

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

United States of America, COLORADO

Date: Friday, March 8, 2019

### **SG 314-15 Production**

Terra Federal SG 314-15 Production

API# 05-045-24127-00

Job Date: Wednesday, January 30, 2019

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

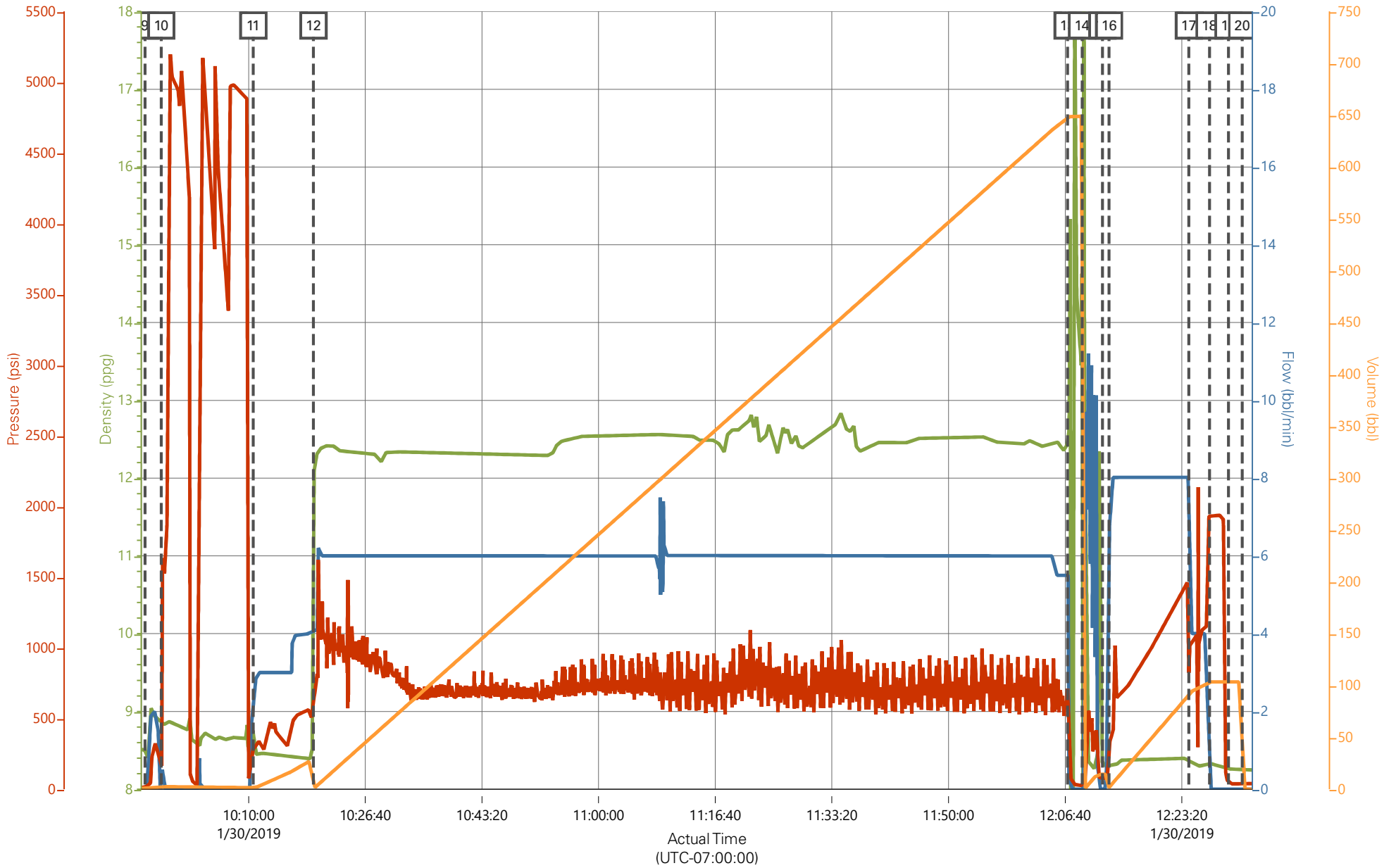
### 1.1 Job Event Log

| Type  | Seq. No. | Graph Label                           | Date      | Time     | Source | DH Density<br>(ppg) | Comb Pump Rate<br>(bbl/min) | PS Pump Press<br>(psi) | Pump Stg Tot<br>(bbl) | Comments  |
|-------|----------|---------------------------------------|-----------|----------|--------|---------------------|-----------------------------|------------------------|-----------------------|---|
| Event | 1        | Call Out                              | 1/30/2019 | 02:30:00 | USER   |                     |                             |                        |                       |   |
| Event | 2        | Pre-Convoy Safety Meeting             | 1/30/2019 | 06:00:00 | USER   |                     |                             |                        |                       |   |
| Event | 3        | Arrive At Loc                         | 1/30/2019 | 07:30:00 | USER   |                     |                             |                        |                       |   |
| Event | 4        | Assessment Of Location Safety Meeting | 1/30/2019 | 07:35:00 | USER   |                     |                             |                        |                       |   |
| Event | 5        | Spot Equipment                        | 1/30/2019 | 07:40:00 | USER   |                     |                             |                        |                       |   |
| Event | 6        | Pre-Rig Up Safety Meeting             | 1/30/2019 | 07:45:00 | USER   |                     |                             |                        |                       |   |
| Event | 7        | Rig-Up Equipment                      | 1/30/2019 | 07:50:00 | USER   |                     |                             |                        |                       |   |
| Event | 8        | Pre-Job Safety Meeting                | 1/30/2019 | 09:30:00 | USER   |                     |                             |                        |                       | PRESSURIZED MUD SCALES VERIFIED ON DRINKING WATER PRIOR TO JOB START  |
| Event | 9        | Start Job                             | 1/30/2019 | 09:55:11 | COM5   |                     |                             |                        |                       | TD: 6731 TP: 6724.8 SJ: 31.6 MW: 10.3 PPG 4 1/2" 11.6#/FT P-110 CSG IN 8 3/4" OH WATER TEST: PH: 7 POTASSIUM: 700 CHLORIDES: 0 SUFATES: <200 TEMP: 78 DEGREES |
