

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

November 27, 2013

Mr. Geoffrey Leking  
NMOCD District 1  
1625 French Drive  
Hobbs, New Mexico 88240  
Via E-mail

HOBBS OCD

DEC 02 2013

RECEIVED

RE: Caza Operating, Caza Ridge "14" State 4H, API: 30-025-40936, Unit P Section 14  
T23S R34E, In-place Burial Notice

Dear Geoffrey:

The "In-place Burial" closure plan for the above referenced pit was approved on February 13, 2013 by the NMOCD, prior to the establishment of the June 2013 pit rule. Construction and operation of the temporary pit has been conducted to satisfy the rule under which it was approved as well as the June 2013 rule. A modified closure plan, prepared using the June 2013 rule was submitted to the NMOCD on September 17, 2013 and approved on September 18, 2013.

On September 12, 2013 five-point composite samples were recovered from both the inner and outer cells of the pit, combined according to the appropriate waste volume in each cell, and stabilized with the available mixing soil at a 3:1 ratio. Laboratory analyses were performed to determine the concentrations of the parameters listed in Table II of 19.15.17.13 NMAC.

The table below shows that TPH (418.1) and Total BTEX from this sampling event exceed the standards set forth in the Rule. A decision was made to allow the waste to remain undisturbed in the pit for several weeks in order to allow aeration and natural attenuation to reduce the hydrocarbon concentrations of the waste before re-sampling. Please note that the TPH result is nearly 5 times higher than GRO+DRO+MRO.

## Summary Comparison of Laboratory Results to Pit Rule Burial Standards

	Sampling Date	Laboratory Results of Stabilized Waste Material (mg/kg)	19.15.17.13 NMAC	
			Table II Depth to GW below waste > 100 Feet (mg/kg)	Estimated Maximum Mix Ratio Required To Achieve Pit Rule Burial Standard (must be <3:1)
GRO + DRO + MRO (EPA Method 8015M)	9/12/13	588	1,000	1.76 : 1
TPH (EPA Method 418.1)	9/12/13	2,900	2,500	3.48 : 1
Chloride (EPA Method 300.0)	9/12/13	32,800	80,000	1.23 : 1
Benzene (EPA Meth. 8021B or 8260B)	9/12/13	3.01	10	0.90 : 1
Total BTEX (EPA Meth. 8021B or 8260B)	9/12/13	62.7	50	3.76 : 1

<sup>1</sup> (5) The operator shall collect, at a minimum, a five point composite of the contents of the temporary pit or drying pad/tank associated with a closed-loop system to demonstrate that, after the waste is solidified or stabilized with soil or other non-waste material at a ratio of no more than 3:1 soil or other non-waste material to waste, the concentration of any contaminant in the stabilized waste is not higher than the parameters in Table II of 19.15.17.13 NMAC.

Due to a communication failure between RT Hicks Consultants and the dirt contractor, on or about October 22, 2013 the in-place closure began prior to formal NMOCD notification or approval. Upon discovering this, the pit closure activity was immediately terminated and a soil-sampling event was scheduled to determine the concentrations of the constituents that exceeded the standards from the previous sampling event.

On October 23, 2013 a five-point composite sample was recovered from the waste that had not yet been mixed by the dirt contractor. It is believed that this sample is conservative with respect to hydrocarbons, in that most of the undisturbed sample was located around the outer edge of the pit and therefore represents a higher percentage of material from the outer cell which contained oil from the flow-back. The composite sample was stabilized with the clean soil at a 3:1 ratio. Laboratory analyses were performed to determine the concentrations of TPH (418.1) and Total BTEX (8021B) for comparison to Table II of 19.15.17.13 NMAC.

The table below shows that only TPH (418.1) from this sampling event continued to exceed the standards set forth in the Rule. We did not have the laboratory to analyze this sample for GRO+DRO+MRO because the standard was met with the previous sample.

