

# HALLIBURTON

iCem<sup>®</sup> Service

## **TERRA ENERGY PARTNERS**

**For: TEP**

Date: Saturday, November 10, 2018

**CLOUGH NR 413-3 Production PJR**

**API #: 05-045-23907-00**

Job Date: Saturday, November 10, 2018

Sincerely,

**Grand Junction Cement Engineering**

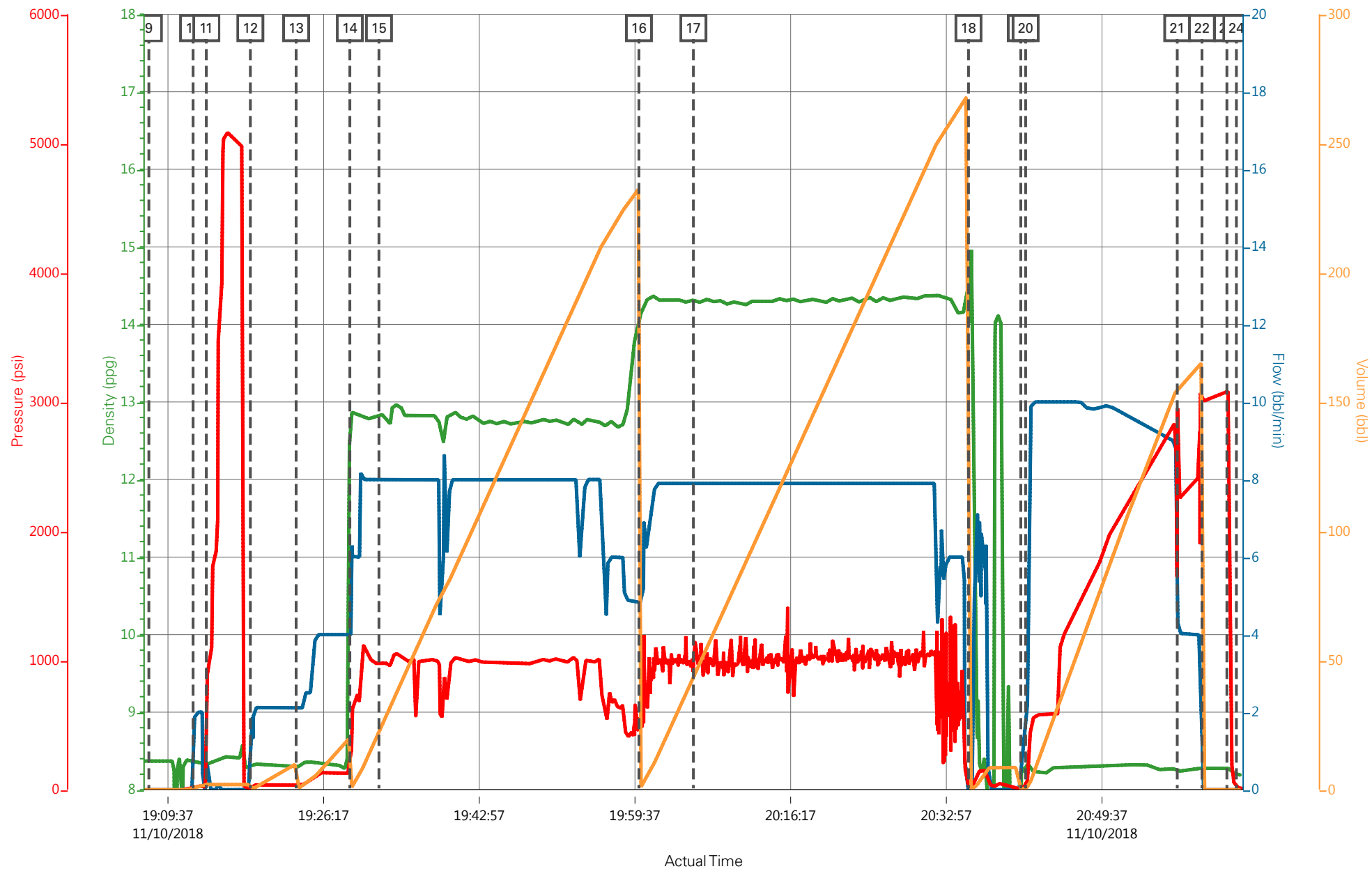
## 2.0 Real-Time Job Summary

## 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	11/10/2018	09:30:00	USER					REQUESTED ON LOCATION @ 14:00
Event	2	Pre-Convoy Safety Meeting	11/10/2018	11:00:00	USER					ALL HES PRESENT
Event	3	Crew Leave Yard	11/10/2018	11:15:00	USER					1 HT 400 PUMP TRUCK E4, 1 660 BULK TRUCK, 1 550 SERVICE PICKUP
Event	4	Arrive At Loc	11/10/2018	13:00:00	USER					RIG RUNNING CASING WHEN HES ARRIVED AT LOCATION
Event	5	Assessment Of Location Safety Meeting	11/10/2018	13:10:00	USER					MET WITH COMP REP, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION AND COLLECTED WATER SAMPLE (PH- 7.0, CHLORIDES- 500, TEMP- 55F). COMP REP WAS OFFERED SDS FOR ALL CHEMICALS USED BY HES.
Event	6	Pre-Rig Up Safety Meeting	11/10/2018	13:20:00	USER					ALL HES PRESENT
Event	7	Rig-Up Equipment	11/10/2018	13:30:00	USER					HES RIGGED UP 1 HT400 PUMP TRUCK, 1 660 BULK TRUCK, 2 CEMENT SILOS, 2" DISCHARGE IRON, AND 4" SUCTION HOSE WITHOUT ENTERING RED ZONE.
Event	8	Pre-Job Safety Meeting	11/10/2018	18:45:00	USER					ALL HES EMPLOYEES AND RIG CREW PRESENT, RIG CIRCULATED @ 10 BPM PRIOR TO JOB PRESSURE @ 1100 PSI. 50 UNITS OF GAS. CALIBRATED MUD SCALES ON WATER.
Event	9	Start Job	11/10/2018	19:07:35	COM6					TD 10087', TP 10080.5', SJ 30.57', SURFACE CSG 9 5/8" 36# J55 SET @ 1128' PRODUCTION CSG 4 1/2" 11.6# P-110, OH 8 3/4", MUD 11.3 PPG
Event	10	Fill Lines	11/10/2018	19:12:19	COM6	8.33	2	45	2	FRESH WATER