| Event | 10       | Test Lines                            | 1/30/2019 | 09:57:31 | COM5   |                     |                             | 5000.00                |                       | 5000 PSI TEST   |
| Event | 11       | Pump Spacer 1                         | 1/30/2019 | 10:10:40 | COM5   | 8.40                | 4.00                        | 361.00                 | 20.00                 | MUDFLUSH SPACER   |
| Event | 12       | Pump Cement                           | 1/30/2019 | 10:19:16 | COM5   | 12.5                | 6.00                        | 593.00                 | 616.10                | 1765 SKS @ 12.5 PPG 1.96 YLD 9.4 GAL/SK H2O. CUSTOMER REQUESTED THAT WE PUMP THE FIRST 200  |

BBL @ 12.3PPG W/ TUFF FIBER, TO HELP MITIGATE LOSSES

|       |    |  |           |          |      |      |      |         |        |   |
|-------|----|--|-----------|----------|------|------|------|---------|--------|---|
| Event | 13 | Shutdown                               | 1/30/2019 | 12:07:00 | USER |      |      |         |        |   |
| Event | 14 | Clean Lines                            | 1/30/2019 | 12:09:05 | COM5 |      |      |         |        |   |
| Event | 15 | Drop Top Plug                          | 1/30/2019 | 12:11:59 | COM5 |      |      |         |        | PLUG AWAY   |
| Event | 16 | Pump Displacement                      | 1/30/2019 | 12:12:56 | COM5 | 8.48 | 8.00 | 1480.00 | 103.70 | FRESH H2O DISPLACEMENT W/ BE-6, MMCR, KCL   |
| Event | 17 | Slow Rate                              | 1/30/2019 | 12:24:20 | USER | 8.48 | 4.00 | 1125.00 | 93.00  |   |
| Event | 18 | Bump Plug                              | 1/30/2019 | 12:27:17 | COM5 | 8.33 | 0.00 | 1932.00 | 103.70 | PLUG BUMPED AT CALCULATED DISPLACEMENT  |
| Event | 19 | Check Floats                           | 1/30/2019 | 12:30:00 | USER |      |      |         |        | FLOATS HELD, GAINED 1 BBL BACK TO PUMP  |
| Event | 20 | End Job                                | 1/30/2019 | 12:31:58 | COM5 |      |      |         |        |   |
| Event | 21 | Post-Job Safety Meeting (Pre Rig-Down) | 1/30/2019 | 12:40:00 | USER |      |      |         |        | GOOD CIRCULATION THROUGH MOST OF CEMENT, LOST RETURNS AT ABOUT 450BBL AWAY ON CEMENT AND DID NOT GAIN RETURNS BACK FOR THE REMAINDER OF THE JOB |
| Event | 22 | Rig-Down Equipment                     | 1/30/2019 | 12:45:00 | USER |      |      |         |        | PIPE WAS RECIPROCATED DURING JOB. NO ADD HOURS. 3# BE-6 USED, 1 GAL MMCR, 40 # SUGAR 5 BOXES WELL LIFE 914                                      |
| Event | 23 | Depart Location Safety Meeting         | 1/30/2019 | 13:55:00 | USER |      |      |         |        |   |
| Event | 24 | Crew Leave Location                    | 1/30/2019 | 14:00:00 | USER |      |      |         |        | THANK YOU FOR CHOOSING HALLIBURTON CEMENTING ANTHONY ANDREWS AND CREW   |

