

# HALLIBURTON

iCem<sup>®</sup> Service

**TERRA ENERGY LTD.**

**For: Terra**

Date: Thursday, February 08, 2018

**SR 514-12 Production PJR**

API #: 05-045-23435

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

### 1.1 Job Event Log

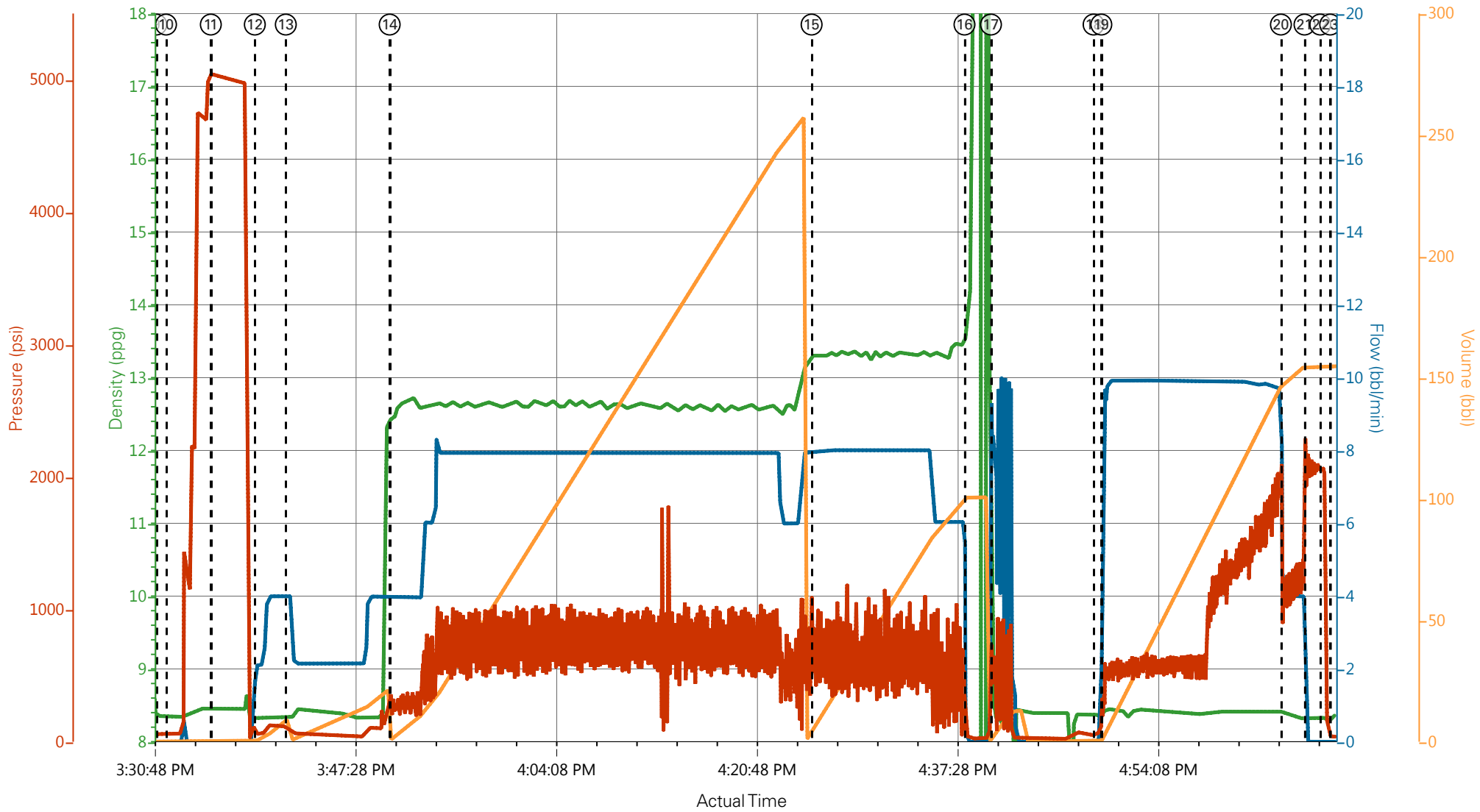
| Type  | Seq. No. | Graph Label                           | Date     | Time     | Source | Pass-Side Pump Pressure<br>(psi) | Downhole Density<br>(ppg) | Combined Pump Rate<br>(bbl/min) | Pump Stage Total<br>(bbl) | Comments   |
|-------|----------|---------------------------------------|----------|----------|--------|----------------------------------|---------------------------|---------------------------------|---------------------------|--|
| Event | 1        | Call Out                              | 2/8/2018 | 04:30:00 | USER   |                                  |                           |                                 |                           | REQUESTED ON LOCATION @ 1030   |
| Event | 2        | Pre-Convoy Safety Meeting             | 2/8/2018 | 07:15:00 | USER   |                                  |                           |                                 |                           | ALL HES PRESENT  |
| Event | 3        | Crew Leave Yard                       | 2/8/2018 | 07:30:00 | USER   |                                  |                           |                                 |                           | 1 F550, 1 PUMP TRUCK & 1 660 BULK TURCK  |
| Event | 4        | Arrive At Loc                         | 2/8/2018 | 09:00:00 | USER   |                                  |                           |                                 |                           | RIG RUNNING CASING   |
| Event | 5        | Assessment Of Location Safety Meeting | 2/8/2018 | 10:00:00 | USER   |                                  |                           |                                 |                           | MET WITH COMP REP AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH- 7, CHLORIDES- 0, TEMP- 61F). COMP REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES. |
| Event | 6        | Pre-Rig Up Safety Meeting             | 2/8/2018 | 11:00:00 | USER   |                                  |                           |                                 |                           | ALL HES PRESENT  |
| Event | 7        | Rig-Up Equipment                      | 2/8/2018 | 11:30:00 | USER   |                                  |                           |                                 |                           | HES RIGGED UP EQUIPMENT WITHOUT ENTERING RED ZONE.   |
| Event | 8        | Pre-Job Safety Meeting                | 2/8/2018 | 15:00:00 | USER   |                                  |                           |                                 |                           | ALL HES AND RIG CREW PRESENT   |
| Event | 9        | Start Job                             | 2/8/2018 | 15:31:12 | USER   |                                  |                           |                                 |                           | TD 10150', TP 10140', SJ 31.4', OH 8.75", CSG 4.5" 11.6#, MUD 9.2 PPG. RIG CIRCULATED WELL @ 10 BPM WITH 1100 PSI.   |

