30-045-29998

Green Analytical Laboratories
dzufelt@greenanalytical.com p: 970.247.4220 f: 970.247.4227 75 Suttle Street Durango, CO 81303
www.GreenAnalytical.com

| | | |
|---|---|---|
| Project: | | |
| Project Name / Number: | | **Reported:** |
| Project Manager: | | |

A Hilcorp sample was submitted to Green Analytical Laboratories, for sample site Helms Federal 1B, on 08/21/18. It was to be analyzed forChloride, pH, Sulfate and TDS. However, upon inspection of the sample submitted, it was determined that the entirety of the 250 ml sample is a light oil, not water. Equal amounts of water and sample were added in a graduated cylinder and confmined the sample would not mix with water. Since it is not water soluble, it cannot be analyzed for the requested parameters. The lab used a "light oils" hydrometer to determine an estimated Specific Gravity, to show that it is suspected as product/light oil. The Specific Gravity of the oil sample is 0.745.

Green Analytical Laboratories

Debbie Zufelt

Debbie Zufelt, Reports Manager





7

| Client: **Hilcorp** | Asset: **North** | Phone# **505-634-6059** | Contact **Kevin Fredrickson** |
|---|---|---|---|
| Address: 9A CR# 5793, Farmington NM 87401 | | E-Mail Addres kfredrickson@hilcorp.com | |


GAL Analytical Laboratories
75 Suttle Street
Durango, CO 81303
Phone:970-247-4220
FAX: 970-247-4227


## CHAIN OF CUSTODY RECORD

| | |
|---|---|
| GAL Work Order # | 1808-236 |
| PO# | |
| Project Name: | |

27.9c
NOICE
C

**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

| | 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 | Barium head |
| 1. Helms Federal 1B | 3 | 8/21/18 | 8AM | KH | 20 | 4 | 1 | N | X | | | | | | X |
| 2. | | | | | | | | | | | | | | | |
| 3. | | | | | | | | | | | | | | | |
| 4. | | | | | | | | | | | | | | | |
| 5. | | | | | | | | | | | | | | | |
| 6. | | | | | | | | | | | | | | | |
| 7. | | | | | | | | | | | | | | | |
| 8. | | | | | | | | | | | | | | | |
| 9. | | | | | | | | | | | | | | | |
| 10. | | | | | | | | | | | | | | | |
| 11. | | | | | | | | | | | | | | | |
| 12. | | | | | | | | | | | | | | | |
| 13. | | | | | | | | | | | | | | | |
| 14. | | | | | | | | | | | | | | | |
| 15. | | | | | | | | | | | | | | | |
| 16. | | | | | | | | | | | | | | | |
| 17. | | | | | | | | | | | | | | | |
| 18. | | | | | | | | | | | | | | | |
| 19. | | | | | | | | | | | | | | | |
| 20. | | | | | | | | | | | | | | | |

| Relinquished by: | Date: | Time: | Received By: | Date: | Time: |
|---|---|---|---|---|---|
| Keith Horton | 8-21-18 | 2:10 | [signature] | 8/21/18 | 1408 |
| [signature] | 8/21/18 | 1655 | Kangaroo Express | 8/21/18 | 1655 |
| Kangaroo Express | 09/22/18 | 0847 | | 09/22/18 | 0847 |

2.2
8:47

oil non-aqueous

GAS ANALYSIS SERVICE

2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: HS180168
Cust No: 35825-10660

## Well/Lease Information

| | | | |
|---|---|---|---|
| Customer Name: | HILCORP (BHD PROJECT) | Source: | INTERMEDIATE CASING |
| Well Name: | HELMS FEDERAL #1B; INT CSG | Well Flowing: | N |
| County/State: | SAN JUAN NM | Pressure: | 408 PSIG |
| Location: | | Flow Temp: | DEG. F |
| Field: | AREA 3 / RUN 311 | Ambient Temp: | 80 DEG. F |
| Formation: | MV | Flow Rate: | MCF/D |
| Cust. Stn. No.: | 98012 | Sample Method: | Purge & Fill |
| | | Sample Date: | 08/28/2018 |
| | API = 3004529998 | Sample Time: | 11.55 AM |
| | | Sampled By: | BOBBY HEINEN |
| Heat Trace: | N | Sampled by (CO): | HILCORP |
| Remarks: | | | |

