

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For: Terra**

Date: Thursday, March 15, 2018

**RU 23-17 Production**

API#05-045-23739

Sincerely,

**Grand Junction Cement Engineering**

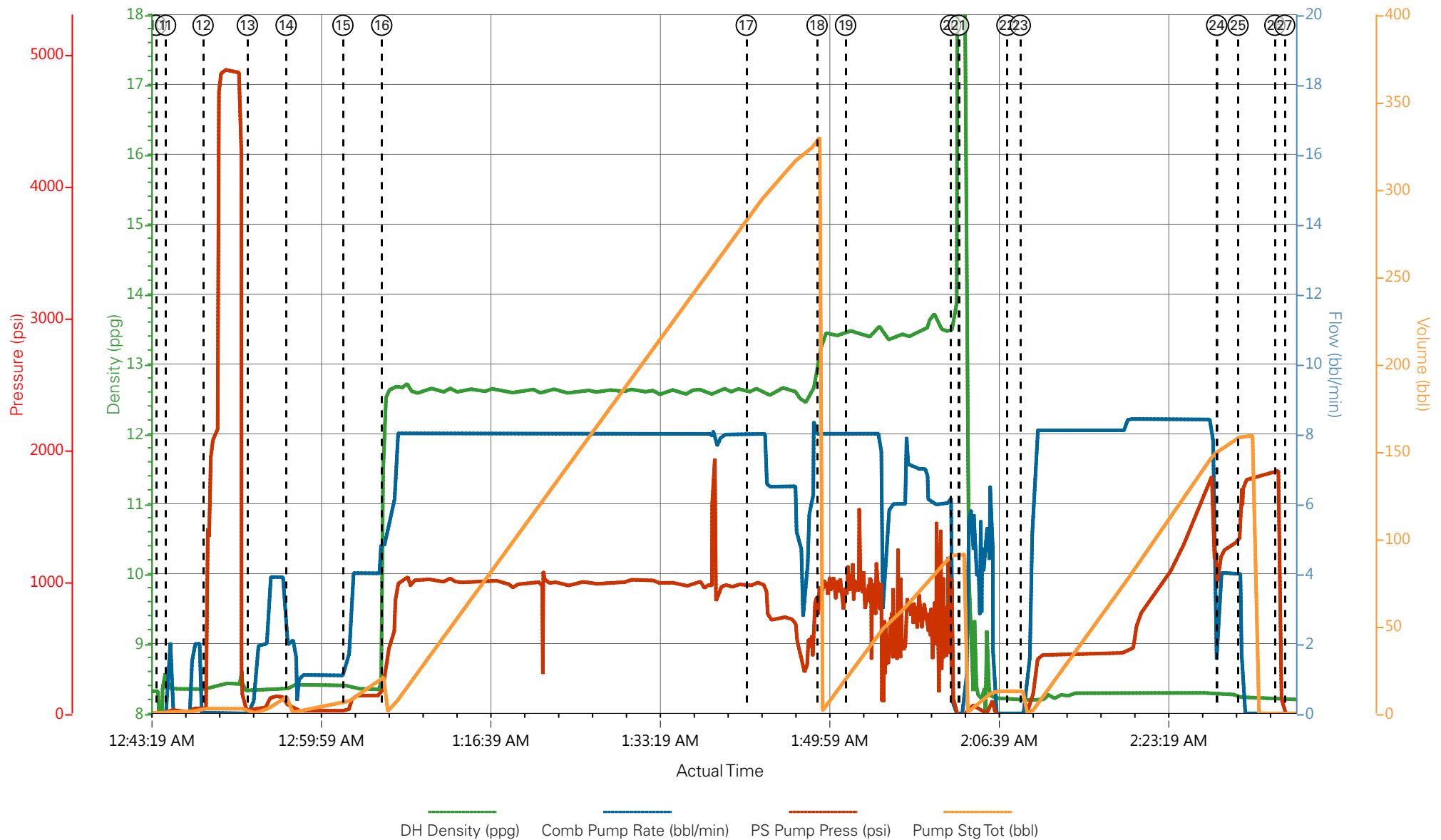
## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	3/14/2018	09:30:00	USER					ON LOCATION REQUESTED 15:00
Event	2	Pre-Convoy Safety Meeting	3/14/2018	11:30:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	3/14/2018	11:45:00	USER					
Event	4	Arrive at Location from Service Center	3/14/2018	15:00:00	USER					RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	3/14/2018	15:10:00	USER					MET WITH COMPANY REP DISCUSSED PROCEDURE SDS OFFERED
Event	6	Pre-Rig Up Safety Meeting	3/14/2018	17:00:00	USER					ALL HES PRESENT
Event	7	Rig-Up Completed	3/14/2018	18:00:00	USER					1-ELITE, 1-660 BULK TRAILER, 1-FIELD SILO, 4.5" QL, 2" PUMP IRON, 4" SUCTION HOSE
