

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For:**

Date: Monday, May 21, 2018

**PA 331-26 Production PJR**

API #: 05-045-23717

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

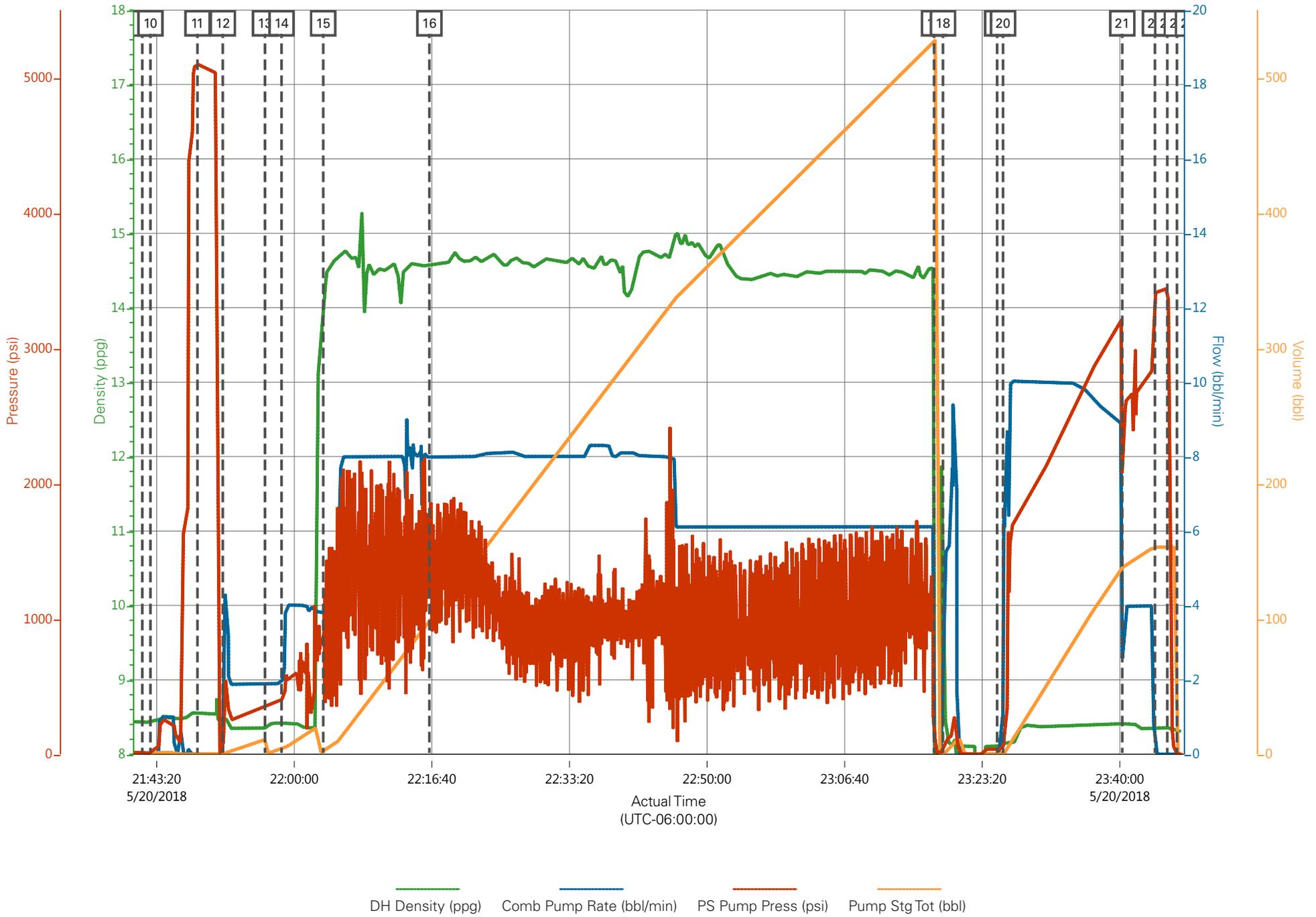
### 1.1 Job Event Log

| Type  | Seq. No. | Graph Label                            | Date      | Time     | Source | PS Pump Press<br><i>(psi)</i> | DH Density<br><i>(ppg)</i> | Comb Pump Rate<br><i>(bbl/min)</i> | Pump Stg Tot<br><i>(bbl)</i> | Comments   |
|-------|----------|--|-----------|----------|--------|-------------------------------|----------------------------|------------------------------------|------------------------------|--|
| Event | 1        | Call Out                               | 5/20/2018 | 12:00:00 | USER   |                               |                            |                                    |                              | REQUESTED ON LOCATION @ 1800   |
| Event | 2        | Pre-Convoy Safety Meeting              | 5/20/2018 | 14:50:00 | USER   |                               |                            |                                    |                              | ALL HES PRESENT  |
| Event | 3        | Crew Leave Yard                        | 5/20/2018 | 15:00:00 | USER   |                               |                            |                                    |                              | 1 F550, 1 PUMP TRUCK & 1 660 BULK TURCK  |
| Event | 4        | Arrive at Location from Service Center | 5/20/2018 | 16:45:00 | USER   |                               |                            |                                    |                              | RIG RUNNING CASING   |
| Event | 5        | Assessment Of Location Safety Meeting  | 5/20/2018 | 17:00:00 | USER   |                               |                            |                                    |                              | MET WITH COMP REP AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH- 7, CHLORIDES- 0, TEMP- 63F). COMP REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES. |
| Event | 6        | Pre-Rig Up Safety Meeting              | 5/20/2018 | 18:00:00 | USER   |                               |                            |                                    |                              | ALL HES PRESENT  |
| Event | 7        | Rig-Up Completed                       | 5/20/2018 | 19:00:00 | USER   |                               |                            |                                    |                              | HES RIGGED UP EQUIPMENT WITHOUT ENTERING RED ZONE.   |
| Event | 8        | Pre-Job Safety Meeting                 | 5/20/2018 | 21:00:00 | USER   |                               |                            |                                    |                              | ALL HES AND RIG CREW PRESENT   |
