

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS-EBUS**

**For: Terra**

Date: Tuesday, March 20, 2018

**RU 323-17 Surface**

API#05-045-23737

Sincerely,

**Grand Junction Cement Engineering**

## 2.0 Real-Time Job Summary

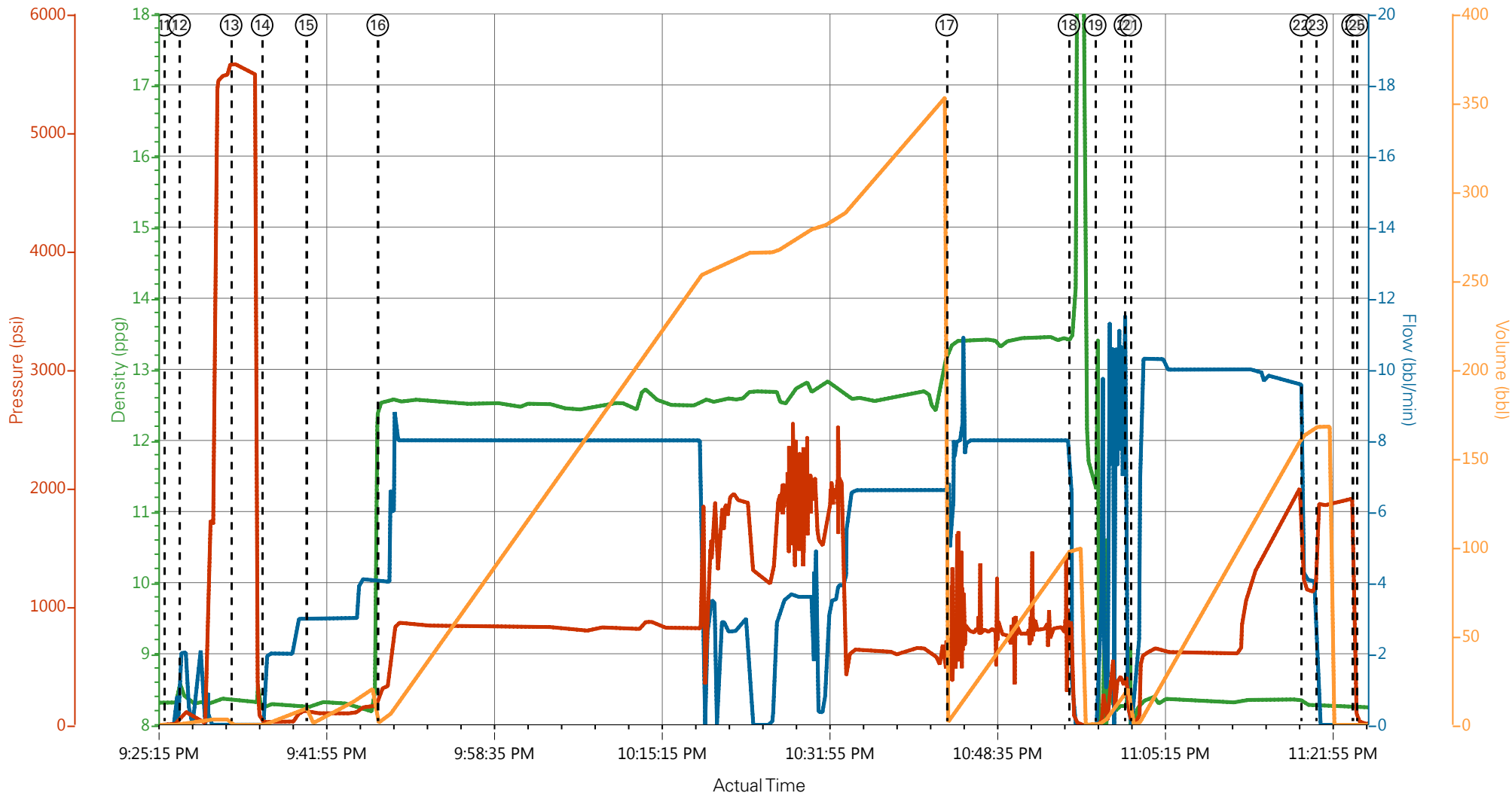
### 2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	PS Pump Press <i>(psi)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	3/19/2018	00:00:00	USER					
Event	2	Pre-Convoy Safety Meeting	3/19/2018	10:00:00	USER					JSA COMPLETE
Event	3	Crew Leave Yard	3/19/2018	10:15:00	USER					
Event	4	Arrive At Loc	3/19/2018	13:00:00	USER					RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	3/19/2018	13:30:00	USER					
Event	6	Other	3/19/2018	15:17:41	USER					WATER TEST: PH-7, TEMP - 70, CL-O
Event	7	Pre-Rig Up Safety Meeting	3/19/2018	15:17:48	USER					JSA COMPLETE
Event	8	Rig-Up Equipment	3/19/2018	15:17:53	USER					
Event	9	Other	3/19/2018	15:19:11	USER					TP-10396, TD, 10403, S.J.- 30.37, HOLE- 8 3/4, MUD#- 8.8, 9 5/8 32# -1107 FT.
Event	10	Pre-Job Safety Meeting	3/19/2018	21:00:00	USER					JSA COMPLETE
Event	11	Start Job	3/19/2018	21:26:08	COM5					
Event	12	Prime Pumps	3/19/2018	21:27:40	COM5					FRESH WATER
Event	13	Test Lines	3/19/2018	21:32:47	COM5	8.33	0.00	5631.00	0.0	5631 PSI
Event	14	Pump Spacer 1	3/19/2018	21:35:52	COM5	8.33	2.00	75.00	10	FRESH WATER
Event	15	Pump Spacer 2	3/19/2018	21:40:15	COM5	8.40	3.00	116.00	20.0	MUD FLUSH
Event	16	Pump Lead Cement	3/19/2018	21:47:21	COM5	12.50	8.00	820	321.3	930 SKS, 12.5 PPG, 1.94 FT3/SK, 9.6 GAL/SK, PSI SPIKED AROUND 260 BBLs GONE, HIT KICK OUTS, GOT BACK INTO IT AT 3 BBLs/MIN PSI WAS AROUND 1900-2000 PSI, OSR WANTED TO SHUT DOWN FOR A MIN TO TALK