# Custom Results



### Job Information

|                |                       |          |                   |            |                |
|----------------|-----------------------|----------|-------------------|------------|----------------|
| Request/Slurry | 2531157/5             | Rig Name | H&P 318           | Date       | 27/JAN/2019    |
| Submitted By   | Connor Matthews       | Job Type | Production Casing | Bulk Plant | Grand Junction |
| Customer       | Terra Energy Partners | Location | Garfield          | Well       | SG 314-15      |

### Well Information

|                   |          |           |         |      |              |
|-------------------|----------|-----------|---------|------|--------------|
| Casing/Liner Size | 4.5 in   | Depth MD  | 6744 ft | BHST | 87°C / 188°F |
| Hole Size         | 8.75 in  | Depth TVD | 6363 ft | BHCT | 52°C / 125°F |
| Pressure          | 3754 psi |           |         |      |              |

### Drilling Fluid Information

|                   |        |                |            |         |             |
|-------------------|--------|----------------|------------|---------|-------------|
| Mud Supplier Name | Baroid | Mud Trade Name | BARADRIL-N | Density | 9.9 lbm/gal |
|-------------------|--------|----------------|------------|---------|-------------|

### Cement Information - Tail Design

| <u>Conc</u> | <u>UOM</u> | <u>Cement/Additive</u> | <u>MP</u> | <u>Sample Type</u> | <u>Sample Date</u> | <u>Lot No.</u> | Cement Properties |             |          |
|-------------|------------|------------------------|-----------|--------------------|--------------------|----------------|-------------------|-------------|----------|
| 141.7       | % BWOC     | Cement Blend           |           |                    |                    |                | Slurry Density    | 12.5        | lbm/gal  |
|             |            |                        |           |                    |                    |                | Slurry Yield      | 1.96        | ft3/sack |
|             |            |                        |           |                    |                    |                | Water Requirement | 9.43        | gal/sack |
|             |            |                        |           |                    |                    |                | Total Mix Fluid   | 9.43        | gal/sack |
|             |            |                        |           |                    |                    |                | Water Source      | Fresh Water |          |
|             |            |                        |           |                    |                    |                | Water Chloride    |             |          |

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# Operation Test Results Request ID 2531157/5

## Thickening Time - ON-OFF-ON, Request Test ID:36188519

30/JAN/2019

| Test Temp (degF) | Pressure (psi) | Reached in (min) | 50 Bc (hh:min) | 70 Bc (hh:min) | 100 Bc (hh:min) | Start Bc | Stirring before stop (mins) | Static Period (min) | Peak reading (BC) |
|------------------|----------------|------------------|----------------|----------------|-----------------|----------|-----------------------------|---------------------|-------------------|
| 125              | 3754           | 34               | 4:56           | 5:05           | 5:14            | 5        | 44                          | 15                  | 8                 |

