

# HALLIBURTON

iCem<sup>®</sup> Service

**TERRA ENERGY LTD.**

**For: Terra**

Date: Saturday, September 30, 2017

**GM 413-4 Production**

API# 05-045-23503

Sincerely,

Grand Junction Cement Engineering

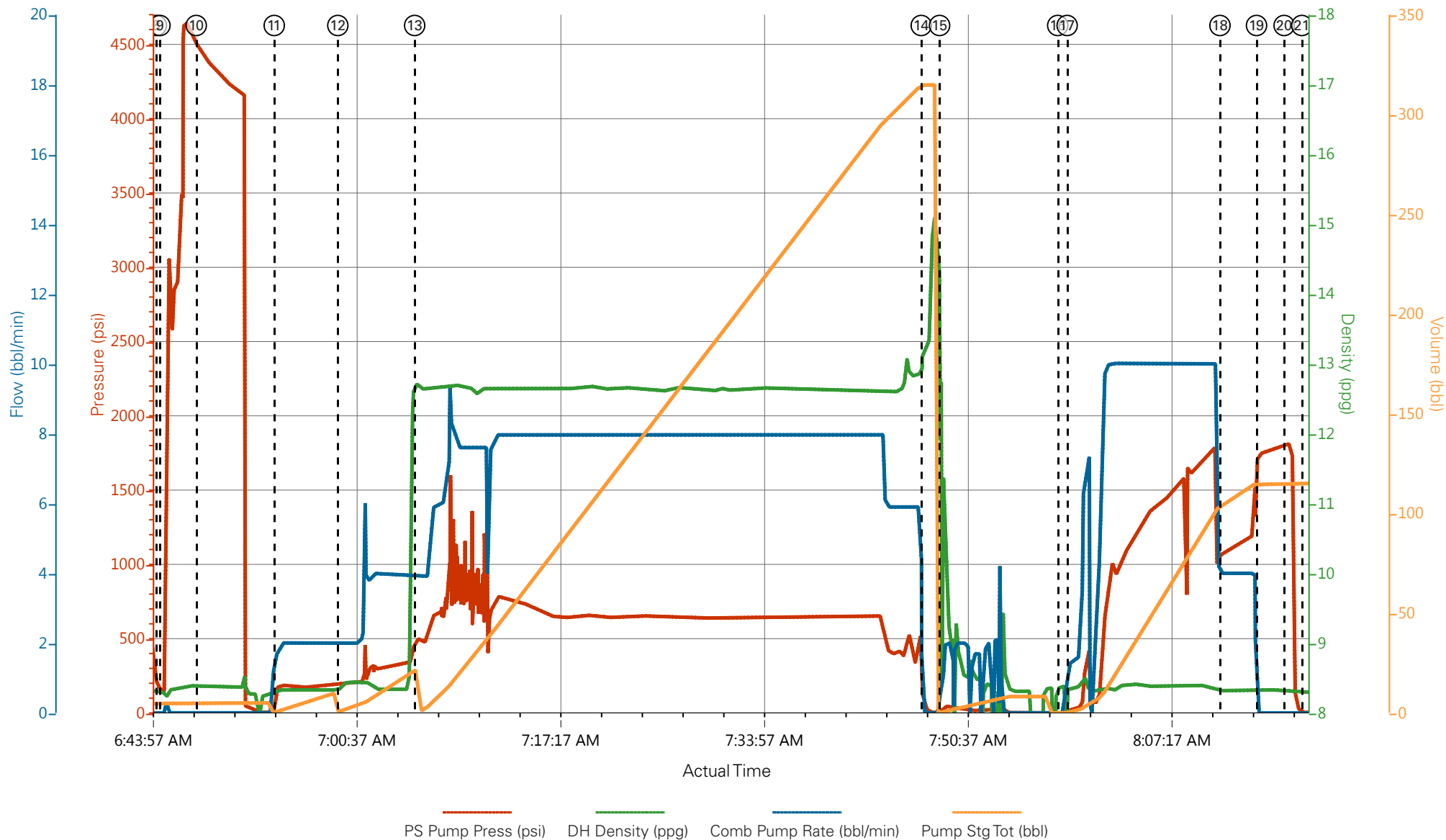
## 1.0 Real-Time Job Summary

## 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	9/29/2017	04:00:00	USER					REQUESTED ON LOCATION @ ASAP
Event	2	Pre-Convoy Safety Meeting	9/30/2017	04:15:00	USER					ALL HES PRESENT
Event	3	Arrive At Loc	9/30/2017	04:40:00	USER					RIG RUNNING CASING
Event	4	Assessment Of Location Safety Meeting	9/30/2017	04:50:00	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	5	Pre-Rig Up Safety Meeting	9/30/2017	05:00:00	USER					ALL HES PRESENT
Event	6	Rig-Up Equipment	9/30/2017	05:05:00	USER					HES RIGGED UP EQUIPMENT WITHOUT ENTERING RED ZONE.
Event	7	Pre-Job Safety Meeting	9/30/2017	05:55:00	USER					ALL HES AND RIG CREW PRESENT
Event	8	Start Job	9/30/2017	06:44:30	COM6					TD 7167', TP 7157', SJ 32.6', OH 8.75'', CSG 4.5'' 11.6#, MUD 9.8 PPG.
Event	9	Prime Pumps	9/30/2017	06:44:47	COM6	145.00	8.29	2.00	1.0	8.33 PPG FRESH WATER
Event	10	Test Lines	9/30/2017	06:47:45	COM6	4465.00	8.38	0.50	5.0	ALL LINES HELD PRESSURE AT 4465 PSI
Event	11	Pump Spacer 1	9/30/2017	06:54:08	COM6	181.00	8.30	4.00	9.6	8.33 PPG FRESH WATER (10 BBL)
Event	12	Pump Spacer 2	9/30/2017	06:59:20	COM6	190.00	8.37	4.00	20.1	8.4 PPG MUDFLUSH III (20 BBL)
Event	13	Pump Cement	9/30/2017	07:05:37	COM6	680.00	12.50	8.00	304.0	NEOCEM CEMENT 870 SKS (304 BBLS), 12.5 PPG, 1.96 FT3/SK, 9.35 GAL/SK
Event	14	Shutdown	9/30/2017	07:47:04	USER					END OF CMT
Event	15	Clean Lines	9/30/2017	07:48:34	USER					WASH UP PUMPS AND LINES TO THE PIT