**Summary Comparison of Laboratory Results to Pit Rule Burial Standards**

	Sampling Date	Laboratory Results of Stabilized Waste Material (mg/kg)	19.15.17.13 NMAC	Estimated Maximum Mix Ratio Required To Achieve Pit Rule Burial Standard (must be <3:1)
			Table II Depth to GW below waste > 100 Feet (mg/kg)	
TPH (EPA Method 418.1)	10/23/13	3,300	2,500	3.96 : 1
Benzene (EPA Meth. 8021B or 8260B)	10/23/13	1.21	10	0.36 : 1
Total BTEX (EPA Meth. 8021B or 8260B)	10/23/13	37.1	50	2.23 : 1

Upon consulting with Cardinal and Hall Environmental Laboratories, we found that the method employed by Cardinal to prepare the sample for analysis is different from that of Hall. We were concerned that Cardinal's method, which does not use a silica gel sieve prior to analysis, may not effectively eliminate organic mud additives (e.g. cellulose) and/or lost circulation material (e.g. cottonseed hulls) from the analytical result. Therefore, on November 12, 2013 a third sampling event was conducted for analysis by Hall. The composite soil sample was recovered from the entire pit and stabilized with clean soil at a 3:1 ratio. No effort was made to represent the correct volumes of the inner and outer cells, since the premature mixing had made that task virtually impossible. Rather, the purpose of the sample was to compare the results of an analysis of GRO+DRO+MRO by 8015D with the results of an analysis of TPH by 418.1 prepared using a silica gel sieve.

Hall Environmental Laboratories performed the laboratory analysis and the results are shown as follows:

GRO (mg/kg)	DRO (mg/kg)	MRO (mg/kg)	TPH (8015D) (mg/kg)	TPH (418.1) (mg/kg)
30	1,300	770	2,100	2,400



November 27, 2013

Page 3

RT Hicks Consultants believes that these results strongly indicate that an analysis of TPH by 418.1, when prepared using a silica gel sieve to remove the affects of the mud additives, provides a much better representation of the actual hydrocarbon contaminants than what we understand is an "oil and grease" method used by Cardinal Laboratories. For crude releases to sandy soil, an oil and grease method is probably fine. However, when non-petroleum organic compounds are present (e.g. drilling fluids), one should rely upon the more robust silica gel sieve technique or perhaps simply add GRO+DRO+MRO.

In light of these results, RT Hicks Consultants believes that the TPH by 418.1 analysis from the September 12, and October 23, 2013 sampling events should be disregarded in favor of the September 12, 2013 GRO+DRO+MRO results. On this bases be believe that the pit qualifies for closure under the current Rule and would like to move as quickly as possible to complete the closure.

In the future, RT Hicks Consultants will only perform analysis of TPH by 418.1 using the silica gel sieve preparation.

Sincerely,  
R.T. Hicks Consultants



Dale Littlejohn

Copy: Caza Operating, LLC

New Mexico State Land Office  
PO Box 1148  
Santa Fe, NM 87504-1148  
CERTIFIED MAIL – RETURN RECEIPT REQUEST

October 03, 2013

DALE LITTLEJOHN

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: CAZA RIDGE #4H

HOBBS OCD

DEC 02 2013

RECEIVED

Enclosed are the results of analyses for samples received by the laboratory on 09/12/13 10:30.

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,



Celey D. Keene

Lab Director/Quality Manager



**Analytical Results For:**

R T HICKS CONSULTANTS  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104

Project: CAZA RIDGE #4H  
Project Number: NONE GIVEN  
Project Manager: DALE LITTLEJOHN  
Fax To: NONE

Reported:  
03-Oct-13 10:13

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
STABLE 3:1 MIX	H302211-01	Soil	12-Sep-13 08:50	12-Sep-13 10:30

Cardinal Laboratories

\*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

DEC 02 2013

**Analytical Results For:**
**R T HICKS CONSULTANTS**  
 901 RIO GRANDE BLVD SUITE F-142  
 ALBUQUERQUE NM, 87104

RECEIVED

 Project: CAZA RIDGE #4H  
 Project Number: NONE GIVEN  
 Project Manager: DALE LITTLEJOHN  
 Fax To: NONE

 Reported:  
 03-Oct-13 10:13

**STABLE 3:1 MIX**
**H302211-01 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
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**Cardinal Laboratories**
**Inorganic Compounds**

