

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

United States of America, COLORADO

Date: Friday, February 22, 2019

### **Federal GM 13-8 Production**

Terra Federal GM 13-8 Production

API# 05-045-24018-00

Job Date: Monday, January 14, 2019

Sincerely,

**Grand Junction Cement Engineering**

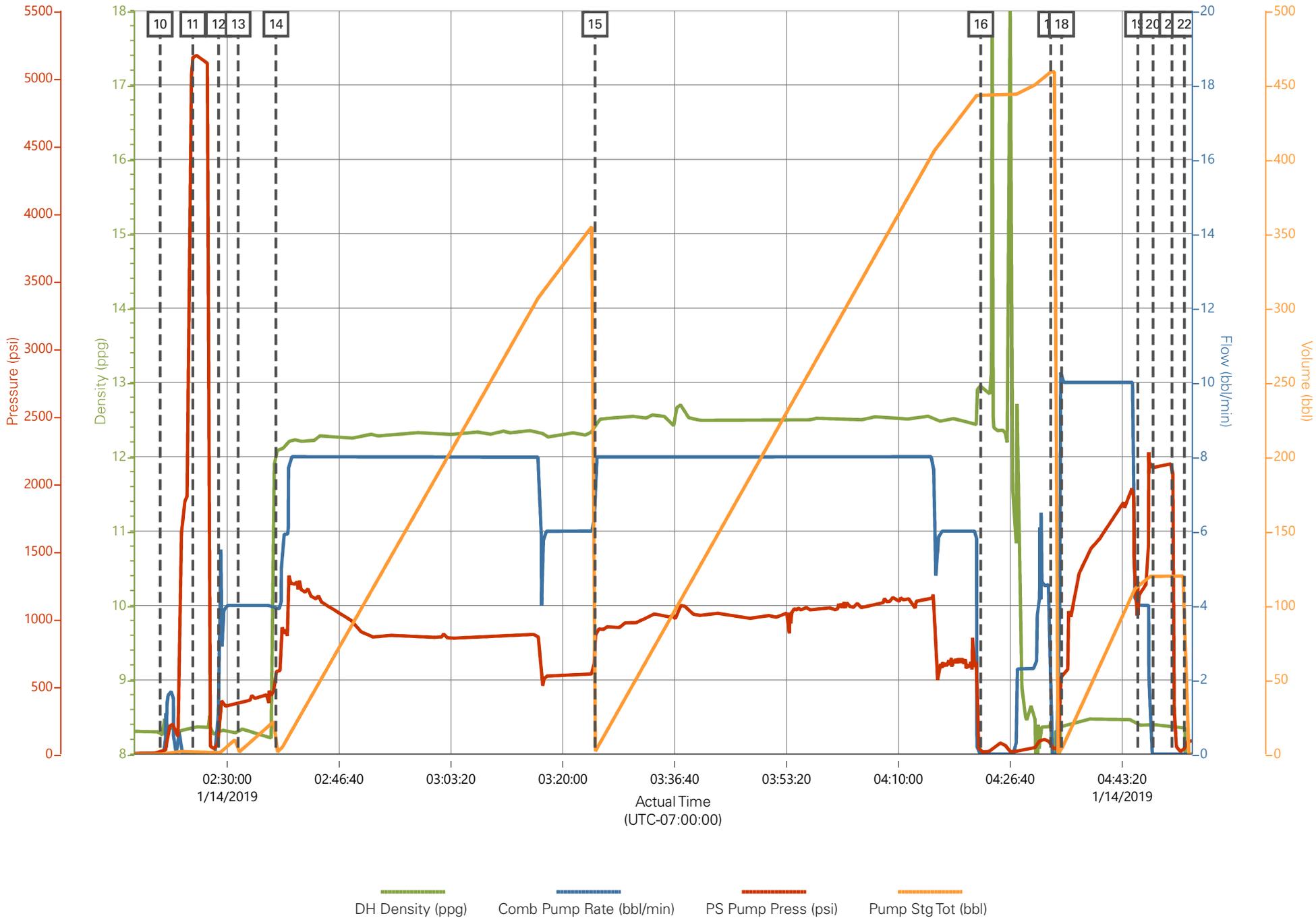
## 1.0 Real-Time Job Summary

### 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>	PS Pump Press <i>(psi)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	1/13/2019	17:30:00	USER					
Event	2	Pre-Convoy Safety Meeting	1/13/2019	19:50:00	USER					
Event	3	Crew Leave Yard	1/13/2019	20:00:00	USER					
Event	4	Arrive At Loc	1/13/2019	21:00:00	USER					REQUESTED ON LOC TIME WAS 2230, CREW ARRIVED AT 2100, RIG RUNNING CASING
Event	5	Assessment Of Location Safety Meeting	1/13/2019	21:10:00	USER					
Event	6	Spot Equipment	1/13/2019	21:15:00	USER					
Event	7	Pre-Rig Up Safety Meeting	1/13/2019	21:25:00	USER					
Event	8	Rig-Up Equipment	1/13/2019	21:30:00	USER					
Event	9	Pre-Job Safety Meeting	1/14/2019	00:00:00	USER					PRESSURIZED MUD SCALES VERIFIED ON DRINKING WATER PRIOR TO JOB START
Event	10	Start Job	1/14/2019	02:20:00	COM5					TD: 7200 TP: 7190 SJ: 31.7 MW: 9.9PPG 4 1/2" 11.6#/FT CSG 13 3/8" 54.5#/FT SURFACE CASING @ 1038' 12 1/4" OH FROM 1038'-5230' 8 3/4" OH FROM 5230 TO TD. WATER TEST: PH: 7 POTASSIUM: 450 CHLORIDES: 0 SULFATES: <200 TEMP: 64 DEGREES
Event	11	Test Lines	1/14/2019	02:24:52	COM5			5154.00		5000 PSI TEST SUCCESSFUL
Event	12	Pump Spacer 1	1/14/2019	02:28:42	COM5	8.33	4.00	215.00	10.0	FRESH H2O SPACER

Event	13	Pump Spacer 2	1/14/2019	02:31:37	COM5	8.40	4.00	384.00	20.0	MUDFLUSH SPACER