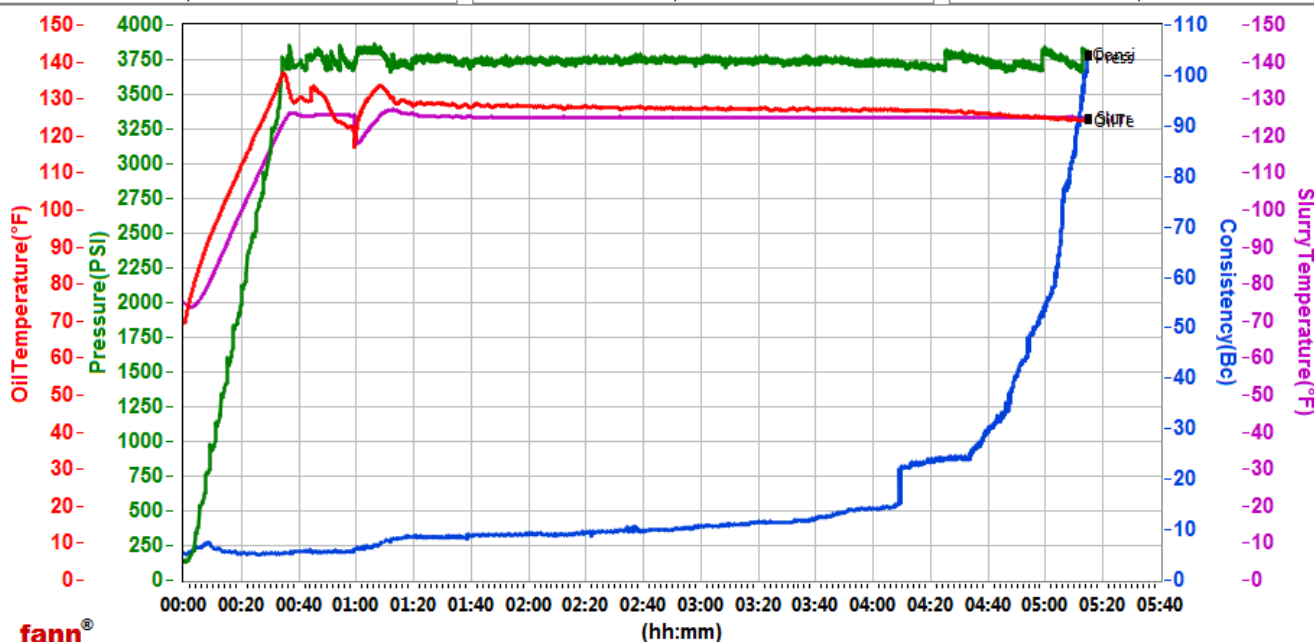
Total SKS 1765

CS0148, Trailer 7094, 165 sks

No deflection, 8Bc--- > 8Bc

### GRAND JUNCTION

| Fields       | Values             | Fields            | Values                 | Events | Results |
|--------------|--------------------|-------------------|------------------------|--------|---------|
| Project Name | TempTest           | Rig               | H&P 318                |        |         |
| SW Version   | 1.0                | Casing/Liner Size | 4.5 INCH               |        |         |
| Test ID      | 36188519 - TT      | Job Type          | PRODUCTION CASING      |        |         |
| Request ID   | 2531157-5          | Cement Weight     | GCC TYPE I/II          |        |         |
| Tested by    | CT                 | Comments          | Light Weight           |        |         |
| Customer     | TERRA ENERGY PARTN | Date Time         | 1/29/2019 10:05:52.894 |        |         |
| Well No      | SG 314-15          | Temp. Units       | degF                   |        |         |



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2531157-5 TERRA BULK PRODUCTION PRIMARY.tdms

Comments Light Weight

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# Operation Test Results Request ID 2531157/4

