

**Technical Report for**

**KRW Consulting, Inc.**

**XOM FRU 197-33A**

**1103-03A**

**Accutest Job Number: D28913**

**Sampling Date: 10/24/11**

**Report to:**

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**Total number of pages in report: 23**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

**Brad Madadian**  
**Laboratory Director**

**Client Service contact: 303-425-6021**

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

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Test results relate only to samples analyzed.

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## Sample Summary

KRW Consulting, Inc.

Job No: D28913

XOM FRU 197-33A  
Project No: 1103-03A

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
D28913-1	10/24/11	13:00 DK	10/27/11	SO	Soil	LONE SPOIL

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Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** KRW Consulting, Inc.

**Job No** D28913

**Site:** XOM FRU 197-33A

**Report Dat** 10/31/2011 4:57:01 PM

On 10/27/2011, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 0.2 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D28913 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

<b>Matrix</b> SO	<b>Batch ID:</b> V5V1091
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- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D28910-1MS, D28910-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method SW846 8015B

<b>Matrix</b> SO	<b>Batch ID:</b> GGB773
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- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D28909-1MS, D28909-1MSD were used as the QC samples indicated.

### Extractables by GC By Method SW846-8015B

<b>Matrix</b> SO	<b>Batch ID:</b> OP4740
------------------	-------------------------

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D28910-1MS, D28910-1MSD were used as the QC samples indicated.

### Wet Chemistry By Method SM19 2540B M

<b>Matrix</b> SO	<b>Batch ID:</b> GN12218
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- The data for SM19 2540B M meets quality control requirements.

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

Sample Results

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Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> LONE SPOIL	
<b>Lab Sample ID:</b> D28913-1	<b>Date Sampled:</b> 10/24/11
<b>Matrix:</b> SO - Soil	<b>Date Received:</b> 10/27/11
<b>Method:</b> SW846 8260B	<b>Percent Solids:</b> 96.8
<b>Project:</b> XOM FRU 197-33A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V18234.D	1	10/28/11	DC	n/a	n/a	V5V1091
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.07 g	5.0 ml	100 ul
Run #2			

### Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	53	23	ug/kg	
108-88-3	Toluene	ND	110	53	ug/kg	
100-41-4	Ethylbenzene	ND	110	26	ug/kg	
1330-20-7	Xylene (total)	ND	210	110	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	96%		61-130%
460-00-4	4-Bromofluorobenzene	94%		53-131%
17060-07-0	1,2-Dichloroethane-D4	88%		62-130%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

3.1  
3

<b>Client Sample ID:</b> LONE SPOIL		
<b>Lab Sample ID:</b> D28913-1		<b>Date Sampled:</b> 10/24/11
<b>Matrix:</b> SO - Soil		<b>Date Received:</b> 10/27/11
<b>Method:</b> SW846 8015B		<b>Percent Solids:</b> 96.8
<b>Project:</b> XOM FRU 197-33A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB13653.D	1	10/27/11	SK	n/a	n/a	GGB773
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	11	5.3	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	88%		60-140%		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

<b>Client Sample ID:</b> LONE SPOIL	<b>Date Sampled:</b> 10/24/11
<b>Lab Sample ID:</b> D28913-1	<b>Date Received:</b> 10/27/11
<b>Matrix:</b> SO - Soil	<b>Percent Solids:</b> 96.8
<b>Method:</b> SW846-8015B SW846 3546	
<b>Project:</b> XOM FRU 197-33A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD11131.D	1	10/28/11	CS	10/28/11	OP4740	GFD553
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	57.8	14	8.9	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	72%		61-142%		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Misc. Forms

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Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody



# Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D28913

Client: KRW

Immediate Client Services Action Required: No

Date / Time Received: 10/27/2011 8:50:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: XOM

Airbill #'s: FEDEX

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared gun	
3. Cooler media:	Ice (bag)	

<u>Quality Control Preservation</u>	<u>Y or N</u>		<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y or N</u>		<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

4.1  
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## GC/MS Volatiles

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### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1091-MB	5V18228.D	1	10/28/11	DC	n/a	n/a	V5V1091

The QC reported here applies to the following samples:

Method: SW846 8260B

D28913-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	22	ug/kg	
100-41-4	Ethylbenzene	ND	100	25	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	200	100	ug/kg	