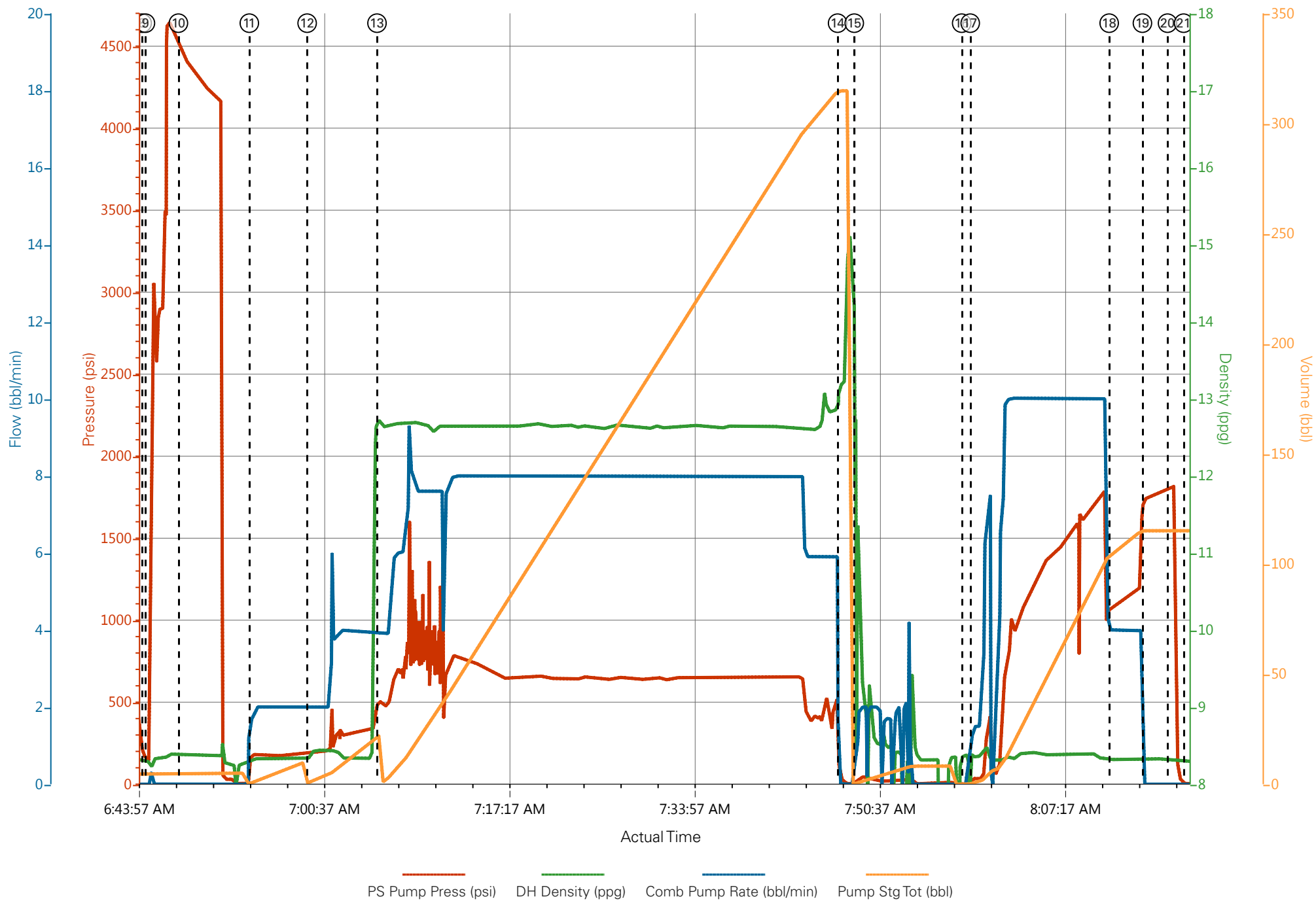
Event	16	Drop Top Plug	9/30/2017	07:58:14	USER					PLUG WENT, VERIFIED BY CO REP.
Event	17	Pump Displacement	9/30/2017	07:59:00	COM6	1638.00	8.39	10.0	100.5	8.34 PPG FRESH WATER (110.4 BBLS) 3 BAGS BE6, 1 GAL MMCR & 10 SKS KCL
Event	18	Slow Rate	9/30/2017	08:11:30	USER	1065.00	8.32	4.00	10.0	SLOW RATE TO 4 BPM PER CO REP TO LAND PLUG
Event	19	Bump Plug	9/30/2017	08:14:30	USER	1741.00	8.33	4.00	110.5	LAND PLUG AT 1340 PSI, BROUGHT UP TO 2345 PSI
Event	20	Check Floats	9/30/2017	08:16:45	USER					FLOATS HELD, 1 BBL BACK TO TRUCK
Event	21	End Job	9/30/2017	08:18:12	USER					GOOD RETURNS THROUGHOUT, PIPE WAS RECIPROCATED
Event	22	Post-Job Safety Meeting (Pre Rig-Down)	9/30/2017	08:25:00	USER					ALL HES PRESENT
Event	23	Rig-Down Equipment	9/30/2017	08:35:00	USER					ALL HES PRESENT
Event	24	Pre-Convoy Safety Meeting	9/30/2017	09:00:00	USER					ALL HES PRESENT
Event	25	Crew Leave Location	9/30/2017	09:15:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, CHRIS SMITH AND CREW

# TEP - GM 413-4 - 4.5" PRODUCTION



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

# TEP - GM 413-4 - 4.5" PRODUCTION



## Job Information

Request/Slurry	2419506/2	Rig Name	H&P 271	Date	27/SEP/2017
Submitted By	Patrick Ealey	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	GM 413-4

## Well Information

Casing/Liner Size	4.5 in	Depth MD	7171 ft	BHST	90°C / 194°F
Hole Size	8.75 in	Depth TVD	6691 ft	BHCT	54°C / 129°F
Pressure	3980 psi				

## Drilling Fluid Information

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	Density	9.2 lbm/gal
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## Cement Information - Primary Design



Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
						Slurry Density	12.5	lbm/gal
						Slurry Yield	1.962	ft3/sack
						Water Requirement	9.434	gal/sack
						Total Mix Fluid	9.434	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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# Operation Test Results Request ID 2419506/2

## Thickening Time - ON-OFF-ON

29/SEP/2017

Test Temp (°F)	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)
129	3980	36	3:53	4:12	5:01	5:25	5	46	15	5