Event	11	Test Lines	11/10/2018	19:13:44	COM6			5100		ALL LINES HELD PRESSURE AT 5100 PSI
Event	12	Pump H2O Spacer	11/10/2018	19:18:27	COM6	8.33	2	45	10	10BBLS FRESH WATER
Event	13	Mud Flush	11/10/2018	19:23:21	COM6	8.4	4	145	20	20BBLS MUD FLUSH
Event	14	Pump Lead Cement	11/10/2018	19:29:06	COM6	12.7	8	1000	216	655 SKS NEOCEM CMT 12.7 PPG, 1.85 FT3/SK, 8.94 GAL/SK
Event	15	Check Weight	11/10/2018	19:32:13	COM6					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	16	Pump Tail Cement	11/10/2018	20:00:03	COM6	14.2	8	1100	224	740 SKS THERMACEM CMT 14.2 PPG, 1.7 FT3/SK, 7.53 GAL/SK.
Event	17	Check Weight	11/10/2018	20:05:53	COM6					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
										END OF CEMENT. CLEAN PUMPS AND LINES TO PIT.
Event	18	Clean Lines	11/10/2018	20:35:20	USER					
Event	19	Pump Displacement	11/10/2018	20:40:56	USER	8.4	10	2870	155.8	1 GAL MMCR IN FIRST 10 BBLS, 3 LBS BE-6 IN FIRST 30 BBLS, 1 50 LB. BAG KCL THROUGHOUT DISPLACEMENT
Event	20	Drop Top Plug	11/10/2018	20:41:27	USER					PLUG VEIRIFIED BY FLAG INDICATOR
Event	21	Slow Rate	11/10/2018	20:57:41	USER	8.4	4	2350	145.8	SLOW RATE TO 4 BPM TO BUMP PLUG
Event	22	Bump Plug	11/10/2018	21:00:20	COM6	8.4	4	2460	155.8	LANDED PLUG AT 2460 PSI, BROUGHT UP TO 3050 PSI
Event	23	Check Floats	11/10/2018	21:03:00	USER					FLOATS HELD, 1.5BBLS BACK TO TRUCK
Event	24	End Job	11/10/2018	21:04:01	COM6					RETURNS THROUGH OUT JOB. PIPE WAS RECIPERICATED. USED TOP PLUG, NO SUGAR USED.
Event	25	Post-Job Safety Meeting (Pre Rig-Down)	11/10/2018	21:15:00	USER					ALL HES PRESENT
Event	26	Rig Down Lines	11/10/2018	21:20:00	USER					ALL HES PRESENT
Event	27	Pre-Convoy Safety Meeting	11/10/2018	22:20:00	USER					ALL HES PRESENT
Event	28	Crew Leave Location	11/10/2018	22:30:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, SHAWN BLOSSOM AND CREW

