

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS-EBUS**

United States of America, COLORADO

### **For: Terra**

Date: Saturday, March 02, 2019

### **TR 544-22-597 Production PJR**

API# 05-045-23691-00

Sincerely,

**Grand Junction Cement Engineering**

## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

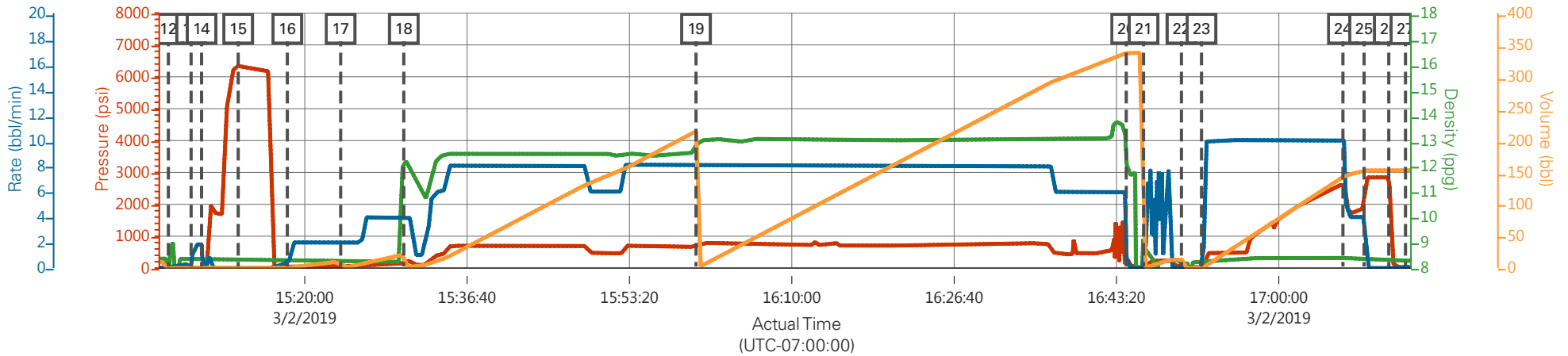
Type	Seq. No.	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	3/2/2019	07:00:00	USER					CREW CALLED OUT TO H&P 271 TEP PRODUCTION JOB. REQUESTED ON LOCATION AT 13:00.
Event	2	Pre-Convoy Safety Meeting	3/2/2019	08:45:00	USER					WITH ALL HES PERSONNEL
Event	3	Crew Leave Yard	3/2/2019	09:00:00	USER					
Event	4	Arrive at Location	3/2/2019	13:00:00	USER					RIG WAS RUNNING CASING UPON HES ARRIVAL
Event	5	Assessment of Location Safety Meeting	3/2/2019	13:05:00	USER					WITH ALL HES PERSONNEL
Event	6	Spot Equipment	3/2/2019	13:10:00	USER					SPOT EQUIPMENT
Event	7	Pre-Rig Up Safety Meeting	3/2/2019	13:20:00	USER					WITH ALL HES PERSONNEL
Event	8	Rig-Up Equipment	3/2/2019	13:30:00	USER					1-RCM ELITE PUMP TRUCK, 2- 1,700 FT3 SILOS, 1-660 FT3 BULK TRUCK, 1-PICKUP TRUCK
Event	9	Rig-Up Completed	3/2/2019	14:20:00	USER					RIG UP COMPLETED. WAIT FOR RIG TO FINISH RUNNING CASING.
Event	10	Pre-Job Safety Meeting	3/2/2019	14:30:00	USER					WITH ALL PERSONNEL ON LOCATION
Event	11	Check Weight	3/2/2019	15:00:00	USER					PRESSURIZED MUD SCALES CALIBRATED USING FRESH WATER PRIOR TO JOB. ALL FLUID DENSITIES VERIFIED USING PRESSURIZED MUD SCALES THROUGHOUT JOB.
Event	12	Start Job	3/2/2019	15:06:00	USER					RIG PUMPED 1,500 SCF AIR DOWN PARASITE STRING UNTIL 70 BBL DISPLACEMENT AWAY WHEN AIR WAS SHUT OFF.
Event	13	Pump Water	3/2/2019	15:08:20	USER	35	8.33	2	2	PUMP 2 BBL H2O AHEAD TO PRIME LINES. PUMPED AT 2 BPM WITH 35 PSI
Event	14	Shutdown	3/2/2019	15:09:24	USER					SHUTDOWN TO LINE OUT VALVES ON MANIFOLD FOR