Event	14	Pump Lead Cement	1/14/2019	02:37:15	COM5	12.30	8.00	869.00	311.9	850 SKS @ 12.3 PPG 2.06 YLD 10.14 GAL/SK H2O
Event	15	Pump Tail Cement	1/14/2019	03:24:47	COM5	12.50	8.00	860.00	384.0	1100 SKS @ 12.5 PPG 1.96 YLD 9.4 GAL/SK H2O
Event	16	Shutdown	1/14/2019	04:22:15	COM5					SHUTDOWN, BLOW DOWN/ CLEAN LINES TO WASHUP TRUCK
Event	17	Drop Top Plug	1/14/2019	04:32:41	COM5					PLUG AWAY
Event	18	Pump Displacement	1/14/2019	04:34:18	COM5	8.48	10.00	1975.00	111.50	FRESH H2O DISPLACEMENT W/ 1 GAL, MMCR, 3# BE-6, KCL
Event	19	Slow Rate	1/14/2019	04:45:39	COM5	8.48	4.00	1274.00	101.00	PRESSURE PRIOR TO SLOW WAS 1975PSI, PRESSURE @ 4BPM 1250PSI
Event	20	Bump Plug	1/14/2019	04:47:56	COM5	8.40	4.00	2122.00	111.50	PLUG BUMPED AT CALCULATED DISPLACEMENT. FINAL CIRCULATING PRESSURE WAS 1250 PSI.
Event	21	Check Floats	1/14/2019	04:50:44	COM5					FLOATS HELD, GAINED APPROX 1 BBL BACK TO PUMP
Event	22	End Job	1/14/2019	04:52:37	COM5					
Event	23	Post-Job Safety Meeting (Pre Rig-Down)	1/14/2019	05:10:00	USER					GOOD CIRCULATION THROUGHOUT JOB. PIPE WAS RECIPROCATED DURING JOB. 40# SUGAR USED. NO ADD HOURS CHARGED.
Event	24	Rig-Down Equipment	1/14/2019	05:15:00	USER					
Event	25	Depart Location Safety Meeting	1/14/2019	06:10:00	USER					
Event	26	Crew Leave Location	1/14/2019	06:15:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENTING ANTHONY ANDREWS AND CREW

# TERRA ENERGY - FEDERAL GM 13-8 - 4 1/2" PRODUCTION



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

### Job Information

<b>Request/Slurry</b>	2525900/2	<b>Rig Name</b>	H&P 271	<b>Date</b>	04/JAN/2019
<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>	GM 13-8