<b>Chloride</b>	<b>32800</b>	16.0	mg/kg	4	3091602	AP	16-Sep-13	4500-CI-B	
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**Organic Compounds**

<b>TPH 418.1</b>	<b>2900</b>	100	mg/kg	10	3092605	CK	02-Oct-13	418.1	SUB-SS
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**Volatile Organic Compounds by EPA Method 8021**
**S-04**

<b>Benzene*</b>	<b>3.01</b>	0.500	mg/kg	500	3091601	MS	17-Sep-13	8021B	
<b>Toluene*</b>	<b>20.8</b>	0.500	mg/kg	500	3091601	MS	17-Sep-13	8021B	
<b>Ethylbenzene*</b>	<b>10.1</b>	0.500	mg/kg	500	3091601	MS	17-Sep-13	8021B	
<b>Total Xylenes*</b>	<b>28.8</b>	1.50	mg/kg	500	3091601	MS	17-Sep-13	8021B	
<b>Total BTEX</b>	<b>62.7</b>	3.00	mg/kg	500	3091601	MS	17-Sep-13	8021B	

<i>Surrogate: 4-Bromofluorobenzene (PID)</i>		134 %		89.4-126	3091601	MS	17-Sep-13	8021B	
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**Petroleum Hydrocarbons by GC FID**

<b>GRO C6-C10</b>	<b>85.5</b>	10.0	mg/kg	1	3091207	MS	13-Sep-13	8015B	
<b>DRO &gt;C10-C28</b>	<b>413</b>	10.0	mg/kg	1	3091207	MS	13-Sep-13	8015B	
<b>EXT DRO &gt;C28-C35</b>	<b>89.2</b>	10.0	mg/kg	1	3091207	MS	13-Sep-13	8015B	

<i>Surrogate: 1-Chlorooctane</i>		88.3 %		65.2-140	3091207	MS	13-Sep-13	8015B	
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<i>Surrogate: 1-Chlorooctadecane</i>		100 %		63.6-154	3091207	MS	13-Sep-13	8015B	
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Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

R T HICKS CONSULTANTS  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104

Project: CAZA RIDGE #4H  
Project Number: NONE GIVEN  
Project Manager: DALE LITTLEJOHN  
Fax To: NONE

Reported:  
03-Oct-13 10:13

**Inorganic Compounds - Quality Control****Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 3091602 - 1:4 DI Water</b>										
<b>Blank (3091602-BLK1)</b>				Prepared & Analyzed: 16-Sep-13						
Chloride	ND	16.0	mg/kg							
<b>LCS (3091602-BS1)</b>				Prepared & Analyzed: 16-Sep-13						
Chloride	416	16.0	mg/kg	400		104	80-120			
<b>LCS Dup (3091602-BSD1)</b>				Prepared & Analyzed: 16-Sep-13						
Chloride	432	16.0	mg/kg	400		108	80-120	3.77	20	

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Analytical Results For:**

R T HICKS CONSULTANTS  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104

Project: CAZA RIDGE #4H  
Project Number: NONE GIVEN  
Project Manager: DALE LITTLEJOHN  
Fax To: NONE

Reported:  
03-Oct-13 10:13

**Organic Compounds - Quality Control****Cardinal Laboratories**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 3092605 - Solvent Extraction****Blank (3092605-BLK1)**

Prepared &amp; Analyzed: 02-Oct-13

TPH 418.1	ND	10.0	mg/kg							
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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

### Analytical Results For:

R T HICKS CONSULTANTS  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104

Project: CAZA RIDGE #4H  
Project Number: NONE GIVEN  
Project Manager: DALE LITTLEJOHN  
Fax To: NONE

Reported:  
03-Oct-13 10:13

### Volatile Organic Compounds by EPA Method 8021 - Quality Control

#### Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch 3091601 - Volatiles

##### Blank (3091601-BLK1)

Prepared & Analyzed: 16-Sep-13

Benzene	ND	0.050	mg/kg							
Toluene	ND	0.050	mg/kg							
Ethylbenzene	ND	0.050	mg/kg							
Total Xylenes	ND	0.150	mg/kg							
Total BTEX	ND	0.300	mg/kg							
Surrogate: 4-Bromofluorobenzene (PID)	0.0571		mg/kg	0.0500		114	89.4-126			

