

# HALLIBURTON

iCem<sup>®</sup> Service

**TERRA ENERGY LTD.**

**For: Terra Energy**

**Ware SR 414-12**

API# 05-045-23455-00  
Ware SR 414-12 Production  
Job Date: Thursday, January 11, 2018

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

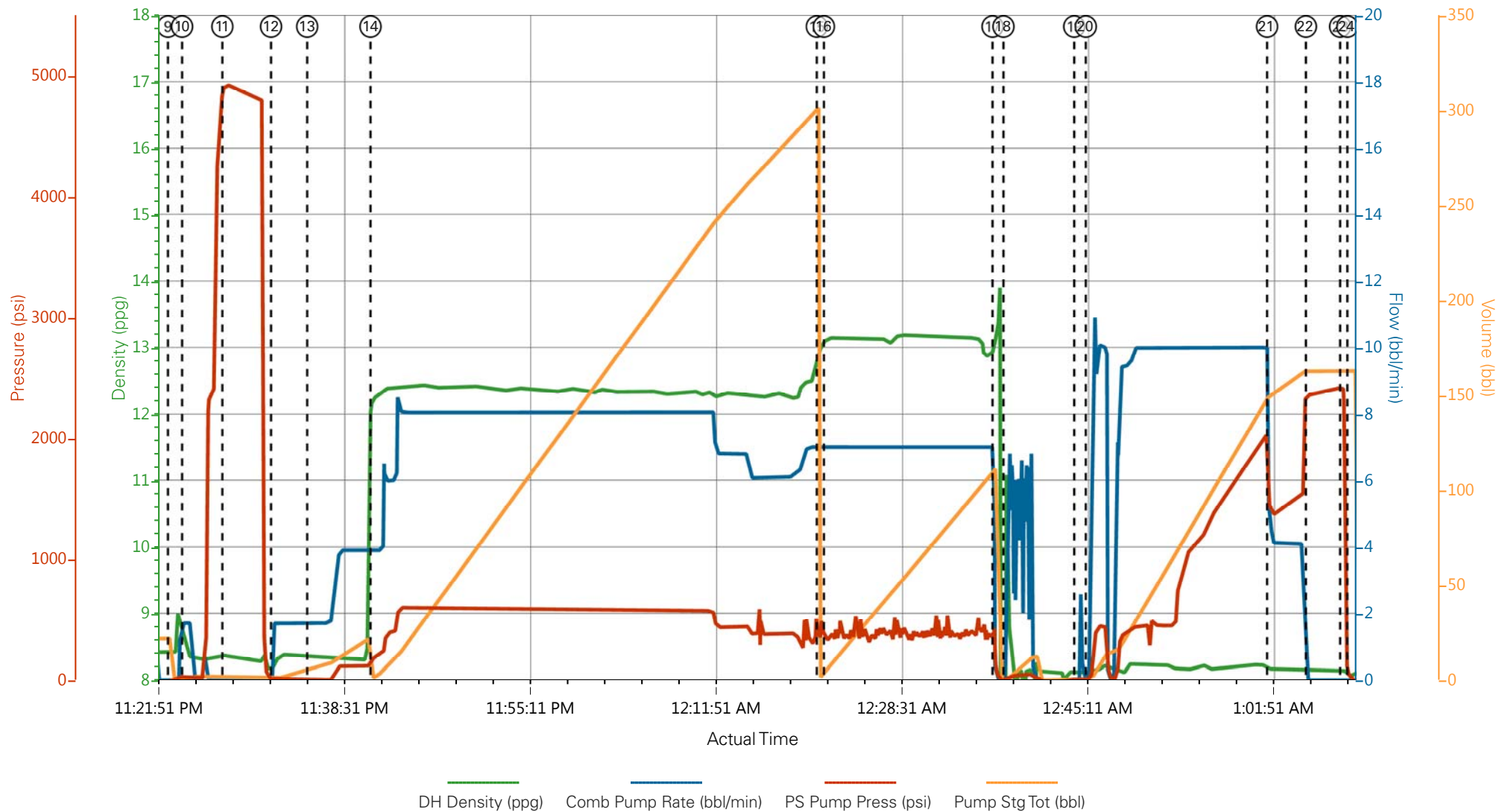
## 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	Pass-Side Pump Pressure (psi)	Downhole Density (ppg)	Combined Pump Rate (bbl/min)	Pump Stage Total (bbl)	Comments
Event	1	Call Out	1/11/2018	10:00:00	USER					REQUESTED ON LOCATION @ 1700
Event	2	Pre-Convoy Safety Meeting	1/11/2018	13:20:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	1/11/2018	13:30:00	USER					1 F550, 1 PUMP TRUCK & 1 660 BULK TURCK
Event	4	Arrive At Loc	1/11/2018	16:00:00	USER					RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	1/11/2018	16:10:00	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	1/11/2018	20:00:00	USER					ALL HES PRESENT
Event	7	Rig-Up Equipment	1/11/2018	20:15:00	USER					HES RIGGED UP EQUIPMENT WITHOUT ENTERING RED ZONE.
Event	8	Pre-Job Safety Meeting	1/11/2018	22:00:00	USER					ALL HES AND RIG CREW PRESENT
Event	9	Start Job	1/11/2018	23:23:00	COM3					TD 10008', TP 100028', SJ 30', OH 8.75", CSG 4.5" 11.6#, MUD 9.3 PPG. RIG CIRCULATED WELL @ 12 BPM WITH 800.
Event	10	Prime Pumps	1/11/2018	23:24:16	COM3	122.00	8.38	1.00	2.0	8.33 PPG FRESH WATER
Event	11	Test Lines	1/11/2018	23:27:52	COM3	4926.00	8.36	0.50	0.5	ALL LINES HELD PRESSURE AT 4920 PSI
Event	12	Pump Spacer 1	1/11/2018	23:32:14	COM3	172.00	8.33	4.00	20.0	8.4 PPG MUDFLUSH III (20 BBL)
Event	13	Check weight	1/11/2018	23:35:28	COM3					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	14	Pump Lead Cement	1/11/2018	23:41:09	COM3	598.00	12.53	8.00	278.0	NEOCEM CEMENT 805 SKS (278 BBLs), 12.5 PPG, 1.96 FT3/SK,