CAS No.	Surrogate Recoveries	Limits	
2037-26-5	Toluene-D8	104%	61-130%
460-00-4	4-Bromofluorobenzene	88%	53-131%
17060-07-0	1,2-Dichloroethane-D4	87%	62-130%

# Blank Spike Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1091-BS	5V18229.D	1	10/28/11	DC	n/a	n/a	V5V1091

The QC reported here applies to the following samples:

Method: SW846 8260B

D28913-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	55.5	111	70-130
100-41-4	Ethylbenzene	50	57.8	116	70-130
108-88-3	Toluene	50	55.4	111	70-130
1330-20-7	Xylene (total)	150	172	115	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	101%	61-130%
460-00-4	4-Bromofluorobenzene	106%	53-131%
17060-07-0	1,2-Dichloroethane-D4	88%	62-130%

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D28910-1MS	5V18231.D	1	10/28/11	DC	n/a	n/a	V5V1091
D28910-1MSD	5V18232.D	1	10/28/11	DC	n/a	n/a	V5V1091
D28910-1	5V18230.D	1	10/28/11	DC	n/a	n/a	V5V1091

The QC reported here applies to the following samples:

Method: SW846 8260B

D28913-1

CAS No.	Compound	D28910-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	122		3770	112	3700	110	2	70-134/30
100-41-4	Ethylbenzene	58.5	J	3810	115	3760	114	1	70-137/30
108-88-3	Toluene	382		3900	108	3900	108	0	70-130/30
1330-20-7	Xylene (total)	432		11900	117	11700	115	2	61-131/30

CAS No.	Surrogate Recoveries	MS	MSD	D28910-1	Limits
2037-26-5	Toluene-D8	99%	97%	98%	61-130%
460-00-4	4-Bromofluorobenzene	110%	109%	93%	53-131%
17060-07-0	1,2-Dichloroethane-D4	83%	84%	82%	62-130%

5.3.1  
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## GC Volatiles

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## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB773-MB	GB13645.D	1	10/27/11	SK	n/a	n/a	GGB773

The QC reported here applies to the following samples:

Method: SW846 8015B

D28913-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	80% 60-140%

# Blank Spike Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB773-BS	GB13646.D	1	10/27/11	SK	n/a	n/a	GGB773

The QC reported here applies to the following samples:

Method: SW846 8015B

D28913-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	122	111	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	92%	60-140%

# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D28909-1MS	GB13648.D	1	10/27/11	SK	n/a	n/a	GGB773
D28909-1MSD	GB13649.D	1	10/27/11	SK	n/a	n/a	GGB773
D28909-1	GB13647.D	1	10/27/11	SK	n/a	n/a	GGB773

The QC reported here applies to the following samples:

Method: SW846 8015B

D28913-1

CAS No.	Compound	D28909-1 mg/kg	Spike Q	mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	5.86	J	121	135	106	136	107	1	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D28909-1	Limits
120-82-1	1,2,4-Trichlorobenzene	93%	88%	93%	60-140%

## GC Semi-volatiles

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## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4740-MB	FD11124.D	1	10/28/11	CS	10/28/11	OP4740	GFD553

The QC reported here applies to the following samples:

Method: SW846-8015B

D28913-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	13	8.7	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	110% 61-142%

7.1.1  
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# Blank Spike Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4740-BS	FD11125.D	1	10/28/11	CS	10/28/11	OP4740	GFD553

The QC reported here applies to the following samples:

Method: SW846-8015B

D28913-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	648	97	60-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	98%	61-142%

7.2.1

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# Matrix Spike/Matrix Spike Duplicate Summary

**Job Number:** D28913  
**Account:** KRWCCOL KRW Consulting, Inc.  
**Project:** XOM FRU 197-33A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP4740-MS	FD11126.D	1	10/28/11	CS	10/28/11	OP4740	GFD553
OP4740-MSD	FD11127.D	1	10/28/11	CS	10/28/11	OP4740	GFD553
D28910-1	FD11128.D	1	10/28/11	CS	10/28/11	OP4740	GFD553

The QC reported here applies to the following samples:

Method: SW846-8015B

D28913-1

CAS No.	Compound	D28910-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	ND	768	718	93	721	94	0	24-157/35

CAS No.	Surrogate Recoveries	MS	MSD	D28910-1	Limits
84-15-1	o-Terphenyl	86%	83%	86%	61-142%

7.3.1

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