## PRESSURE TEST

Event	15	Pressure Test	3/2/2019	15:13:10	USER	6350				SET KICKOUTS TO 500 PSI FOR LOW TEST TO ENSURE KICKOUTS ARE FUNCTIONING PROPERLY. BROUGHT PRESSURE UP TO 6,350 PSI FOR HIGH TEST.
Event	16	Pump H2O Spacer	3/2/2019	15:18:13	USER	75	8.33	2	10	PUMP 10 BBL H2O SPACER. PUMPED AT 2 BPM WITH 75 PSI
Event	17	Pump Mud Flush III Spacer	3/2/2019	15:23:41	USER	190	8.33	4	20	PUMP 20 BBL MUD FLUSH III SPACER. PUMPED AT 4 BPM WITH 190 PSI. USED 80 LBS MUD FLUSH III FOR SPACER.
Event	18	Pump Lead Cement	3/2/2019	15:30:10	USER	800	12.5	8	195.2	PUMP 195.2 BBL NEOCEM GJ2 LEAD CEMENT. 565 SKS AT 12.5 PPG, 1.94 FT3/SK, 9.6 GAL/SK. PUMPED AT 8 BPM WITH 800 PSI
Event	19	Pump Tail Cement	3/2/2019	16:00:10	USER	800	13	8	293.1	PUMP 293.1 BBL NEOCOM HT TAIL CEMENT. 795 SKS AT 13 PPG, 2.07 FT3/SK, 9.43 GAL/SK. PUMPED AT 8 BPM WITH 800 PSI
Event	20	Shutdown	3/2/2019	16:44:20	USER					SHUTDOWN TO DROP TOP PLUG.
Event	21	Clean Lines	3/2/2019	16:46:07	USER					WASH PUMPS AND LINES TO PIT.
Event	22	Drop Top Plug	3/2/2019	16:50:00	USER					DROP THIRD PARTY TOP LATCH DOWN PLUG. PLUG LAUNCHED. WITNESSED BY CUSTOMER REP.
Event	23	Pump Displacement	3/2/2019	16:52:04	USER	2230	8.4	10	136.7	PUMP 136.7 BBL KCL DISPLACEMENT AT 10 BPM WITH 2,230 PSI. 3 LBS BE-6 IN FIRST 30 BBL, 1 GAL MMCR IN FIRST 10 BBL.
Event	24	Slow Rate	3/2/2019	17:06:35	USER	1850	8.42	2	10	SLOW RATE TO 4 BPM 10 BBL PRIOR TO CALCULATED DISPLACEMENT TO BUMP PLUG.
Event	25	Bump Plug	3/2/2019	17:08:45	USER	2830			146.7	PLUG BUMPED AT 4 BPM. FCP-1,850 PSI.BROUGHT PRESSURE UP TO 2,830 PSI. TOTAL DISPLACEMENT-146.7 BBL
Event	26	Check Floats	3/2/2019	17:11:17	USER					FLOATS HOLDING. RETURNED 1.5 BBL FLUID TO TRUCK
Event	27	End Job	3/2/2019	17:13:00	USER					PIPE WAS STATIC DURING JOB. GOOD CIRCULATION THROUGHOUT CEMENT. LOST CIRCULATION AFTER SHUTTING DOWN TO DROP PLUG FOR DISPLACEMENT.
Event	28	Pre-Rig Down Safety Meeting	3/2/2019	17:15:00	USER					WITH ALL HES PERSONNEL

