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www.greenanalytical.com

26 August 2022

David Bounds
Hilcorp
382 Road 3100
Aztec, NM 87410
RE: Formation Comparison

Enclosed are the results of analyses for samples received by the laboratory on 08/17/22 15:44. This data replaces the previous report (See case narrative). The data to follow was performed, in whole or in part, by Green Analytical Laboratories. Any data that was performed by a subcontract laboratory is included within the GAL report, or with an additional report attached.

If you need any further assistance, please feel free to contact me.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Jeremy D. Allen', is written in a cursive style.

Jeremy D Allen
Laboratory Director

All accredited analytes contained in this report are denoted by an asterisk (*). For a complete list of accredited analytes please do not hesitate to contact us via any of the contact information contained in this report. All of our certifications can be viewed at <http://greenanalytical.com/certifications/>

Green Analytical Laboratories is NELAP accredited through the Texas Commission on Environmental Quality. Accreditation applies to drinking water and non-potable water matrices for trace metals and a variety of inorganic parameters. Green Analytical Laboratories is also accredited through the Colorado Department of Public Health and Environment and EPA region 8 for trace metals, Cyanide, Fluoride, Nitrate, and Nitrite in drinking water. TNI Certificate Number: T104704514-22-14

Our affiliate laboratory, Cardinal Laboratories, is also NELAP accredited through the Texas Commission on Environmental Quality for a variety of organic constituents in drinking water, non-potable water and solid matrices. Cardinal is also accredited for regulated VOCs, TTHM, and HAA-5 in drinking water through the Colorado Department of Public Health and Environment and EPA region 8. TNI Certificate Number: T104704398-22-15



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Hilcorp
382 Road 3100
Aztec NM, 87410

Project: Formation Comparison
Project Name / Number: South
Project Manager: David Bounds

Reported:
08/26/22 12:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Notes
Harrington 6-Tubing	2208246-01	Water	08/17/22 07:00	08/17/22 15:44	
Harrington 6-Bradenhead	2208246-02	Water	08/17/22 07:00	08/17/22 15:44	

Green Analytical Laboratories

A handwritten signature in blue ink that reads 'Jeremy D. Allen'.

Jeremy D Allen, Laboratory Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. In no event shall Green Analytical Laboratories be liable for incidental or consequential damages. GALs liability, and clients exclusive remedy for any claim arising, 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 within thirty days after completion of the applicable service.



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Hilcorp	Project: Formation Comparison	
382 Road 3100	Project Name / Number: South	Reported:
Aztec NM, 87410	Project Manager: David Bounds	08/26/22 12:02

The following report has been reissued to correct the sample name, per client instructions. This replaces the previously issued report dated "2208246 GAL FINAL 08 25 22 1224".

Green Analytical Laboratories

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Jeremy D Allen, Laboratory Director

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Hilcorp
382 Road 3100
Aztec NM, 87410

Project: Formation Comparison
Project Name / Number: South
Project Manager: David Bounds

Reported:
08/26/22 12:02

**Harrington 6-Tubing
Area 9**

2208246-01 (Produced Water)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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General Chemistry

Alkalinity, Bicarbonate as CaCO ₃ *	230	10.0	2.27	mg/L	10	08/18/22 16:30	2320 B		HTB
Alkalinity, Carbonate as CaCO ₃ *	<10.0	10.0	2.27	mg/L	10	08/18/22 16:30	2320 B		HTB
Chloride*	8690	100	5.55	mg/L	100	08/24/22 12:00	EPA300.0		AES
Total Dissolved Solids*	13000	40.0		mg/L	4	08/23/22 17:36	EPA160.1		AES
Sulfate*	<12.4	100	12.4	mg/L	100	08/24/22 12:00	EPA300.0		AES

Potentially Dissolved Metals by ICP

Calcium*	60.6	2.00	0.472	mg/L	20	08/24/22 14:48	EPA200.7		AES
Iron*	12.7	1.00	0.711	mg/L	20	08/24/22 14:48	EPA200.7		AES
Magnesium*	24.3	2.00	0.615	mg/L	20	08/24/22 14:48	EPA200.7		AES
Manganese*	<0.400	0.400	0.149	mg/L	20	08/24/22 14:48	EPA200.7		AES
Sodium*	5100	20.0	2.11	mg/L	20	08/24/22 14:48	EPA200.7		AES

