

# Earth Technologies of New Mexico

ETNM PR-001

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## Remediation and Site Delineation Protocol GIANT HANAGAN STATE #1 ACO - 269

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### 1.0 Purpose

This protocol is to provide a detailed outline of the steps to be employed in the remediation of two (2) unregistered pits in Eddy County, New Mexico.

### 2.0 Scope

This protocol is site specific for the above project.

### 3.0 Preliminary

Prior to any field operations, Earth Technologies of New Mexico will conduct the following activities:

#### 3.1 Client Review

3.1 ETNM will meet with appointed personnel within New Tech Global Ventures to review this protocol and make any requested modifications or alterations.

3.2 Changes to this protocol will be documented and submitted for final review by New Tech Global Ventures prior to the initiation of actual fieldwork.

3.3 Upon client approval, this protocol and supporting documentation will be submitted to the Hobbs district office of the NMOCD for approval.

#### 4.0 Safety

4.1 Prior to work on the site, ETNM will obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate, sub-contractors.

4.2 A tailgate safety meeting will be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location will be wearing standard PPE, and Fire Retardant Clothing or Coveralls. Each vehicle must be equipped with two way communication capabilities.

## **5.0 Delineation Procedure**

5.1 Approximately 48 cubic yards of previously excavated materials will be re-deposited within the existing excavation.

5.2 Using information obtained from historic satellite imagery, the approximate locations of the pits will be established and an EM-38 survey run extending to a minimum distance of twenty feet beyond each pit perimeter.

5.3 The approximate center of each pit and one background sample will be bored to a minimum depth of 5' below ground surface and a composite sample of each obtained in accordance with WEQP-77.

5.3 Any significant electromagnetic anomalies discovered in the investigation will be field titrated for the presence and concentration of chlorides in accordance with WEQP-97 and volatile organic compounds (VOC's) in accordance with WEQP-18A.

5.4 The composite samples will be forwarded to Cardinal Laboratories for analysis of the presence and concentrations of Total Petroleum Hydrocarbons (TPH) SW-846 8015M, BTEX SW-846 8021B and chlorides.

## **6.0 Delineation Report**

At the conclusion of the project, ETNM will prepare a delineation report which contains the following minimum information:

- Photographs of the location prior to movement of any materials
- Photographs of all excavations at the point of maximum soil removal
- Photographs of the location at time of the leveled location
- Laboratory analytical reports of all sampled materials
- Copies of this protocol and all testing procedures

## ETNM INC. CL- FIELD TITRATION RESULTS

**LOCATION: GIANT HANAGAN ST. #1**

**DEPTH TO GW: +/- 300'>325'**

**1/13/2012**

Sample pt	Time	Depth	Soil	Water	CF	AGNO <sub>3</sub>	CL-	PID	SOIL LITHOLOGY	LAB CL-	B	T	E	X	GRO	DRO
Back Ground	953	0'>6"	9 5	28 9	3.04	0 03	91	N/A	7 5YR-3/4 very dark brown sandy loam damp no odor	112	<0 050	<0.050	<0 050	<0 150	<10 0	<10 0
	956	2 5'	11 3	27.5	2 43	0 03	73	N/A	7 5YR-8/2 pinkish white fractured rocky sandy caliche dry no odor							
	958	5'	10 8	25 8	2 39	0 09	215	N/A	7 5YR-8/2 pinkish white fractured rocky sandy caliche dry no odor							
Large Pit Center	145	0'>6"	13 1	29 2	2.23	1.68	3744	N/A	5YR-4/2 dark reddish gray sandy rocky caliche loam damp no odor							
	149	2.5'	11.7	27 2	2 32	2 85	13247	N/A	10YR-7/2 light gray fractured rocky sandy caliche damp no odor	10800					<10 0	<10.0
	151	5'	9 1	29 3	3 22	0 72	4635	N/A	10YR-6/3 pale brown rocky sandy caliche damp slight odor	4400	<0.050	<0 050	0 249	<0 150	<50 0	11400
Small Pit Center	153	0'>6"	12 6	26.9	2 13	0 1	427	N/A	5YR-6/4/2 dark reddish gray sandy rocky caliche loam damp no odor	272					<10 0	42 9
	155	2 5'	12 9	26 4	2 05	0 2	818	N/A	7 5YR-5/3 brown sandy rocky caliche damp no odor							
	157	5'	13 2	26 7	2.02	0 39	1577	N/A	7 5YR-8/2 pinkish white fractured rocky sandy caliche dry no odor	1310	<0 050	<0 050	<0 050	<0 150	<10 0	<10 0

