

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

United States of America, COLORADO

### **For: Terra**

Date: Thursday, March 14, 2019

### **TR 44-22-597 Production PJR**

API# 05-045-23690-00

Sincerely,

**Grand Junction Cement Engineering**

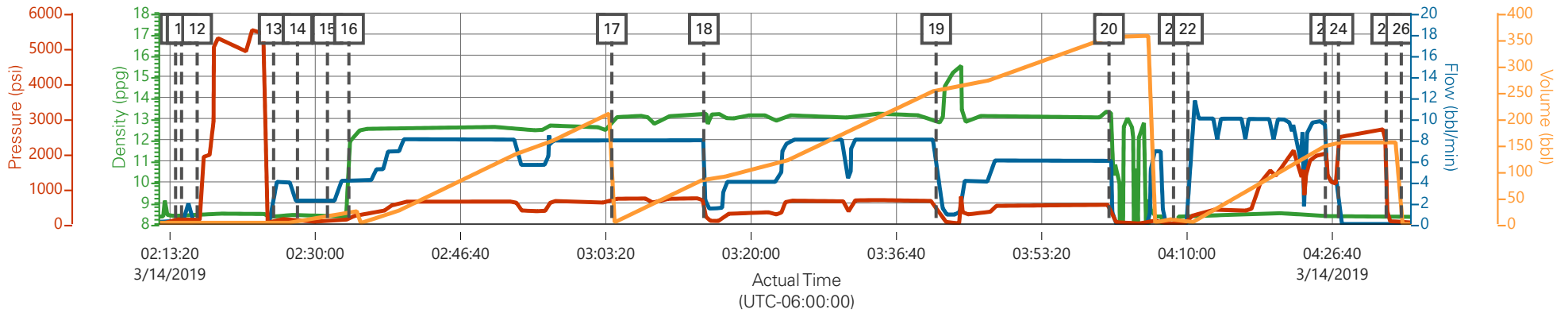
## 1.0 Real-Time Job Summary

### 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	3/13/2019	03:30:00						Requested on Location @ 11:00
Event	2	Pre-Convoy Safety Meeting	3/13/2019	04:50:00						
Event	3	Crew Leave Yard	3/13/2019	05:00:00						1 Elite, 1 660, 1 pickup
Event	4	Arrive At Loc	3/13/2019	11:00:00						Rig running casing
Event	5	Assessment Of Location Safety Meeting	3/13/2019	11:10:00						JSA completed - Customer offered/received SDS - water test pH 7.0, CI <200, temp 53 degrees
Event	6	Pre-Rig Up Safety Meeting	3/13/2019	11:30:00						
Event	7	Rig-Up Equipment	3/13/2019	12:00:00						DME iron to ground manifold, standpipe, hardline to pit. Water hoses to both uprights, bulk hoses to Silo's and 660.
Event	8	Other	3/13/2019	23:00:00						Mud scales calibrated to drinking water prior to job.
Event	9	Pre-Job Safety Meeting	3/14/2019	01:40:00						All HES personnel, rig crew, and company rep.
Event	10	Start Job	3/14/2019	02:13:59						TD 9430', TP 9434.1', SJ 31.77', OH 8.75", Csg 4.5" 11.6 lb/ft P-110 Prev. Csg. 9.625" 36# @ 2773', Mud 9.0 ppg.
Event	11	Fill Lines	3/14/2019	02:14:40		8.33	2	120	5	Fresh Water
Event	12	Test Lines	3/14/2019	02:16:27				5520		No Leaks