##### LCS (3091601-BS1)

Prepared & Analyzed: 16-Sep-13

Benzene	1.98	0.050	mg/kg	2.00		99.0	76.4-135			
Toluene	2.14	0.050	mg/kg	2.00		107	80.2-135			
Ethylbenzene	2.27	0.050	mg/kg	2.00		113	78.5-133			
Total Xylenes	6.92	0.150	mg/kg	6.00		115	80.1-135			
Surrogate: 4-Bromofluorobenzene (PID)	0.0564		mg/kg	0.0500		113	89.4-126			

##### LCS Dup (3091601-BSD1)

Prepared & Analyzed: 16-Sep-13

Benzene	2.07	0.050	mg/kg	2.00		104	76.4-135	4.45	16.4	
Toluene	2.23	0.050	mg/kg	2.00		112	80.2-135	4.08	16.6	
Ethylbenzene	2.37	0.050	mg/kg	2.00		118	78.5-133	4.29	16.1	
Total Xylenes	7.12	0.150	mg/kg	6.00		119	80.1-135	2.88	15.8	
Surrogate: 4-Bromofluorobenzene (PID)	0.0582		mg/kg	0.0500		116	89.4-126			

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

### Analytical Results For:

R T HICKS CONSULTANTS  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104

Project: CAZA RIDGE #4H  
Project Number: NONE GIVEN  
Project Manager: DALE LITTLEJOHN  
Fax To: NONE

Reported:  
03-Oct-13 10:13

### Petroleum Hydrocarbons by GC FID - Quality Control

#### Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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#### Batch 3091207 - General Prep - Organics

##### Blank (3091207-BLK1)

Prepared & Analyzed: 12-Sep-13

GRO C6-C10	ND	10.0	mg/kg							
DRO >C10-C28	ND	10.0	mg/kg							
EXT DRO >C28-C35	ND	10.0	mg/kg							
Total TPH C6-C28	ND	10.0	mg/kg							
Surrogate: 1-Chlorooctane	37.9		mg/kg	50.0		75.9	65.2-140			
Surrogate: 1-Chlorooctadecane	43.7		mg/kg	50.0		87.4	63.6-154			

##### LCS (3091207-BS1)

Prepared & Analyzed: 12-Sep-13

GRO C6-C10	200	10.0	mg/kg	200		100	66.4-124			
DRO >C10-C28	192	10.0	mg/kg	200		96.1	61.6-132			
Total TPH C6-C28	392	10.0	mg/kg	400		98.0	69.7-122			
Surrogate: 1-Chlorooctane	44.2		mg/kg	50.0		88.4	65.2-140			
Surrogate: 1-Chlorooctadecane	49.4		mg/kg	50.0		98.7	63.6-154			

##### LCS Dup (3091207-BSD1)

Prepared & Analyzed: 12-Sep-13

GRO C6-C10	210	10.0	mg/kg	200		105	66.4-124	4.71	23.4	
DRO >C10-C28	200	10.0	mg/kg	200		99.8	61.6-132	3.84	23.1	
Total TPH C6-C28	409	10.0	mg/kg	400		102	69.7-122	4.29	20.6	
Surrogate: 1-Chlorooctane	46.9		mg/kg	50.0		93.8	65.2-140			
Surrogate: 1-Chlorooctadecane	52.5		mg/kg	50.0		105	63.6-154			

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



**Notes and Definitions**

SUB-SS	Analysis subcontracted to SunStar Laboratories, Inc.
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



101 East Marland, Hobbs, NM 88240  
(575) 393-2326 FAX (575) 393-2476

Page 9 of 9



PHONE (575) 393-2326 • 101 E. MARLAND • HOBBS, NM 88240

November 05, 2013

DALE LITTLEJOHN

R T HICKS CONSULTANTS

901 RIO GRANDE BLVD SUITE F-142

ALBUQUERQUE, NM 87104

RE: CAZA RIDGE '14' STATE #4H

Enclosed are the results of analyses for samples received by the laboratory on 10/23/13 14:12.

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).