Thickening Time - ON-OFF-ON, Request Test ID:36187591

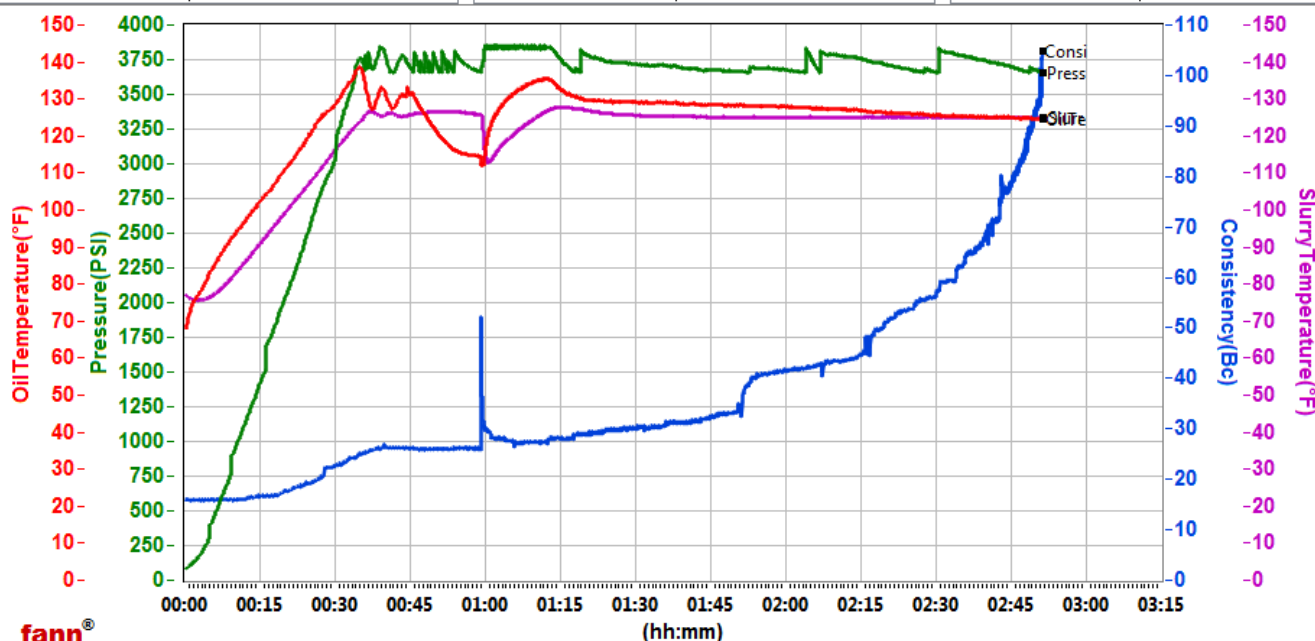
29/JAN/2019

| Test Temp<br>(degF) | Pressure<br>(psi) | Reached in<br>(min) | 30 Bc<br>(hh:mm) | 50 Bc<br>(hh:mm) | 70 Bc<br>(hh:mm) | 100 Bc<br>(hh:mm) | Start Bc | Stirring<br>before stop<br>(mins) | Static<br>Period<br>(min) | Peak<br>reading<br>(BC) |
|---------------------|-------------------|---------------------|------------------|------------------|------------------|-------------------|----------|-----------------------------------|---------------------------|-------------------------|
| 125                 | 3754              | 34                  | 1:27             | 2:19             | 2:40             | 2:50              | 15       | 44                                | 15                        | 52                      |

CS0145 TR#2878 400 SKS

## GRAND JUNCTION

| Fields       | Values             | Fields            | Values                 | Events | Results |
|--------------|--------------------|-------------------|------------------------|--------|---------|
| Project Name | TempTest           | Rig               | H&P 318                |        |         |
| SW Version   | 1.0                | Casing/Liner Size | 4.5 INCH               |        |         |
| Test ID      | 36187591- TT       | Job Type          | PRODUCTION CASING      |        |         |
| Request ID   | 2531157-4          | Cement Weight     | GCC TYPE I-II          |        |         |
| Tested by    | DS                 | Comments          | Standard               |        |         |
| Customer     | TERRA ENERGY PARTN | Date Time         | 1/29/2019 03:07:07.039 |        |         |
| Well No      | SG 314-15          | Temp. Units       | degF                   |        |         |



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2531157-4 TERRA BULK PRODUCTION PRIMARY.tdms

Comments Standard

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# Operation Test Results Request ID 2531157/3