Event	13	Pump Spacer	3/14/2019	02:25:13	8.33	4	125	5	Fresh Water
Event	14	Pump Spacer	3/14/2019	02:27:58	8.4	4	135	20	80 lbs. Mud Flush III
Event	15	Check Weight	3/14/2019	02:31:23					Density verified via mud cup
Event	16	Pump Lead Cement	3/14/2019	02:33:51	12.5	8	670	193.5	560 sks, 12.5 ppg, 1.94 yield, 9.6 gal/sk
Event	17	Pump Tail Cement	3/14/2019	03:04:01	13.0	8	700	294.9	800 sks, 13.0 ppg, 2.07 Yield, 9.43 gal/sk
Event	18	Slow Rate	3/14/2019	03:14:34					Second upright valve frozen, had to swap line to another water tank.
Event	19	Slow Rate	3/14/2019	03:41:13					Swap to pump tractor compressor, 660 compressor quit.
Event	20	Shutdown	3/14/2019	04:01:03					Wash lines to pit
Event	21	Drop Top Plug	3/14/2019	04:08:27					Co-Rep Verify Plug Launched
Event	22	Pump Displacement	3/14/2019	04:10:06	8.4	10	2000	145.7	3 lbs BE-6, 1 gal MMCR, 2% KCl, Passenger side deck engine quit running 4 times during displacement.
Event	23	Slow Rate	3/14/2019	04:25:52	8.4	4	1490	135	Slow Rate 10 bbls to Calculated Displacement
Event	24	Bump Plug	3/14/2019	04:27:22			2580		Plug Bumped at 1490 psi, Brought up to 2580 psi
Event	25	Check Floats	3/14/2019	04:32:51					Floats held – 1.5 bbl back to the truck
Event	26	End Job	3/14/2019	04:34:35					Good returns throughout job. Pipe was not reciprocated during job.
Event	27	Pre-Rig Down Safety Meeting	3/14/2019	05:12:45					40 lbs sugar used, Customer supplied top plug, 10 add hours
Event	28	Rig-Down Equipment	3/14/2019	05:16:15					
Event	29	Pre-Convoy Safety Meeting	3/14/2019	05:31:39					
Event	30	Crew Leave Location	3/14/2019	08:00:00					Thanks for using Halliburton Cement, Chris Martinez and crew.