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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,

Celey D. Keene

Lab Director/Quality Manager



HOBBS OCD

DEC 02 2013

RECEIVED

**Analytical Results For:**

R T HICKS CONSULTANTS  
DALE LITTLEJOHN  
901 RIO GRANDE BLVD SUITE F-142  
ALBUQUERQUE NM, 87104  
Fax To: NONE

Received: 10/23/2013  
Reported: 11/05/2013  
Project Name: CAZA RIDGE '14' STATE #4H  
Project Number: NONE GIVEN  
Project Location: LEA COUNTY, NM

Sampling Date: 10/23/2013  
Sampling Type: Soil  
Sampling Condition: \*\* (See Notes)  
Sample Received By: Jodi Henson

**Sample ID: 3:1 MIX SAMPLE (H302568-01)**

BTEX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Benzene*</b>	<b>1.21</b>	0.050	10/24/2013	ND	2.05	103	2.00	0.398	
<b>Toluene*</b>	<b>11.1</b>	0.050	10/24/2013	ND	2.14	107	2.00	0.0304	
<b>Ethylbenzene*</b>	<b>6.45</b>	0.050	10/24/2013	ND	2.17	108	2.00	0.263	
<b>Total Xylenes*</b>	<b>18.3</b>	0.150	10/24/2013	ND	6.55	109	6.00	1.57	
<b>Total BTEX</b>	<b>37.1</b>	0.300	10/24/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIC) 104 % 89.4-126

TPH 418.1		mg/kg		Analyzed By: CK					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>TPH 418.1</b>	<b>3300</b>	100	10/31/2013	ND	76.0	92.7	82.0	11.1	SUB-SS

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

SUB-SS	Analysis subcontracted to SunStar Laboratories, Inc.
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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**Cardinal Laboratories****\*=Accredited Analyte**

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Celey D. Keene, Lab Director/Quality Manager



**101 East Marland, Hobbs, NM 88240  
(575) 393-2326 FAX (575) 393-2476**

## CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

[illegible]





Hall Environmental Analysis Laboratory  
4901 Hawkins NE  
Albuquerque, NM 87109  
TEL: 505-345-3975 FAX: 505-345-4107  
Website: [www.hallenvironmental.com](http://www.hallenvironmental.com)

November 22, 2013

Randall Hicks

R.T. Hicks Consultants, LTD

901 Rio Grande Blvd. NW

Suite F-142

Albuquerque, NM 87104

TEL: (505) 266-5004

FAX (505) 266-0745

RE: Caza Ridge 4H

OrderNo.: 1311617

Dear Randall Hicks:

Hall Environmental Analysis Laboratory received 1 sample(s) on 11/14/2013 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to [www.hallenvironmental.com](http://www.hallenvironmental.com) or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

## Analytical Report

Lab Order 1311617

Date Reported: 11/22/2013

## Hall Environmental Analysis Laboratory, Inc.

CLIENT: R.T. Hicks Consultants, LTD

Client Sample ID: Caza Ridge 4H Pit 3:1 Final Min

Project: Caza Ridge 4H

Collection Date: 11/12/2013 3:05:00 PM

Lab ID: 1311617-001

Matrix: SOIL

Received Date: 11/14/2013 9:35:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 8015D: DIESEL RANGE ORGANICS</b>							Analyst: <b>BCN</b>
Diesel Range Organics (DRO)	1300	100		mg/Kg	10	11/19/2013 1:17:22 PM	10373
Motor Oil Range Organics (MRO)	770	500		mg/Kg	10	11/19/2013 1:17:22 PM	10373
Surr: DNOP	0	66-131	S	%REC	10	11/19/2013 1:17:22 PM	10373
<b>EPA METHOD 8015D: GASOLINE RANGE</b>							Analyst: <b>NSB</b>
Gasoline Range Organics (GRO)	30	4.9		mg/Kg	1	11/18/2013 11:54:27 AM	10364
Surr: BFB	240	74.5-129	S	%REC	1	11/18/2013 11:54:27 AM	10364
<b>EPA METHOD 418.1: TPH</b>							Analyst: <b>BCN</b>
Petroleum Hydrocarbons, TR	2400	200		mg/Kg	10	11/19/2013	10341