**2/10/2012**

Sample pt	TIME	DEPTH	SOIL	WATER	CF	AGNO <sub>3</sub>	CL-	PID	SOIL LITHOLOGY
B1	117	10'	10 3	29 3	2 84	0 79	4493	2 7	2 5YR-7/4 light reddish brown sandy sand damp
	215	15'	10 1	30	2 97	0 87	5167	11 5	2 5YR-7/4 light reddish brown sandy sand damp
	347	20'	10 3	29 5	2 86	0 83	4753	7 6	2 5YR-7/4 light reddish brown sandy sand damp
	418	25'	10	31 3	3 13	0 74	4631	4 7	2 5YR-7/4 light reddish brown sandy sand damp
	443	30'	10 7	31 8	2 97	0 84	4991	3 8	2 5YR-7/4 light reddish brown sandy sand damp

**2/11/2012**

B1	NO SAMPLE BIT REFUSAL, pulled off of bore, due to auger getting stuck and no advancement after 2hrs, very hard caliche or indurated sandstone								
B2	111	10'	10 4	26 6	2 56	0 75	3835	3 6	2 5YR-7/3 light reddish brown sandy sand damp
	212	15'	10 5	29 4	2 80	0 93	5206	2 3	2 5YR-7/4 light reddish brown sandy sand damp
	241	20'	10 3	26 5	2 57	1 05	5401	1 5	2 5YR-7/4 light reddish brown sandy sand damp