Thickening Time - ON-OFF-ON, Request Test ID:36187570

29/JAN/2019

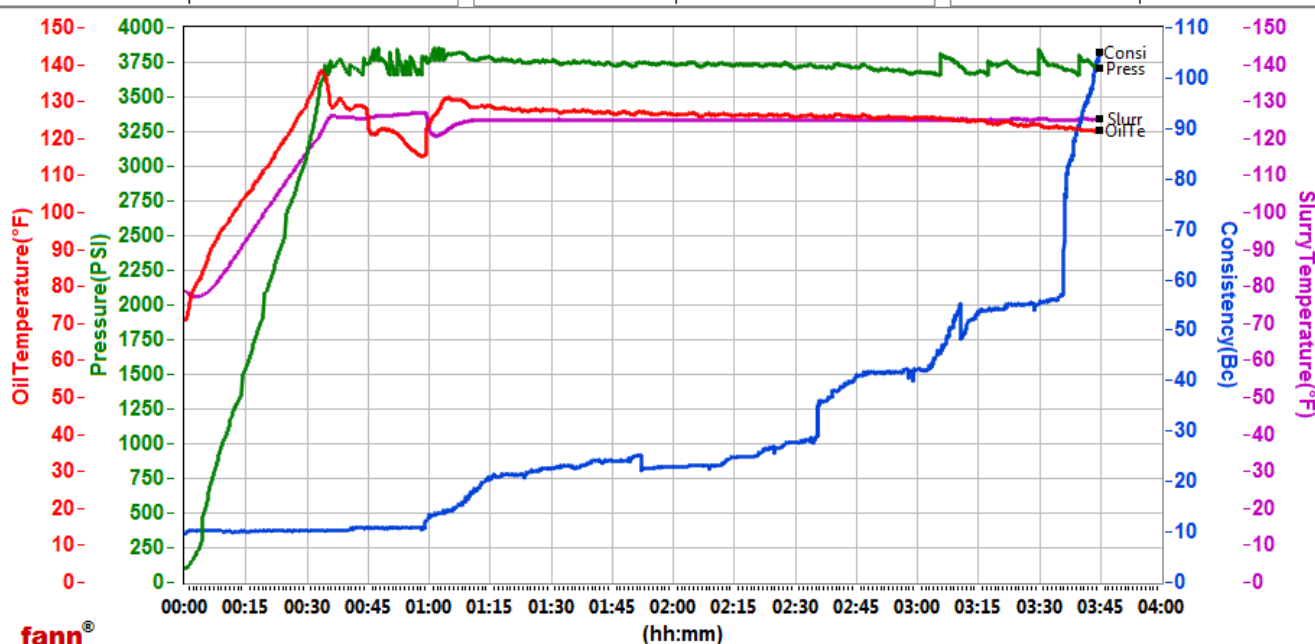
| Test Temp<br>(degF) | Pressure<br>(psi) | Reached in<br>(min) | 30 Bc<br>(hh:mm) | 50 Bc<br>(hh:mm) | 70 Bc<br>(hh:mm) | 100 Bc<br>(hh:mm) | Start Bc | Stirring<br>before stop<br>(mins) | Static<br>Period<br>(min) | Peak<br>reading<br>(BC) |
|---------------------|-------------------|---------------------|------------------|------------------|------------------|-------------------|----------|-----------------------------------|---------------------------|-------------------------|
| 125                 | 3754              | 34                  | 2:35             | 3:08             | 3:36             | 3:43              | 10       | 44                                | 15                        | 12                      |

CS0144 TR#8678 400 SKS

Deflected from 10Bc-- > 12Bc

## GRAND JUNCTION

| Fields       | Values             | Fields            | Values                 | Events | Results |
|--------------|--------------------|-------------------|------------------------|--------|---------|
| Project Name | TempTest           | Rig               | H&P318                 |        |         |
| SW Version   | 1.0                | Casing/Liner Size | 4.5 INCH               |        |         |
| Test ID      | 36187570 - TT      | Job Type          | PRODUCTION CASING      |        |         |
| Request ID   | 2531157-3          | Cement Weight     | GCC TYPE I-II          |        |         |
| Tested by    | DS                 | Comments          | Standard               |        |         |
| Customer     | TERRA ENERGY PARTN | Date Time         | 1/29/2019 02:49:02.411 |        |         |
| Well No      | SG 314-15          | Temp. Units       | degF                   |        |         |



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2531157-3 TERRA PRODUCTION BULK PRIMARYms.tdms

Comments Standard

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## Operation Test Results Request ID 2531157/2

Thickening Time - ON-OFF-ON, Request Test ID:36184980

29/JAN/2019

| Test Temp<br>(degF) | Pressure<br>(psi) | Reached in<br>(min) | 30 Bc<br>(hh:mm) | 50 Bc<br>(hh:mm) | 70 Bc<br>(hh:mm) | 100 Bc<br>(hh:mm) | Start Bc | Stirring<br>before stop<br>(mins) | Static<br>Period<br>(min) | Peak<br>reading<br>(BC) |
|---------------------|-------------------|---------------------|------------------|------------------|------------------|-------------------|----------|-----------------------------------|---------------------------|-------------------------|
| 125                 | 3754              | 34                  | 3:56             | 4:01             | 4:14             | 4:33              | 9        | 44                                | 15                        | 15                      |