9.35 GAL/SK

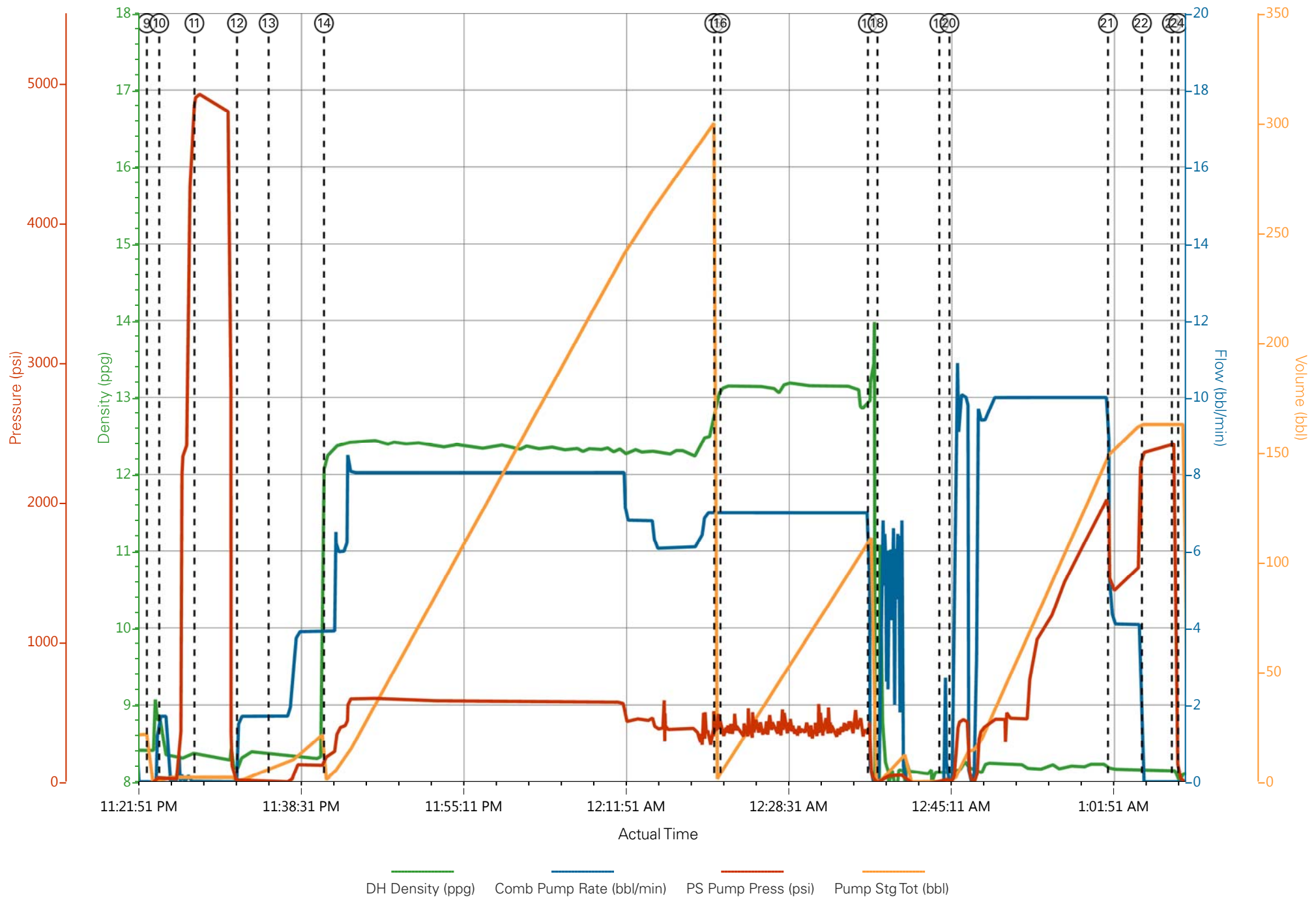
Event	15	Pump Tail Cement	1/12/2018	00:21:09	COM3	496.00	13.30	7.00	82.0	THERMACEM CEMENT 265 SKS (82 BBLS), 13.3 PPG, 1.73 FT3/SK, 7.81 GAL/SK
Event	16	Check weight	1/12/2018	00:21:47	COM3					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	17	Shutdown	1/12/2018	00:36:54	USER					END OF CMT
Event	18	Clean Lines	1/12/2018	00:37:53	USER					WASH UP PUMPS AND LINES TO THE PIT
Event	19	Drop Plug	1/12/2018	00:44:14	USER					PLUG WENT, VERIFIED BY CO REP.
Event	20	Pump Displacement	1/12/2018	00:45:16	COM3	2033.00	8.33	10.00	145.0	8.34 PPG FRESH WATER (155 BBLS) 3 BAGS BE6, 1 GAL MMCR & 14 SKS KCL
Event	21	Slow Rate	1/12/2018	01:01:31	USER	1380.00	8.36	4.00	10.0	SLOW RATE TO 4 BPM PER CO REP TO LAND PLUG
Event	22	Bump Plug	1/12/2018	01:05:00	USER	1555.00	8.36		155.0	LAND PLUG AT 1560 PSI, BROUGHT UP TO 2345 PSI
Event	23	Check Floats	1/12/2018	01:08:04	USER	2355.00	8.36		155.0	FLOATS HELD, 1.5 BBL BACK TO TRUCK
Event	24	End Job	1/12/2018	01:08:43	USER					GOOD RETURNS THROUGHOUT, PIPE WAS NOT RECIPROCATED
Event	25	Post-Job Safety Meeting (Pre Rig-Down)	1/12/2018	01:11:19	USER					ALL HES PRESENT
Event	26	Rig-Down Equipment	1/12/2018	01:40:00	USER					ALL HES PRESENT
Event	27	Pre-Convoy Safety Meeting	1/12/2018	02:20:00	USER					ALL HES PRESENT
