

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

### **For: Terra**

Date: Monday, October 01, 2018

H&P 271

### **PA 533-24 Production PJR**

API # 05-045-23791

Sincerely,

**Grand Junction Cement Engineering**

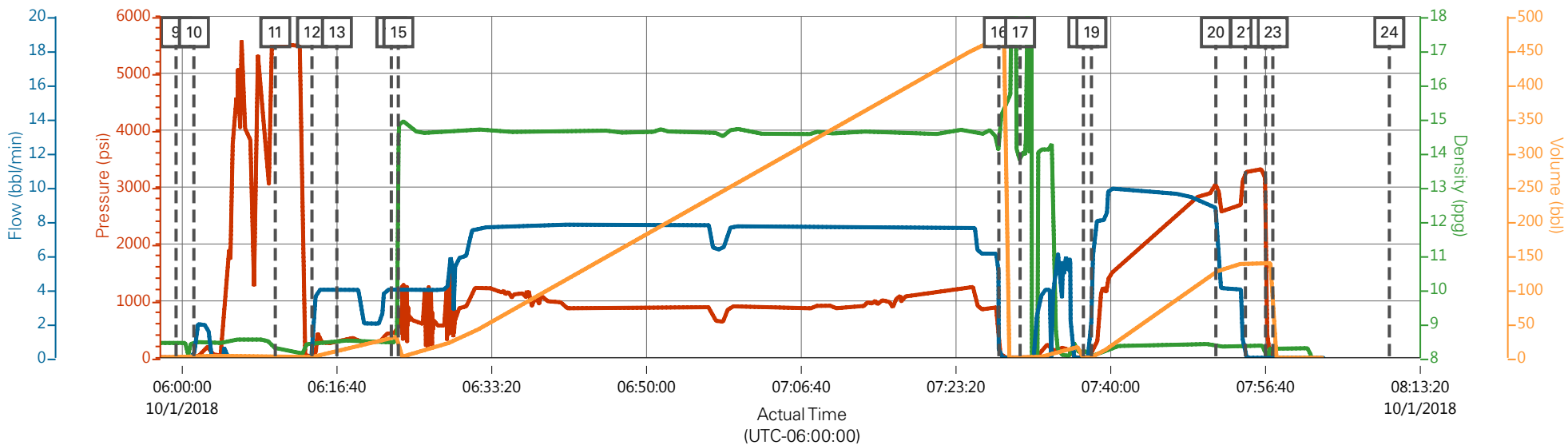
## 1.0 Real-Time Job Summary

## 1.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	9/30/2018	21:00:00	USER					REQUESTED ON LOCATION @ 03:00
Event	2	Depart Yard Safety Meeting	9/30/2018	23:45:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	10/1/2018	00:00:00	USER					1 HT 400 PUMP TRUCK E1, 1 660 BULK TRUCK, 1 SERVICE PICKUP
Event	4	Arrive At Loc	10/1/2018	01:30:00	USER					ARRIVED TO LOCATION 1.5 HRS EARLY. RIG RUNNING CASING.
Event	5	Assessment Of Location Safety Meeting	10/1/2018	01:45:00	USER					MET WITH COMP REP, WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE. COMP REP WAS OFFERED SDS FOR ALL CHEMICALS USED BY HES.
Event	6	Spot Equipment	10/1/2018	02:00:00	USER					1 HT 400 PUMP TRUCK E1, 1 660 BULK TRUCK, 1 SERVICE PICKUP
Event	7	Pre-Rig Up Safety Meeting	10/1/2018	02:20:00	USER					ALL HES PRESENT
Event	8	Pre-Job Safety Meeting	10/1/2018	05:20:00	USER					ALL HES EMPLOYEES AND RIG CREW PRESENT, RIG CIRCULATED @ 10 BPM PRIOR TO JOB PRESSURE @ 1240 PSI THROUGH A CRT.
Event	9	Start Job	10/1/2018	05:59:20	USER					PRESSURIZED MUD SCALES WERE CALIBRATED TO DRINKING WATER PRIOR TO JOB. TD 8,991', TP 8,984.23', SJ 31.1', SURFACE CSG 9 5/8" 36# J-55 SET @ 1124', PRODUCTION CSG 4 1/2" 11.6#, OH 8 3/4", MUD 11.2 PPG
Event	10	Prime Lines	10/1/2018	06:01:15	USER	8.33	2.0	410	3	FRESH WATER
Event	11	Test Lines	10/1/2018	06:10:01	USER			5500		PRESSURE HELD