|       |    |                         |          |          |               |         |       |      |        |  |
|-------|----|-------------------------|----------|----------|---------------|---------|-------|------|--------|--|
| Event | 10 | Prime Pumps             | 2/8/2018 | 15:32:00 | RTD<br>Import | 55.79   | 8.35  | 1.00 | 2.0    | 8.33 PPG FRESH WATER   |
| Event | 11 | Test Lines              | 2/8/2018 | 15:35:43 | RTD<br>Import | 5030.25 | 8.46  | 0.50 | 0.5    | ALL LINES HELD PRESSURE<br>AT 5227 PSI                                       |
| Event | 12 | Pump Spacer 1*          | 2/8/2018 | 15:39:22 | RTD<br>Import | 164.23  | 8.34  | 4.00 | 10.0   | 8.33 PPG FRESH WATER (10<br>BBL)   |
| Event | 13 | Pump Spacer2*           | 2/8/2018 | 15:41:57 | RTD<br>Import | 167.36  | 8.33  | 3.99 | 20.0   | 8.4 PPG MUDFLUSH III (20<br>BBL)   |
| Event | 14 | Pump Lead Cement*       | 2/8/2018 | 15:50:34 | RTD<br>Import | 721.73  | 12.52 | 7.99 | 280.0  | NEOCEM CEMENT 810 SKS<br>(280 BBLs), 12.5 PPG, 1.96<br>FT3/SK, 9.35 GAL/SK   |
| Event | 15 | Pump Tail Cement*       | 2/8/2018 | 16:25:37 | RTD<br>Import | 631.43  | 13.28 | 7.94 | 82.0   | THERMACEM CEMENT 265<br>SKS (82 BBLs), 13.3 PPG,<br>1.73 FT3/SK, 7.81 GAL/SK |
| Event | 16 | Shutdown                | 2/8/2018 | 16:38:18 | USER          |         |       |      |        | END OF CMT   |
| Event | 17 | Clean Lines             | 2/8/2018 | 16:40:30 | USER          |         |       |      |        | WASH UP PUMPS AND<br>LINES TO THE PIT  |
| Event | 18 | Drop Plug               | 2/8/2018 | 16:49:02 | USER          |         |       |      |        | PLUG WENT, VERIFIED BY<br>CO REP.  |
| Event | 19 | Pump Displacement*      | 2/8/2018 | 16:49:40 | RTD<br>Import | 1829.62 | 8.34  | 9.96 | 147.25 | 8.34 PPG FRESH WATER<br>(157.25 BBLs) 3 BAGS BE6, 1<br>GAL MMCR & 15 SKS KCL |
| Event | 20 | Slow Rate               | 2/8/2018 | 17:04:35 | USER          | 1360.62 | 8.39  | 4.01 | 10.1   | SLOW RATE TO 4 BPM PER<br>CO REP TO LAND PLUG                                |
| Event | 21 | Bump Plug               | 2/8/2018 | 17:06:33 | USER          | 1974.89 | 8.34  | 4.00 | 157.25 | LAND PLUG AT 1360 PSI,<br>BROUGHT UP TO 2000 PSI                             |
| Event | 22 | Check Floats            | 2/8/2018 | 17:07:51 | USER          | 2049.89 | 8.33  | 0.00 | 157.25 | FLOATS HELD, 1 BBL BACK<br>TO TRUCK  |
| Event | 23 | End Job                 | 2/8/2018 | 17:08:41 | USER          | 38.92   | 8.31  | 0.00 | 157.25 | RETURNS THROUGHOUT,<br>PIPE WAS NOT<br>RECIPROCATED                          |
| Event | 24 | Post-Job Safety Meeting | 2/8/2018 | 17:20:00 | USER          |         |       |      |        | ALL HES PRESENT  |