Event	8	Pre-Job Safety Meeting	3/14/2018	23:30:00	USER					ALL HES AND RIG CREW PRESENT
Event	9	Other	3/14/2018	23:35:00	USER					RIG PUMPED 1 1/2 BOTTOM UP 400GPM, 375PSI. WATER:TEMP-60, CL-0, PH-7
Event	10	Start Job	3/15/2018	00:44:04	USER	8.30	0.00	0.00	0.0	TD-10425', TP-10418', SJ-31.1', CSG-4.5" 11.6# P110, SCSG-9.625" 32.3# SHOE AT 1102', OH-8.75", MUD-8.8PPG PIPE RECIPROCATED THROUGH JOB
Event	11	Prime Pumps	3/15/2018	00:45:00	USER	8.37	2.00	47.00	3.0	FRESH WATER
Event	12	Test Lines	3/15/2018	00:48:41	COM5	8.35	0.00	4885.00	3.1	ALL PRESSURE HELD ON LINES
Event	13	Pump Water Spacer	3/15/2018	00:53:02	COM5	8.33	4.00	104.00	10.0	FRESH WATER
Event	14	Pump Mud Flush III	3/15/2018	00:56:51	COM5	8.35	4.00	135.00	20.0	MUD FLUSH III
Event	15	Check weight	3/15/2018	01:02:26	COM5					WEIGHT VERIFIED BY PRESSURIZED MUD SCALES