# TERRA CLOUD NR 413-3, 4.5" PRODUCTION



**Job Information**

Request/Slurry	2511701/1	Rig Name	H&P 318	Date	29/OCT/2018
Submitted By	Lukas Van Zyl	Job Type	Production Casing	Bulk Plant	Grand Junction
Customer	Terra Energy Partners	Location	Garfield	Well	NR 413-3

**Well Information**

Casing/Liner Size	4.5 in	Depth MD	10119 ft	BHST	121°C / 249°F
Hole Size	8.75 in	Depth TVD	9934 ft	BHCT	82°C / 179°F
Pressure	6254 psi				

**Drilling Fluid Information**

Mud Supplier Name	Mud Trade Name	Density
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**Cement Information - Lead Design**

Conc	UOM	Cement/Additive	Sample Type	Sample Date	Lot No.	Cement Properties		
						Slurry Density	12.7	lbm/gal
						Slurry Yield	1.851	ft3/sack
						Water Requirement	8.949	gal/sack
						Total Mix Fluid	8.949	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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# **Operation Test Results Request ID 2511701/1**

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

**04/NOV/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)
179	6254	58	3:47	4:05	4:11	4:24	16	68	15	22

Total sks = 655

CS2406 TR#1513 420 SKS

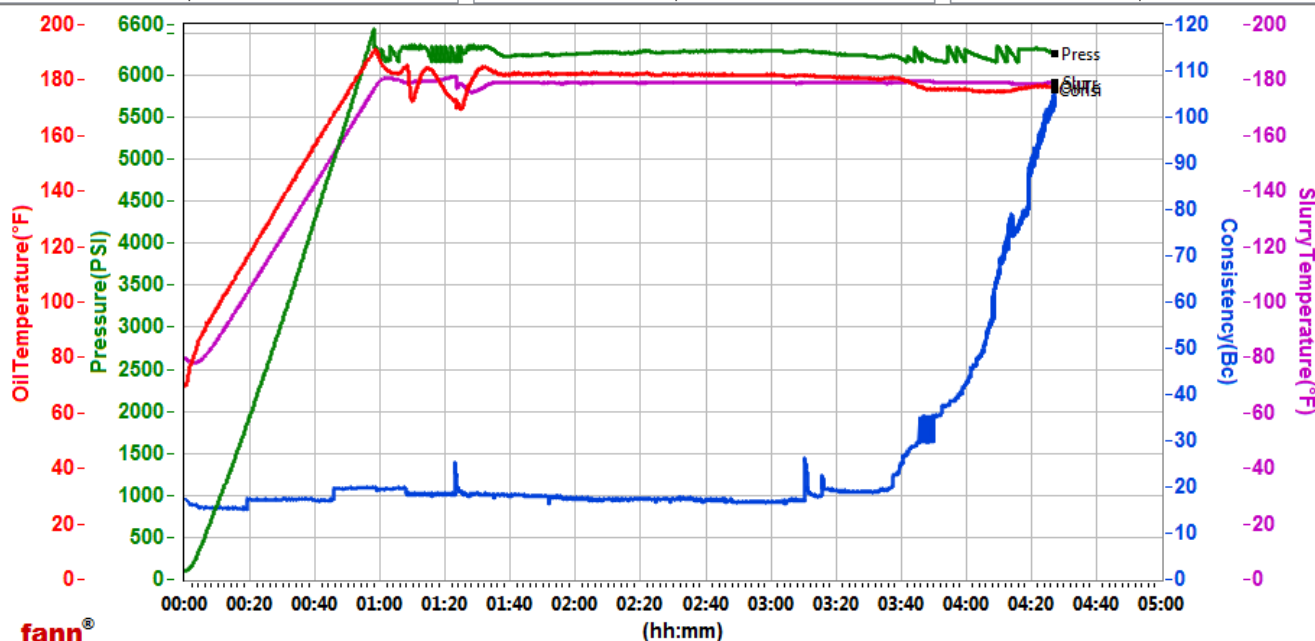
CS2407 TR#7428 235 SKS

deflected from 18Bc--- > 22Bc--- > 19Bc within one minute

Please see the graph for Heat of hydration at 3:43

## **Grand Junction**

Fields	Values	Fields	Values	Events	Results
Project Name	TempTest	Rig	H&P318		
SW Version	1.0	Casing/Liner Size	4.5'		
Test ID	359-TT	Job Type	PRODUCTION CASING		
Request ID	GJ2511701-1	Cement Weight	GCC TYPE I-II		
Tested by	DEBA	Comments	Standard		
Customer	TERRA ENERGY PARTN	Date Time	11/4/2018 12:02:51.709		
Well No	NR 413-3	Temp. Units	degF		