CS0146 TR#1513 400 SKS

CS0147 TR#8476 400 SKS

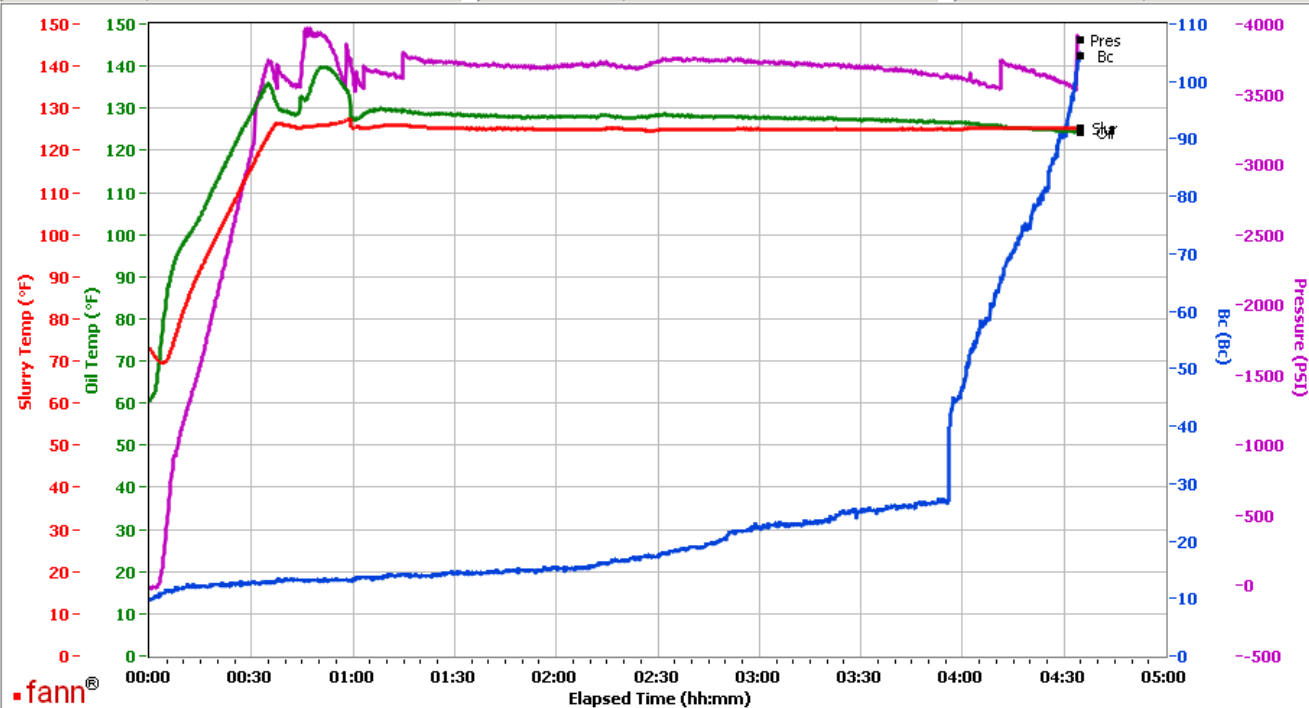
no deflection, 15Bc---> 15Bc

### Grand Junction Colorado

| Fields            | Values                               |
|-------------------|--------------------------------------|
| Project Name      | GJ2531157-2 TERRA PRODUCTION BULK PR |
| Test ID           | 36184980-TT                          |
| Request ID        | GJ2531157-2                          |
| Tested by         | DEBA                                 |
| Customer          | TERRA ENERGY PARTNERS                |
| Well No           | SG 314-15                            |
| Rig               | H8P 318                              |
| Casing/Liner Size | 4.5 INCH                             |

| Fields         | Values            |
|----------------|-------------------|
| Job Type       | PRODUCTION CASING |
| Cement Type    | GCC TYPE I-II     |
| Cement Weight  | Light Weight      |
| Test Date      | 01/28/19          |
| Test Time      | 07:23 PM          |
| Temp. Units    | degF              |
| Pressure Units | PSI               |
| SW Version     | 2.1.0.507         |

| Events    | Results |
|-----------|---------|
| 30.00 Bc  | 03h:56m |
| 40.00 Bc  | 03h:56m |
| 50.00 Bc  | 04h:01m |
| 70.00 Bc  | 04h:14m |
| 100.00 Bc | 04h:33m |
| 00h:30m   | 12.81   |
| 01h:00m   | 13.34   |
| 01h:30m   | 14.56   |



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9YZ0P2R\GJ2531157-2 TERRA PRODUCTION BULK PRIMARY[1].tdms

Comments CS0146, TR#1513, 400 SKS AND CS0147, TR#1513, 400 SKS

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# **Operation Test Results Request ID 2531157/1**