ABOUT IT, PUMPED ANOTHER 10 BBLS +/- BEFORE PSI BROKE FREE. THERE WERE NO RETURNS DURING THIS.

Event	17	Pump Tail Cement	3/19/2018	22:43:53	COM5	13.30	8.0	850.0	81.6	265 SKS, 13.3 PPG, 1.73 FT3/SK, 7.81 GAL/SK
Event	18	Shutdown	3/19/2018	22:56:02	COM5					TO DROP TOP PLUG AND WASH PUMPS AND LINES TO PIT.
Event	19	Clean Lines	3/19/2018	22:58:39	COM5					PUMPED AIR FROM RIG TO PIT, THEN WASHED UP PUMP TO PIT.
Event	20	Drop Top Plug	3/19/2018	23:01:36	COM5					AWAY
Event	21	Pump Displacement	3/19/2018	23:02:10	COM5	8.33	10.0	1992	160.7	KCL WATER WITH 5 GAL MMCR, 3 BAGS BE-6
Event	22	Slow Rate	3/19/2018	23:19:04	USER	8.33	4.00	1130.00	150.0	TO BUMP PLUG
Event	23	Bump Plug	3/19/2018	23:20:37	COM5	8.33	4.00	1125.0	160.7	PLUG BUMPED
Event	24	Check Floats	3/19/2018	23:24:13	USER			1912.00		FLOATS HELD, 1 BBL BACK TO TRUCK
Event	25	End Job	3/19/2018	23:24:40	COM5					INTERMITTENT RETURNS THROUGH OUT JOB, RIG CIRCULATED AT 450 GPM @ 1000 PSI
Event	26	Post-Job Safety Meeting (Pre Rig-Down)	3/19/2018	23:45:00	USER					JSA COMPLETE
Event	27	Rig-Down Equipment	3/20/2018	01:00:00	USER					
Event	28	Crew Leave Location	3/20/2018	01:15:00	USER					THANK YOU FOR USING HALLIBURTON CEMENT, JAMES LEIST AND CREW