| Event | 9        | Start Job                              | 5/20/2018 | 21:41:35 | COM6   |                               |                            |                                    |                              | TD 9322', TP 9314.2', SJ 28.54', OH 8.75", CSG 4.5" 11.6#, MUD 12.5 PPG.   |
| Event | 10       | Prime Pumps                            | 5/20/2018 | 21:42:35 | USER   | 60.00                         | 8.33                       | 1.00                               | 2.10                         | 8.33 PPG FRESH WATER   |

|       |    |                   |           |          |      |         |       |       |        |  |
|-------|----|-------------------|-----------|----------|------|---------|-------|-------|--------|--|
| Event | 11 | Test Lines        | 5/20/2018 | 21:48:16 | COM6 | 5102.00 | 8.33  | 0.50  | 0.50   | ALL LINES HELD PRESSURE AT 5102 PSI  |
| Event | 12 | Pump Spacer 1     | 5/20/2018 | 21:51:20 | USER | 355.00  | 8.33  | 4.00  | 10.00  | 8.33 PPG FRESH WATER (10 BBL)  |
| Event | 13 | Pump Spacer 2     | 5/20/2018 | 21:56:27 | COM6 | 355.00  | 8.33  | 20.00 | 20.00  | 8.4 PPG MUDFLUSH III (20 BBL)  |
| Event | 14 | Check Weight      | 5/20/2018 | 21:58:27 | COM6 |         |       |       |        | WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES                                      |
| Event | 15 | Pump Cement       | 5/20/2018 | 22:03:30 | COM6 | 1218.00 | 14.50 | 8.00  | 463.00 | EXPANDACEM CEMENT 1970 SKS (463 BBLs), 14.5 PPG, 1.32 FT3/SK, 5.85 GAL/SK        |
| Event | 16 | Check Weight      | 5/20/2018 | 22:16:22 | COM6 |         |       |       |        | WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES                                      |
| Event | 17 | Shutdown          | 5/20/2018 | 23:17:30 | USER |         |       |       |        | END OF CMT   |
| Event | 18 | Clean Lines       | 5/20/2018 | 23:18:34 | USER |         |       |       |        | WASH UP PUMPS AND LINES  |
| Event | 19 | Drop Top Plug     | 5/20/2018 | 23:25:08 | USER |         |       |       |        | PLUG WENT, VERIFIED BY CO REP  |
| Event | 20 | Pump Displacement | 5/20/2018 | 23:25:51 | COM6 | 3204.00 | 8.33  | 10.0  | 133.90 | 8.34 PPG FRESH WATER (143.9 BBLs) 3 BAGS BE6, 1 GAL MMCR & 14 SKS KCL            |
| Event | 21 | Slow Rate         | 5/20/2018 | 23:40:18 | USER | 2640.00 | 8.33  | 4.00  | 10.00  | SLOW RATE TO 4 BPM PER CO REP TO LAND PLUG                                       |
| Event | 22 | Bump Plug         | 5/20/2018 | 23:44:15 | USER | 2900.00 | 8.33  | 4.00  | 143.90 | LAND PLUG AT 2900 PSI, BROUGHT UP TO 3412 PSI FOR A 10 MIN CSG TEST.             |
| Event | 23 | Check Floats      | 5/20/2018 | 23:45:45 | USER | 3400.00 | 8.33  | 0     | 143.90 | FLOATS HELD, 1 BBL BACK TO TRUCK   |
| Event | 24 | End Job           | 5/20/2018 | 23:46:55 | USER |         |       |       |        | GOOD RETURNS THROUGHOUT, PIPE WAS RECIPROCATED, HES DID NOT VERIFY ANY SPACER TO |

