft): 20.39 (toc)

Casing Volume (gal): 6.1

**PURGING INFORMATION**

Bailer: Pump: X (rate): 1.5 gpm

Time: (init./fin) 11:08/11:25

Volume Removed (gal): 25

No. of Casing Vol: 4.1

Time	Volume Removed (Gal.)	Total Casing Volumes	Temp °F	Cond (µS)	pH	Comments
11:08	--	--	--	--	--	Initial, no odor, no sheen
11:13	5	0.8	72.1	799	6.4	Turbid
11:17	10	1.6	69.2	777	6.2	Slightly turbid
11:20	15	2.5	68.7	679	6.2	Slightly turbid
11:22	20	3.3	68.5	676	6.1	Slightly turbid
11:25	25	4.1	68.9	787	6.1	Slightly turbid

**SAMPLE INFORMATION**

Bailer: X Pump: (gpm):

Decon Procedure: TSP

Dist. H<sub>2</sub>O

Disposable: X

Other

Sample	Time	Size	Presv.	Test	Comments
MW-2	11:40	40ml (3)	ACID	TPHg/BTEX/MTBE	Slightly turbid

3174-F9  
May 6, 1997

**ENGEO INCORPORATED  
GROUND-WATER SAMPLING INFORMATION**

Job Name: 2900 Ladd Avenue

Job Number: 3174-F9

Location: Livermore, California

Date: April 29, 1997

Client: L.V.J.U.S.D.

By: Keith Nowell

**WELL INFORMATION**

Well Number: MW-3

Diameter (in): 2

Total Depth (ft): 52.52 (toc)

Screen Length: 25'

Depth to Water (ft): 20.05 (toc)

Casing Volume (gal): 5.5

**PURGING INFORMATION**

Bailer: Pump: X (rate): 2.0 gpm

Time: (init./fin) 10:23/10:34

Volume Removed (gal): 22

No. of Casing Vol: 4.0

Time	Volume Removed (Gal.)	Total Casing Volumes	Temp °F	Cond (µS)	pH	Comments
10:23	--	--	--	--	--	Initial, no odor, no sheen
10:25	5.5	1.0	69.5	1084	6.9	Slightly turbid
10:28	11	2.0	67.1	1059	6.4	Slightly turbid
10:31	16.5	3.0	67.4	1045	6.4	Slightly turbid
10:34	22	4.0	67.2	1028	6.3	Slightly turbid

**SAMPLE INFORMATION**

Bailer: X Pump: (gpm):

Decon Procedure: TSP

Dist. H<sub>2</sub>O

Disposable: X

Other

Sample	Time	Size	Presv.	Test	Comments
MW-3	10:40	40ml (3)	ACID	TPHg/BTEX/MTBE	Slightly turbid

3174-F9  
May 6, 1997

**ENGEO INCORPORATED  
GROUND-WATER SAMPLING INFORMATION**

<u>Job Name: 2900 Ladd Avenue</u>	<u>Job Number: 3174-F9</u>
<u>Location: Livermore, California</u>	<u>Date: April 29, 1997</u>
<u>Client: L.V.J.U.S.D.</u>	<u>By: Keith Nowell</u>

**WELL INFORMATION**

<u>Well Number: MW-4</u>	<u>Diameter (in): 2</u>
<u>Total Depth (ft): 53.55 (toc)</u>	<u>Screen Length: 25'</u>
<u>Depth to Water (ft): 20.57 (toc)</u>	<u>Casing Volume (gal): 5.5</u>

**PURGING INFORMATION**

<u>Bailer: Pump: X (rate): 1.6 gpm</u>	<u>Time: (init./fin) 09:30/09:44</u>
<u>Volume Removed (gal): 22</u>	<u>No. of Casing Vol: 4.0</u>

Time	Volume Removed (Gal.)	Total Casing Volumes	Temp °F	Cond (µS)	pH	Comments
09:30	--	--	--	--	--	Initial, no odor, no sheen
09:34	5.5	1.0	69.3	1330	7.1	Clear
09:39	11	2.0	70.0	1187	6.7	Slightly turbid
09:42	16.5	3.0	69.7	1297	6.6	Clear
09:44	22	4.0	69.2	1241	6.6	Slightly turbid