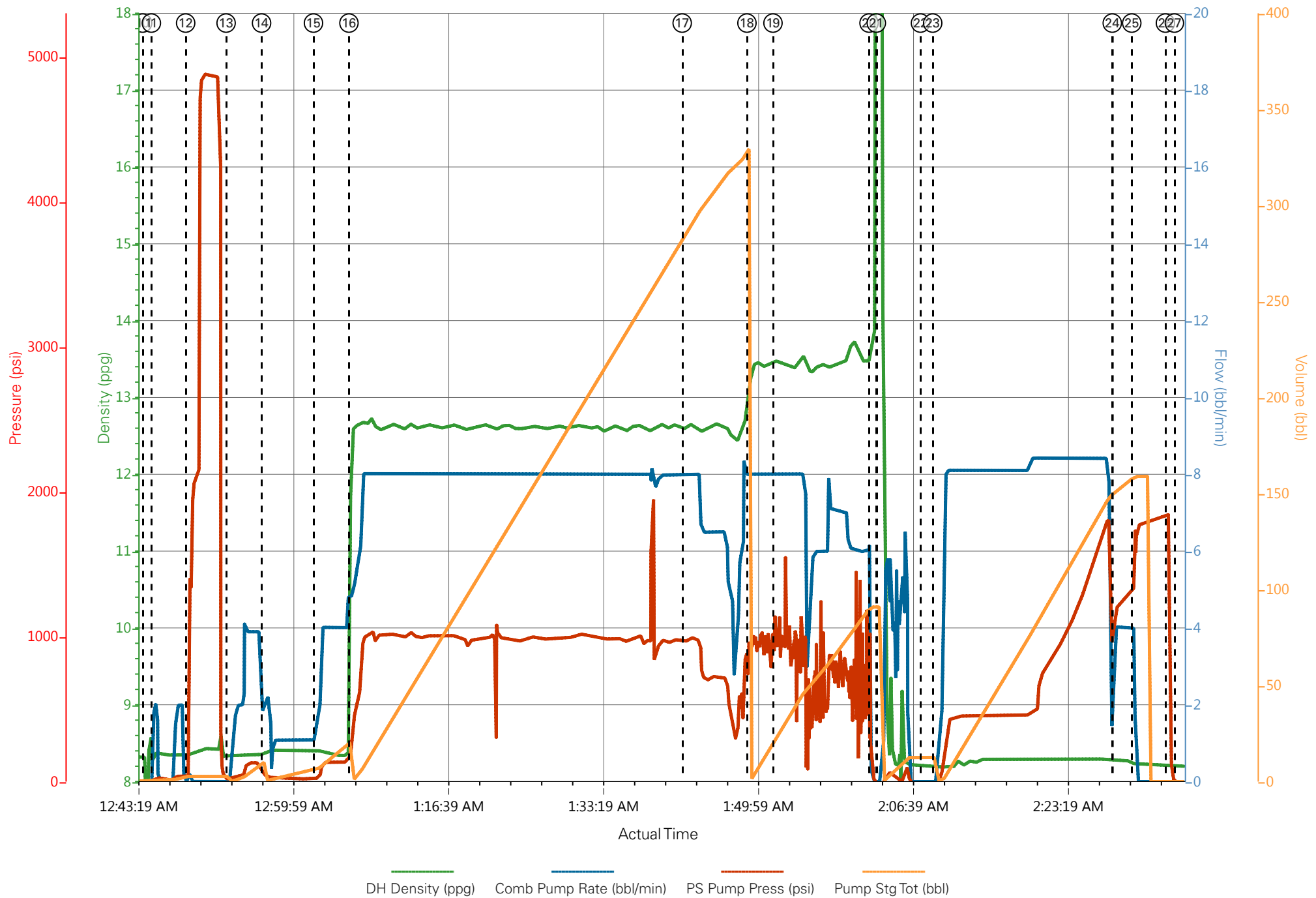
Event	16	Pump Lead Cement	3/15/2018	01:06:15	COM5	12.50	8.00	1060.00	321.3	NEOCER LEAD 930SKS, 12.5PPG, 1.94CF/SK, 9.6GL/SK
Event	17	Check weight	3/15/2018	01:42:06	COM5					WEIGHT VERIFIED BY PRESSURIZED MUD SCALES
Event	18	Pump Tail Cement	3/15/2018	01:49:04	COM5	13.30	8.00	1000.00	81.6	THERMACER TAIL 265SKS, 13.3PPG, 1.73CF/SK, 7.81GL/SK
Event	19	Check weight	3/15/2018	01:51:52	COM5					WEIGHT VERIFIED BY PRESSURIZED MUD SCALES
Event	20	Shutdown	3/15/2018	02:02:12	USER					END OF CEMENT
Event	21	Clean Lines	3/15/2018	02:03:00	USER					CLEANED PUMPS AND LINES AND BLOWN BACK TO PIT
Event	22	Drop Plug	3/15/2018	02:07:45	USER					PLUG AWAY
Event	23	Pump Displacement	3/15/2018	02:09:03	COM5	8.40	8.50	1809.00	160.9	KCL WATER, 3# BE6 AND 1 GAL MMCR ADDED
Event	24	Slow Rate	3/15/2018	02:28:22	USER	8.40	4.00	1176.00	150.5	SLOW RATE LAST 10 BBLS
Event	25	Bump Plug	3/15/2018	02:30:28	USER	8.40	4.00	1305.00	160.9	PLUG BUMPED
Event	26	Check Floats	3/15/2018	02:34:06	USER	8.40	0.00	1845.00	0.0	FLOATS HELD 1 BBL BACK
Event	27	End Job	3/15/2018	02:35:03	COM5					RETURNS THROUGH OUT JOB
Event	28	Post-Job Safety Meeting (Pre Rig-Down)	3/15/2018	02:40:00	USER					ALL HES PRESENT
Event	29	Rig-Down Completed	3/15/2018	03:45:00	USER					
Event	30	Pre-Convoy Safety Meeting	3/15/2018	04:00:00	USER					ALL HES PRESENT
Event	31	Crew Leave Location	3/15/2018	04:15:00	USER					THANK YOU FOR CHOOSING HALLIBURTON, ANDREW BRENNECKE AND CREW