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	7201 ft	<b>BHST</b>	88°C / 191°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	6552 ft	<b>BHCT</b>	53°C / 127°F
<b>Pressure</b>	3886 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	Baroid	<b>Mud Trade Name</b>	BARADRIL-N	<b>Density</b>	9.9 lbm/gal
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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	12.3	lbm/gal
							Slurry Yield	2.06	ft <sup>3</sup> /sack
							Water Requirement	10.17	gal/sack
							Total Mix Fluid	10.17	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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**Operation Test Results Request ID 2525900/2**

**Thickening Time - ON-OFF-ON, Request Test ID:36130181**

**10/JAN/2019**

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)
127	3886	35	3:43	5:01	5:23	5:39	7	45	15	6

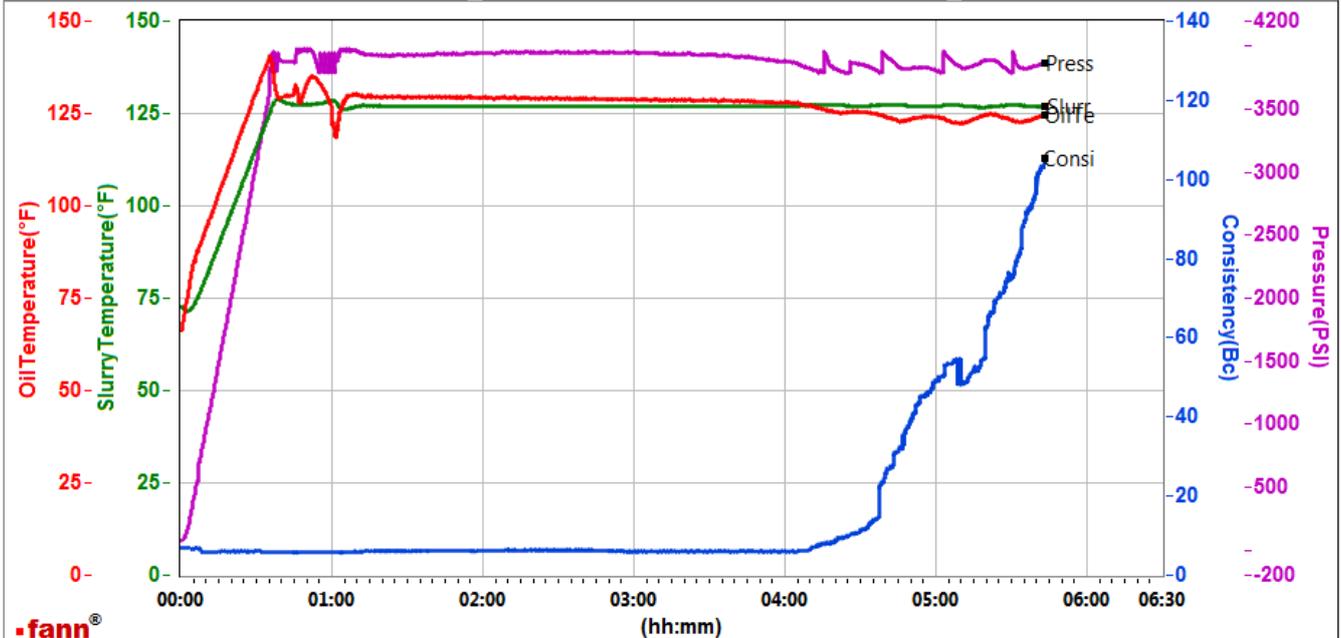
CS0047 TR#8658 55SKS add on

CS0048 TR#1513 425 SKS

No deflection. Please note heat of hydration started around 4:08.

**GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2525900-2 Terra Prodi	Rig	H&P 271	30 Bc	3:43
SW Version	1.0	Casing/Liner Size	4.5INCH	50 Bc	5:01
Test ID	36130181-TT	Job Type	PRODUCTION CASING	70 Bc	5:23
Request ID	2525900-2	Cement Weight	GCC TYPE I-II	100 Bc	5:39
Tested by	DEBA	Comments	Light Weight		
Customer	TERRA ENERGY	Date Time	1/9/2019 13:03:45.234		
Well No	GM 13-8	Temp. Units	degF		



Data File N:\01 Test Graphs\GJ2525900-2 TERRA PRODUCTION BULK LEAD.tdms  
 Comments Light Weight