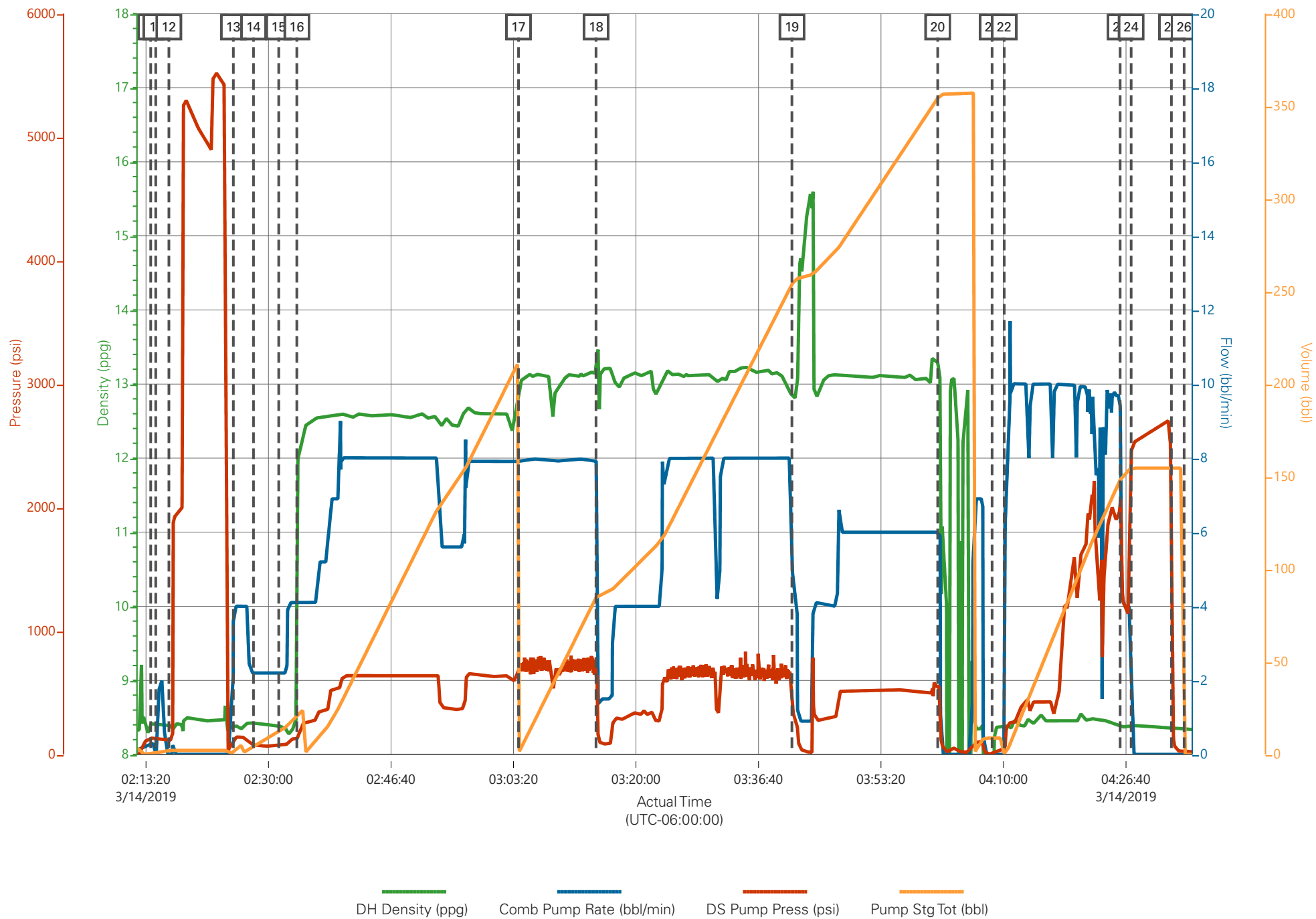
# Terra, TR 44-22-597 4 1/2" Production



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

Description	Actual Time (UTC-06:00:00)	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Pump Stg Tot (bbl)	
10 Start Job	02:13:59	8.42	0.30	135.00	0.30	
11 Fill Lines	02:14:40	8.42	0.00	128.00	0.50	
12 Test Lines	02:16:27	8.40	0.00	117.00	2.20	
13 Pump Spacer	02:25:13	8.38	3.60	110.00	0.70	
14 Pump Spacer	02:27:58	8.42	2.20	75.00	5.10	
15 Check Weight	02:31:23	8.41	2.20	71.00	12.60	
16 Pump Lead Cement	02:33:51	10.63	4.10	113.00	20.50	
17 Pump Tail Cement	03:04:01	12.91	7.90	664.00	0.80	
18 Slow Rate	03:14:34	13.15	7.90	732.00	84.70	
19 Slow Rate	03:41:13	12.83	5.60	440.00	254.00	
20 Shutdown	04:01:03	13.29	6.00	522.00	354.30	
21 Drop Top Plug	04:08:27	0.08	0.00	3.00	8.90	
22 Pump Displacement	04:10:06	8.38	0.70	28.00	0.00	
23 Slow Rate	04:25:52	8.39	9.50	1989.00	148.20	
24 Bump Plug	04:27:22	8.39	0.00	2435.00	154.60	
25 Check Floats	04:32:51	8.36	0.00	1665.00	154.60	
26 End Job	04:34:35	8.34	0.00	22.00	0.00	

# Terra, TR 44-22-597 4 1/2" Production



**Job Information**

Request/Slurry	2540189/1	Rig Name	H&P 271	Date	07/MAR/2019
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	Trail Ridge 44-22-597

**Well Information**

Casing/Liner Size	4.5 in	Depth MD	9470 ft	BHST	112°C / 234°F
Hole Size	8.75 in	Depth TVD	9065 ft	BHCT	73°C / 164°F
Pressure	5646 psi				

**Drilling Fluid Information**

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	Density	
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**Cement Information - Lead Design**

<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>MP</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
							Slurry Density	12.5	lbm/gal
							Slurry Yield	1.94	ft3/sack
							Water Requirement	9.62	gal/sack
							Total Mix Fluid	9.62	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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# **Operation Test Results Request ID 2540189/1**

## **Thickening Time - ON-OFF-ON, Request Test ID:36296053**

**11/MAR/2019**

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)
164	5646	46	5:48	6:05	6:18	7:18	5	56	15	8