# TERRA - RU 23-17 - 4.5" PRODUCTION



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

# TERRA - RU 23-17 - 4.5" PRODUCTION



## Job Information

Request/Slurry	2459237/1	Rig Name	H&P 318	Date	08/MAR/2018
Submitted By	Aaron Woolsey	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	RU 23-17

## Well Information

Casing/Liner Size	4.5 in	Depth MD	10620 ft	BHST	127°C / 260°F
Hole Size	8.75 in	Depth TVD	10586 ft	BHCT	92°C / 198°F
Pressure	6710 psi				

## Drilling Fluid Information

Mud Supplier Name	Mud Trade Name	Density
-------------------	----------------	---------

## Cement Information - Lead Design



Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
		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		

This report is the property of Halliburton Energy Services and neither it nor any part thereof, nor a copy thereof, is to be published or disclosed without first securing the expressed written approval of Halliburton. It may however be used in the course of regular business operations by any person or concern receiving such report from Halliburton. This report is for information purposes only and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage regardless of cause, including any act or omission of Halliburton, resulting from the use hereof.

# Operation Test Results Request ID 2459237/1

## Thickening Time - ON-OFF-ON

12/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	6710	52	4:03	4:57	5:16	5:16	21	62	15	13

Total sks = 930

Composite:

CS0610 TR#8658 400 SKS

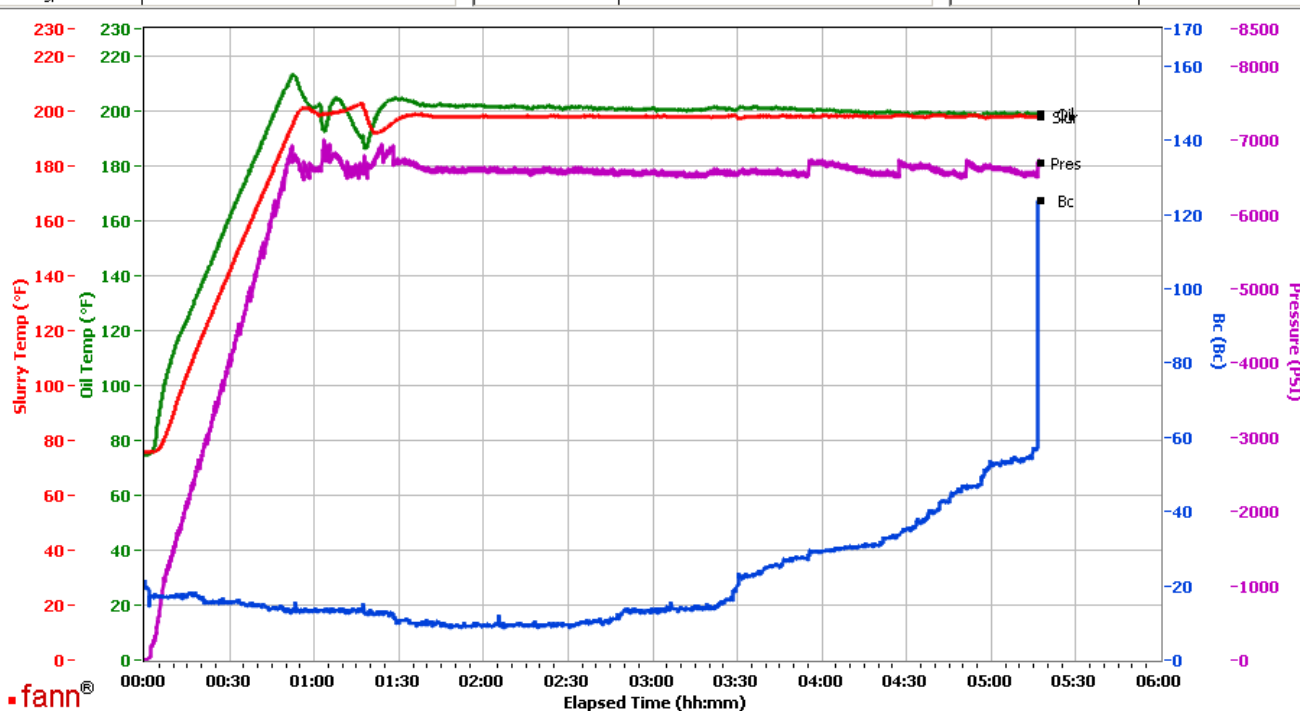
CS0611 TR#8476 400 SKS

CS0612 TR#7304 130 SKS

No deflection

## Grand Junction, Colorado

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2459237-1 TERRA PRODUCTION BULK LE	Job Type	PRODUCTION CASING	30.00 Bc	04h:03m
Test ID	35317673	Cement Type	HOLCIM TYPE I-II	40.00 Bc	04h:38m
Request ID	GJ2459237-1	Cement Weight	Standard	50.00 Bc	04h:57m
Tested by	DEBA	Test Date	03/12/18	70.00 Bc	05h:16m
Customer	TERRA ENERGY PARTNERS	Test Time	02:14 AM	100.00 Bc	05h:16m
Well No	RU 23-17	Temp. Units	degF	00h:30m	15.05
Rig	H&P 318	Pressure Units	PSI	01h:00m	13.19
Casing/Liner Size	4.5"	SW Version	2.1.0.507	01h:30m	10.90