|       |    |   |           |          |      | SURFACE.  |
|-------|----|---|-----------|----------|------|---|
| Event | 25 | Post-Job Safety Meeting<br>(Pre Rig-Down) | 5/20/2018 | 23:48:16 | USER | ALL HES PRESENT   |
| Event | 26 | Rig-Down Completed                        | 5/21/2018 | 00:45:00 | USER | ALL HES PRESENT   |
| Event | 27 | Pre-Convoy Safety Meeting                 | 5/21/2018 | 00:50:00 | USER | ALL HES PRESENT   |
| Event | 28 | Crew Leave Location                       | 5/21/2018 | 01:00:00 | USER | THANK YOU FOR CHOOSING<br>HALLIBURTON CEMENT,<br>CHRIS SMITH AND CREW |

# TEP - PA 331-26 - 4.5" PRODUCTION



### Job Information

|                       |                       |                 |                   |                   |                |
|-----------------------|-----------------------|-----------------|-------------------|-------------------|----------------|
| <b>Request/Slurry</b> | 2473008/3             | <b>Rig Name</b> | H&P 271           | <b>Date</b>       | 07/MAY/2018    |
| <b>Submitted By</b>   | Connor Matthews       | <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>       | PA 331-26      |

### Well Information

|                          |          |                  |         |             |               |
|--------------------------|----------|------------------|---------|-------------|---------------|
| <b>Casing/Liner Size</b> | 4.5 in   | <b>Depth MD</b>  | 9379 ft | <b>BHST</b> | 106°C / 223°F |
| <b>Hole Size</b>         | 8.75 in  | <b>Depth TVD</b> | 8416 ft | <b>BHCT</b> | 67°C / 153°F  |
| <b>Pressure</b>          | 5191 psi |                  |         |             |               |

### Drilling Fluid Information

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

### Cement Information - Primary Design

| <u>Conc</u> | <u>UOM</u> | <u>Cement/Additive</u> | <u>Sample Type</u> | <u>Sample Date</u> | <u>Lot No.</u> | <u>Cement Properties</u> |             |                       |
|-------------|------------|------------------------|--------------------|--------------------|----------------|--------------------------|-------------|-----------------------|
|             |            | VariCem                |                    |                    |                | Slurry Density           | 14.5        | lbm/gal               |
|             |            |                        |                    |                    |                | Slurry Yield             | 1.32        | ft <sup>3</sup> /sack |
|             |            |                        |                    |                    |                | Water Requirement        | 5.849       | gal/sack              |
|             |            |                        |                    |                    |                | Total Mix Fluid          | 5.849       | gal/sack              |
|             |            |                        |                    |                    |                | Water Source             | Fresh Water |                       |
|             |            |                        |                    |                    |                | Water Chloride           |             |                       |

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## Operation Test Results Request ID 2473008/3

### Thickening Time - ON-OFF-ON

**14/MAY/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) |
|------------------|----------------|------------------|----------------|----------------|----------------|-----------------|----------|-----------------------------|---------------------|
| 153              | 5191           | 43               | 1:08           | 4:08           | 4:08           | 4:09            | 53       | 15                          | 32                  |