Data File C:\Users\hx25273\Desktop\new Graph M290\GJ2511701-1 TERRA PRODUCTION BULK LEAD.tdms

Comments Standard

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# HALLIBURTON

## Rockies, Grand Junction

## Lab Results- Tail

### Job Information

<b>Request/Slurry</b>	2511702/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	29/OCT/2018
<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>	NR 413-3

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	10119 ft	<b>BHST</b>	121°C / 249°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9934 ft	<b>BHCT</b>	82°C / 179°F
<b>Pressure</b>	6254 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	<b>Mud Trade Name</b>	<b>Density</b>
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### 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>		
						Slurry Density	14.2	lbm/gal
						Slurry Yield	1.704	ft3/sack
						Water Requirement	7.53	gal/sack
						Total Mix Fluid	7.53	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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# Operation Test Results Request ID 2511702/1

## Thickening Time - ON-OFF-ON

04/NOV/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)
179	6245	58	2:28	2:31	2:32	2:34	11	68	15	12

Total sks = 740

CS2403 TR#8476 370 SKS

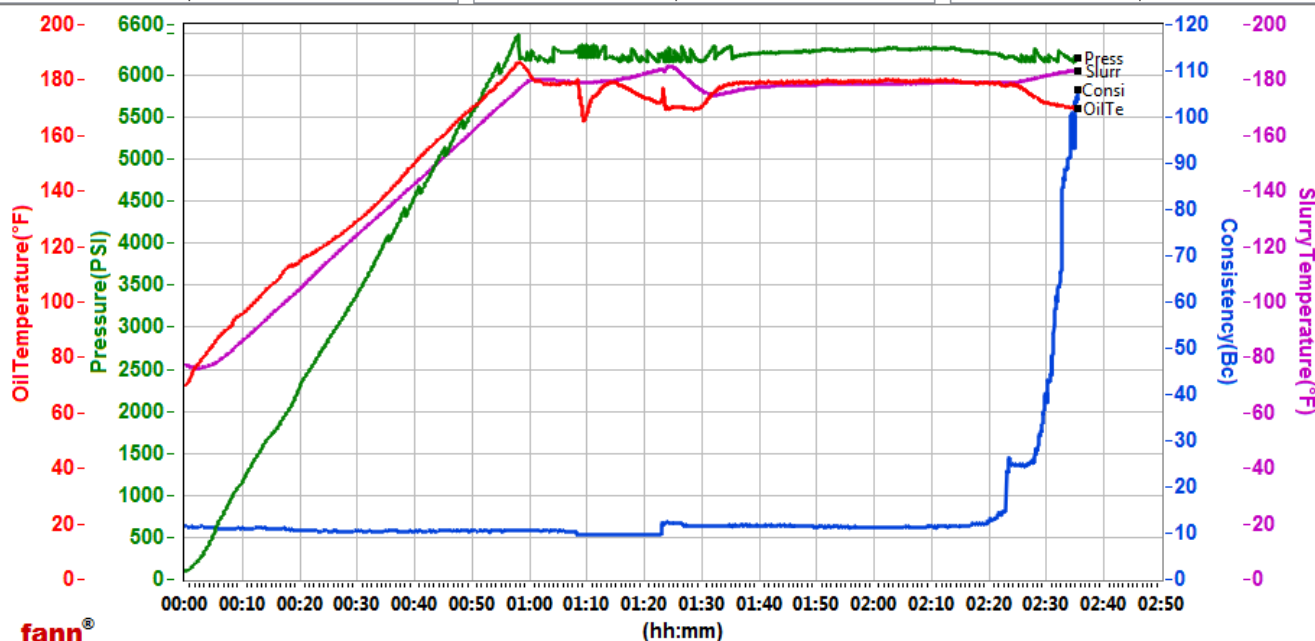
CS2404 TR#8678 370 SKS

deflected from, 10Bc-- > 12Bc

please see the graph for heat of hydration at 2:25

## GRAND JUNCTION

Fields	Values	Fields	Values	Events	Results
Project Name	TempTest	Rig	H&P 318		
SW Version	1.0	Casing/Liner Size	4.5 INCH		
Test ID	35939021- TT	Job Type	PRODUCTION CASING		
Request ID	GJ2511702-1	Cement Weight	MOUNTAIN G		
Tested by	DEBA	Comments	Standard		
Customer	TERRA ENERGY PARTN	Date Time	11/4/2018 06:48:36.482		
Well No	NR 413-3	Temp. Units	degF		



Data File C:\Users\hx25273\Desktop\new Graph M290\GJ2511702-1TERRA RODUCTION BULK TAIL.tdms

Comments Standard

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