Event	12	Pump H2O Spacer	10/1/2018	06:13:58	COM5	8.33	4.0	300	10	FRESH WATER
Event	13	Pump Mud Flush III	10/1/2018	06:16:39	USER	8.4	4.0	440	20	20 BBL MUDFLUSH III. USED 80 LBS MUD FLUSH III
Event	14	Check Weight	10/1/2018	06:22:31	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	15	Pump Cement	10/1/2018	06:23:16	COM5	14.5	7.8	1000	447	1900 SACKS EXPANDACEM CMT, 14.5 PPG, 1.32 FT3/SK, 5.85 GAL/SK
Event	16	Shutdown	10/1/2018	07:27:57	USER					END OF CEMENT
Event	17	Clean Pump And Lines	10/1/2018	07:30:14	USER					BLEW LINE WITH AIR FROM FLOOR TO PIT. CLEANED LINES FROM PUMP TO PIT.
Event	18	Drop Top Plug	10/1/2018	07:37:03	USER					VERIFIED BY FLAG INDICATOR
Event	19	Pump Displacement	10/1/2018	07:37:55	COM5	8.4	9.0	2900	128.8	1 GAL MMCR IN FIRST 10 BBLS, 3 LBS BE-6 IN FIRST 30 BBLS, 1 50 LB. BAG KCL EVERY 10 BBLS.
Event	20	Slow Rate	10/1/2018	07:51:19	USER	8.4	4.0	2680	10	SLOWED RATE TO BUMP PLUG
Event	21	Bump Plug	10/1/2018	07:54:30	COM5	8.4	4.0	2680	138.8	PLUG BUMPED
Event	22	Check Floats	10/1/2018	07:56:40	USER			3300		FLOATS HELD 1.5 BBL FLOWED BACK TO TRUCK
Event	23	End Job	10/1/2018	07:57:27	USER					PIPE WAS RECIPICATED THROUGHOUT JOB WITH GOOD RETURNS. USED TOP PLUG, 1 GAL MMCR, 3 BE-6, AND 80 LBS MUD FLUSH III FOR JOB
Event	24	Post-Job Safety Meeting (Pre Rig-Down)	10/1/2018	08:10:00	USER					ALL HES PRESENT
Event	25	Pre-Convoy Safety Meeting	10/1/2018	10:45:00	USER					ALL HES PRESENT
Event	26	Depart Location	10/1/2018	11:00:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, DUSTIN HYDE AND CREW