total sks=1970

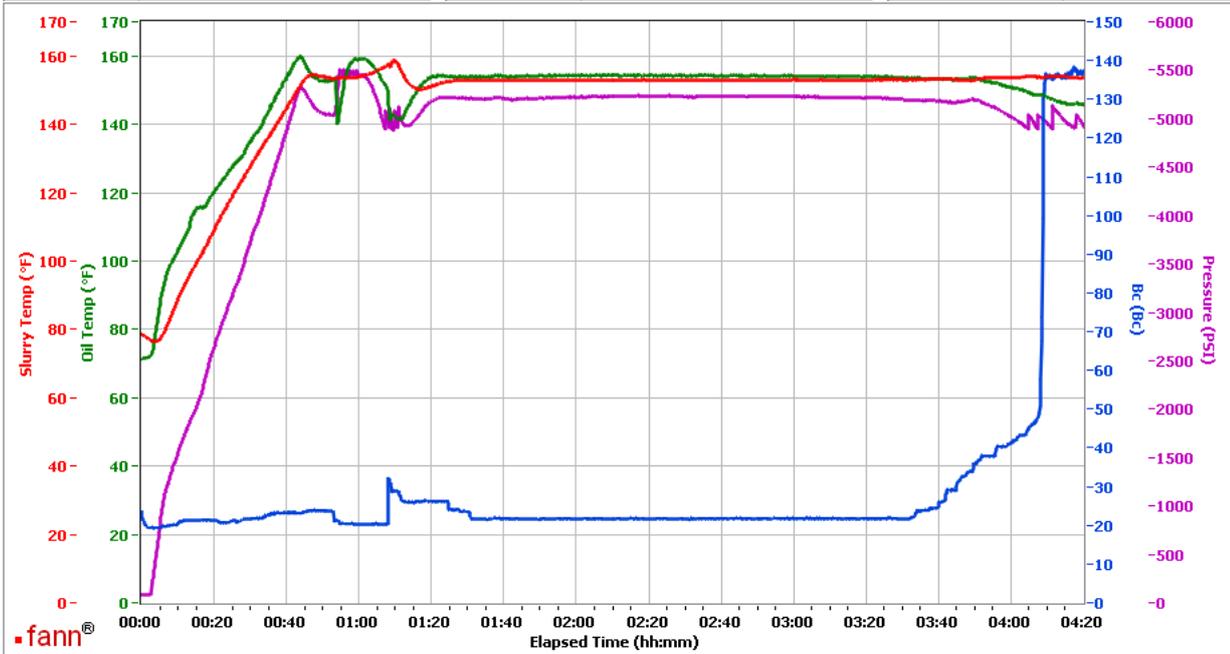
CS1044 TR#6813 270 SKS

deflected from 20Bc--- > 32Bc

heat of hydration at 3:45

### Grand Junction Colorado

| Fields            | Values                               | Fields         | Values            | Events    | Results |
|-------------------|--------------------------------------|----------------|-------------------|-----------|---------|
| Project Name      | GJ2473008-3 TERRA PRODUCTION BULK PR | Job Type       | PRODUCTION CASING | 30.00 Bc  | 01h:08m |
| Test ID           | 35496973                             | Cement Type    | MOUNTAIN G        | 40.00 Bc  | 03h:56m |
| Request ID        | GJ2473008-3                          | Cement Weight  | Standard          | 50.00 Bc  | 04h:08m |
| Tested by         | DEBA                                 | Test Date      | 05/14/18          | 70.00 Bc  | 04h:08m |
| Customer          | TERRA ENERGY PARTNERS                | Test Time      | 12:36 PM          | 100.00 Bc | 04h:09m |
| Well No           | PA 331-26                            | Temp. Units    | degF              | 00h:30m   | 21.66   |
| Rig               | H&P 271                              | Pressure Units | PSI               | 01h:00m   | 20.34   |
| Casing/Liner Size | 4.5"                                 | SW Version     | 2.1.0.507         | 01h:30m   | 23.62   |



Data File: C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\0HU9OBIZ\GJ2473008-3 TERRA PRODUCTION BULK PRIMARY[1].tdms  
 Comments: CS1044 TR#6813 270 SKS

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**Operation Test Results Request ID 2473008/2**

