

# HALLIBURTON

iCem<sup>®</sup> Service

## **TEP ROCKY MOUNTAIN LLC**

**For: Terra**

Date: Tuesday, November 21, 2017

**PA 542-26 Production**

API #05-045-23647-00

Sincerely,

**Grand Junction Cement Engineering**

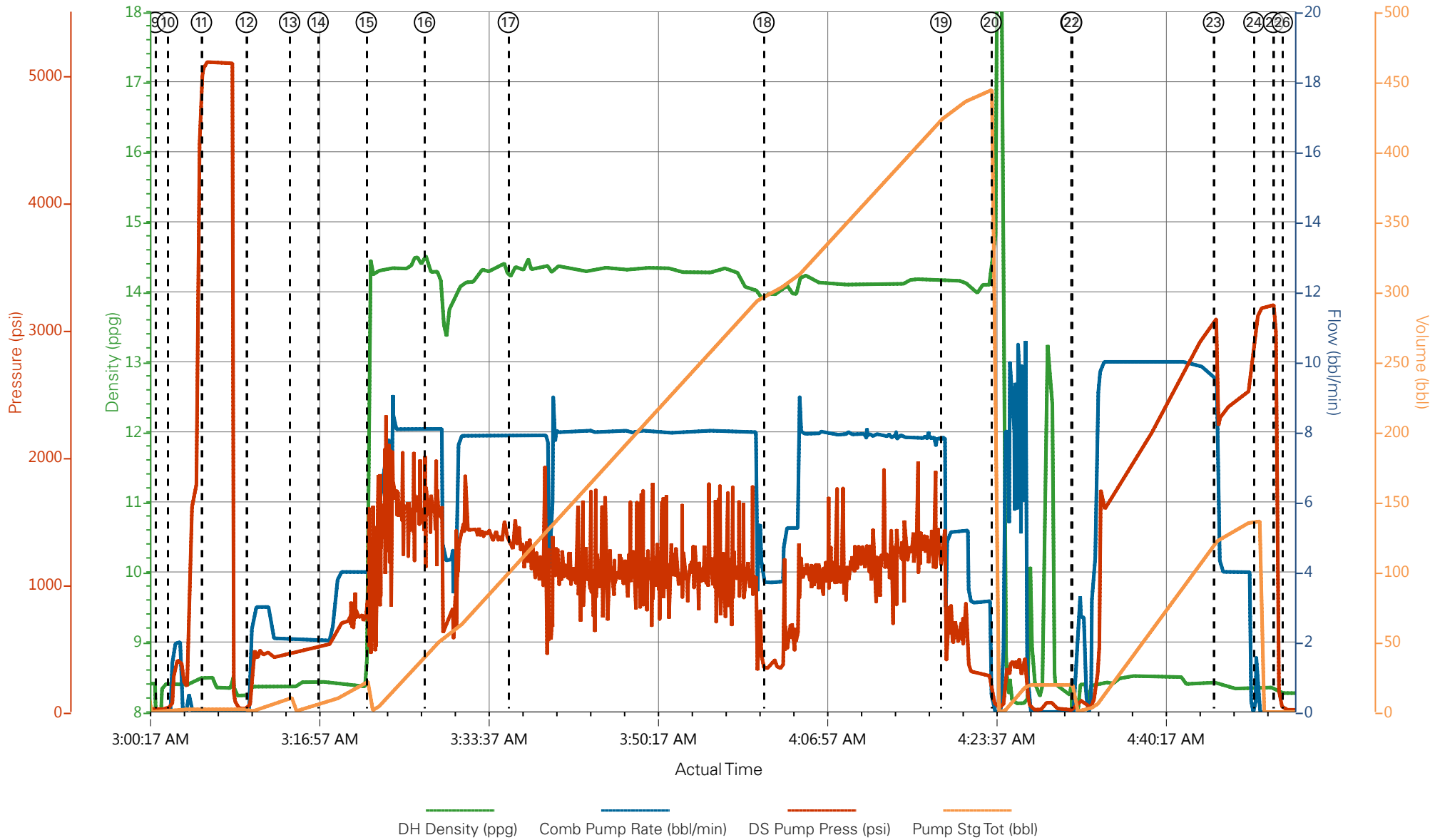
## 1.0 Real-Time Job Summary

### 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	DS Pump Press <i>(psi)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	11/20/2017	20:00:00	USER					REQUESTED ON LOCATION @ 01:00
Event	2	Pre-Convoy Safety Meeting	11/20/2017	22:45:00	USER					ALL HES EMPLOYEES PRESENT
Event	3	Crew Leave Yard	11/20/2017	23:00:00	USER					1 HT 400 PUMP TRUCK E4, 1 660 BULK TRUCK, 1 550 SERVICE PICKUP
Event	4	Arrive At Loc	11/21/2017	00:00:00	USER					ARRIVED TO LOCATION 1 HOUR EARLY. RIG RUNNING CASING UPON HES ARRIVAL
Event	5	Assessment Of Location Safety Meeting	11/21/2017	00:15:00	USER					ASSESSED LOCATION AND COLLECTED WATER SAMPLE. MET WITH COMPANY REP, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION COMPANY REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES.