Event	28	Crew Leave Location	1/12/2018	02:30:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, CHRIS SMITH AND CREW

# TEP - SR 414-12 - 4.5" PRODUCTION



- |   |                          |                      |   |
|---|--------------------------|----------------------|---|
| ① Call Out                              | ⑧ Pre-Job Safety Meeting | ⑮ Pump Tail Cement   | 22 Bump Plug                              |
| ② Pre-Convoy Safety Meeting             | ⑨ Start Job              | ⑯ Check weight       | 23 Check Floats                           |
| ③ Crew Leave Yard                       | ⑩ Prime Pumps            | ⑰ Shutdown           | 24 End Job                                |
| ④ Arrive At Loc                         | ⑪ Test Lines             | ⑱ Clean Lines        | 25 Post-Job Safety Meeting (Pre Rig-Down) |
| ⑤ Assessment Of Location Safety Meeting | ⑫ Pump Spacer 1          | ⑲ Drop Plug          | 26 Rig-Down Equipment                     |
| ⑥ Pre-Rig Up Safety Meeting             | ⑬ Check weight           | 20 Pump Displacement | 27 Pre-Convoy Safety Meeting              |
| ⑦ Rig-Up Equipment                      | ⑭ Pump Lead Cement       | 21 Slow Rate         | 28 Crew Leave Location                    |