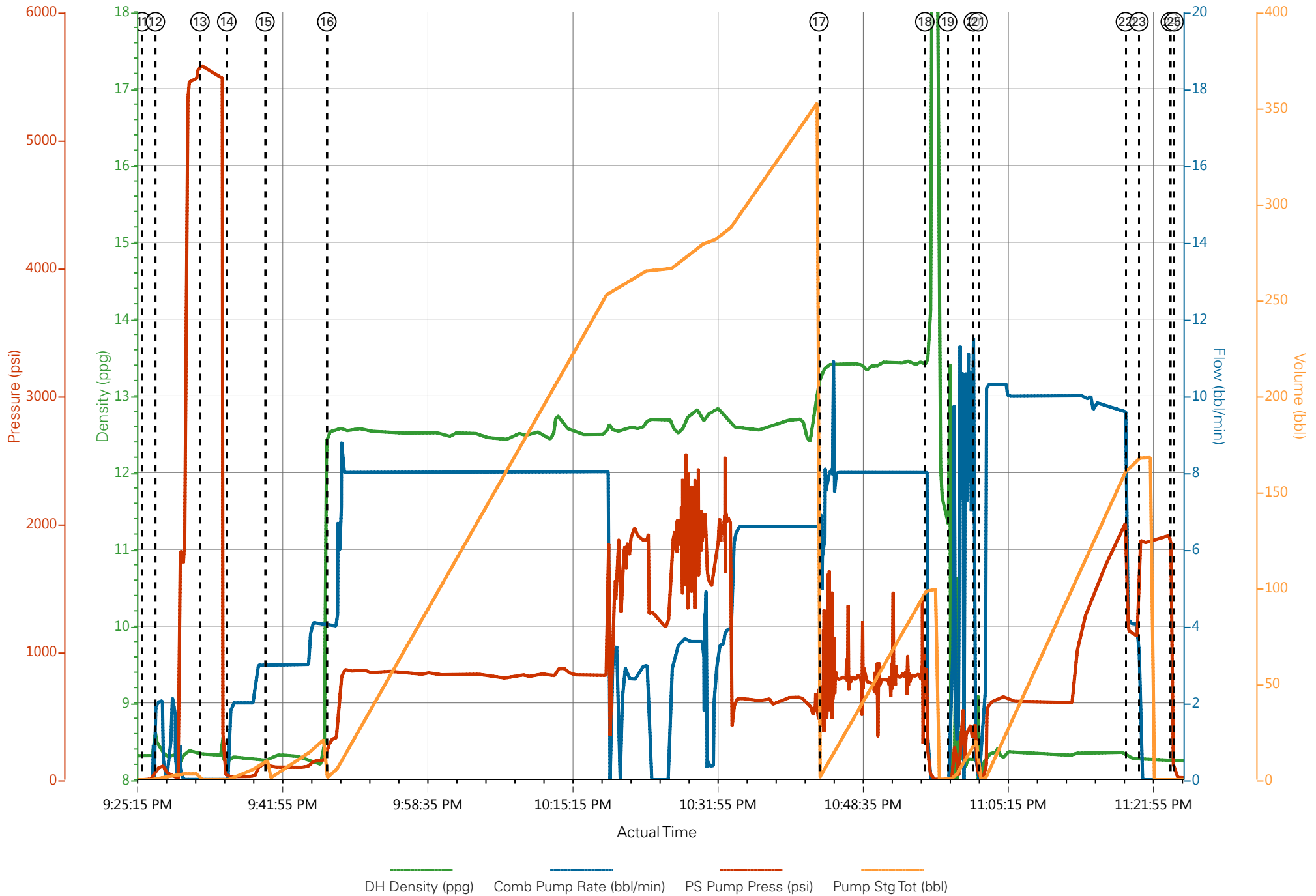
# TEP - RU 323-17 - 4.5 PRODUCTION CASING



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

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

# TEP - RU 323-17 - 4.5 PRODUCTION CASING



### Job Information

<b>Request/Slurry</b>	2460001/2	<b>Rig Name</b>	H&P 318	<b>Date</b>	12/MAR/2018
<b>Submitted By</b>	Patrick Ealey	<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>	RU 323-17

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10599 ft	<b>BHST</b>	127°C / 260°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	10583 ft	<b>BHCT</b>	92°C / 198°F
<b>Pressure</b>	6708 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	<b>Mud Trade Name</b>	<b>Density</b>
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### 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>	<u>Cement Properties</u>		
		NeoCem				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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**Operation Test Results Request ID 2460001/2**