Event	6	Spot Equipment	11/21/2017	00:30:00	USER					1 HT 400 PUMP TRUCK E4, 1 660 BULK TRUCK, 1 550 SERVICE PICKUP
Event	7	Pre-Rig Up Safety Meeting	11/21/2017	01:00:00	USER					ALL HES EMPLOYEES PRESENT
Event	8	Pre-Job Safety Meeting	11/21/2017	02:15:00	USER					ALL HES EMPLOYEES AND RIG CREW PRESENT, RIG CIRCULATED @ 14 BPM PRIOR TO JOB PRESSURE @ 400 PSI.
Event	9	Start Job	11/21/2017	03:01:07	USER					TD 8275', TP 8272', SJ 33.4', SURFACE CSG 9 5/8" 32.3# H-40 SET @ 1136.8' PRODUCTION CSG 4 1/2" 11.6# P-110, OH 8 3/4", MUD 12.1 PPG
Event	10	Prime Lines	11/21/2017	03:02:19	USER	8.33	2.0	400	3	FRESH WATER
Event	11	Test Lines	11/21/2017	03:05:39	COM5			5110		PRESSURE HELD
Event	12	Pump H2O Spacer	11/21/2017	03:10:04	COM5	8.33	2.0	440	10	FRESH WATER
Event	13	Pump Mud Flush III	11/21/2017	03:14:19	COM5	8.4	4.0	740	20	80 LBS MUD FLUSH III IN 20 BBL