# TEP - SR 414-12 - 4.5" PRODUCTION



## Job Information

<b>Request/Slurry</b>	2443012/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	07/JAN/2018
<b>Submitted By</b>	Lukas Van Zyl	<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 414-12

## Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10011 ft	<b>BHST</b>	116°C / 241°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9470 ft	<b>BHCT</b>	77°C / 171°F
<b>Pressure</b>	5935 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>	<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	

These are draft results and have not been approved for final use.

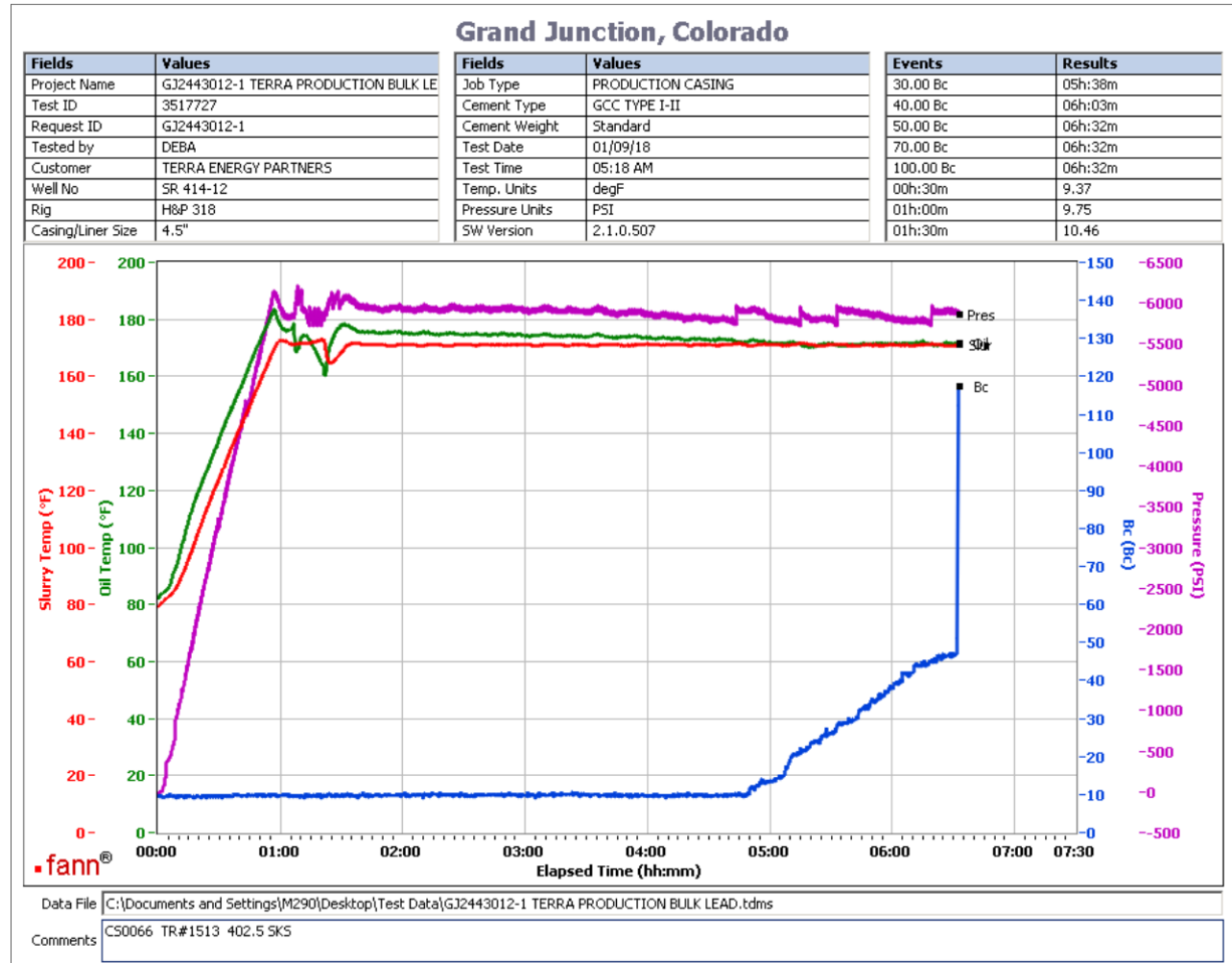
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# Operation Test Results Request ID 2443012/1