(Pre Rig-Down)

|       |    |                           |          |          |      |   |
|-------|----|---------------------------|----------|----------|------|---|
| Event | 25 | Rig-Down Equipment        | 2/8/2018 | 17:45:00 | USER | ALL HES PRESENT   |
| Event | 26 | Pre-Convoy Safety Meeting | 2/8/2018 | 18:20:00 | USER | ALL HES PRESENT   |
| Event | 27 | Crew Leave Yard           | 2/8/2018 | 18:30:00 | USER | THANK YOU FOR CHOOSING<br>HALLIBURTON CEMENT,<br>CHRIS SMITH AND CREW |

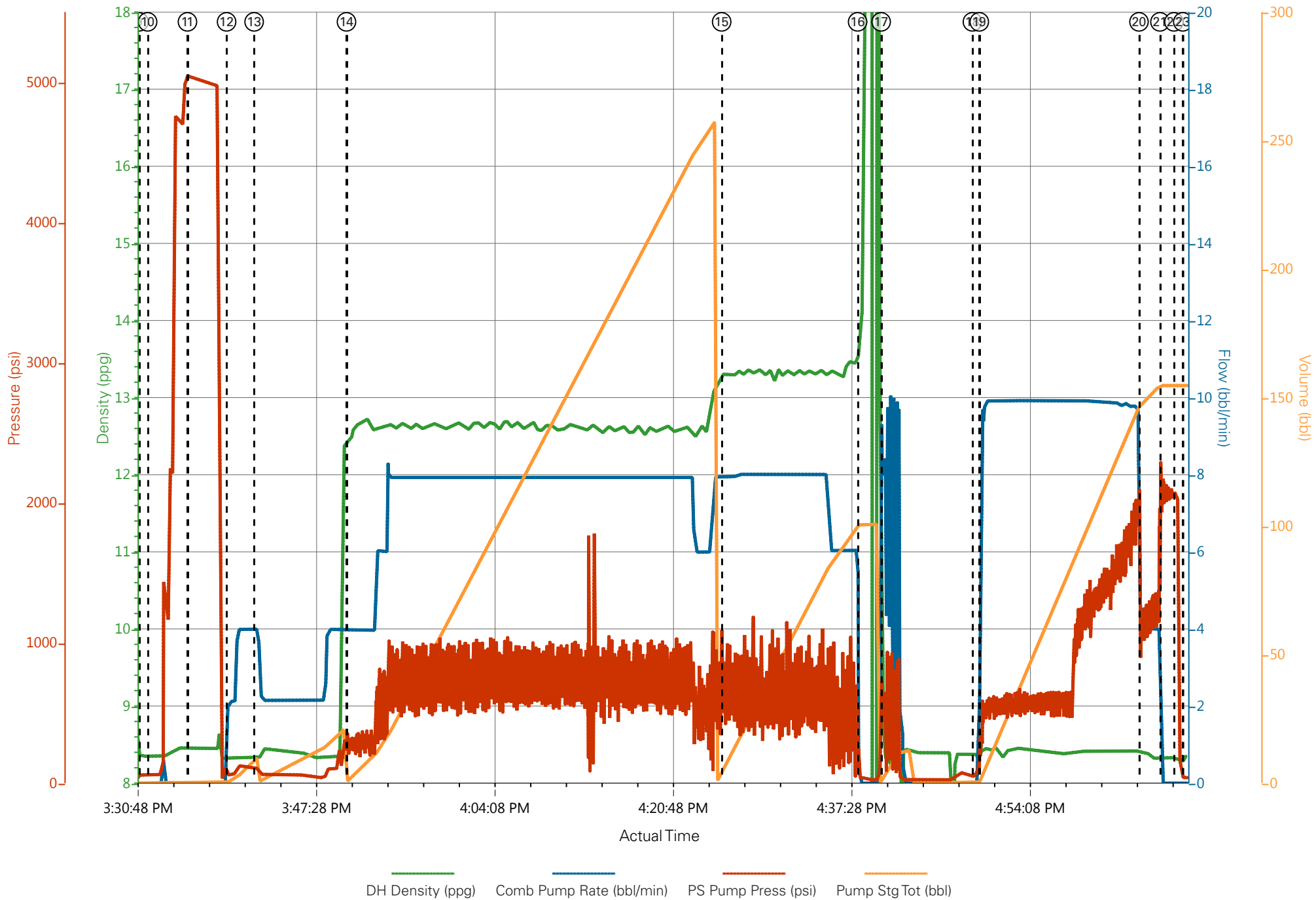
# TEP - SR 514-12 - 4.5" PRODUCTION



DH Density (ppg)    Comb Pump Rate (bbl/min)    PS Pump Press (psi)    Pump Stg Tot (bbl)

- |                             |   |                  |                     |                      |   |         |
|-----------------------------|---|------------------|---------------------|----------------------|---|---------|
| ① Call Out                  | ⑤ Assessment Of Location Safety Meeting | ⑨ Start Job      | ⑬ Pump Spacer2*     | ⑰ Clean Lines        | 21 Bump Plug                              | 25 Rig- |
| ② Pre-Convoy Safety Meeting | ⑥ Pre-Rig Up Safety Meeting             | ⑩ Prime Pumps    | ⑭ Pump Lead Cement* | ⑱ Drop Plug          | 22 Check Floats                           | 26 Pre- |