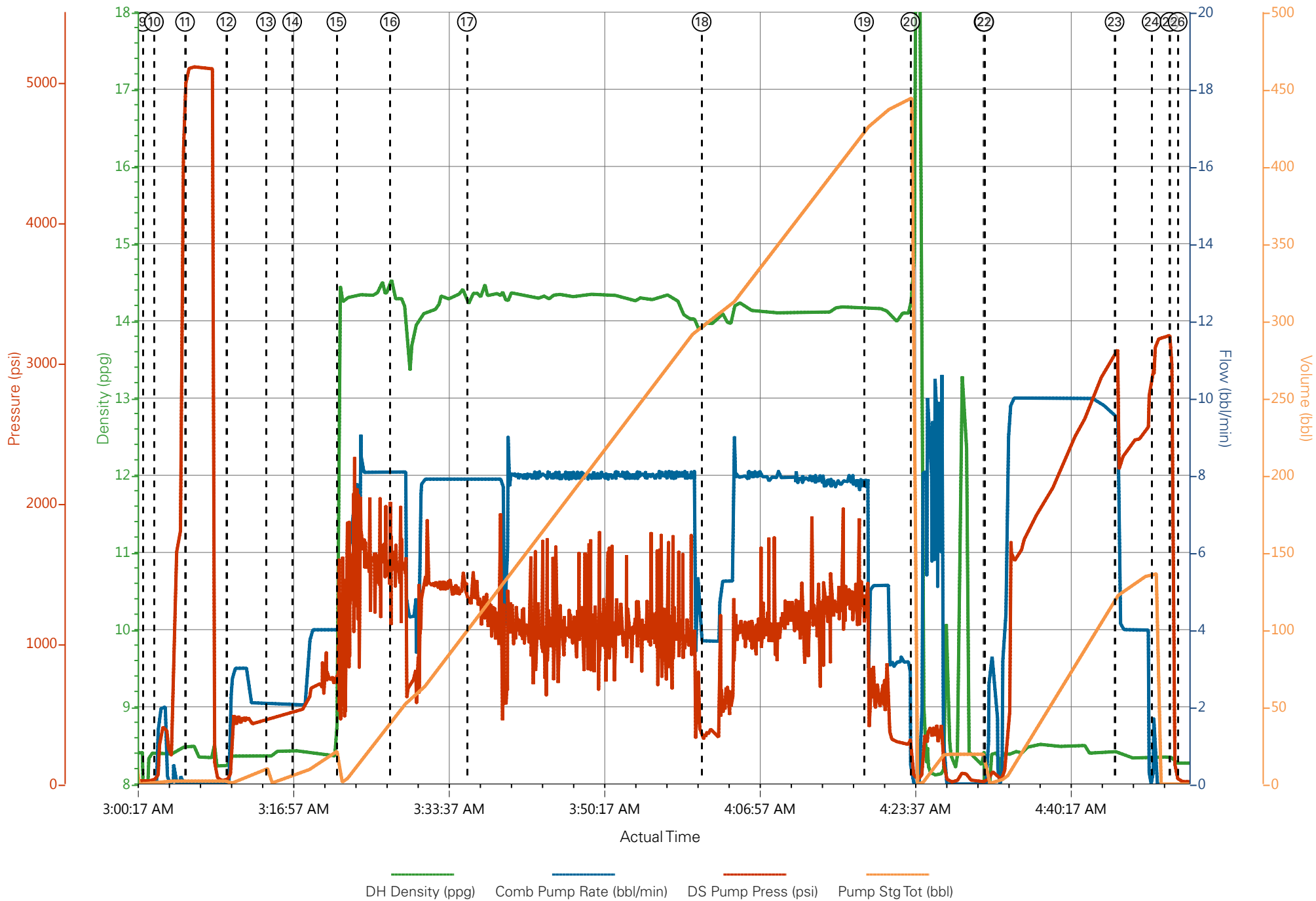
Event	14	Check weight	11/21/2017	03:17:08	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	15	Pump Cement	11/21/2017	03:21:52	COM5	14.2	8.0	1550	402.3	1625 SKS EXPANDACEM CMT 14.2 PPG, 1.39 FT3/SK, 6.36 GAL/SK,
Event	16	Check weight	11/21/2017	03:27:36	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	17	Check weight	11/21/2017	03:35:51	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	18	Check weight	11/21/2017	04:01:01	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	19	Slow Rate	11/21/2017	04:18:26	USER					SLOWED TO END CEMENT
										END OF CEMENT. WASHED UP INTO PIT, BLEW DOWN LINES FROM FLOOR AND SWITCHED TO POSITIVE DISPLACEMENT.
Event	20	Shutdown	11/21/2017	04:23:24	COM5					
Event	21	Pump Displacement	11/21/2017	04:31:15	COM5	8.4	10.0	3030	117.7	1 GAL MMCR IN FIRST 10 BBLS, 3 LBS BE-6 IN FIRST 30 BBLS, 1 50 LB. BAG KCL THROUGHOUT DISPLACEMENT
Event	22	Drop Top Plug	11/21/2017	04:31:19	USER					VERIFIED BY FLAG INDICATOR
Event	23	Slow Rate	11/21/2017	04:45:17	USER	8.4	4.0	2350	10	SLOWED TO BUMP PLUG
Event	24	Bump Plug	11/21/2017	04:49:16	COM5	8.4	4.0	2550	127.7	PLUG BUMPED
Event	25	Check Floats	11/21/2017	04:51:11	USER			3200		FLOATS HELD 1.5 BBL FLOW BACK TO TRUCK
Event	26	End Job	11/21/2017	04:52:03	USER					RETURNS THROUGHOUT JOB
Event	27	Post-Job Safety Meeting (Pre Rig-Down)	11/21/2017	05:00:00	USER					ALL HES EMPLOYEES PRESENT
Event	28	Pre-Convoy Safety Meeting	11/21/2017	06:45:00	USER					ALL HES EMPLOYEES PRESENT
Event	29	Depart Location	11/21/2017	07:00:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, DUSTIN HYDE AND CREW