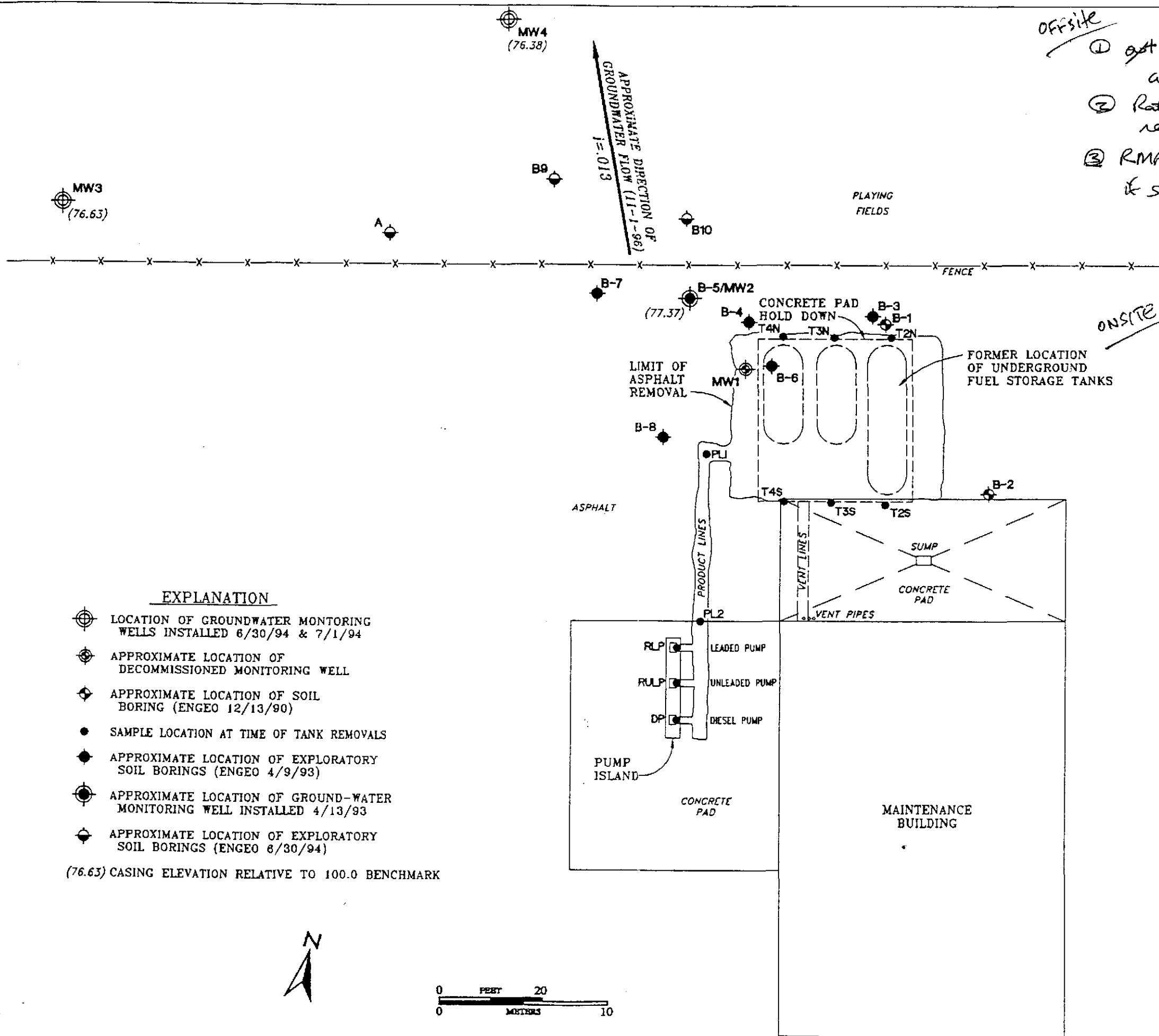
**SAMPLE INFORMATION**

<u>Bailer: X Pump: (gpm):</u>	<u>Dist. H<sub>2</sub>O</u>
<u>Decon Procedure: TSP</u>	<u>Other</u>
<u>Disposable: X</u>	

Sample	Time	Size	Presv.	Test	Comments
MW-4	10:00	40ml (3)	ACID	TPHg/BTEX/MTBE	Clear

3174-F9  
May 6, 1997

COPYRIGHT © 1996 BY ENGEO INCORPORATED. THIS DOCUMENT MAY NOT BE REPRODUCED IN WHOLE OR IN PART BY ANY MEANS WHATSOEVER, NOR MAY IT BE QUOTED OR EXCERPTED WITHOUT THE EXPRESS WRITTEN CONSENT OF ENGEO INCORPORATED.