| ③ Crew Leave Yard           | ⑦ Rig-Up Equipment                      | ⑪ Test Lines     | ⑮ Pump Tail Cement* | ⑲ Pump Displacement* | 23 End Job                                | 27 Crew |
| ④ Arrive At Loc             | ⑧ Pre-Job Safety Meeting                | ⑫ Pump Spacer 1* | ⑯ Shutdown          | 20 Slow Rate         | 24 Post-Job Safety Meeting (Pre Rig-Down) |         |

# TEP - SR 514-12 - 4.5" PRODUCTION



— DH Density (ppg)    
 — Comb Pump Rate (bbl/min)    
 — PS Pump Press (psi)    
 — Pump Stg Tot (bbl)

### Job Information

|                       |                       |                 |                   |                   |                |
|-----------------------|-----------------------|-----------------|-------------------|-------------------|----------------|
| <b>Request/Slurry</b> | 2451192/1             | <b>Rig Name</b> | H&P 318           | <b>Date</b>       | 05/FEB/2018    |
| <b>Submitted By</b>   | Aaron Katz            | <b>Job Type</b> | Production Casing | <b>Bulk Plant</b> | Grand Junction |
| <b>Customer</b>       | Terra Energy Partners | <b>Location</b> | Garfield          | <b>Well</b>       | SR 514-12      |