**Thickening Time - ON-OFF-ON**

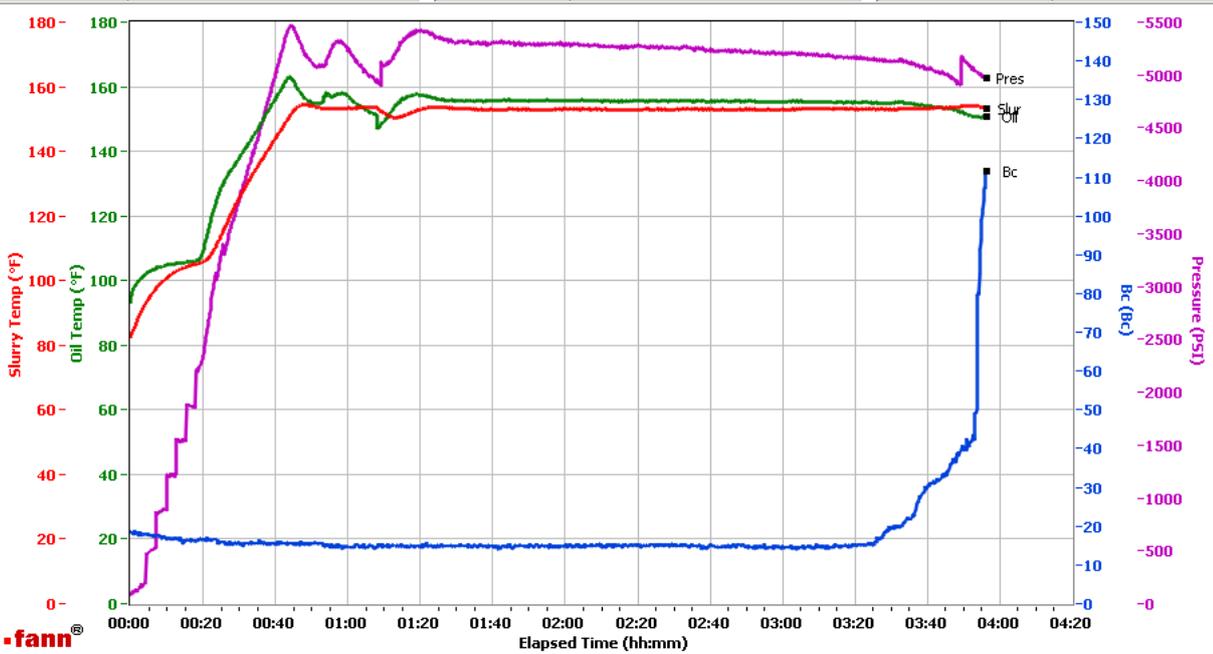
**14/MAY/2018**

| Test Temp (degF) | Pressure (psi) | Reached in (min) | 30 Bc (hh:mm) | 50 Bc (hh:mm) | 70 Bc (hh:mm) | 100 Bc (hh:mm) | Start Bc | Stirring before stop (mins) | Static Period (min) | Peak reading (BC) |
|------------------|----------------|------------------|---------------|---------------|---------------|----------------|----------|-----------------------------|---------------------|-------------------|
| 153              | 5191           | 43               | 3:39          | 3:53          | 3:53          | 3:55           | 18       | 53                          | 15                  | 15                |

total sks=1970  
 CS1042 TR#8476 425 SKS  
 No deflection

**Grand Junction Colorado**

| Fields            | Values                               | Fields         | Values            | Events    | Results |
|-------------------|--------------------------------------|----------------|-------------------|-----------|---------|
| Project Name      | GJ2473008-2 TERRA PRODUCTION BULK PR | Job Type       | PRODUCTION CASING | 30.00 Bc  | 03h:39m |
| Test ID           | 35494982                             | Cement Type    | MOUNTAIN G        | 40.00 Bc  | 03h:49m |
| Request ID        | GJ2473008-2                          | Cement Weight  | Standard          | 50.00 Bc  | 03h:53m |
| Tested by         | DEBA                                 | Test Date      | 05/14/18          | 70.00 Bc  | 03h:53m |
| Customer          | TERRA ENERGY PARTNERS                | Test Time      | 04:45 AM          | 100.00 Bc | 03h:55m |
| Well No           | PA 331-26                            | Temp. Units    | degF              | 00h:30m   | 15.79   |
| Rig               | H&P 271                              | Pressure Units | PSI               | 01h:00m   | 14.63   |
| Casing/Liner Size | 4.5"                                 | SW Version     | 2.1.0.507         | 01h:30m   | 15.05   |



Data File C:\Documents and Settings\Administrator\Local Settings\Temporary Internet Files\Content.IE5\OTUB09Y7\GJ2473008-2 TERRA PRODUCTION BULK PRIMARY[1].tdms  
 Comments CS1042 TR#8476 425 SKS

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**Operation Test Results Request ID 2473008/1**