# TERRA - TRI STATE PA 542-26 - 4 1/2" PRODUCTION



- |   |                             |                      |                |                      |   |
|---|-----------------------------|----------------------|----------------|----------------------|---|
| ① Call Out                              | ⑥ Spot Equipment            | ⑪ Test Lines         | ⑯ Check weight | 21 Pump Displacement | 26 End Job                                |
| ② Pre-Convoy Safety Meeting             | ⑦ Pre-Rig Up Safety Meeting | ⑫ Pump H2O Spacer    | ⑰ Check weight | 22 Drop Top Plug     | 27 Post-Job Safety Meeting (Pre Rig-Down) |
| ③ Crew Leave Yard                       | ⑧ Pre-Job Safety Meeting    | ⑬ Pump Mud Flush III | ⑱ Check weight | 23 Slow Rate         | 28 Pre-Convoy Safety Meeting              |
| ④ Arrive At Loc                         | ⑨ Start Job                 | ⑭ Check weight       | ⑲ Slow Rate    | 24 Bump Plug         | 29 Depart Location                        |
| ⑤ Assessment Of Location Safety Meeting | ⑩ Prime Lines               | ⑮ Pump Cement        | 20 Shutdown    | 25 Check Floats      |   |

TERRA - TRI STATE PA 542-26 - 4 1/2" PRODUCTION



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

### Job Information

<b>Request/Slurry</b>	2431083/1	<b>Rig Name</b>	H&P 271	<b>Date</b>	17/NOV/2017
<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>	PA 542-26

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	8275 ft	<b>BHST</b>	102°C / 215°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	7908 ft	<b>BHCT</b>	63°C / 145°F
<b>Pressure</b>	4857 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	AMC	<b>Mud Trade Name</b>		<b>Density</b>	
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### Cement Information - Primary Design