### Well Information

|                          |          |                  |          |             |               |
|--------------------------|----------|------------------|----------|-------------|---------------|
| <b>Casing/Liner Size</b> | 4.5 in   | <b>Depth MD</b>  | 10115 ft | <b>BHST</b> | 117°C / 242°F |
| <b>Hole Size</b>         | 8.75 in  | <b>Depth TVD</b> | 9507 ft  | <b>BHCT</b> | 78°C / 172°F  |
| <b>Pressure</b>          | 5955 psi |                  |          |             |               |

### Drilling Fluid Information

|                          |  |                       |  |                |  |
|--------------------------|--|-----------------------|--|----------------|--|
| <b>Mud Supplier Name</b> |  | <b>Mud Trade Name</b> |  | <b>Density</b> |  |
|--------------------------|--|-----------------------|--|----------------|--|

### Cement Information - Lead Design

| <u>Conc</u> | <u>UOM</u> | <u>Cement/Additive</u> | <u>Sample Type</u> | <u>Sample Date</u> | <u>Lot No.</u> | <b>Cement Properties</b> |             |          |
|-------------|------------|------------------------|--------------------|--------------------|----------------|--------------------------|-------------|----------|
|             |            | NeoCem Lead            |                    |                    |                | Slurry Density           | 12.5        | lbm/gal  |
|             |            |                        |                    |                    |                | Slurry Yield             | 1.941       | ft3/sack |
|             |            |                        |                    |                    |                | Water Requirement        | 9.623       | gal/sack |
|             |            |                        |                    |                    |                | Total Mix Fluid          | 9.623       | gal/sack |
|             |            |                        |                    |                    |                | Water Source             | Fresh Water |          |
|             |            |                        |                    |                    |                | Water Chloride           |             |          |

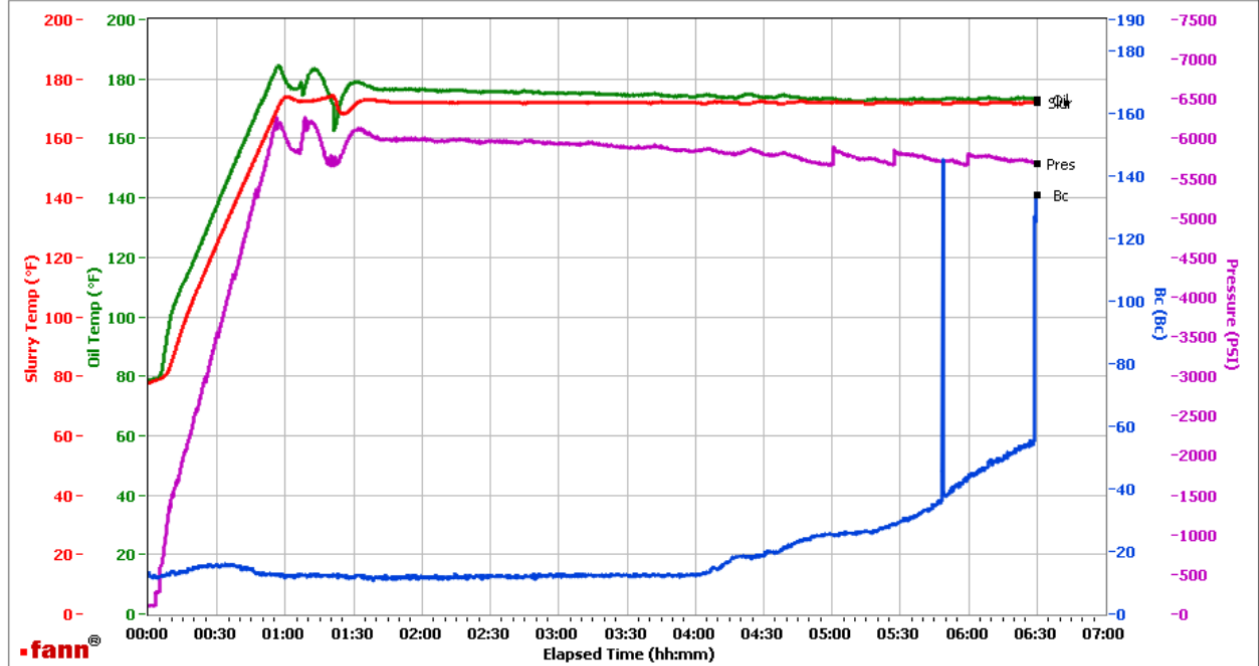
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Thickening Time - ON-OFF-ON