Total sks = 560

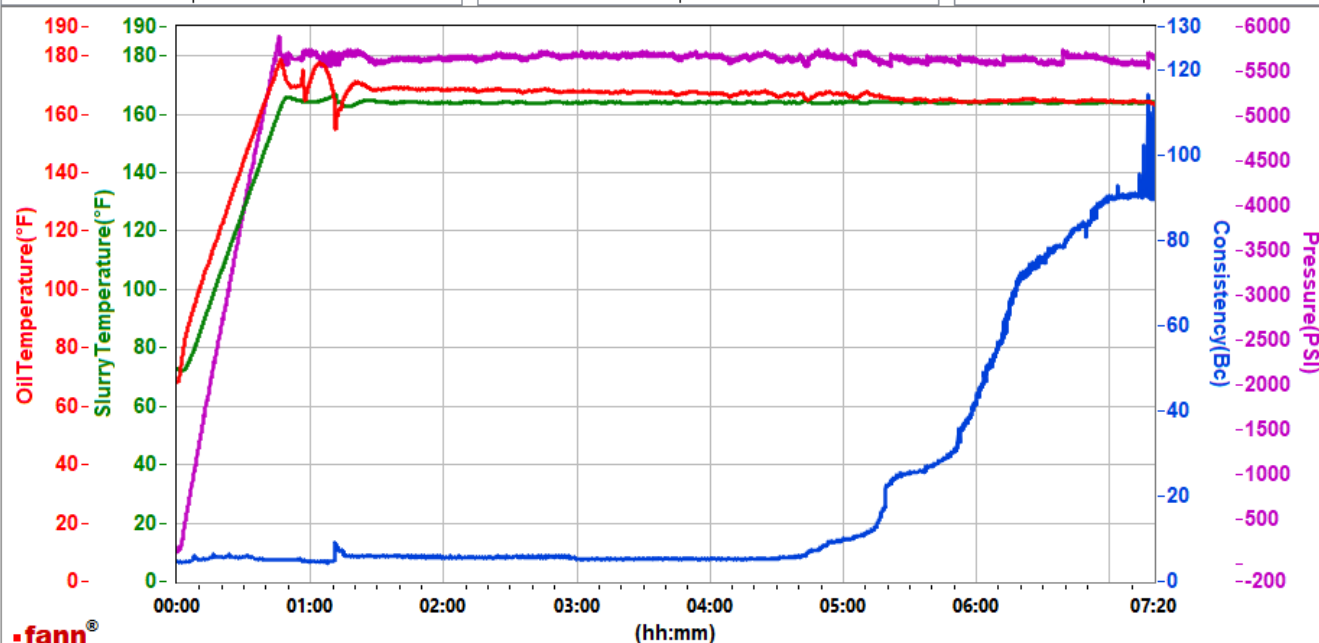
CS0313 TR#8658 420 SKS

CS0314 TR#4549 140 SKS

Deflected 4-->8-->6 after 1 minute.

### **GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2540189-1 Terra Bulk I	Rig	H&P 271	30 Bc	5:48
SW Version	1.0	Casing/Liner Size	4.5 INCH	50 Bc	6:05
Test ID	36296053 - TT	Job Type	PRODUCTION CASING	70 Bc	6:18
Request ID	2540189-1	Cement Weight	GCC TYPE I-II	100 Bc	7:18
Tested by	DS	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	3/10/2019 08:32:35.455		
Well No	TR 44-22-597	Temp. Units	degF		



Data File N:\01 Test Graphs\GJ2540189-1 TERRA BULK PRODUCTION LEAD.tdms

Comments Light Weight

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# HALLIBURTON

## Rockies, Grand Junction

### Lab Results- Tail

#### Job Information

Request/Slurry	2540190/1	Rig Name	H&P 271	Date	07/MAR/2019
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	Trail Ridge 44-22-597

#### Well Information

Casing/Liner Size	4.5 in	Depth MD	9470 ft	BHST	112°C / 234°F
Hole Size	8.75 in	Depth TVD	9065 ft	BHCT	73°C / 164°F
Pressure	5646 psi				

#### Drilling Fluid Information

Mud Supplier Name	Baroid	Mud Trade Name	BARADRIL-N	Density	
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#### Cement Information - Tail Design