## Analysis

| Component:: | Mole%: | Unormalized %: | **GPM: | *BTU: | *SP Gravity: |
|---|---|---|---|---|---|
| Nitrogen | 0.2219 | 0.2231 | 0.0240 | 0.00 | 0.0021 |
| CO2 | 0.3671 | 0.3690 | 0.0630 | 0.00 | 0.0056 |
| Methane | 87.5496 | 88.0036 | 14.8820 | 884.25 | 0.4849 |
| Ethane | 6.9174 | 6.9533 | 1.8550 | 122.42 | 0.0718 |
| Propane | 2.8329 | 2.8476 | 0.7830 | 71.28 | 0.0431 |
| Iso-Butane | 0.5002 | 0.5028 | 0.1640 | 16.27 | 0.0100 |
| N-Butane | 0.7944 | 0.7985 | 0.2510 | 25.92 | 0.0159 |
| I-Pentane | 0.2603 | 0.2616 | 0.0950 | 10.41 | 0.0065 |
| N-Pentane | 0.1825 | 0.1834 | 0.0660 | 7.32 | 0.0045 |
| Hexane Plus | 0.3737 | 0.3756 | 0.1670 | 19.70 | 0.0124 |
| Total | 100.0000 | 100.5185 | 18.3500 | 1157.56 | 0.6570 |

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY
**@ 14.730 PSIA & 60 DEG. F.

| | | | |
|---|---|---|---|
| COMPRESSIBLITY FACTOR (1/Z): | 1.0029 | CYLINDER #: | 4201 |
| BTU/CU.FT IDEAL: | 1160.2 | CYLINDER PRESSURE: | 381 PSIG |
| BTU/CU.FT (DRY) CORRECTED FOR (1/Z): | 1163.6 | ANALYIS DATE: | 09/05/2018 |
| BTU/CU.FT (WET) CORRECTED FOR (1/Z): | 1143.4 | ANALYIS TIME: | 10:05:55 AM |
| DRY BTU @ 15.025: | 1186.9 | ANALYSIS RUN BY: | RICHARD WILSON |
| REAL SPECIFIC GRAVITY: | 0.6586 | | |

**GPM, BTU, and SPG calculations as shown above are based on current GPA constants.**
**GPA Standard: GPA-2261**
**GC: Danalyzer Model 500** **Last Cal/Verify: 09/07/2018**
**GC Method: C6+ Gas**

HILCORP (BHD PROJECT)

WELL ANALYSIS COMPARISON

| | | | |
|---|---|---|---|
| **Lease:** | HELMS FEDERAL #1B; INT CSG | INTERMEDIATE CASING | 09/07/2018 |
| **Stn. No.:** | 98012 | MV | 35825-10660 |
| **Mtr. No.:** | | | |

API 3004529998

| | |
|---|---|
| **Smpl Date:** | 08/28/2018 |
| **Test Date:** | 09/05/2018 |
| **Run No:** | HS180168 |
| **Nitrogen:** | 0.2219 |
| **CO2:** | 0.3671 |
| **Methane:** | 87.5496 |
| **Ethane:** | 6.9174 |
| **Propane:** | 2.8329 |
| **I-Butane:** | 0.5002 |
| **N-Butane:** | 0.7944 |
| **I-Pentane:** | 0.2603 |
| **N-Pentane:** | 0.1825 |
| **Hexane+:** | 0.3737 |
| **BTU:** | 1163.6 |
| **GPM:** | 18.3500 |
| **SPG:** | 0.6586 |

GAS ANALYSIS SERVICE

2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: HS180167
Cust No: 35825-10655

## Well/Lease Information

| | | | |
|---|---|---|---|
| Customer Name: | HILCORP (BHD PROJECT) | Source: | CASING |
| Well Name: | HELMS FEDERAL #1B; CSG | Well Flowing: | N |
| County/State: | SAN JUAN NM | Pressure: | 82 PSIG |
| Location: | | Flow Temp: | DEG. F |
| Field: | AREA 3 / RUN 311 | Ambient Temp: | 80 DEG. F |
| Formation: | MV | Flow Rate: | MCF/D |
| Cust. Stn. No.: | 98012 | Sample Method: | Purge & Fill |
| | | Sample Date: | 08/28/2018 |
| | | Sample Time: | 12.10 PM |
| | | Sampled By: | BOBBY HEINEN |
| Heat Trace: | N | Sampled by (CO): | HILCORP |
| Remarks: | | | |

API 30045299 98

## Analysis

| Component:: | Mole%: | Unormalized %: | **GPM: | *BTU: | *SP Gravity: |
|---|---|---|---|---|---|
| Nitrogen | 0.3559 | 0.3560 | 0.0390 | 0.00 | 0.0034 |
| CO2 | 0.2869 | 0.2870 | 0.0490 | 0.00 | 0.0044 |
| Methane | 92.3410 | 92.3576 | 15.6900 | 932.64 | 0.5115 |
| Ethane | 4.9136 | 4.9145 | 1.3170 | 86.96 | 0.0510 |
| Propane | 1.2803 | 1.2805 | 0.3540 | 32.21 | 0.0195 |
| Iso-Butane | 0.1488 | 0.1488 | 0.0490 | 4.84 | 0.0030 |
| N-Butane | 0.1753 | 0.1753 | 0.0550 | 5.72 | 0.0035 |
| I-Pentane | 0.0362 | 0.0362 | 0.0130 | 1.45 | 0.0009 |
| N-Pentane | 0.0302 | 0.0302 | 0.0110 | 1.21 | 0.0008 |
| Hexane Plus | 0.4318 | 0.4319 | 0.1930 | 22.76 | 0.0143 |
| Total | 100.0000 | 100.0180 | 17.7700 | 1087.79 | 0.6122 |