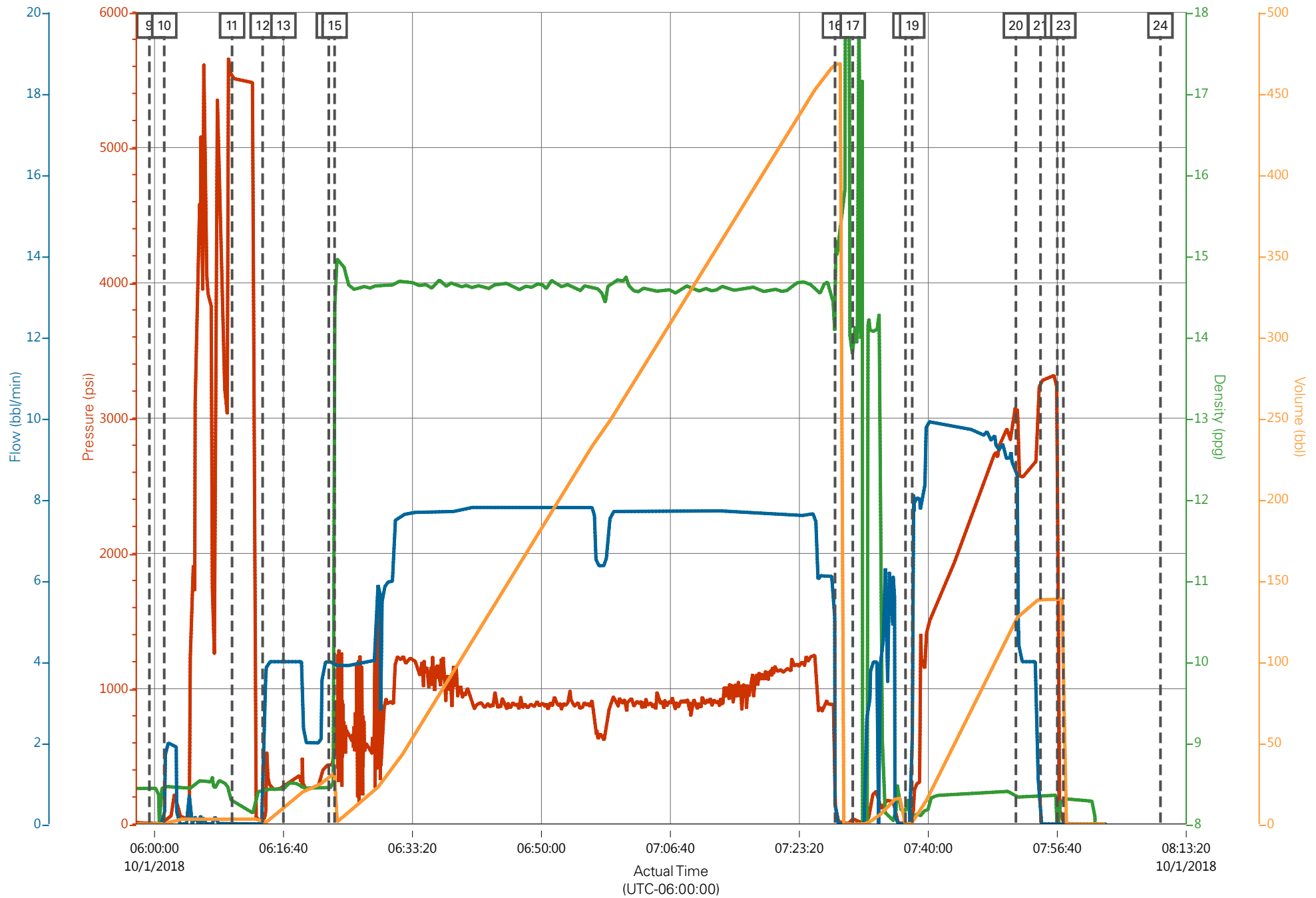
# TEP PA 533-24 Production



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

Description	Actual Time (UTC-06:00:00)	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	
9 Start Job	05:59:20	5.00	8.44	0.00	0.00	
10 Prime Lines	06:01:15	16.00	8.47	0.00	0.00	
11 Test Lines	06:10:01	5521.00	8.29	0.00	3.00	
12 Pump H2O Spacer	06:13:58	18.00	8.40	0.00	0.00	
13 Pump Mud Flush III	06:16:39	276.00	8.43	4.00	9.90	
14 Check Weight	06:22:31	435.00	8.45	4.00	28.50	
15 Pump Cement	06:23:16	503.00	13.81	3.90	31.50	
16 Shutdown	07:27:57	191.00	14.17	0.00	468.20	
17 Clean Pump And Lines	07:30:14	43.00	13.78	0.00	0.00	
18 Drop Top Plug	07:37:03	0.00	8.16	0.00	0.00	
19 Pump Displacement	07:37:55	65.00	8.06	2.10	0.40	
20 Slow Rate	07:51:19	3033.00	8.34	8.80	125.70	
21 Bump Plug	07:54:30	3273.00	8.36	0.00	138.50	
22 Check Flaots	07:56:40	2716.00	8.14	0.00	138.50	
23 End Job	07:57:27	2.00	8.30	0.00	0.00	
24 Post-Job Safety Meeting (Pre Rig-Down)	08:10:00	n/a	n/a	n/a	n/a	

# TEP PA 533-24 Production



Job Information

Request/Slurry	2502700/3	Rig Name	H&P 271	Date	21/SEP/2018
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	PA 533-24

Well Information

Casing/Liner Size	4.5 in	Depth MD	9015 ft	BHST	109°C / 228°F
Hole Size	8.75 in	Depth TVD	8701 ft	BHCT	70°C / 158°F
Pressure	5391 psi				

Drilling Fluid Information

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

Cement Information - Primary Design

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
						Slurry Density	14.5	lbm/gal
						Slurry Yield	1.32	ft3/sack
						Water Requirement	5.849	gal/sack
						Total Mix Fluid	5.849	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 2502700/3**