Event	29	Rig-Down Equipment	3/2/2019	17:20:00	USER	
Event	30	Rig-Down Completed	3/2/2019	18:20:00	USER	
Event	31	Pre-Convoy Safety Meeting	3/2/2019	18:25:00	USER	WITH ALL HES PERSONNEL
Event	32	Crew Leave Location	3/2/2019	18:30:00	USER	
Event	33	Rig Info	3/2/2019	18:31:00	USER	RIG ON BOTTOM AT 13:30, CIRCULATED AT 12 BPM WHILE PUMPING 1,000 SCF AIR DOWN CASING AND 1,500 SCF DOWN PARASITE STRING, 900 PSI PUMP PRESSURE, 740 BBL CIRCULATED
Event	34	Well Info	3/2/2019	18:32:00	USER	TD-9,501', TP-9,496.95', SHOE-30.2', HOLE 8 3/4", MUD-9.2 PPG WBM, CSG-4 1/2" 11.6 LB/FT P-110, PREV CSG SET AT 2,756' 9 5/8" 36 LB/FT
Event	35	Job Info	3/2/2019	18:33:00	USER	CALCULATED TOP OF TAIL CEMENT-4,148', CALCULATED TOP OF LEAD CEMENT-688', USED 80 LBS MUDFLUSH III, 3 LBS BE-6, 1 GALLON MMCR FOR JOB. THIRD PARTY TOP PLUG WAS USED FOR JOB. HES TOP PLUG WAS RETURNED TO WAREHOUSE.
Event	36	Comment	3/2/2019	18:34:00	USER	THANK YOU FOR USING HALLIBURTON CEMENT DEPARTMENT. JEREMY YOUNG AND CREW.