# ETNM INC. CL- FIELD TITRATION RESULTS

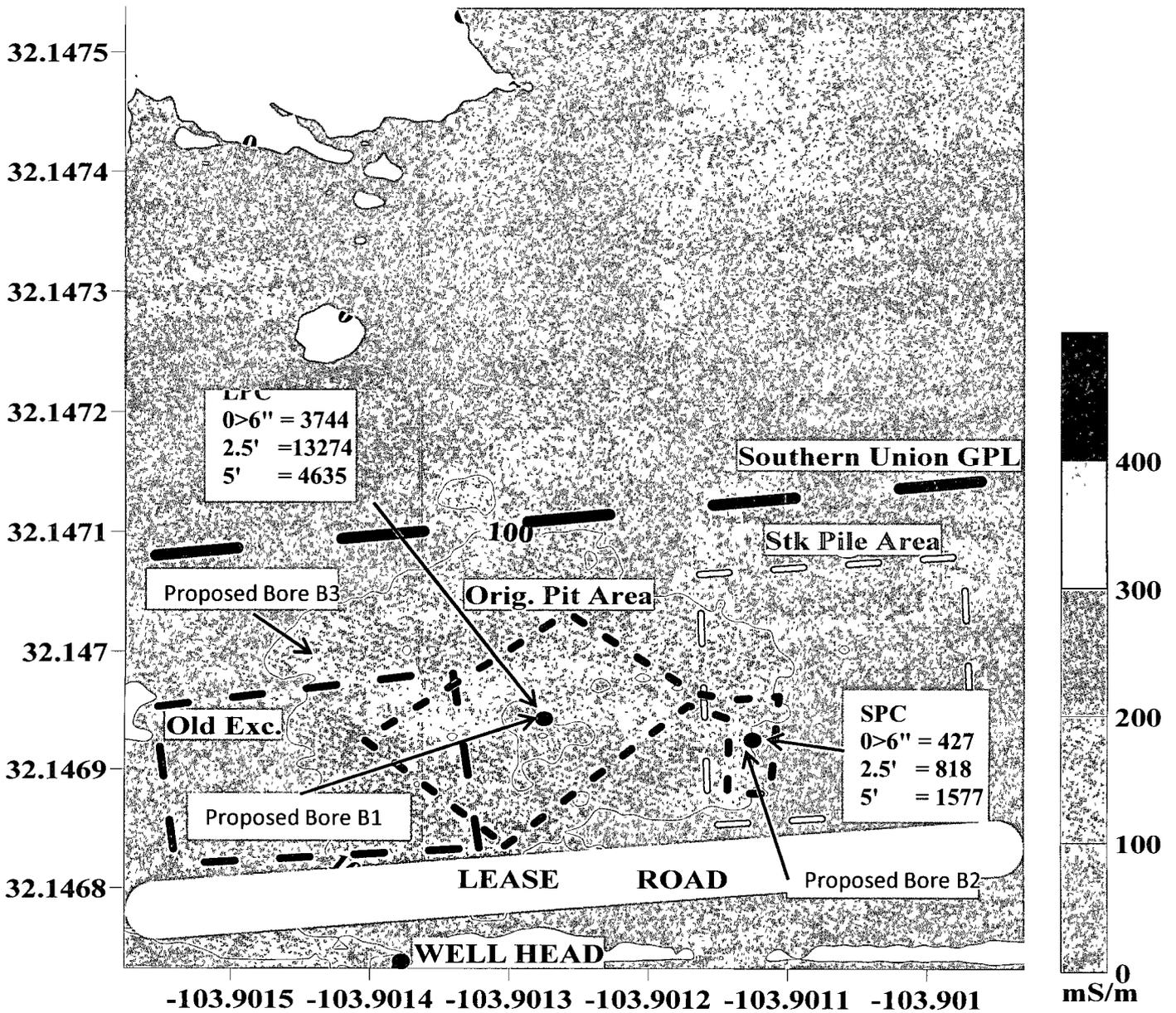
**LOCATION: GIANT HANAGAN ST. #1**

**DEPTH TO GW: +/- 300'>325'**

**1/13/2012**

Sample pt	Time	Depth	Soil	Water	CF	AGNO <sub>3</sub>	CL-	PID	SOIL LITHOLOGY	LAB CL-	B	T	E	X	GRO	DRO
Back Ground	953	0">6"	9.5	28.9	3.04	0.03	91	N/A	7.5YR-3/4 very dark brown sandy loam damp no odor	112	<0.050	<0.050	<0.050	<0.150	<10.0	<10.0
	956	2.5'	11.3	27.5	2.43	0.03	73	N/A	7.5YR-8/2 pinkish white fractured rocky sandy caliche dry no odor							
	958	5'	10.8	25.8	2.39	0.09	215	N/A	7.5YR-8/2 pinkish white fractured rocky sandy caliche dry no odor							
Large Pit Center	145	0">6"	13.1	29.2	2.23	1.68	3744	N/A	5YR-4/2 dark reddish gray sandy rocky caliche loam damp no odor							
	149	2.5'	11.7	27.2	2.32	2.85	13247	N/A	10YR-7/2 light gray fractured rocky sandy caliche damp no odor	10800					<10.0	<10.0
	151	5'	9.1	29.3	3.22	0.72	4635	N/A	10YR-6/3 pale brown rocky sandy caliche damp slight odor	4400	<0.050	<0.050	0.249	<0.150	<50.0	11400
Small Pit Center	153	0">6"	12.6	26.9	2.13	0.1	427	N/A	5YR-6/4/2 dark reddish gray sandy rocky caliche loam damp no odor	272					<10.0	42.9
	155	2.5'	12.9	26.4	2.05	0.2	818	N/A	7.5YR-5/3 brown sandy rocky caliche damp no odor							
	157	5'	13.2	26.7	2.02	0.39	1577	N/A	7.5YR-8/2 pinkish white fractured rocky sandy caliche dry no odor	1310	<0.050	<0.050	<0.050	<0.150	<10.0	<10.0

**GIANT HANAGAN STATE #1**  
**UL/G SEC 8 - T25S - R38E**  
**1980FNL & 1980FEL**  
**GPS LAT & LON WGS84**  
**N32.1476716249719 / W103.901258599901**  
**DEPTH TO GW 300' > 325'**  
**EM38 SURVEY VERTICAL 0'>5' BGS**  
**1-13-12**





January 20, 2012

ROY R. RASCON  
WHOLE EARTH ENVIRONMENTAL, INC.  
2103 ARBOR COVE  
KATY, TX 77494

RE: GIANT HANAGAN ST. #1

Enclosed are the results of analyses for samples received by the laboratory on 01/16/12 16:23.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (\*). For a complete list of accredited analytes and matrices visit the TCEQ website at [www.tceq.texas.gov/field/qa/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/qa/lab_accred_certif.html).

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Celey D. Keene". The signature is written in a cursive style.

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	01/16/2012	Sampling Date:	01/13/2012
Reported	01/20/2012	Sampling Type:	Soil
Project Name	GIANT HANAGAN ST. #1	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NONE GIVEN		

**Sample ID: BCKGROUND @ 5' BGS (H200100-01)**

BTEX 8021B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/18/2012	ND	1.95	97.4	2.00	8.31		
Toluene*	<0.050	0.050	01/18/2012	ND	2.06	103	2.00	8.11		
Ethylbenzene*	<0.050	0.050	01/18/2012	ND	2.06	103	2.00	8.37		
Total Xylenes*	<0.150	0.150	01/18/2012	ND	6.39	107	6.00	7.91		

*Surrogate 4-Bromofluorobenzene (PIL)* 109 % 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>112</b>	16.0	01/17/2012	ND	448	112	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/18/2012	ND	83.2	83.2	100	10.7		
DRO >C10-C28	<10.0	10.0	01/18/2012	ND	71.8	71.8	100	18.4		