**Thickening Time - ON-OFF-ON**

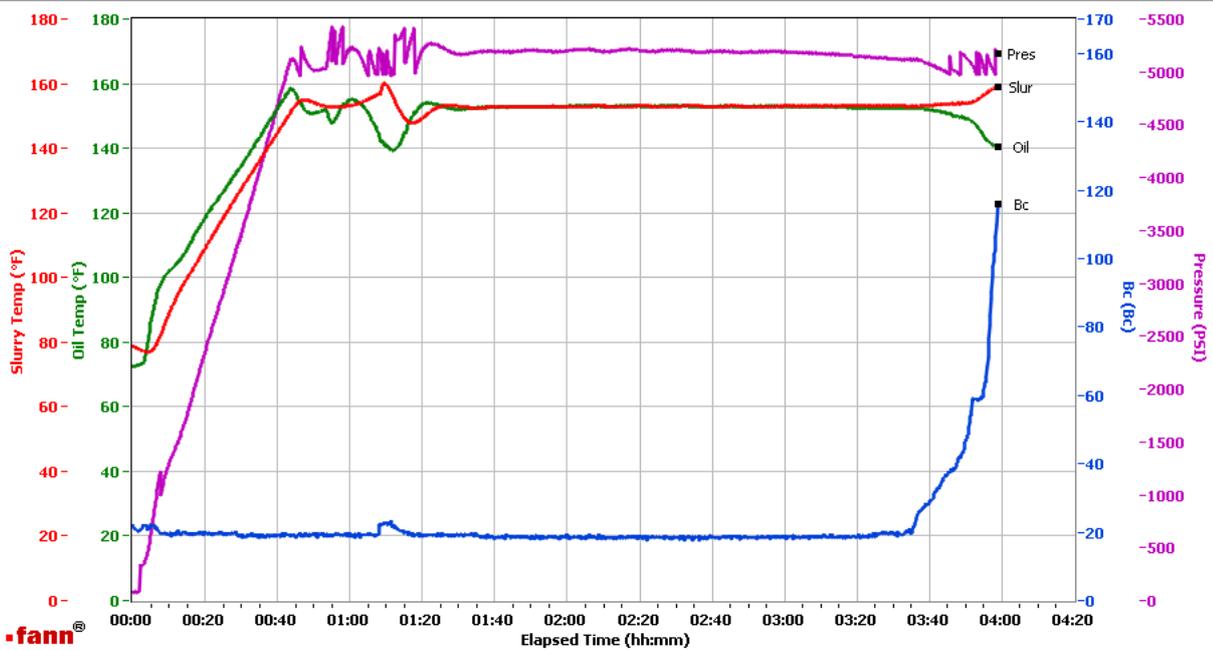
**14/MAY/2018**

| 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) |
|------------------|----------------|------------------|----------------|----------------|----------------|-----------------|----------|-----------------------------|---------------------|-------------------|
| 153              | 5191           | 43               | 3:41           | 3:50           | 3:56           | 3:57            | 20       | 53                          | 15                  | 22                |

total sks=1970  
 CS1039 TR#8677 425 SKS  
 CS1040 TR#2878 425 SKS  
 CS1041 TR#1513 425 SKS  
 Deflected 19-- > 22

**Grand Junction Colorado**

| Fields            | Values                               | Fields         | Values            | Events    | Results |
|-------------------|--------------------------------------|----------------|-------------------|-----------|---------|
| Project Name      | GJ2473008-1 TERRA PRODUCTION BULK PR | Job Type       | PRODUCTION CASING | 30.00 Bc  | 03h:41m |
| Test ID           | 35477535                             | Cement Type    | MOUNTAIN G        | 40.00 Bc  | 03h:47m |
| Request ID        | GJ2473008-1                          | Cement Weight  | Standard          | 50.00 Bc  | 03h:50m |
| Tested by         | DEBA                                 | Test Date      | 06/20/11          | 70.00 Bc  | 03h:56m |
| Customer          | TERRA ENERGY PARTNERS                | Test Time      | 05:11 PM          | 100.00 Bc | 03h:57m |
| Well No           | PA 331-26                            | Temp. Units    | degF              | 00h:30m   | 18.39   |
| Rig               | H&P 271                              | Pressure Units | PSI               | 01h:00m   | 18.84   |
| Casing/Liner Size | 4.5"                                 | SW Version     | 2.1.0.1219        | 01h:30m   | 19.19   |



Data File C:\Documents and Settings\HPHT\Desktop\Test Data\GJ2473008-1 TERRA PRODUCTION BULK PRIMARY.tdms  
 Comments CS1039 TR#8677 425 SKS, CS1040 TR#2878 425 SKS AND CS1041 TR#1513 425 SKS

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