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Jeremy D Allen, Laboratory Director

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Hilcorp
382 Road 3100
Aztec NM, 87410

Project: Formation Comparison
Project Name / Number: South
Project Manager: David Bounds

Reported:
08/26/22 12:02

**Harrington 6-Bradenhead
Area 9**

2208246-02 (Produced Water)

Analyte	Result	RL	MDL	Units	Dilution	Analyzed	Method	Notes	Analyst
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General Chemistry

Alkalinity, Bicarbonate as CaCO ₃ *	70.0	10.0	2.27	mg/L	10	08/18/22 16:30	2320 B		HTB
Alkalinity, Carbonate as CaCO ₃ *	460	10.0	2.27	mg/L	10	08/18/22 16:30	2320 B		HTB
Chloride*	10.6	20.0	1.11	mg/L	20	08/24/22 12:21	EPA300.0		AES
Total Dissolved Solids*	1370	10.0		mg/L	1	08/23/22 17:38	EPA160.1		AES
Sulfate*	591	20.0	2.48	mg/L	20	08/24/22 12:21	EPA300.0		AES

Potentially Dissolved Metals by ICP

Calcium*	2.40	2.00	0.472	mg/L	20	08/24/22 14:53	EPA200.7		AES
Iron*	40.4	1.00	0.711	mg/L	20	08/24/22 14:53	EPA200.7		AES
Magnesium*	<2.00	2.00	0.615	mg/L	20	08/24/22 14:53	EPA200.7		AES
Manganese*	<0.400	0.400	0.149	mg/L	20	08/24/22 14:53	EPA200.7		AES
Sodium*	487	20.0	2.11	mg/L	20	08/24/22 14:53	EPA200.7		AES

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Jeremy D Allen, Laboratory Director

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Hilcorp
382 Road 3100
Aztec NM, 87410

Project: Formation Comparison
Project Name / Number: South
Project Manager: David Bounds

Reported:
08/26/22 12:02

General Chemistry - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B222263 - General Prep - Wet Chem										
Blank (B222263-BLK1)				Prepared & Analyzed: 08/18/22						
Alkalinity, Bicarbonate as CaCO ₃	ND	10.0	mg/L							
Alkalinity, Carbonate as CaCO ₃	ND	10.0	mg/L							
Batch B222264 - IC- Ion Chromatograph										
Blank (B222264-BLK1)				Prepared: 08/19/22 Analyzed: 08/24/22						
Chloride	ND	1.00	mg/L							
Sulfate	ND	1.00	mg/L							
LCS (B222264-BS1)				Prepared: 08/19/22 Analyzed: 08/24/22						
Chloride	24.8	1.00	mg/L	25.0		99.0	90-110			
Sulfate	24.5	1.00	mg/L	25.0		97.9	90-110			
LCS Dup (B222264-BSD1)				Prepared: 08/19/22 Analyzed: 08/24/22						
Chloride	24.8	1.00	mg/L	25.0		99.2	90-110	0.206	20	
Sulfate	24.5	1.00	mg/L	25.0		97.9	90-110	0.0245	20	
Batch B222306 - General Prep - Wet Chem										
Blank (B222306-BLK1)				Prepared & Analyzed: 08/23/22						
Total Dissolved Solids	ND	10.0	mg/L							
Reference (B222306-SRM1)				Prepared & Analyzed: 08/23/22						
Total Dissolved Solids	365	10.0	mg/L	380		96.0	85-115			

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382 Road 3100
Aztec NM, 87410

Project: Formation Comparison
Project Name / Number: South
Project Manager: David Bounds

Reported:
08/26/22 12:02

Potentially Dissolved Metals by ICP - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch B222323 - Potentially Dissolved ICP

Blank (B222323-BLK1)