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

**16/MAR/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)
198	6708	52	4:21	5:15	5:21	5:21	13	62	15

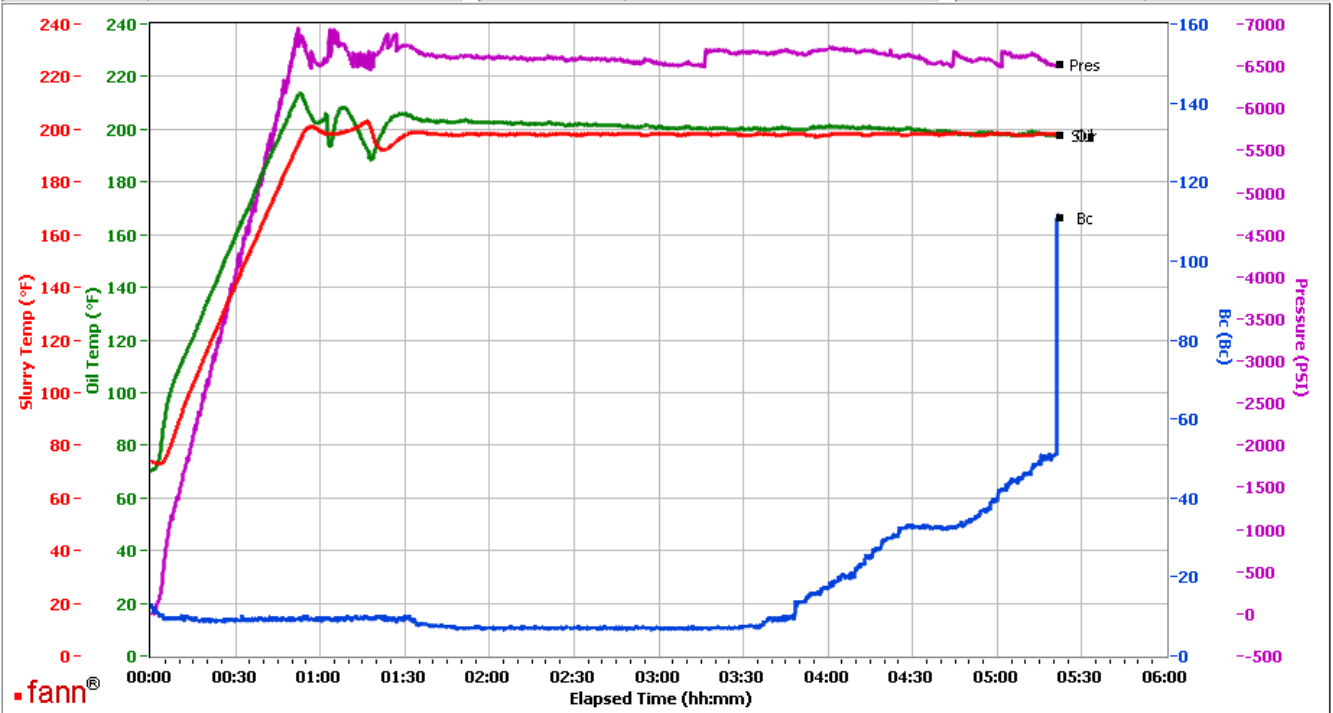
Total sks = 930  
 CS0648 TR#5692 130 SKS  
 Deflection: 10 – 10

**Grand Junction, Colorado**

Fields	Values
Project Name	GJ2460001-2 TERRA PRODUCTION BULK LE
Test ID	35337742
Request ID	GJ2460001-2
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	RU 323-17
Rig	H8P 318
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	HOLCIM TYPE I-II
Cement Weight	Standard
Test Date	03/16/18
Test Time	03:37 AM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	04h:21m
40.00 Bc	04h:58m
50.00 Bc	05h:15m
70.00 Bc	05h:21m
100.00 Bc	05h:21m
00h:30m	8.84
01h:00m	9.35
01h:30m	9.95



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\4TIJ89YN\GJ2460001-2 TERRA PRODUCTION BULK LEAD[1].tdms  
 Comments CS0648 TR#5692 130 SKS

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# Operation Test Results Request ID 2460001/1

## Thickening Time - ON-OFF-ON

15/MAR/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)
198	6708	52	3:52	4:35	4:46	4:49	9	62	15	6

Total sks = 930

Composite:

CS0638 TR#8678 400 SKS

CS0639 TR#1513 400 SKS

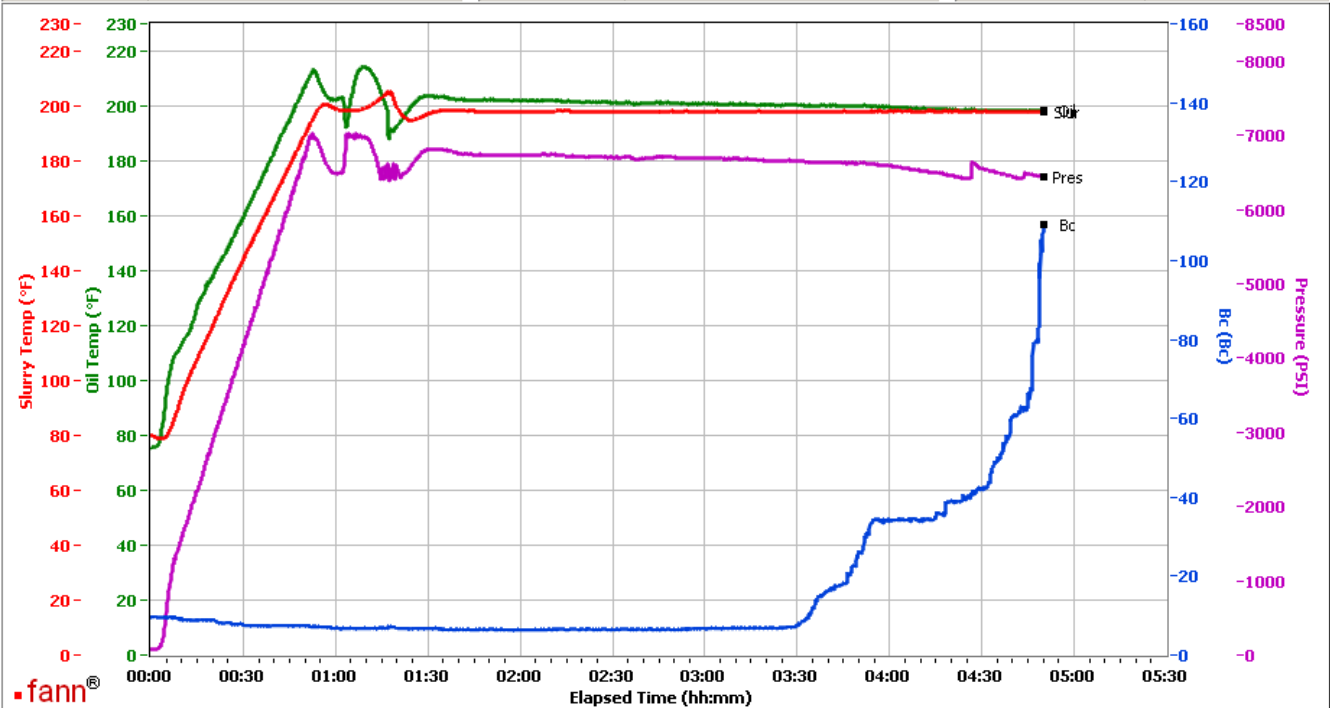
No deflection.

### Grand Junction Colorado

Fields	Values
Project Name	GJ2460001-1 TERRA PRODUCTION BULK LE
Test ID	35327373
Request ID	GJ2460001-1
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	RU 323-17
Rig	H8P 318
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	HOLCIM TYPE I-II
Cement Weight	Standard
Test Date	03/15/18
Test Time	02:44 AM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:52m
40.00 Bc	04h:24m
50.00 Bc	04h:35m
70.00 Bc	04h:46m
100.00 Bc	04h:49m
00h:30m	7.87
01h:00m	6.90
01h:30m	6.79



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\0HU9OBIZ\GJ2460001-1 TERRA PRODUCTION BULK LEAD[1].tdms  
 Comments COMPOSITE: CS0638 TR#8678 400 SKS AND CS0639 TR#1513 400 SKS

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### Job Information

<b>Request/Slurry</b>	2460002/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	12/MAR/2018
<b>Submitted By</b>	Patrick Ealey	<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>	RU 323-17