Thickening Time - ON-OFF-ON

09/JAN/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)
171	5935	56	5:38	6:32	6:32	6:32	9	66	15	9



Total sks= 805  
CS0066 TR# 1513 402.5 SKS

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## Thickening Time - ON-OFF-ON

10/JAN/2018

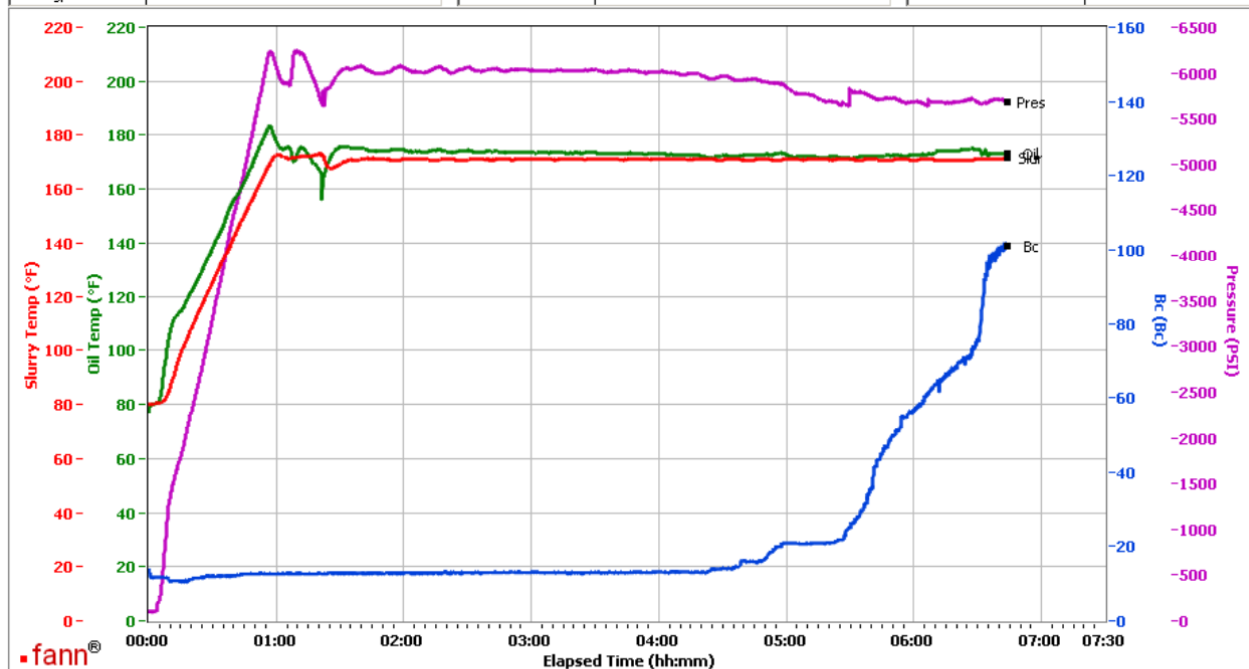
Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
171	5935	56	5:36	5:50	6:22	6:39	13	66	15	13

## Grand Junction Colorado

Fields	Values
Project Name	GJ2443012-2 TERRA PRODUCTION BULK LE
Test ID	35161064
Request ID	GJ2443012-2
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	SR 414-12
Rig	H&P 318
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	GCC TYPE I-II
Cement Weight	Standard
Test Date	01/10/18
Test Time	05:06 AM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	05h:36m
40.00 Bc	05h:41m
50.00 Bc	05h:50m
70.00 Bc	06h:22m
100.00 Bc	06h:39m
00h:30m	12.20
01h:00m	12.73
01h:30m	12.81



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9Y20P2R\GJ2443012-2 TERRA PRODUCTION BULK LEAD CONFIRMATION TT[1].tdms

Comments CS0069 TR#1656 402.5 SKS

Deflection: 13 - 13

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## Job Information

<b>Request/Slurry</b>	2443013/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	07/JAN/2018
<b>Submitted By</b>	Lukas Van Zyl	<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 414-12

## Well Information

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<b>Pressure</b>	5935 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>		
		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		

These are draft results and have not been approved for final use.