06/FEB/2018

| Test Temp (degF) | Pressure (psi) | Reached in (min) | 30 Bc (hh: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) |
|------------------|----------------|------------------|----------------|----------------|----------------|-----------------|----------|-----------------------------|---------------------|-------------------|
| 172              | 5955           | 56               | 5:31           | 6:12           | 6:29           | 6:29            | 13       | 66                          | 15                  | 12                |

| Grand Junction Colorado |                                      |                |                   |
|-------------------------|--------------------------------------|----------------|-------------------|
| Fields                  | Values                               | Fields         | Values            |
| Project Name            | GJ2451192-1 TERRA PRODUCTION BULK LE | Job Type       | PRODUCTION CASING |
| Test ID                 | 35231849                             | Cement Type    | GCC TYPE I/II     |
| Request ID              | GJ2451192-1                          | Cement Weight  | Standard          |
| Tested by               | DEBA                                 | Test Date      | 02/06/18          |
| Customer                | TERRA ENERGY PARTNERS                | Test Time      | 08:06 AM          |
| Well No                 | SR 514-12                            | Temp. Units    | degF              |
| Rig                     | H&P 318                              | Pressure Units | PSI               |
| Casing/Liner Size       | 4.5"                                 | SW Version     | 2.1.0.507         |



Data File: C:\Documents and Settings\Administrator\Desktop\Test Data\GJ2451192-1 TERRA PRODUCTION BULK LEAD.tdms  
 Comments: COMPOSITE: CS 0362 TR#8678 405 SKS AND CS0369 TR#2878 405 SKS

Total sks = 810  
 Composite:  
 CS0362 TR#8678 405 SKS  
 CS0369 TR#2878 405 SKS  
 No deflection.

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**Job Information**

|                       |                       |                 |                   |                   |                |
|-----------------------|-----------------------|-----------------|-------------------|-------------------|----------------|
| <b>Request/Slurry</b> | 2451193/1             | <b>Rig Name</b> | H&P 318           | <b>Date</b>       | 05/FEB/2018    |
| <b>Submitted By</b>   | Aaron Katz            | <b>Job Type</b> | Production Casing | <b>Bulk Plant</b> | Grand Junction |
| <b>Customer</b>       | Terra Energy Partners | <b>Location</b> | Garfield          | <b>Well</b>       | SR 514-12      |

**Well Information**

|                          |          |                  |          |             |               |
|--------------------------|----------|------------------|----------|-------------|---------------|
| <b>Casing/Liner Size</b> | 4.5 in   | <b>Depth MD</b>  | 10115 ft | <b>BHST</b> | 117°C / 242°F |
| <b>Hole Size</b>         | 8.75 in  | <b>Depth TVD</b> | 9507 ft  | <b>BHCT</b> | 78°C / 172°F  |
| <b>Pressure</b>          | 5955 psi |                  |          |             |               |

**Drilling Fluid Information**

|                          |  |                       |  |                |  |
|--------------------------|--|-----------------------|--|----------------|--|
| <b>Mud Supplier Name</b> |  | <b>Mud Trade Name</b> |  | <b>Density</b> |  |
|--------------------------|--|-----------------------|--|----------------|--|