*Offsite*

- ① get GW + soil vol to outside air (Tier 1)
- ② Rationale that site will remain open field
- ③ RMPP construction worker if soil cont at 5'

*ONSITE*

- ① same
- ② indoor air, unless RMPP w/ dead restric will not be over contain
- ③ include in RMPP construction works

**EXPLANATION**

- ⊕ LOCATION OF GROUNDWATER MONITORING WELLS INSTALLED 6/30/94 & 7/1/94
- ⊙ APPROXIMATE LOCATION OF DECOMMISSIONED MONITORING WELL
- ◆ APPROXIMATE LOCATION OF SOIL BORING (ENGEO 12/13/90)
- SAMPLE LOCATION AT TIME OF TANK REMOVALS
- ◆ APPROXIMATE LOCATION OF EXPLORATORY SOIL BORINGS (ENGEO 4/9/93)
- ⊕ APPROXIMATE LOCATION OF GROUND-WATER MONITORING WELL INSTALLED 4/13/93
- ◆ APPROXIMATE LOCATION OF EXPLORATORY SOIL BORINGS (ENGEO 6/30/94)

(76.63) CASING ELEVATION RELATIVE TO 100.0 BENCHMARK

FIGURE NO. **1**

JOB NO.: 3174-P9  
 DATE: MAY 1997  
 DRAWN BY: [Signature]  
 CHECKED BY: [Signature]

**MONITORING WELL LOCATIONS**  
 L.V.J.U.S.D. MAINTENANCE YARD  
 2900 LADD AVENUE  
 LIVERMORE, CALIFORNIA

**ENGEO**  
 INCORPORATED



# CHROMALAB, INC.

Environmental Services (SDB)

May 7, 1997

Submission #: 9704482

ENGEQ, INC.

Atten: Keith Norwell

Project: 2900 LADD AVENUE  
Received: April 29, 1997

Project#: 3174-F8

re: One sample for Gasoline BTEX MTBE analysis.  
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: MW-2

Spl#: 129343

Matrix: WATER


Sampled: April 29, 1997


Run#: 6700

Analyzed: May 7, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	4900	2500	N.D.	108	50
MTBE	N.D.	250	N.D.	90	50
BENZENE	640	25	N.D.	91	50
TOLUENE	240	25	N.D.	93	50
ETHYL BENZENE	83	25	N.D.	95	50
XYLENES	200	25	N.D.	98	50

Note: Reporting Limits Increased Due To Matrix Interference.

  
Kayvan Kimyai  
Chemist

  
Marianne Alexander  
Gas/BTEX Supervisor

# CHROMALAB, INC.

Environmental Services (SDB)

May 7, 1997

Submission #: 9704482

ENGEO, INC.

Atten: Keith Norwell

Project: 2900 LADD AVENUE  
Received: April 29, 1997

Project#: 3174-F8

re: One sample for Gasoline BTEX MTBE analysis.  
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: MW-4

Spl#: 129345


Matrix: WATER

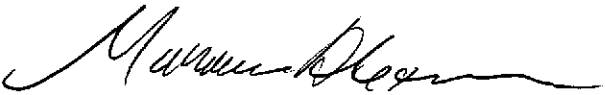
Sampled: April 29, 1997

Run#: 6700

Analyzed: May 6, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	108	1
MTBE	9.2	5.0	N.D.	90	1
BENZENE	2.6	0.50	N.D.	91	1
TOLUENE	N.D.	0.50	N.D.	93	1
ETHYL BENZENE	N.D.	0.50	N.D.	95	1
XYLENES	N.D.	0.50	N.D.	98	1

  
Kayvan Kimyai  
Chemist

  
Marianne Alexander  
Gas/BTEX Supervisor

# CHROMALAB, INC.

Environmental Services (SDB)

May 7, 1997

Submission #: 9704482

ENGE0, INC.