Data File C:\Documents and Settings\M290\Desktop\Test Data\GJ2459237-1 TERRA PRODUCTION BULK LEAD.tdms

Comments COMPOSITE: CS0610 TR#8658 400 SKS , CS0611 TR#8476 400 SKS AND CS0612 TR#7304 130 SKS

This report is the property of Halliburton Energy Services and neither it nor any part thereof, nor a copy thereof, is to be published or disclosed without first securing the expressed written approval of Halliburton. It may however be used in the course of regular business operations by any person or concern receiving such report from Halliburton. This report is for information purposes only and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage regardless of cause, including any act or omission of Halliburton, resulting from the use hereof.

# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

<b>Request/Slurry</b>	2459238/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	08/MAR/2018
<b>Submitted By</b>	Aaron Woolsey	<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 23-17

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10620 ft	<b>BHST</b>	127°C / 260°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	10586 ft	<b>BHCT</b>	92°C / 198°F
<b>Pressure</b>	6710 psi				

### Drilling Fluid Information

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

### 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				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		

This report is the property of Halliburton Energy Services and neither it nor any part thereof, nor a copy thereof, is to be published or disclosed without first securing the expressed written approval of Halliburton. It may however be used in the course of regular business operations by any person or concern receiving such report from Halliburton. This report is for information purposes only and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage regardless of cause, including any act or omission of Halliburton, resulting from the use hereof.



# Operation Test Results Request ID 2459238/1

## Thickening Time - ON-OFF-ON

13/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	6710	52	6:10	6:52	7:02	7:02	23	62	15	18