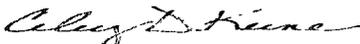
*Surrogate 1-Chlorooctane* 84.0 % 55.5-154

*Surrogate 1-Chlorooctadecane* 92.9 % 57.6-158

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received	01/16/2012	Sampling Date.	01/13/2012
Reported:	01/20/2012	Sampling Type:	Soil
Project Name:	GIANT HANAGAN ST. #1	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By	Jodi Henson
Project Location:	NONE GIVEN		

**Sample ID: LPC @ 2.5' BGS (H200100-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>10800</b>	16.0	01/17/2012	ND	432	108	400	3.64		

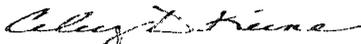
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/18/2012	ND	83.2	83.2	100	10.7		
DRO >C10-C28	<10.0	10.0	01/18/2012	ND	71.8	71.8	100	18.4		

<i>Surrogate 1-Chlorooctane</i>	76.1 %	55.5-154
<i>Surrogate 1-Chlorooctadecane</i>	85.7 %	57.6-158

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 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	01/16/2012	Sampling Date:	01/13/2012
Reported	01/20/2012	Sampling Type:	Soil
Project Name:	GIANT HANAGAN ST. #1	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location	NONE GIVEN		

**Sample ID: LPC @ 5' BGS (H200100-03)**

BTEX 8021B		mg/kg		Analyzed By: AP				S-04		
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/18/2012	ND	1.95	97.4	2.00	8.31		
Toluene*	<0.050	0.050	01/18/2012	ND	2.06	103	2.00	8.11		
<b>Ethylbenzene*</b>	<b>0.249</b>	0.050	01/18/2012	ND	2.06	103	2.00	8.37		
Total Xylenes*	<0.150	0.150	01/18/2012	ND	6.39	107	6.00	7.91		

*Surrogate 4-Bromofluorobenzene (PIL) 177% 644-134*

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>4400</b>	16.0	01/17/2012	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<50.0	50.0	01/19/2012	ND	185	92.5	200	2.26		
<b>DRO &gt;C10-C28</b>	<b>11400</b>	50.0	01/19/2012	ND	167	83.3	200	7.39		

*Surrogate 1-Chlorooctane 84.5% 555-154*
*Surrogate 1-Chlorooctadecane 109% 576-158*

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	01/16/2012	Sampling Date:	01/13/2012
Reported:	01/20/2012	Sampling Type:	Soil
Project Name:	GIANT HANAGAN ST. #1	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NONE GIVEN		

**Sample ID: SPC @ 0>6" (H200100-04)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>272</b>	16.0	01/18/2012	ND	432	108	400	3.64		
TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/19/2012	ND	185	92.5	200	2.26		
<b>DRO &gt;C10-C28</b>	<b>42.9</b>	10.0	01/19/2012	ND	167	83.3	200	7.39		

Surrogate 1-Chlorooctane	94.4 %	55.5-154
Surrogate 1-Chlorooctadecane	109 %	57.6-158

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 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	01/16/2012	Sampling Date	01/13/2012
Reported:	01/20/2012	Sampling Type:	Soil
Project Name:	GIANT HANAGAN ST. #1	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NONE GIVEN		

**Sample ID: SPC @ 5' BGS (H200100-05)**

BTEX 8021B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	01/19/2012	ND	1.95	97.4	2.00	8.31		
Toluene*	<0.050	0.050	01/19/2012	ND	2.06	103	2.00	8.11		
Ethylbenzene*	<0.050	0.050	01/19/2012	ND	2.06	103	2.00	8.37		
Total Xylenes*	<0.150	0.150	01/19/2012	ND	6.39	107	6.00	7.91		

*Surrogate 4-Bromofluorobenzene (PIL)* 104% 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>1310</b>	16.0	01/18/2012	ND	432	108	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	01/19/2012	ND	185	92.5	200	2.26		
DRO >C10-C28	<10.0	10.0	01/19/2012	ND	167	83.3	200	7.39		

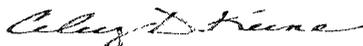
*Surrogate 1-Chlorooctane* 94.0% 55.5-154

*Surrogate 1-Chlorooctadecane* 105% 57.6-158

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Celey D. Keene, Lab Director/Quality Manager

### Notes and Definitions

- S-04            The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect
- ND             Analyte NOT DETECTED at or above the reporting limit
- RPD            Relative Percent Difference
- \*\*             Samples not received at proper temperature of 6°C or below
- \*\*\*            Insufficient time to reach temperature
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
                  Samples reported on an as received basis (wet) unless otherwise noted on report

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