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10599 ft	<b>BHST</b>	127°C / 260°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	10583 ft	<b>BHCT</b>	92°C / 198°F
<b>Pressure</b>	6708 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>		<b>Mud Trade Name</b>		<b>Density</b>	
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### 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>	
						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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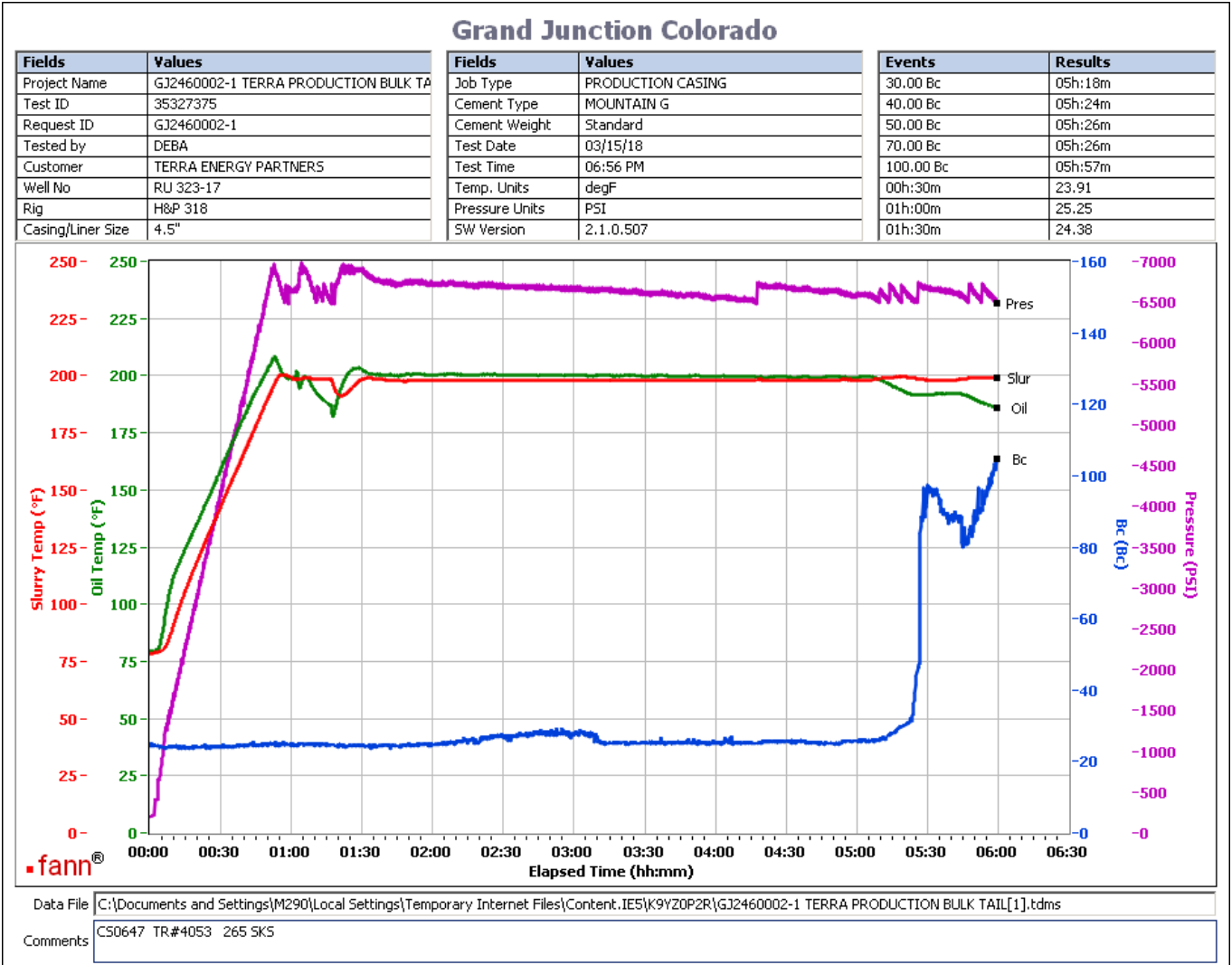
**Operation Test Results Request ID 2460002/1**

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

**16/MAR/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)
198	6708	52	5:18	5:26	5:26	5:57	24	62	15	24

Total sks = 265  
 CS0647 TR#4053 256 SKS  
 Deflection: 24 - 24



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