HOBBS OCD

DEC 02 2013

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Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

**Qualifiers:**

- \* Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit

Page 1 of 4

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1311617

22-Nov-13

Client: R.T. Hicks Consultants, LTD

Project: Caza Ridge 4H

Sample ID	MB-10341		SampType:	MBLK		TestCode:	EPA Method 418.1: TPH				
Client ID:	PBS		Batch ID:	10341		RunNo:	14899				
Prep Date:	11/14/2013		Analysis Date:	11/19/2013		SeqNo:	429708		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Petroleum Hydrocarbons, TR	ND	20									

Sample ID	LCS-10341		SampType:	LCS		TestCode:	EPA Method 418.1: TPH				
Client ID:	LCSS		Batch ID:	10341		RunNo:	14899				
Prep Date:	11/14/2013		Analysis Date:	11/19/2013		SeqNo:	429709		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Petroleum Hydrocarbons, TR	100	20	100.0	0	104	80	120				

Sample ID	LCSD-10341		SampType:	LCSD		TestCode:	EPA Method 418.1: TPH				
Client ID:	LCSS02		Batch ID:	10341		RunNo:	14899				
Prep Date:	11/14/2013		Analysis Date:	11/19/2013		SeqNo:	429710		Units: mg/Kg		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Petroleum Hydrocarbons, TR	100	20	100.0	0	104	80	120	0	20		

### Qualifiers:

\* Value exceeds Maximum Contaminant Level.  
E Value above quantitation range  
J Analyte detected below quantitation limits  
O RSD is greater than RSDlimit  
R RPD outside accepted recovery limits  
S Spike Recovery outside accepted recovery limits

B Analyte detected in the associated Method Blank  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
P Sample pH greater than 2 for VOA and TOC only.  
RL Reporting Detection Limit



# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1311617

22-Nov-13

Client: R.T. Hicks Consultants, LTD

Project: Caza Ridge 4H

Sample ID	MB-10373	SampType:	MBLK	TestCode:	EPA Method 8015D: Diesel Range Organics					
Client ID:	PBS	Batch ID:	10373	RunNo:	14849					
Prep Date:	11/18/2013	Analysis Date:	11/18/2013	SeqNo:	428499	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	9.4		10.00		94.2	66	131			

Sample ID	MB-10375	SampType:	MBLK	TestCode:	EPA Method 8015D: Diesel Range Organics					
Client ID:	PBS	Batch ID:	10375	RunNo:	14849					
Prep Date:	11/18/2013	Analysis Date:	11/18/2013	SeqNo:	428500	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	9.1		10.00		91.3	66	131			

Sample ID	MB-10380	SampType:	MBLK	TestCode:	EPA Method 8015D: Diesel Range Organics					
Client ID:	PBS	Batch ID:	10380	RunNo:	14849					
Prep Date:	11/18/2013	Analysis Date:	11/18/2013	SeqNo:	428534	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	8.6		10.00		86.0	66	131			

Sample ID	LCS-10373	SampType:	LCS	TestCode:	EPA Method 8015D: Diesel Range Organics					
Client ID:	LCSS	Batch ID:	10373	RunNo:	14849					
Prep Date:	11/18/2013	Analysis Date:	11/18/2013	SeqNo:	428570	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	48	10	50.00	0	95.2	62.1	127			
Surr: DNOP	4.5		5.000		90.9	66	131			

Sample ID	LCS-10375	SampType:	LCS	TestCode:	EPA Method 8015D: Diesel Range Organics					
Client ID:	LCSS	Batch ID:	10375	RunNo:	14849					
Prep Date:	11/18/2013	Analysis Date:	11/18/2013	SeqNo:	428571	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.6		5.000		91.5	66	131			

Sample ID	LCS-10380	SampType:	LCS	TestCode:	EPA Method 8015D: Diesel Range Organics					
Client ID:	LCSS	Batch ID:	10380	RunNo:	14849					
Prep Date:	11/18/2013	Analysis Date:	11/18/2013	SeqNo:	428651	Units:	%REC			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: DNOP	4.4		5.000		88.3	66	131			