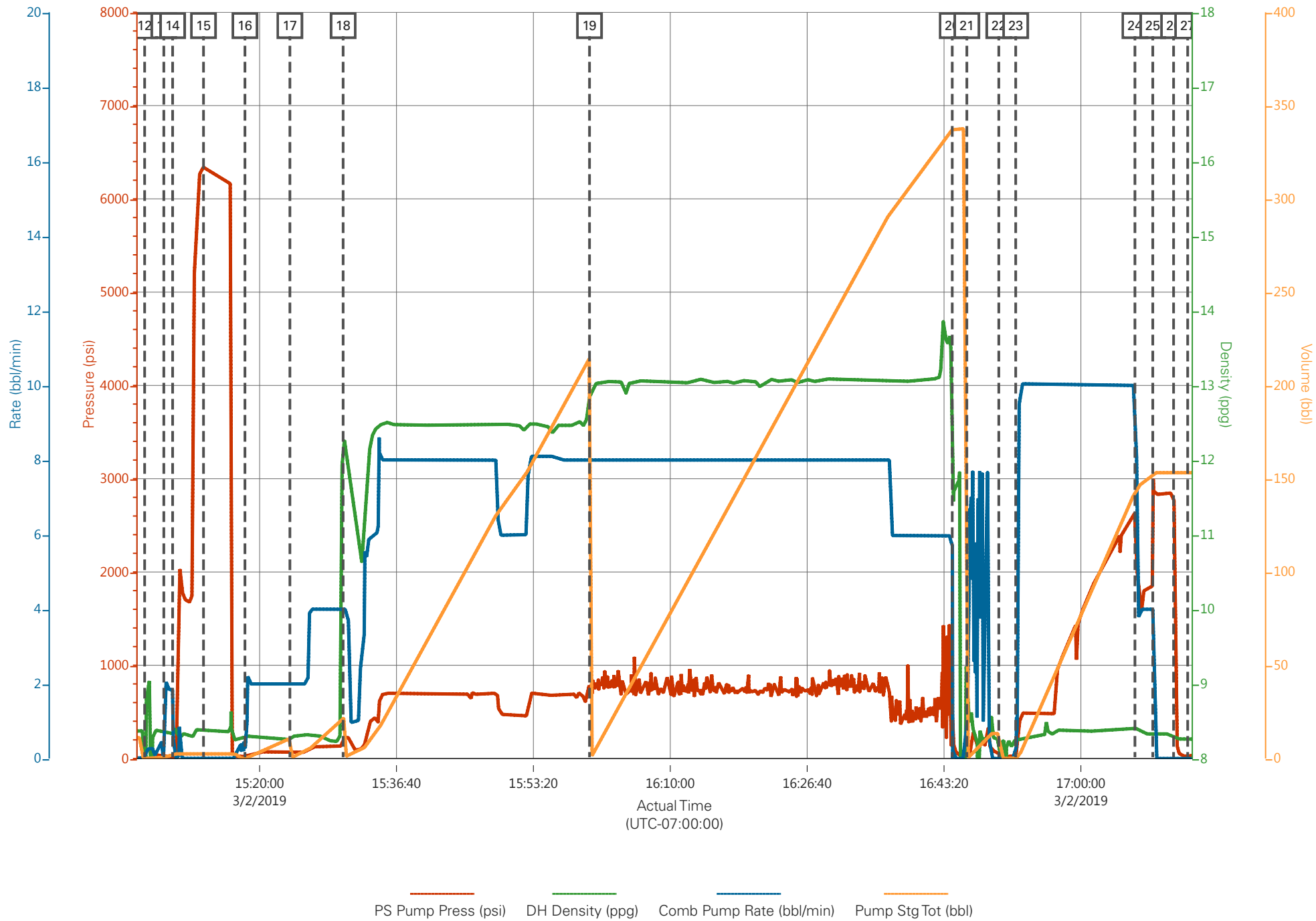
# TEP - TR 544-22-597 - PRODUCTION



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

Description	Actual Time (UTC-07:00:00)	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)
12 Start Job	15:06:00	4.00	7.69	0.10	0.00
13 Pump Water	15:08:20	33.00	8.35	0.00	0.60
14 Shutdown	15:09:24	32.00	8.33	1.90	2.40
15 Pressure Test	15:13:10	6350.00	8.38	0.00	2.50
16 Pump H2O Spacer	15:18:13	22.00	8.29	0.20	0.30
17 Pump Mud Flush III Spacer	15:23:41	74.00	8.25	2.00	0.10
18 Pump Lead Cement	15:30:10	182.00	12.26	4.00	21.40
19 Pump Tail Cement	16:00:10	712.00	12.85	8.00	214.40
20 Shutdown	16:44:20	541.00	12.81	6.00	337.50
21 Clean Lines	16:46:07	34.00	9.09	1.00	0.10
22 Drop Top Plug	16:50:00	65.00	8.25	0.00	13.40
23 Pump Displacement	16:52:04	17.00	8.24	0.00	0.00
24 Slow Rate	17:06:35	2623.00	8.42	10.00	142.80
25 Bump Plug	17:08:45	2214.00	8.30	4.00	152.90
26 Check Floats	17:11:17	2837.00	8.32	0.00	153.20
27 End Job	17:13:00	26.00	8.26	0.00	153.20

# TEP - TR 544-22-597 - PRODUCTION



## Job Information

Request/Slurry	2537592/1	Rig Name	H&P 271	Date	24/FEB/2019
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	TR 544-22-597

## Well Information

Casing/Liner Size	4.5 in	Depth MD	9501 ft	BHST	112°C / 233°F
Hole Size	8.75 in	Depth TVD	9022 ft	BHCT	73°C / 163°F
Pressure	5615 psi				

## Drilling Fluid Information

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



Conc	UOM	Cement/Additive	MP	Sample Type	Sample Date	Lot No.	Cement Properties		
							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 2537592/1

## Thickening Time - ON-OFF-ON, Request Test ID:36264739

28/FEB/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)
163	5615	46	5:46	5:46	5:46	5:46	8	56	15	7