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**Operation Test Results Request ID 2525900/1**

**Thickening Time - ON-OFF-ON, Request Test ID:36115486**

**08/JAN/2019**

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)
127	3886	35	3:43	3:53	4:36	4:50	6	45	15	6

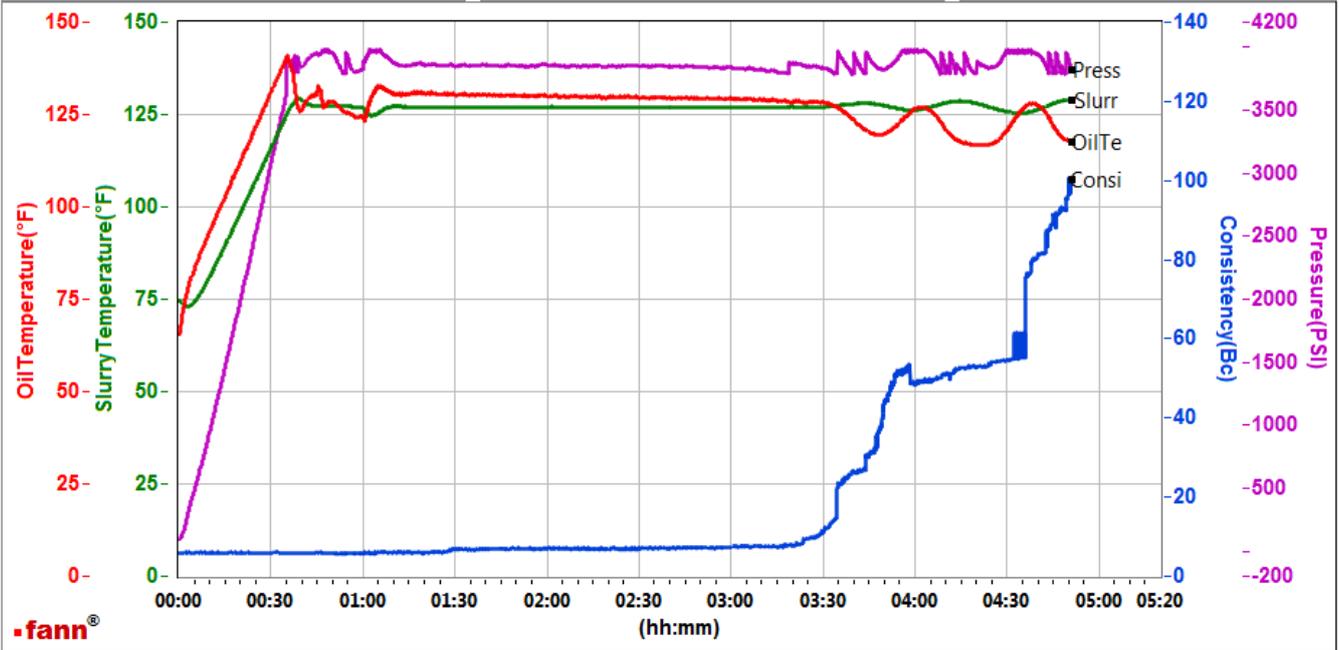
Total SKS = 370

CS0039 TR 8658 370 SKS

No deflection. Please note heat of hydration started around 3:30 and 95% of slurry was set hard and balled up around paddle.

**GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2525900-1 Terra Prodi	Rig	H&P 271	30 Bc	3:43
SW Version	1.0	Casing/Liner Size	4.5INCH	50 Bc	3:53
Test ID	36115486-TT	Job Type	PRODUCTION CASING	70 Bc	4:36
Request ID	2525900-1	Cement Weight	GCC TYPE I-II	100 Bc	4:50
Tested by	JASON	Comments	Light Weight		
Customer	TERRA ENERGY	Date Time	1/8/2019 05:33:28.485		
Well No	GM 13-8	Temp. Units	degF		



Data File	N:\01 Test Graphs\GJ2525900-1 TERRA PRODUCTION BULK LEAD.tdms
Comments	Light Weight

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### Job Information

<b>Request/Slurry</b>	2525901/2	<b>Rig Name</b>	H&P 271	<b>Date</b>	04/JAN/2019
<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>	GM 13-8