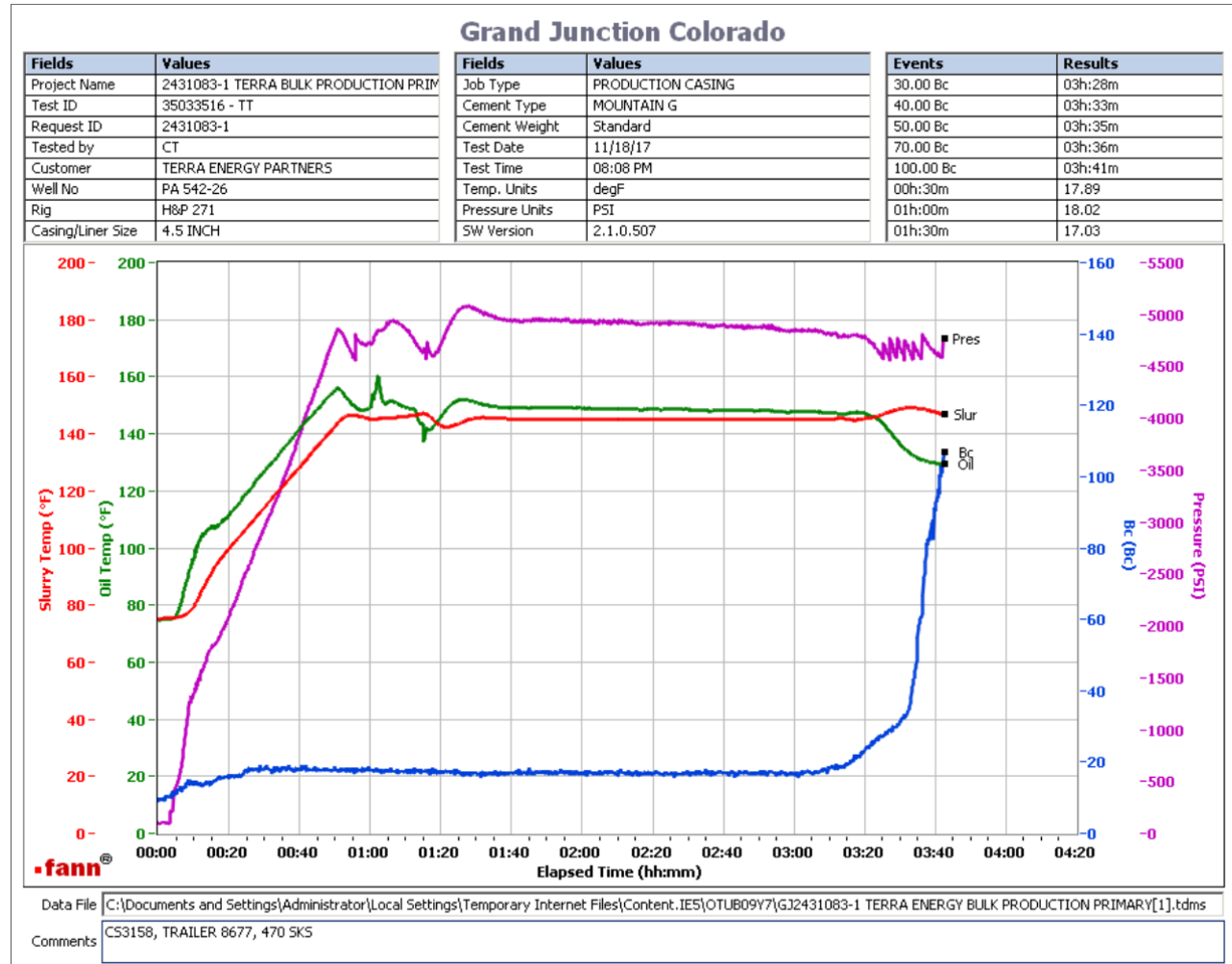
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		HalCem Primary				Slurry Density	14.2	lbm/gal
						Slurry Yield	1.387	ft3/sack
						Water Requirement	6.36	gal/sack
						Total Mix Fluid	6.36	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Thickening Time - ON-OFF-ON

18/NOV/2017

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)
145	4857	50	3:28	3:35	3:36	3:41	10	60	15	17