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY
**@ 14.730 PSIA & 60 DEG. F.

| | | | |
|---|---|---|---|
| COMPRESSIBLITY FACTOR (1/Z): | 1.0025 | CYLINDER #: | 6074 |
| BTU/CU.FT IDEAL: | 1090.3 | CYLINDER PRESSURE: | 77 PSIG |
| BTU/CU.FT (DRY) CORRECTED FOR (1/Z): | 1093.0 | ANALYIS DATE: | 09/05/2018 |
| BTU/CU.FT (WET) CORRECTED FOR (1/Z): | 1074.0 | ANALYIS TIME: | 09:46:57 AM |
| DRY BTU @ 15.025: | 1114.9 | ANALYSIS RUN BY: | RICHARD WILSON |
| REAL SPECIFIC GRAVITY: | 0.6135 | | |

**GPM, BTU, and SPG calculations as shown above are based on current GPA constants.**
**GPA Standard: GPA-2261**
**GC: Danalyzer Model 500** **Last Cal/Verify: 09/07/2018**
**GC Method: C6+ Gas**

HILCORP (BHD PROJECT)

WELL ANALYSIS COMPARISON

| | | | |
|---|---|---|---|
| **Lease:** | HELMS FEDERAL #1B; CSG | CASING | 09/07/2018 |
| **Stn. No.:** | 98012 | MV | 35825-10655 |
| **Mtr. No.:** | | API 3004529998 | |

| | |
|---|---|
| **Smpl Date:** | 08/28/2018 |
| **Test Date:** | 09/05/2018 |
| **Run No:** | HS180167 |
| **Nitrogen:** | 0.3559 |
| **CO2:** | 0.2869 |
| **Methane:** | 92.3410 |
| **Ethane:** | 4.9136 |
| **Propane:** | 1.2803 |
| **I-Butane:** | 0.1488 |
| **N-Butane:** | 0.1753 |
| **I-Pentane:** | 0.0362 |
| **N-Pentane:** | 0.0302 |
| **Hexane+:** | 0.4318 |
| **BTU:** | 1093.0 |
| **GPM:** | 17.7700 |
| **SPG:** | 0.6135 |

**NEW MEXICO ENERGY, MINERALS & NATURAL RESOURCES DEPARTMENT**

OIL CONSERVATION DIVISION
AZTEC DISTRICT OFFICE
1000 RIO BRAZOS ROAD
AZTEC NM 87410
(505) 334-6178 FAX: (505) 334-6170
http://emnrd.state.nm.us/ocd/District III/3distric.htm

# BRADENHEAD TEST REPORT

(submit 1 copy to above address)

Date of Test 8/27/2018 Operator Hilcorp Energy Company API # 3004529998

Property Name HELMS FEDERAL Well No. 1B Location: Unit M Section 22 Township 030N Range 010W

Well Status Flowing Initial PSI: Tubing 75 Intermediate 452 Casing 82 Bradenhead 0

OPEN BRADENHEAD AND INTERMEDIATE TO ATMOSPHERE INDIVIDUALLY FOR 15 MINUTES EACH

| Testing | PRESSURE | | | | |
|---|---|---|---|---|---|
| | BRADENHEAD | | | INTERM | |
| TIME | BH | Int | Csg | Int | Csg |
| 5 min | 0 | 452 | 84 | 38 | 85 |
| 10 min | 0 | 452 | 84 | 20 | 86 |
| 15 min | 0 | 452 | 85 | 21 | 86 |
| 20 min | | | | 21 | 86 |
| 25 min | | | | 21 | 86 |
| 30 min | | | | 22 | 86 |

| FLOW CHARACTERISTICS | BRADENHEAD | INTERMEDIATE |
|---|---|---|
| Steady Flow | | |
| Surges | | |
| Down to Nothing | | |
| Nothing | Y | |
| Gas | | |
| Gas & Water | | Y |
| Water | | |

**If Bradenhead flowed water, check all of the descriptions that apply below:**

CLEAR ____ FRESH ____ SALTY ____ SULFUR ____ BLACK ____

**If Intermediate flowed water, check all of the descriptions that apply below:**

CLEAR ____ FRESH ____ SALTY ____ SULFUR ____ BLACK Y

**5 MINUTE SHUT-IN PRESSURE** Bradenhead 0 Intermediate 120

REMARKS:

No Bradenhead pressure after 24 hour shut in. Intermediate has oil present while producing to the pit sample was taken to Green Analytical 8/21/18.

Tested By khorton Witness Monica

NMOCD
SEP 11 2018
DISTRICT III