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	7201 ft	<b>BHST</b>	88°C / 191°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	6552 ft	<b>BHCT</b>	53°C / 127°F
<b>Pressure</b>	3886 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	Baroid	<b>Mud Trade Name</b>	BARADRIL-N	<b>Density</b>	9.9 lbm/gal
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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	12.5	lbm/gal
							Slurry Yield	1.96	ft <sup>3</sup> /sack
							Water Requirement	9.43	gal/sack
							Total Mix Fluid	9.43	gal/sack
							Water Source	Fresh Water	
							Water Chloride		

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**Operation Test Results Request ID 2525901/2**

**Thickening Time - ON-OFF-ON, Request Test ID:36130283**

**10/JAN/2019**

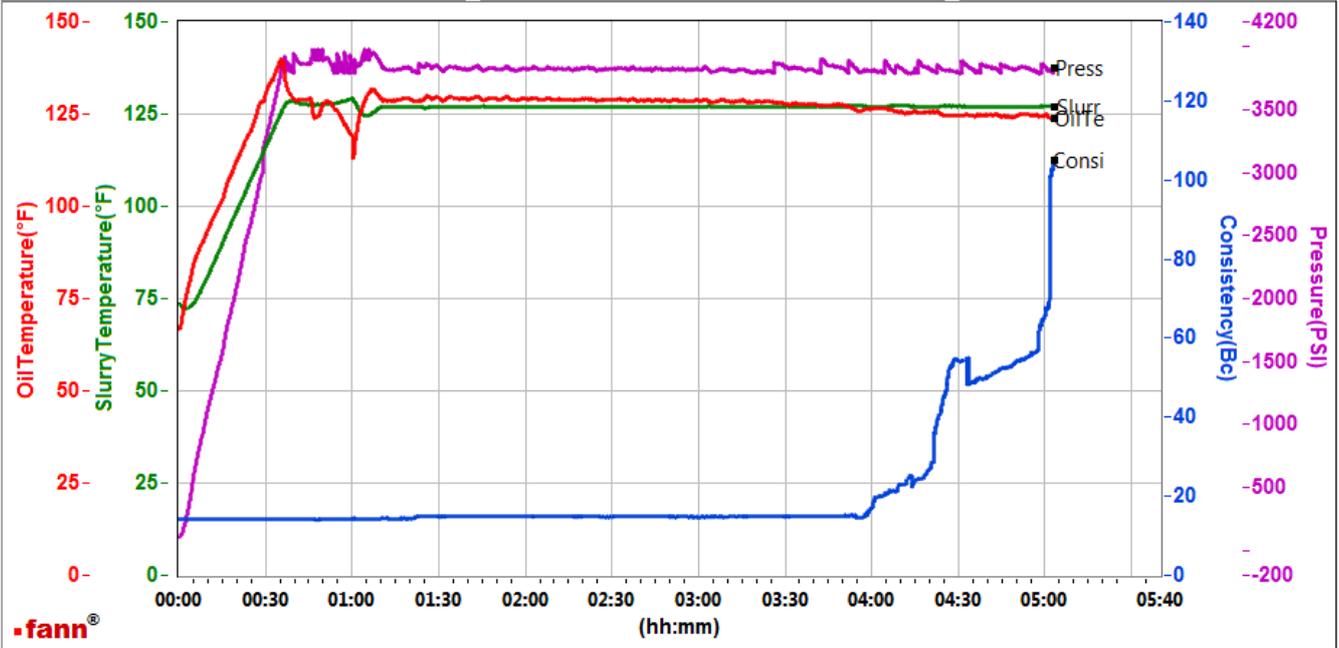
Test Temp (degF)	Pressure (psi)	Reached in (min)	30 Bc (hh:mm)	50 Bc (hh:mm)	70 Bc (hh:mm)	100 Bc (hh:mm)	Start Bc	Stirring before stop (mins)	Static Period (min)	Peak reading (BC)
127	3886	35	4:21	4:26	5:01	5:02	14	45	15	15

CS0046 TR#8677 55 SKS add on  
 CS0049 TR#8476 425 SKS  
 CS0050 TR#7094 140 SKS

No deflection. Please note heat of hydration started around 3:52.

**GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	GJ2525901-2 Terra Prodi	Rig	H&P 271	30 Bc	4:21
SW Version	1.0	Casing/Liner Size	4.5 INCH	50 Bc	4:26
Test ID	36130288-TT	Job Type	PRODUCTION CASING	70 Bc	5:01
Request ID	2525901-2	Cement Weight	GCC TYPE I-II	100 Bc	5:02
Tested by	DEBA	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	1/9/2019 14:24:42.124		
Well No	GM 13-8	Temp. Units	degF		



Data File N:\01 Test Graphs\GJ2525901-2 TERRA PRODUCTION BULK TAIL.tdms  
 Comments Light Weight

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**Operation Test Results Request ID 2525901/1**

**Thickening Time - ON-OFF-ON, Request Test ID:36115488**

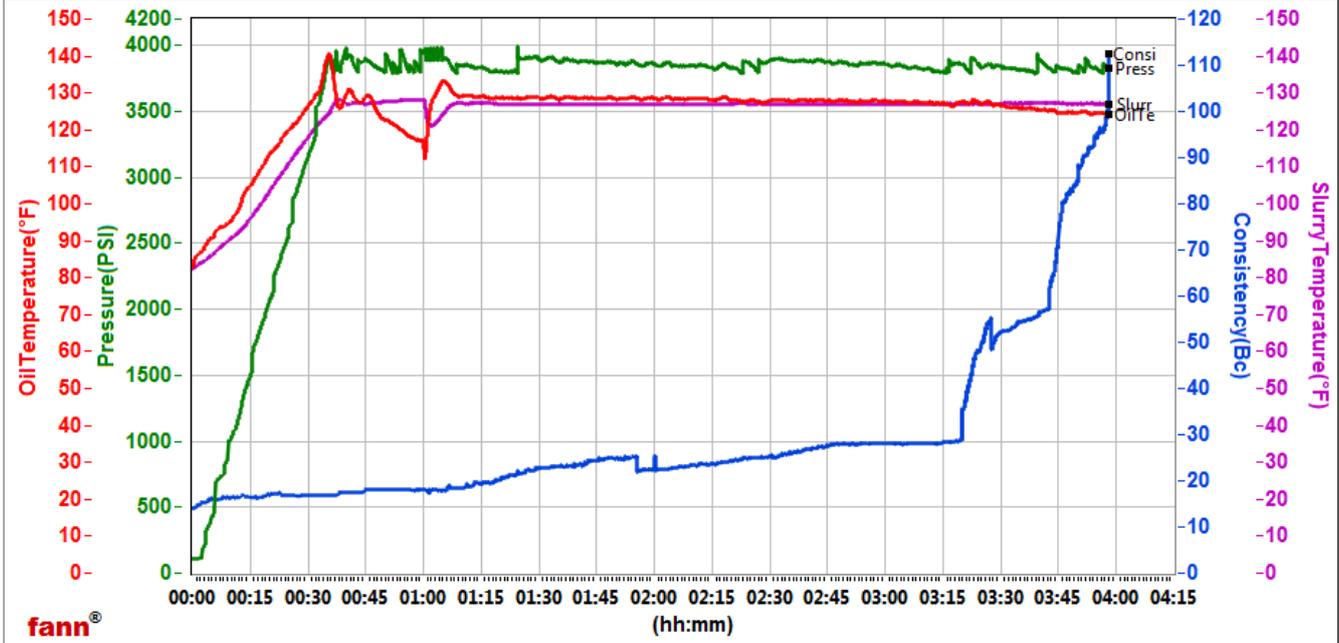
**08/JAN/2019**

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)
127	3886	35	3:19	3:25	3:44	3:57	14	45	15	18

Total SKS = 480  
 CS0040 TR 8677 370 SKS  
 CS0041 TR 7094 (Front) 110 SKS  
 No deflection, 18Bc--- > 18Bc  
 please note heat of hydration at 3:30

**GRAND JUNCTION**

Fields	Values	Fields	Values	Events	Results
Project Name	TempTest	Rig	H&P 271		
SW Version	1.0	Casing/Liner Size	4.5 INCH		
Test ID	36115488-TT	Job Type	PRODUCTION CASING		
Request ID	2525901-1	Cement Weight	GCC TYPE II		
Tested by	JASON	Comments	Light Weight		
Customer	TERRA ENERGY PARTN	Date Time	1/8/2019 09:17:39.895		
Well No	GM 13-8	Temp. Units	degF		



Data File C:\Users\hx25273\Desktop\HPHT Graphs\GJ2525901-1 TERRA PRODUCTION BULK TAIL.tdms  
 Comments Light Weight

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