## **Thickening Time - ON-OFF-ON**

**27/SEP/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)
158	5391	44	4:20	4:32	4:34	4:41	21	54	15	25

total sks=1900

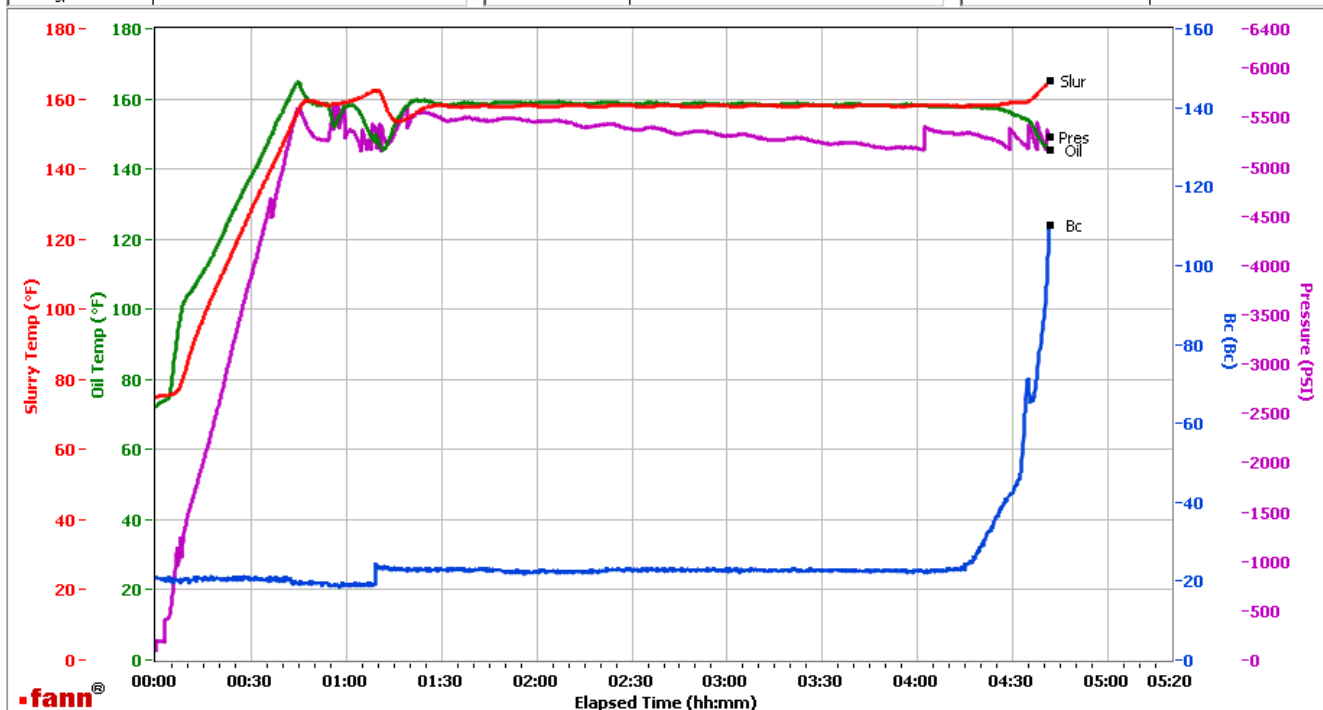
CS2157 TR 7304 100 SKS

## **Grand Junction Colorado**

Fields	Values
Project Name	GJ2502700-3 TERRA PRODUCTION BULK PR
Test ID	35855895
Request ID	2502700-3
Tested by	JASON
Customer	TERRA
Well No	PA 533-24
Rig	H&P 271
Casing/Liner Size	4.5 INCH

Fields	Values
Job Type	PRODUCTION
Cement Type	MOUNTAIN G
Cement Weight	Standard
Test Date	11/04/11
Test Time	08:32 AM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.1219

Events	Results
30.00 Bc	04h:20m
40.00 Bc	04h:27m
50.00 Bc	04h:32m
70.00 Bc	04h:34m
100.00 Bc	04h:41m
00h:30m	20.41
01h:00m	18.97
01h:30m	22.52



Data File C:\Documents and Settings\HPHT\Desktop\Test Data\GJ2502700-3 TERRA BULK PRODUCTION PRIMARY.tdms

Comments CS2157 TR 7304 100 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.