**Thickening Time - ON-OFF-ON, Request Test ID:36185315**

**29/JAN/2019**

| Test Temp<br>(degF) | Pressure<br>(psi) | Reached in<br>(min) | 30 Bc<br>(hh:mm) | 50 Bc<br>(hh:mm) | 70 Bc<br>(hh:mm) | 100 Bc<br>(hh:mm) | Start Bc | Stirring<br>before stop<br>(mins) | Static<br>Period<br>(min) | Peak<br>reading<br>(BC) |
|---------------------|-------------------|---------------------|------------------|------------------|------------------|-------------------|----------|-----------------------------------|---------------------------|-------------------------|
| 125                 | 3754              | 34                  | 1:37             | 2:07             | 2:18             | 2:31              | 6        | 44                                | 15                        | 14                      |

Total SKS 1765

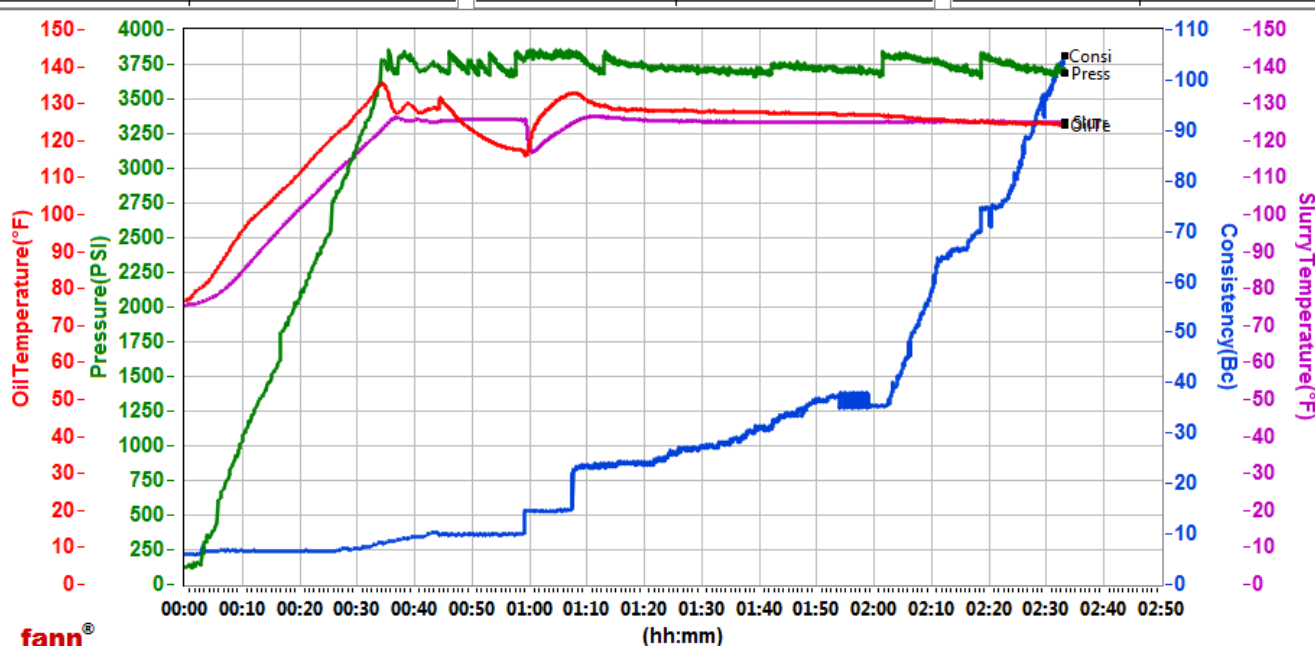
CS0144 TR#8678 400 SKS

CS0145 TR#2878 400 SKS

deflected from 10Bc--- > 14Bc

## **GRAND JUNCTION**

| Fields       | Values             | Fields            | Values                 | Events | Results |
|--------------|--------------------|-------------------|------------------------|--------|---------|
| Project Name | TempTest           | Rig               | H&P 318                |        |         |
| SW Version   | 1.0                | Casing/Liner Size | 4.5 INCH               |        |         |
| Test ID      | 36185315 - TT      | Job Type          | PRODUCTION CASING      |        |         |
| Request ID   | 2531157-1          | Cement Weight     | GCC TYPE I/II          |        |         |
| Tested by    | DS                 | Comments          | Light Weight           |        |         |
| Customer     | TERRA ENERGY PARTN | Date Time         | 1/28/2019 14:36:29.636 |        |         |
| Well No      | SG 314-15          | Temp. Units       | degF                   |        |         |



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2531157-1 TERRA PRODUCTION BULK PRIMARY RETEST.tdms

Comments Light Weight

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