Total sks = 565

CS0268, Trailer 8476, 420 sks

CS0270, Trailer 6813, 145 sks

no deflection, 7Bc--- > 7Bc

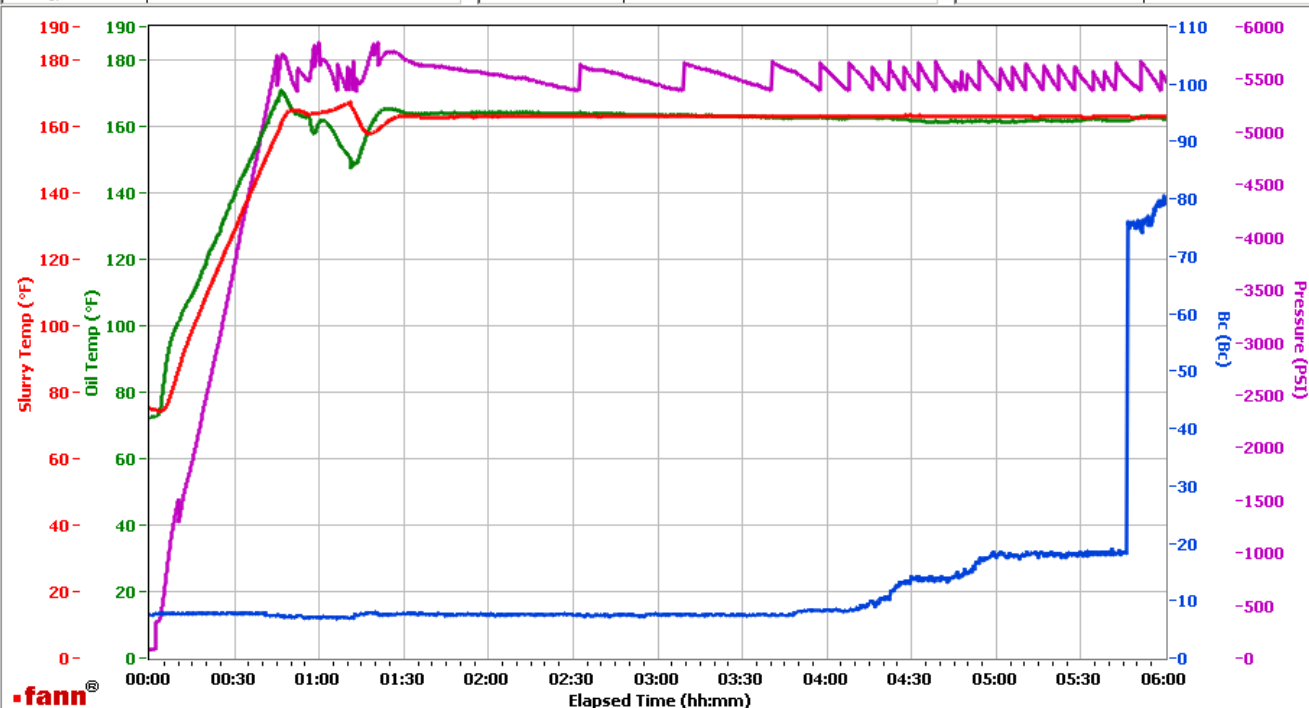
heat of hydration at 5:46

## Grand Junction Colorado

Fields	Values
Project Name	GJ2537592-1 TERRA BULK PRODUCTION LE
Test ID	36264739 - TT
Request ID	2537592-1
Tested by	CT
Customer	TERRA ENERGY PARTNERS
Well No	TR 544-22-597
Rig	H&P 271
Casing/Liner Size	4.5 INCH

Fields	Values
Job Type	PRODUCTION CASING
Cement Type	GCC TYPE I-II
Cement Weight	Standard
Test Date	02/28/19
Test Time	05:02 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.1219

Events	Results
30.00 Bc	05h:46m
40.00 Bc	05h:46m
50.00 Bc	05h:46m
70.00 Bc	05h:46m
100.00 Bc	NaN
00h:30m	8.12
01h:00m	8.12
01h:30m	8.12



Data File C:\Documents and Settings\HPHT\Local Settings\Temporary Internet Files\Content.IE5\09ERK9UN\GJ2537592-1 TERRA BULK PRODUCTION LEAD[1].tdms

Comments CS0268, TRAILER 8476, 420 SKS - CS0270, TRAILER 6813, 145 SKS

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

Request/Slurry	2537593/1	Rig Name	H&P 271	Date	24/FEB/2019
Submitted By	Connor Matthews	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	TR 544-22-597

### Well Information

Casing/Liner Size	4.5 in	Depth MD	9501 ft	BHST	112°C / 233°F
Hole Size	8.75 in	Depth TVD	9022 ft	BHCT	73°C / 163°F
Pressure	5615 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 2537593/1**