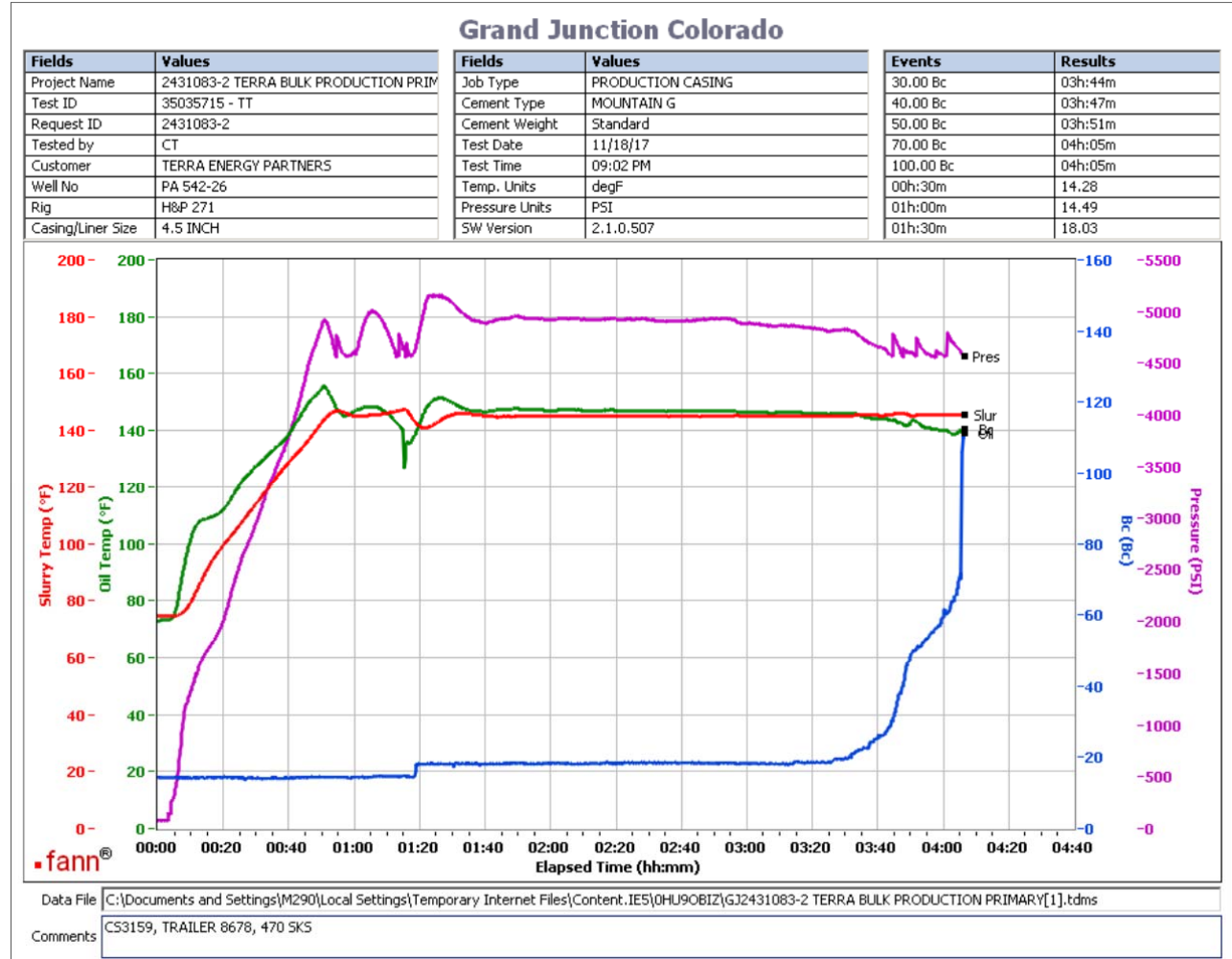
Total sks = 1625  
 CS3158, Trailer 8677, 470 sks  
 Deflection: 17 - 17

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**Operation Test Results Request ID 2431083/2**

**Thickening Time - ON-OFF-ON 18/NOV/2017**

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)
145	4857	50	3:44	3:51	4:05	4:05	14	60	15	14