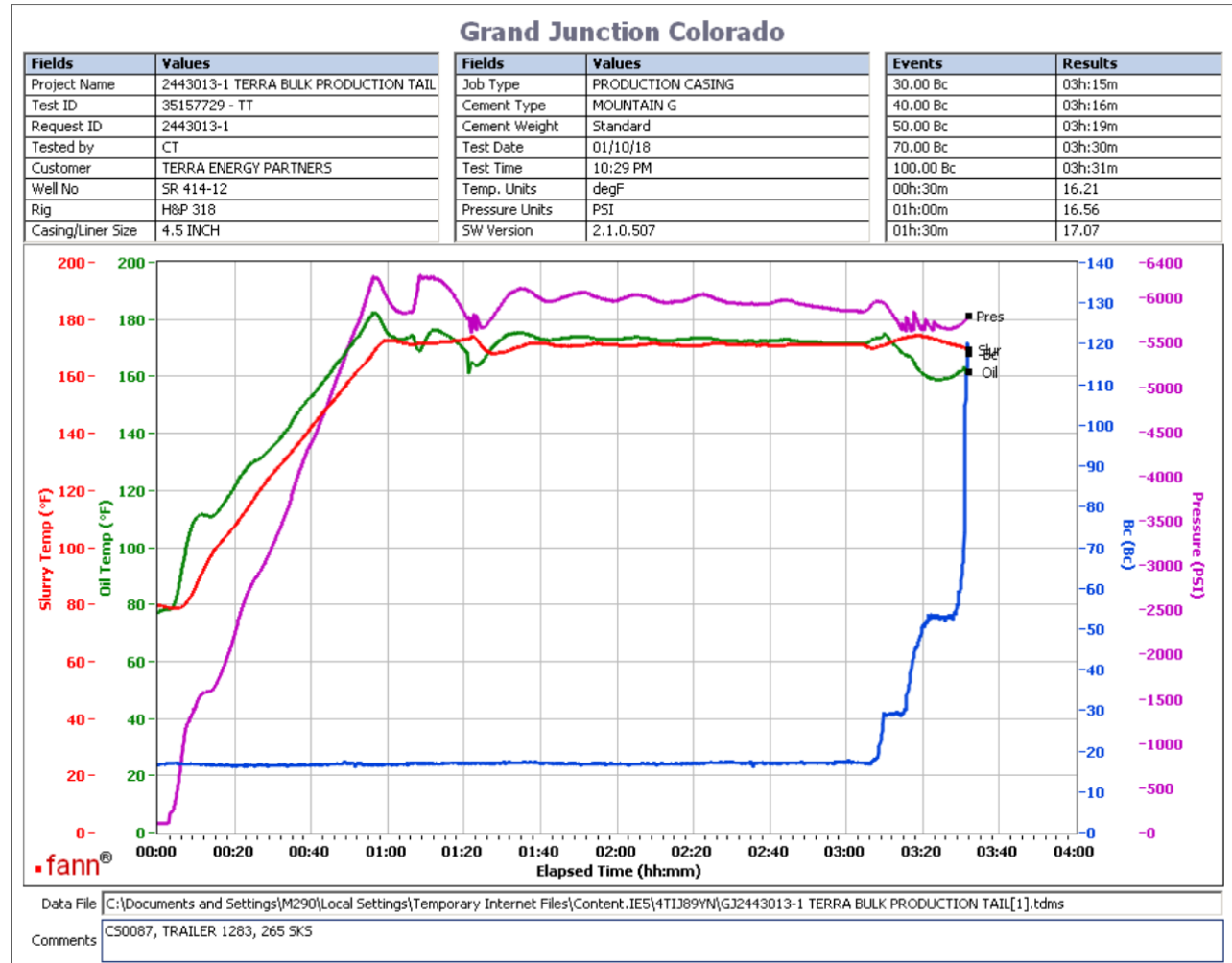
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# **Operation Test Results Request ID 2443013/1**

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

**10/JAN/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)
171	5935	56	3:15	3:19	3:30	3:31	17	66	15	17



265 sks tail  
CS0087, Trailer 1283, 265 SKS  
no deflection was observed. 17Bc--- > 17 BC

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