Prepared & Analyzed: 08/24/22

Calcium	ND	0.100	mg/L							
Iron	ND	0.050	mg/L							
Magnesium	ND	0.100	mg/L							
Manganese	ND	0.020	mg/L							
Sodium	ND	1.00	mg/L							

LCS (B222323-BS1)

Prepared & Analyzed: 08/24/22

Calcium	3.98	0.100	mg/L	4.00		99.6	85-115			
Iron	3.99	0.050	mg/L	4.00		99.8	85-115			
Magnesium	20.4	0.100	mg/L	20.0		102	85-115			
Manganese	2.03	0.020	mg/L	2.00		101	85-115			
Sodium	3.26	1.00	mg/L	3.24		101	85-115			

LCS Dup (B222323-BSD1)

Prepared & Analyzed: 08/24/22

Calcium	3.80	0.100	mg/L	4.00		95.1	85-115	4.67	20	
Iron	3.95	0.050	mg/L	4.00		98.6	85-115	1.14	20	
Magnesium	19.6	0.100	mg/L	20.0		98.0	85-115	3.83	20	
Manganese	2.00	0.020	mg/L	2.00		100	85-115	1.39	20	
Sodium	3.22	1.00	mg/L	3.24		99.4	85-115	1.33	20	

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis *Results reported on as received basis unless designated as dry.
RPD	Relative Percent Difference
LCS	Laboratory Control Sample (Blank Spike)
RL	Report Limit
MDL	Method Detection Limit

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5060 Kust

shannegan@hilcorp.com

Client: Hilcorp	Asset: South	Phone#: 505-419-3410	Contact: David Bounds
Address: 9A CR# 5793, Farmington NM 87401		E-Mail Address: dbounds@hilcorp.com	



75 Suttle Street
Durango, CO 81303
Phone: 970-247-4220
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CHAIN OF CUSTODY RECORD

GAL Work Order # **2208-246**

PO#

Project Name:

Sample Location:

(1)BumperSpring, (2)CompressorDischarge, (3)Flowline, (4)Meter, (5)Oil Tank
(6)PigLauncher, (7)PigReceiver, (8)Pipeline, (9)Pit Tank, (10)PostFilter, (11)PreFilter
(12)SeparatorInlet, (13)SeparatorOutlet, (14)SeparatorDump, (15)SWDInlet
(16)SWDOutlet, (17)TransferPump, (18)ValveCan, (19)WaterTank, (20)Wellhead
(21)Other

Sample Type:

(1)Casing, (2)CO2GasTube, (3)Coupon, (4)Water, (5)H2SGasTube, (6)Metals
(7)O2GasTube, (8)PipeSection, (9)Residual, (10)Sludge, (11)Solid, (12)Tubing, (13)Other

25.9C
Noice u

Collection								Preservative				Analyses Required			
Well Name (Sample Name)	Area	Date	Time	Collected By: (Init.)	Sample Location	Sample Type	No. of Containers	Filtered: Y / N	Unpreserved	H2SO4	Other:	Iron and Manganese	Phosphate	Full Water API	Formation Comparison
1. Harrington 9-Tubing	9	8-17	7am	JS	20	4	1	N	✓						X
2. Harrington 9-bradenhead	9	8-17	7am	JS	21	4	1	N	✓						X
3.															
4.															
5.															
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20.															

Relinquished by:	Date:	Time:	Received By:	Date:	Time:
<i>[Signature]</i>	8-17-22	1544	<i>[Signature]</i>	8/17/22	1544
<i>[Signature]</i>	8/17/22	1655	<i>[Signature]</i>	8/17/22	1655

[Signature] 8/18/22 0800
2.3% on Ice

District I

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District II

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Phone:(575) 748-1283 Fax:(575) 748-9720

District III

1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV

1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 138875

CONDITIONS

Operator: HILCORP ENERGY COMPANY 1111 Travis Street Houston, TX 77002	OGRID: 372171
	Action Number: 138875
	Action Type: [UF-GA] Gas Analysis (GAS ANALYSIS)

CONDITIONS

Created By	Condition	Condition Date
mkuehling	TDS BH = 1370 - tubing produced water = 13000	9/15/2022