Total sks = 870

Composite:

CS2679, Trailer 4053, 100 sks

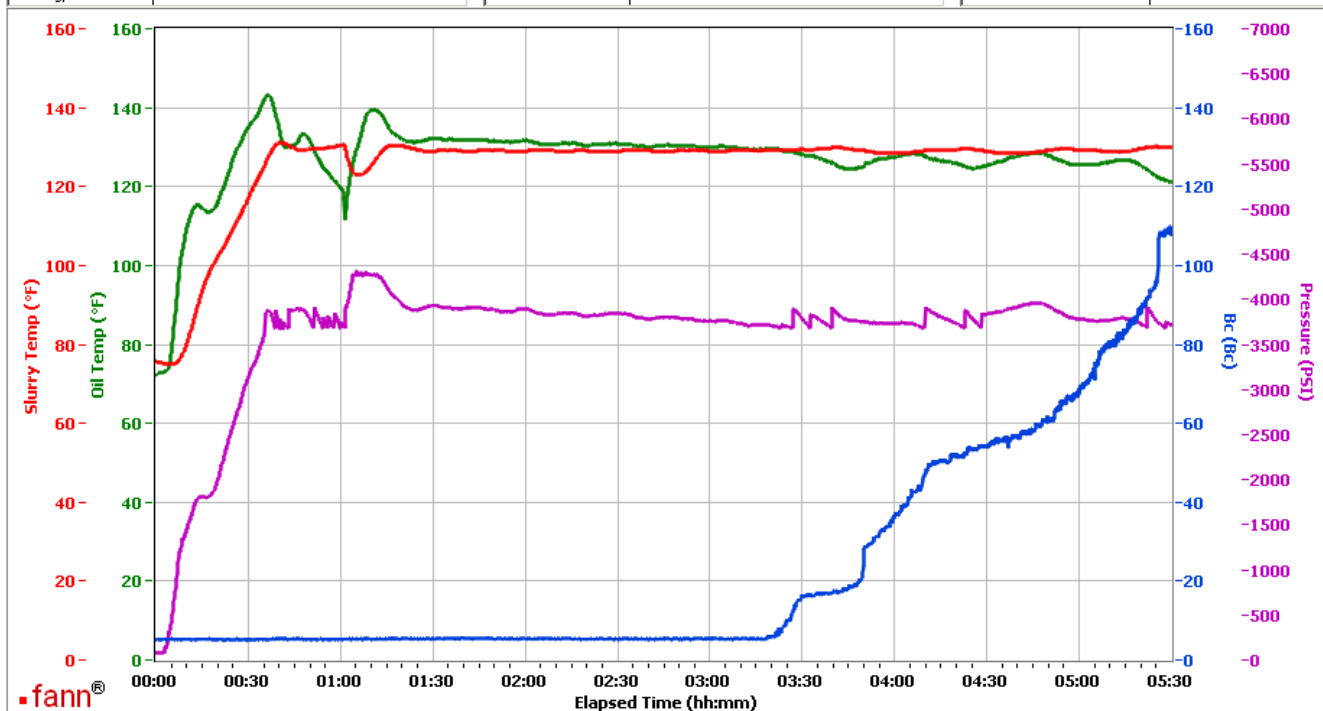
Deflection: 5 – 5

## Grand Junction Colorado

Fields	Values
Project Name	2419506-2 TERRA ENERGY BULK PRODUCTI
Test ID	34902105 - TT
Request ID	2419506-2
Tested by	CT
Customer	TERRA ENERGY
Well No	GM 413-4
Rig	H&P 271
Casing/Liner Size	4.5 INCH

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	TYPE I-II
Cement Weight	Standard
Test Date	09/28/17
Test Time	11:56 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:53m
40.00 Bc	04h:04m
50.00 Bc	04h:12m
70.00 Bc	05h:01m
100.00 Bc	05h:25m
00h:30m	5.41
01h:00m	5.41
01h:30m	5.41



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\CDER4HUV\GJ2419506-2 TERRA ENERGY BULK PRODUCTION PRIMARY[1].tdms

Comments CS2679, TRAILER 4053, 100 SKS

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## Operation Test Results Request ID 2419506/1

### Thickening Time - ON-OFF-ON

28/SEP/2017

Test Temp (°F)	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)
129	3980	36	3:47	3:51	3:55	4:12	19	46	15	16