## **Thickening Time - ON-OFF-ON, Request Test ID:36264741**

**28/FEB/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)
163	5615	46	2:28	2:42	2:42	2:54	14	56	15	14

Total sks 795

CS0269, Trailer MT199, 350 sks

CS0274, Trailer 6813, 95 sks

CS0275, Trailer MT613, 350 sks

No deflection, 14-- > 14 bc

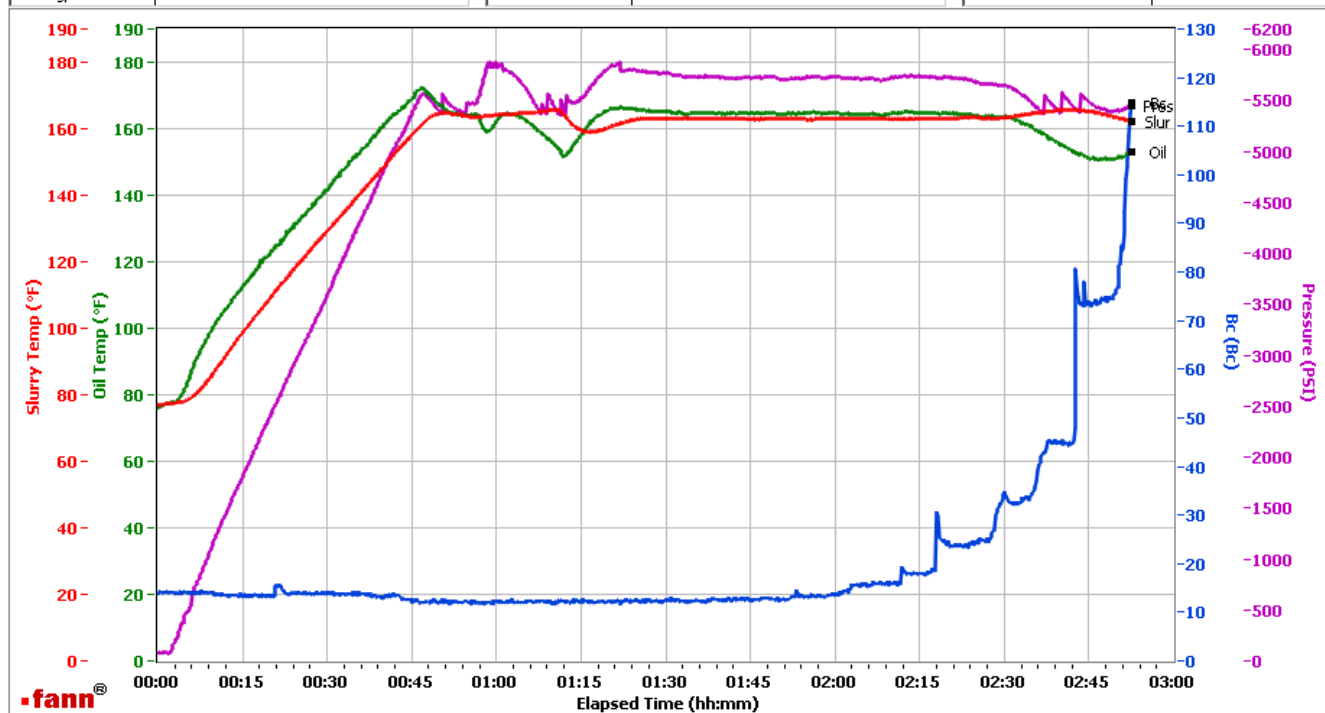
Heat of hydration at 2:33

### **Grand Junction, Colorado**

Fields	Values
Project Name	GJ2537593-1 TERRA BULK PRODUCTION TA
Test ID	36264741-TT
Request ID	2537593-1
Tested by	CT
Customer	TERRA ENERGY PARTNERS
Well No	TR 544-22-597
Rig	H&P 271
Casing/Liner Size	4.5 INCH

Fields	Values
Job Type	PRODUCTION
Cement Type	GCC TYPE I-II
Cement Weight	Light Weight
Test Date	02/27/19
Test Time	07:18 PM
Temp. Units	degF
Pressure Units	PSI
SW Version	2.1.0.507

Events	Results
30.00 Bc	02h:28m
40.00 Bc	02h:42m
50.00 Bc	02h:42m
70.00 Bc	02h:42m
100.00 Bc	02h:51m
00h:30m	13.81
01h:00m	12.08
01h:30m	12.78



Data File C:\Documents and Settings\M290\Desktop\Test Data\GJ2537593-1 TERRA BULK PRODUCTION TAIL.tdms

Comments CS0269, TRAILER MT199, 350 SKS - CS0274, TRAILER 6813, 95 SKS - CS0275, TRAILER MT613, 350 SKS

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