### Qualifiers:

- |   |  |
|---|--|
| * Value exceeds Maximum Contaminant Level.        | B Analyte detected in the associated Method Blank    |
| E Value above quantitation range                  | H Holding times for preparation or analysis exceeded |
| J Analyte detected below quantitation limits      | ND Not Detected at the Reporting Limit               |
| O RSD is greater than RSDlimit                    | P Sample pH greater than 2 for VOA and TOC only.     |
| R RPD outside accepted recovery limits            | RL Reporting Detection Limit                         |
| S Spike Recovery outside accepted recovery limits |  |

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

WO#: 1311617

22-Nov-13

Client: R.T. Hicks Consultants, LTD

Project: Caza Ridge 4H

Sample ID	MB-10364	SampType:	MBLK	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	PBS	Batch ID:	10364	RunNo:	14860					
Prep Date:	11/15/2013	Analysis Date:	11/18/2013	SeqNo:	428823	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	910		1000		91.3	74.5	129			

Sample ID	LCS-10364	SampType:	LCS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	LCSS	Batch ID:	10364	RunNo:	14860					
Prep Date:	11/15/2013	Analysis Date:	11/18/2013	SeqNo:	428824	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	25	5.0	25.00	0	99.8	74.5	126			
Surr: BFB	1000		1000		99.9	74.5	129			

Sample ID	1311617-001AMS	SampType:	MS	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	Caza Ridge 4H Pit 3	Batch ID:	10364	RunNo:	14860					
Prep Date:	11/15/2013	Analysis Date:	11/18/2013	SeqNo:	428826	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	58	4.9	24.46	30.49	111	76	156			
Surr: BFB	2600		978.5		261	74.5	129			S

Sample ID	1311617-001AMSD	SampType:	MSD	TestCode:	EPA Method 8015D: Gasoline Range					
Client ID:	Caza Ridge 4H Pit 3	Batch ID:	10364	RunNo:	14860					
Prep Date:	11/15/2013	Analysis Date:	11/18/2013	SeqNo:	428827	Units:	mg/Kg			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	50	4.9	24.46	30.49	81.2	76	156	13.5	17.7	
Surr: BFB	2400		978.5		242	74.5	129	0	0	S

### Qualifiers:

- \* Value exceeds Maximum Contaminant Level.
- E Value above quantitation range
- J Analyte detected below quantitation limits
- O RSD is greater than RSDlimit
- R RPD outside accepted recovery limits
- S Spike Recovery outside accepted recovery limits

- B Analyte detected in the associated Method Blank
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- P Sample pH greater than 2 for VOA and TOC only.
- RL Reporting Detection Limit



## Sample Log-In Check List

Client Name: RT HICKS

Work Order Number: 1311617

RcptNo: 1

Received by/date:

A.F.

11/14/13

Logged By: Ashley Gallegos

11/14/2013 9:35:00 AM

*AG*

Completed By: Ashley Gallegos

11/14/2013 1:53:07 PM

*AG*

Reviewed By:

*AG*

11/15/13

### Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒
2. Is Chain of Custody complete? Yes ☒ No ☐ Not Present ☐
3. How was the sample delivered? Client

### Log In

4. Was an attempt made to cool the samples? Yes ☒ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☒ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☒ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☒ No ☐
8. Are samples (except VOA and ONG) properly preserved? Yes ☒ No ☐
9. Was preservative added to bottles? Yes ☐ No ☒ NA ☐
10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☒
11. Were any sample containers received broken? Yes ☐ No ☒
12. Does paperwork match bottle labels?  
(Note discrepancies on chain of custody) Yes ☒ No ☐ # of preserved bottles checked for pH:   
( <2 or >12 unless noted )
13. Are matrices correctly identified on Chain of Custody? Yes ☒ No ☐ Adjusted?   
\_\_\_\_\_
14. Is it clear what analyses were requested? Yes ☒ No ☐
15. Were all holding times able to be met?  
(If no, notify customer for authorization.) Yes ☒ No ☐ Checked by:   
\_\_\_\_\_

### Special Handling (If applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☒

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: \_\_\_\_\_

Client Instructions: \_\_\_\_\_

17. Additional remarks:

### 18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Not Present			