Total sks = 870

Composite:

CS2664 TR 2878 385 SKS

CS2662 TR 8678 385 SKS

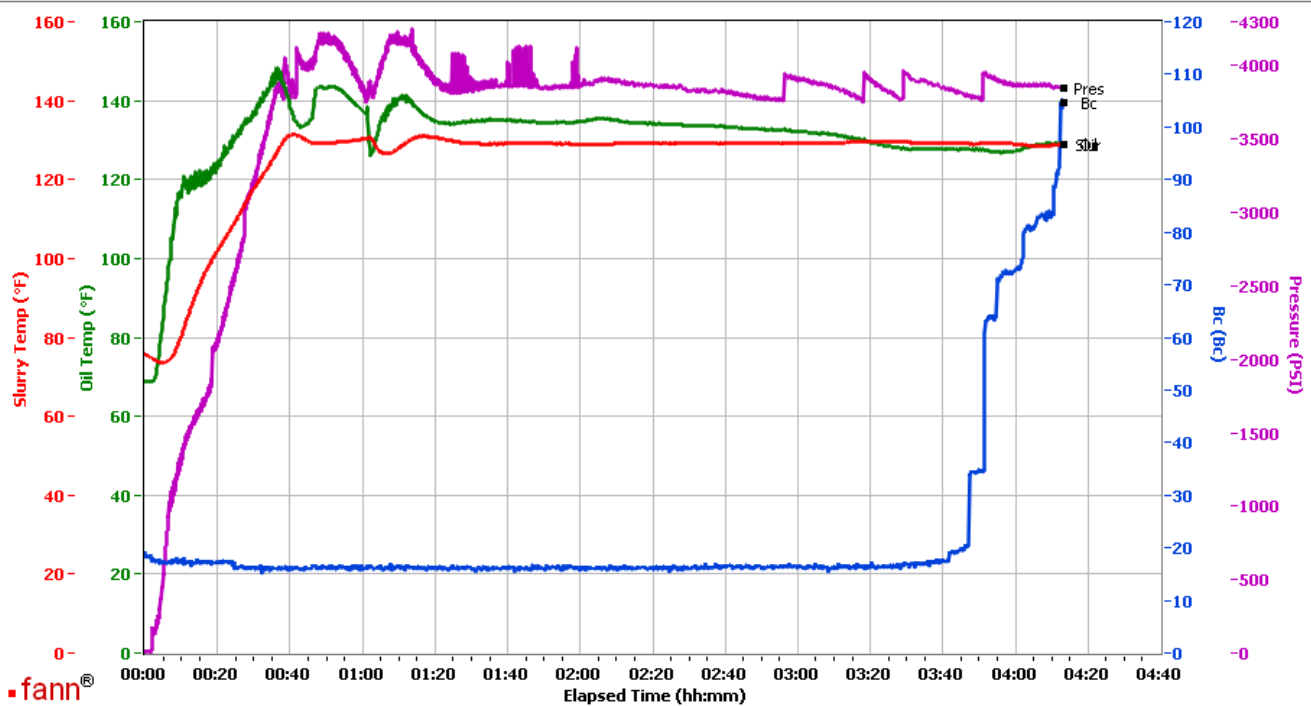
no deflection was recorded on the graph. 15Bc--- > 15Bc

### Grand Junction Colorado

Fields	Values
Project Name	GJ2419506-1 TERRA PRODUCTION PRIMAR
Test ID	34898061
Request ID	GJ2419606-1
Tested by	JASON
Customer	TERRA
Well No	GM 413-4
Rig	H&P 271
Casing/Liner Size	4.5"

Fields	Values
Job Type	PRODUCTION
Cement Type	HOLCIM TYPE I-II
Cement Weight	Light Weight
Test Date	09/27/17
Test Time	07:50 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:47m
40.00 Bc	03h:51m
50.00 Bc	03h:51m
70.00 Bc	03h:55m
100.00 Bc	04h:12m
00h:30m	16.01
01h:00m	16.23
01h:30m	15.92



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\0HU90BIZ\GJ2419506-1 TERRA PRODUCTION PRIMARY BULK COMPOSITE[1].tdms

Comments CS2664 TR 2878 385 SKS CS 2662 TR 8678 385 SKS

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