**Cement Information - Tail Design** 

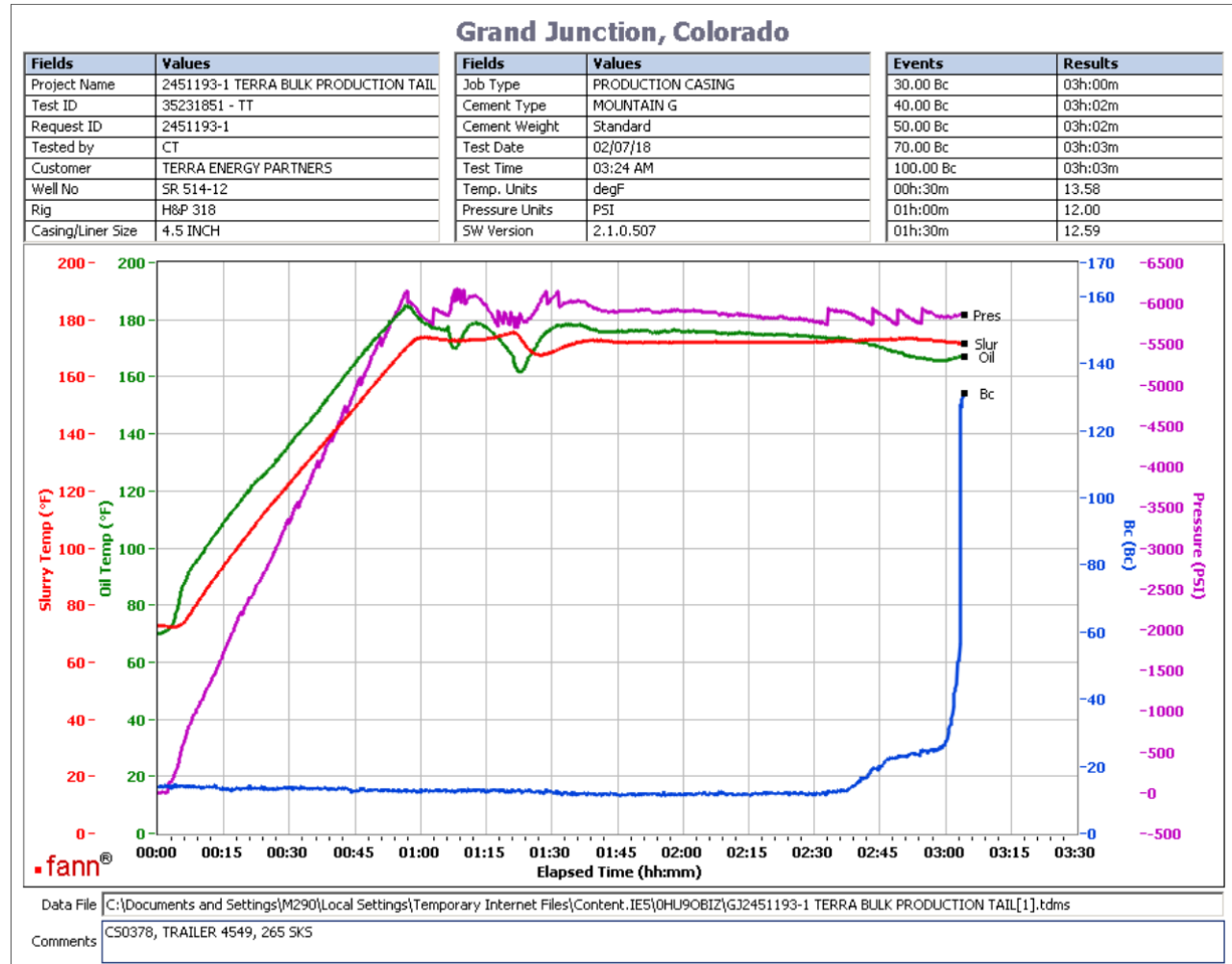
| <u>Conc</u> | <u>UOM</u> | <u>Cement/Additive</u> | <u>Sample Type</u> | <u>Sample Date</u> | <u>Lot No.</u> | <b>Cement Properties</b> |             |          |
|-------------|------------|------------------------|--------------------|--------------------|----------------|--------------------------|-------------|----------|
|             |            | ThermaCem Tail         |                    |                    |                | Slurry Density           | 13.3        | lbm/gal  |
|             |            |                        |                    |                    |                | Slurry Yield             | 1.733       | ft3/sack |
|             |            |                        |                    |                    |                | Water Requirement        | 7.799       | gal/sack |
|             |            |                        |                    |                    |                | Total Mix Fluid          | 7.799       | gal/sack |
|             |            |                        |                    |                    |                | Water Source             | Fresh Water |          |
|             |            |                        |                    |                    |                | Water Chloride           |             |          |

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Thickening Time - ON-OFF-ON

07/FEB/2018

| Test Temp (degF) | Pressure (psi) | Reached in (min) | 30 Bc (hh: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) |
|------------------|----------------|------------------|----------------|----------------|----------------|-----------------|----------|-----------------------------|---------------------|-------------------|
| 172              | 5955           | 56               | 3:00           | 3:02           | 3:03           | 3:03            | 14       | 66                          | 15                  | 13                |



265 sks tail  
 CS0378, Trailer 4549, 265 sks  
 No deflection. Please note that heat of hydration started around 2:38.

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