## Operation Test Results Request ID 2502700/2

### Thickening Time - ON-OFF-ON

27/SEP/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)
158	5391	44	3:54	4:12	4:18	4:24	17	54	15	25

total sks=1900

CS2150, Trailer 1513, 450 sks

CS2151, Trailer 8476, 450 sks

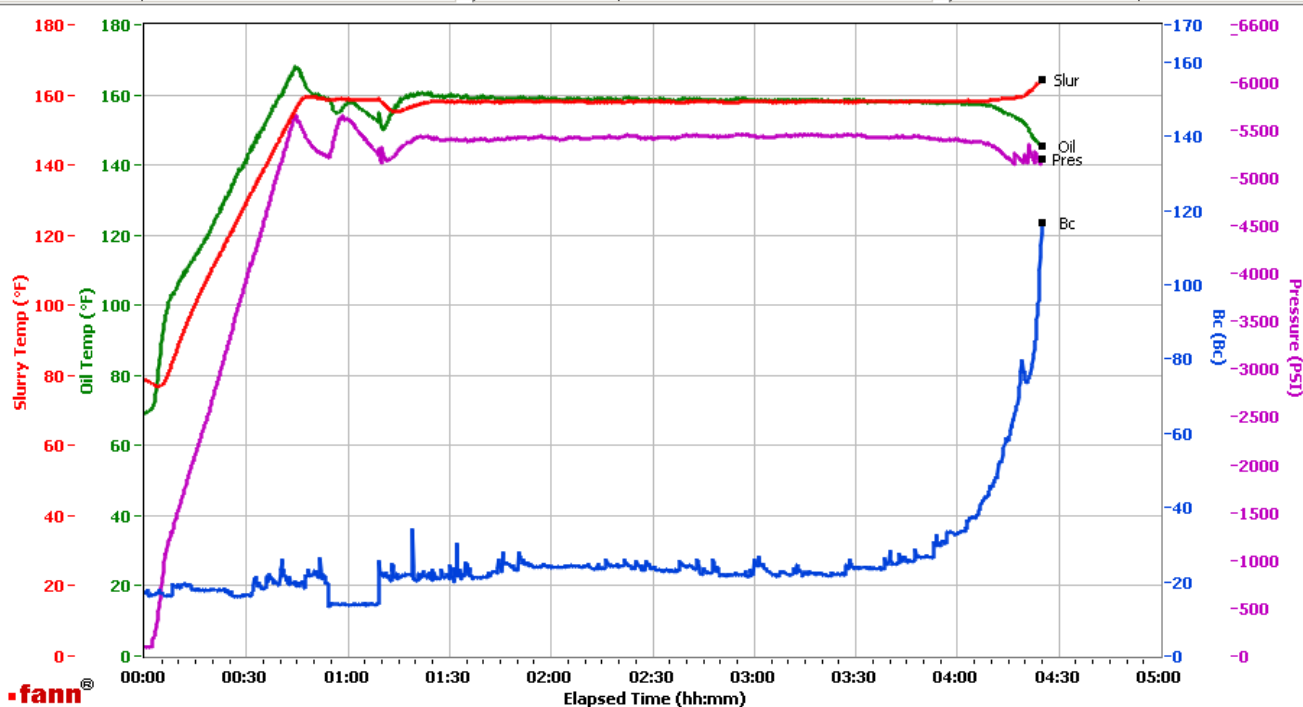
Deflected 22--> 25. Please note heat of hydration started around 4:00.

### Grand Junction, Colorado

Fields	Values
Project Name	GJ2502700-2 TERRA BULK PRODUCTION PR
Test ID	35839890 - TT
Request ID	2502700-2
Tested by	CT
Customer	TERRA ENERGY PARTNERS
Well No	PA 533-24
Rig	H&P 271
Casing/Liner Size	4.5 INCH

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	MOUNTAIN G
Cement Weight	Standard
Test Date	09/26/18
Test Time	10:27 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	03h:54m
40.00 Bc	04h:06m
50.00 Bc	04h:12m
70.00 Bc	04h:18m
100.00 Bc	04h:24m
00h:30m	16.45
01h:00m	13.79
01h:30m	24.36



Data File C:\Documents and Settings\M290\Desktop\Test Data\GJ2502700-2 TERRA BULK PRODUCTION PRIMARY.tdms

Comments CS2150, TRAILER 1513, 450 SKS - CS2151, 8476, 450 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.