<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>MP</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
							Slurry Density	13	lbm/gal
							Slurry Yield	2.07	ft3/sack
							Water Requirement	9.42	gal/sack
							Total Mix Fluid	9.42	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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## Operation Test Results Request ID 2540190/1

### Thickening Time - ON-OFF-ON, Request Test ID:36296055

11/MAR/2019

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)
164	5646	46	2:30	2:38	2:49	2:52	9	56	15	9

Total sks =800

CS0315 TR#8677 350 SKS

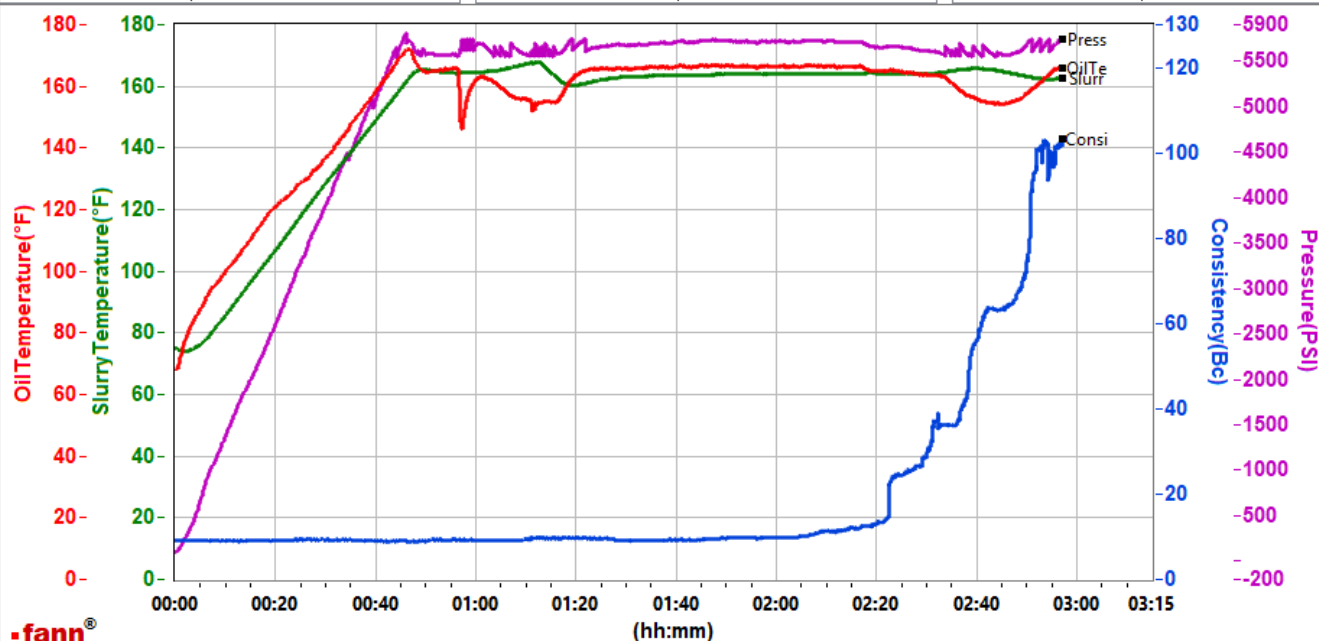
CS0316 TR#8678 350 SKS

CS0317 TR#4549 front 100 SKS

No deflection. Please note heat of hydration started around 2:33 on graph.

### GRAND JUNCTION

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2540190-1 Terra Bulk I	Rig	H&P 271	30 Bc	2:30
SW Version	1.0	Casing/Liner Size	4.5 INCH	50 Bc	2:38
Test ID	36296055- TT	Job Type	PRODUCTION CASING	70 Bc	2:49
Request ID	2540190-1	Cement Weight	GCC TYPE I-II	100 Bc	2:52
Tested by	DS	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	3/10/2019 12:25:59.514		
Well No	TR 44-22-597	Temp. Units	degF		



Data File N:\01 Test Graphs\GJ2540190-1 TERRA BULK PRODUCTION TAIL.tdms

Comments Light Weight

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