Total sks = 265

CS0617 tr#4053 265 sks

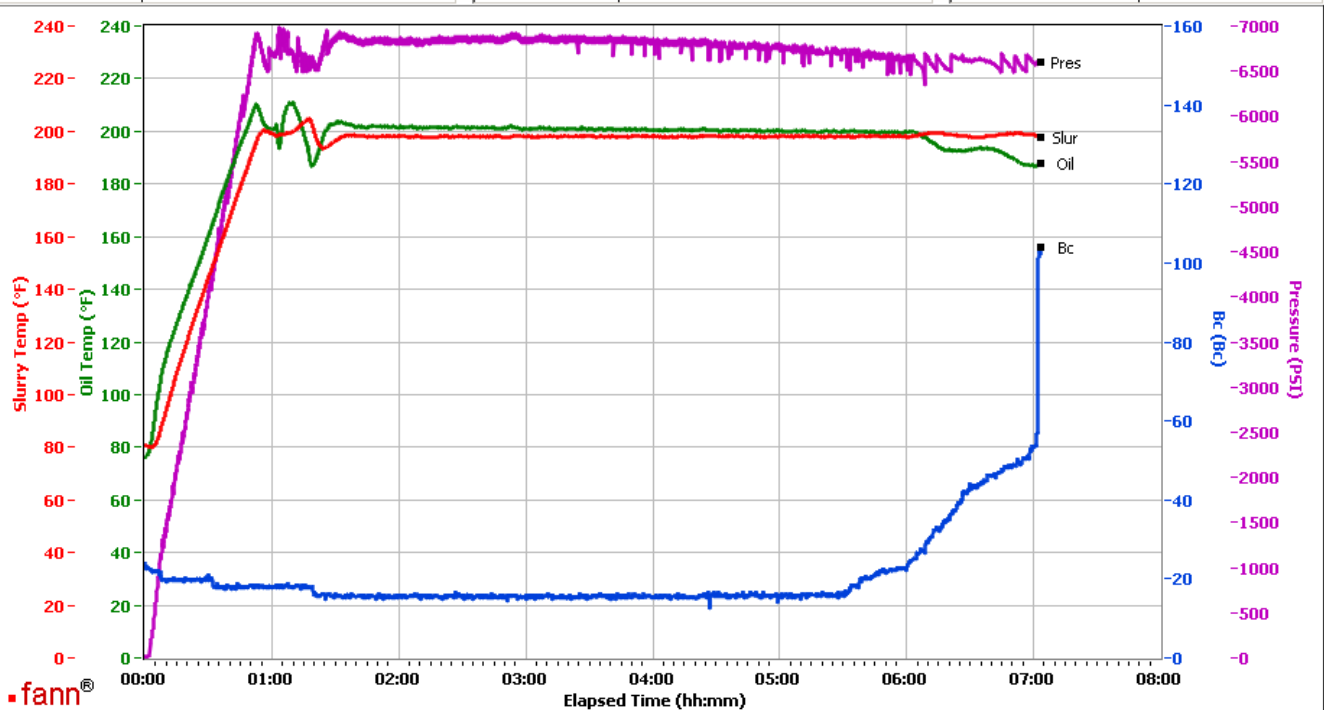
Deflection: 18 – 18

## Grand Junction, Colorado

Fields	Values
Project Name	GJ2459238-1 TERRA PRODUCTION BULK TA
Test ID	35317675
Request ID	GJ2459238-1
Tested by	DEBA
Customer	TERRA ENERGY PARTNERS
Well No	RU 23-17
Rig	H8P318
Casing/Liner Size	4.5

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	MOUNTAIN G
Cement Weight	Standard
Test Date	03/12/18
Test Time	10:18 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	06h:10m
40.00 Bc	06h:25m
50.00 Bc	06h:52m
70.00 Bc	07h:02m
100.00 Bc	07h:02m
00h:30m	21.15
01h:00m	17.78
01h:30m	15.73



Data File C:\Documents and Settings\M290\Local Settings\Temporary Internet Files\Content.IE5\CDER4HUV\GJ2459238-1 TERRA PRODUCTION BULK TAIL[1].tdms

Comments CS0617 TR#4053 265 SKS

This report is the property of Halliburton Energy Services and neither it nor any part thereof, nor a copy thereof, is to be published or disclosed without first securing the expressed written approval of Halliburton. It may however be used in the course of regular business operations by any person or concern receiving such report from Halliburton. This report is for information purposes only and the content is limited to the sample described. Halliburton makes no warranties, expressed or implied, as to the accuracy of the contents or results. Any user of this report agrees Halliburton shall not be liable for any loss or damage regardless of cause, including any act or omission of Halliburton, resulting from the use hereof.