# Operation Test Results Request ID 2502700/1

## Thickening Time - ON-OFF-ON

26/SEP/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)
158	5391	44	4:18	4:26	4:29	4:31	6	54	15	21

total sks=1900

CS2148, Trailer 8678, 450 sks

CS2149, Trailer 2878, 450 sks

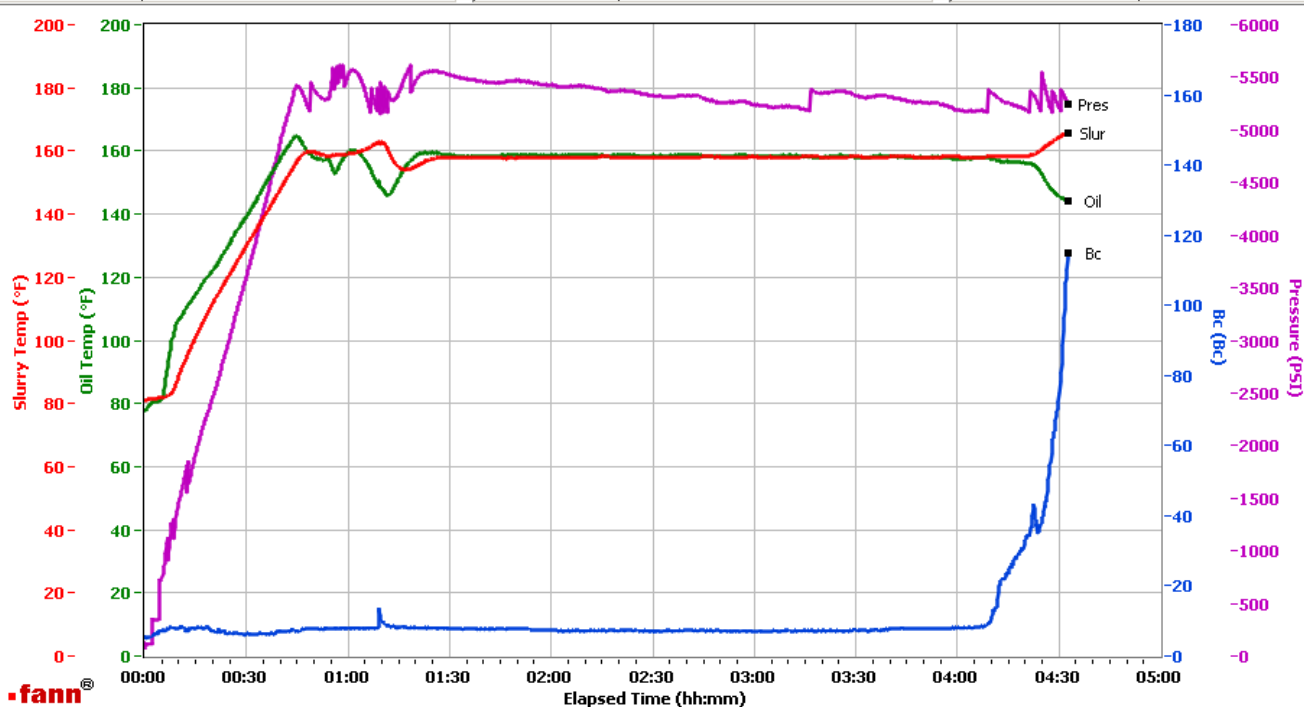
Deflection: 8 - 21 to 11 after one minute

## Grand Junction Colorado

Fields	Values
Project Name	GJ2502700-1 TERRA BULK PRODUCTION PR
Test ID	35839890 - TT
Request ID	2502700-1
Tested by	CT
Customer	TERRA ENERGY PARTNERS
Well No	PA 533-24
Rig	H&P 271
Casing/Liner Size	4.5 INCH

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	MOUNTAIN G
Cement Weight	Standard
Test Date	11/03/11
Test Time	03:01 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.1219

Events	Results
30.00 Bc	04h:18m
40.00 Bc	04h:22m
50.00 Bc	04h:26m
70.00 Bc	04h:29m
100.00 Bc	04h:31m
00h:30m	6.10
01h:00m	7.99
01h:30m	7.89



Data File C:\Documents and Settings\HPHT\Local Settings\Temporary Internet Files\Content.IE5\8HEN8T6Z\GJ2502700-1 TERRA BULK PRODUCTION PRIMARY[1].tdms

Comments CS2148, TRAILER 8678, 450 SKS - CS2149, TRAILER 2878, 450 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.