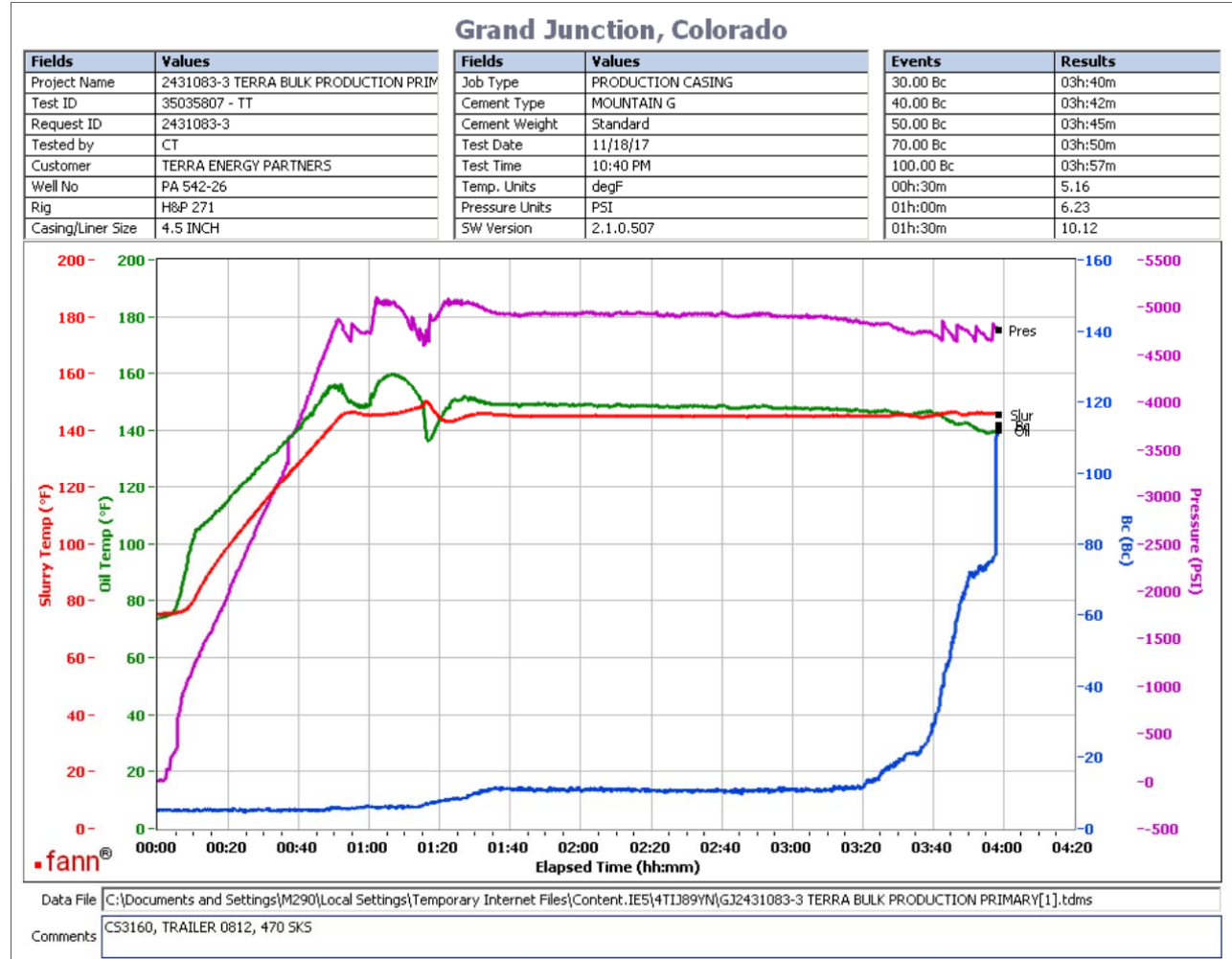
1625 sks Total  
 CS3159, Trailer 8678, 470 sks  
 Deflection: 14 – 14

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**Operation Test Results Request ID 2431083/3**

**Thickening Time - ON-OFF-ON 18/NOV/2017**

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)
145	4857	50	3:40	3:45	3:50	3:57	5	60	15	6



1625 sks Total  
 CS3160, Trailer 0812, 470 sks  
 Deflection: 6 – 6

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**Operation Test Results Request ID 2431083/4**

**Thickening Time - ON-OFF-ON 19/NOV/2017**

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)
145	4857	50	3:39	3:52	3:59	4:05	30	60	15	23

### Grand Junction Colorado

Fields	Values	Fields	Values	Events	Results
Project Name	2431083-4 TERRA BULK PRODUCTION PRIM	Job Type	PRODUCTION CASING	30.00 Bc	03h:39m
Test ID	35035862 - TT	Cement Type	MOUNTAIN G	40.00 Bc	03h:45m
Request ID	2431083-4	Cement Weight	Standard	50.00 Bc	03h:52m
Tested by	CT	Test Date	11/18/17	70.00 Bc	03h:59m
Customer	TERRA ENERGY PARTNERS	Test Time	04:58 PM	100.00 Bc	04h:05m
Well No	PA 542-26	Temp. Units	degF	00h:30m	25.41
Rig	H&P 271	Pressure Units	PSI	01h:00m	24.99
Casing/Liner Size	4.5 INCH	SW Version	2.1.0.507	01h:30m	22.78

Data File: C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\K9YZ0P2R\GJ2431083-4 TERRA BULK PRODUCTION PRIMARY[1].tdms

Comments: CS3161, TRAILER 1972, 215 SKS

Total sks = 1625  
 CS3161, Trailer 1972, 215 sks  
 deflected from 20Bc--- > 23Bc  
 heat of hydration at 3:45hr

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