Atten: Keith Norwell

Project: 2900 LADD AVENUE  
Received: April 29, 1997

Project#: 3174-F8

re: One sample for Gasoline BTEX MTBE analysis.  
Method: SW846 8020A Nov 1990 / 8015Mod

Client Sample ID: MW-3

Spl#: 129344


Matrix: WATER


Sampled: April 29, 1997

Run#: 6700

Analyzed: May 7, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE	N.D.	50	N.D.	108	1
MTBE	N.D.	5.0	N.D.	90	1
BENZENE	1.7	0.50	N.D.	91	1
TOLUENE	N.D.	0.50	N.D.	93	1
ETHYL BENZENE	N.D.	0.50	N.D.	95	1
XYLENES	N.D.	0.50	N.D.	98	1

  
Kayvan Kimyai  
Chemist

  
Marianne Alexander  
Gas/BTEX Supervisor

# CHROMALAB, INC.

Environmental Service (SDB)

## Sample Receipt Checklist

Client Name: **ENGEO, INC.**

Date/Time Received: **04/29/97** | 1240

Reference/Submis: **33430** | **9704482**

Received by: MN

Checklist completed by: Chris Koucky

Reviewed by: MN 4/30/97

Signature

Date

Initials | Date

Matrix: H<sub>2</sub>O Carrier name: Client C/L \_\_\_\_\_

Shipping container/cooler in good condition? Yes  No  Not Present

Custody seals intact on shipping container/cooler? Yes  No  Not Present

Custody seals intact on sample bottles? Yes  No  Not Present

Chain of custody present? Yes  No

Chain of custody signed when relinquished and received? Yes  No

Chain of custody agrees with sample labels? Yes  No

Samples in proper container/bottle? Yes  No

Sample containers intact? Yes  No

Sufficient sample volume for indicated test? Yes  No

All samples received within holding time? Yes  No

Container/Temp Blank temperature in compliance? Temp: 7.7 °C Yes  No

Water - VOA vials have zero headspace? No VOA vials submitted  Yes  No

Water - pH acceptable upon receipt?  Adjusted?  Checked by chemist for VOAs

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted: \_\_\_\_\_ Date contacted: \_\_\_\_\_ Person contacted: \_\_\_\_\_

Contacted by: \_\_\_\_\_ Regarding: \_\_\_\_\_

Comments: \_\_\_\_\_

Corrective Action: \_\_\_\_\_

482/129343-129345

33429<sup>m</sup>  
33430

**ENGEO**  
INCORPORATED  
2401 CROW CANYON ROAD, SUITE 200  
SAN RAMON, CALIFORNIA 94583  
PHONE (510) 838-1600

**CHAIN OF CUSTODY RECORD**

PROJECT NUMBER		PROJECT NAME					TPH - GASOLINE (EPA 8015/5030)	TPH - DIESEL (EPA 8015/2550/2510)	PURGEABLE AROMATICS BTX (EPA 802, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240)	BASE/NEUTRALS, ACIDS (EPA 825, 8270)	TOTAL OIL & GREASE (SMWW 5520(F))	OC PESTICIDES/PCB (EPA 608, 8080)	OP PESTICIDES (EPA 614/8140)	TITLE 26 METALS (17)	PRIORITY METALS (13)	REMARKS REQUIRED DETECTION LIMITS													
3174-FB		2900 Ladd Avenue																													
SAMPLED BY: (SIGNATURE)		DATE					TIME					MATRIX					NUMBER OF CONTAINERS					CONTAINER SIZE					PRESERVATIVE (HCl)				
Keith Nowell		4/29/97					10:00					Aqueous					3					40ml					Acid				
Keith Nowell		4/29/97					10:40					Aqueous					3					40ml					Acid				
Keith Nowell		4/29/97					11:40					Aqueous					3					40ml					Acid				
RELINQUISHED BY: (SIGNATURE)		DATE/TIME					RECEIVED BY: (SIGNATURE)					RELINQUISHED BY: (SIGNATURE)					DATE/TIME					RECEIVED BY: (SIGNATURE)									
Keith Nowell		4/29/97 12:40																													
RELINQUISHED BY: (SIGNATURE)		DATE/TIME					RECEIVED BY: (SIGNATURE)					RELINQUISHED BY: (SIGNATURE)					DATE/TIME					RECEIVED BY: (SIGNATURE)									
RELINQUISHED BY: (SIGNATURE)		DATE/TIME					RECEIVED FOR LABORATORY BY: (SIGNATURE)					DATE/TIME					REMARKS														
							[Signature]					4/29/1240					Standard TAT														

JMP #: 9704482 REP: PM  
CLIENT: ENGEO  
JE: 05/06/97  
EF #: 33430

MTBE ADDED  
AS PER KEITH  
NOWELL 4/29/97