

# HALLIBURTON

iCem<sup>®</sup> Service

**TEP ROCKY MOUNTAIN LLC**

**For: Terra Energy Partners,**

November 03, 2017

**WARE SR 412-12**

API: 05-045-23449-00

Sincerely,

**Grand Junction Cement Engineering**

## 1.0 Real-Time Job Summary

## 1.1 Job Event Log

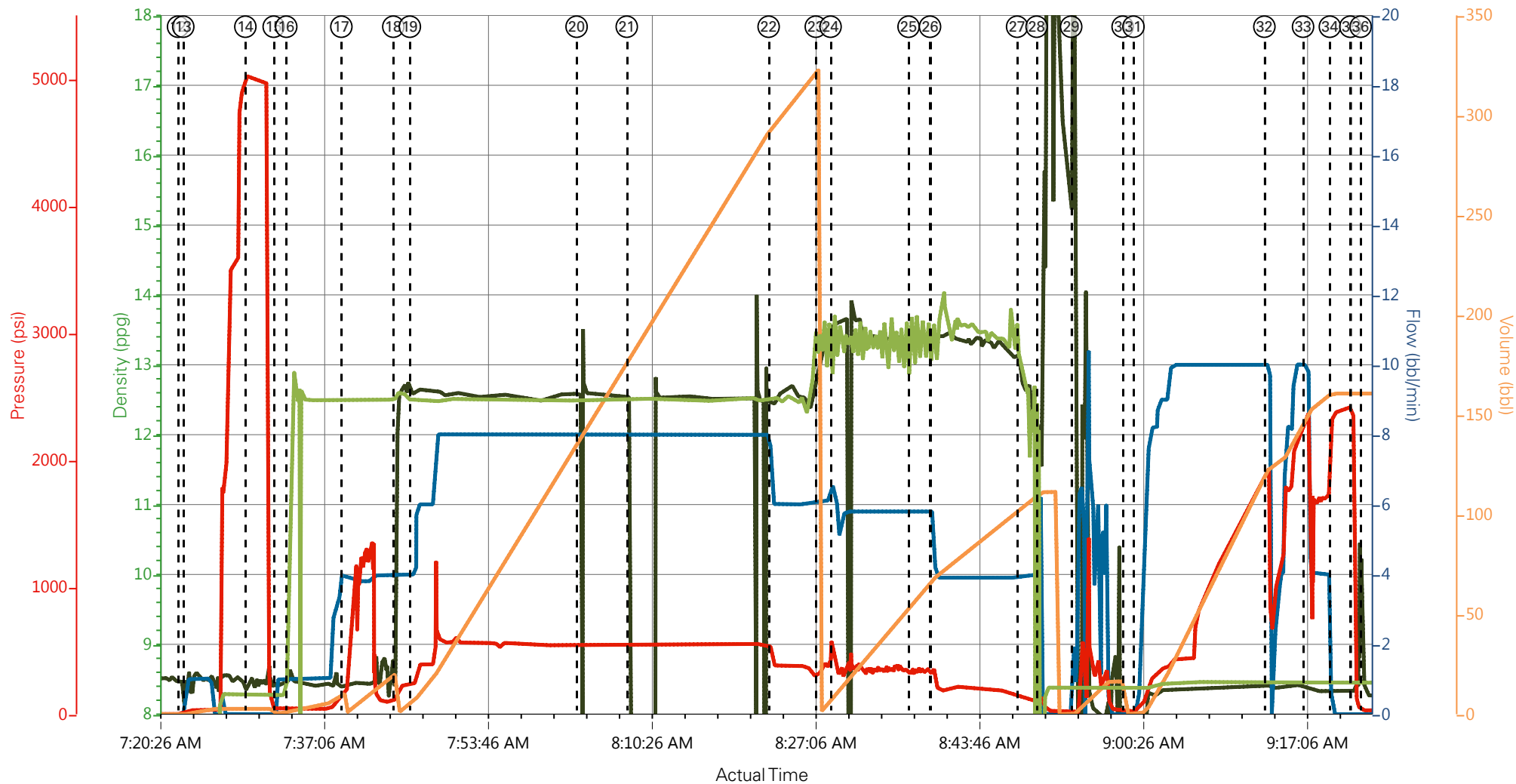
Type	Seq. No.	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	11/2/2017	17:00:00	USER					REQUESTED ON LOCATION @ 23:00
Event	2	Pre-Convoy Safety Meeting	11/2/2017	18:45:00	USER					ALL HES EMPLOYEES PRESENT
Event	3	Crew Leave Yard	11/2/2017	19:00:00	USER					1 HT 400 PUMP TRUCK E4, 1 660 BULK TRUCK, 1 550 SERVICE PICKUP
Event	4	Arrive At Loc	11/2/2017	21:00:00	USER					ARRIVED 2 HOURS EARLY TO LOCATION. RIG RUNNING CASING UPON HES ARRIVAL.
Event	5	Assessment Of Location Safety Meeting	11/2/2017	21:15:00	USER					ASSESSED LOCATION AND COLLECTED WATER SAMPLE. MET WITH COMPANY REP, AND WENT OVER NUMBERS AND JOB PROCEDURE. WALKED AROUND LOCATION COMPANY REP WAS OFFERED SDS FOR ALL CHEMICLES USED BY HES.
Event	6	Spot Equipment	11/2/2017	21:30:00	USER					1 HT 400 PUMP TRUCK E4, 1 660 BULK TRUCK, 1 550 SERVICE PICKUP
Event	7	Pre-Rig Up Safety Meeting	11/2/2017	22:00:00	USER					ALL HES EMPLOYEES PRESENT
Event	8	Rig-Up Equipment	11/2/2017	22:15:00	USER					RIGGED UP 1HT 400 PUMP TRUCK E4 TO 1 660 BULK TRUCK AND 1 1700 CUFT SILO. RIGGED UP TO 2 WATER SOURCES. RAN IRON TO MANIFOLD, WASHUP LINE TO PIT AND IRON TO REDZONE, WILL RESUME WHEN REDZONE IS CLEARED FOR HES TO FINNISH RIG UP
Event	9	Rig-up Lines	11/3/2017	06:00:00	USER					REDZONE CLEARED, FINISHED RIGGING UP TO STAND PIPE
Event	10	Pre-Job Safety Meeting	11/3/2017	06:45:00	USER					ALL HES EMPLOYEES AND RIG CREW PRESENT, RIG CIRCULATED @ 10.7 BPM PRIOR TO JOB PRESSURE @ 400 PSI.
Event	11	Other	11/3/2017	07:00:00	USER					STARTED TO CHARGE FOR ADD HOURS
Event	12	Start Job	11/3/2017	07:22:34	COM5					TD 9987', TP 9987', SJ 32', SURFACE CSG 9 5/8" 32.3# H-40 SET @

1131' PRODUCTION CSG 4 1/2" 11.6# P-110, OH 8 3/4", MUD 9.6

Event	13	Prime Lines	11/3/2017	07:23:06	COM5	8.33	2.0	30	4	FRESH WATER
Event	14	Test Lines	11/3/2017	07:29:25	COM5			5030		PRESSURE HELD
Event	15	Pump H2O Spacer	11/3/2017	07:32:18	COM5	8.33	4.0	250	10	FRESH WATER
Event	16	Other	11/3/2017	07:33:35	USER					STARTED MIXING UP CEMENT
Event	17	Pump Mud Flush III	11/3/2017	07:39:11	COM5	8.4	4.0	1250	20	80 LBS MUDFLUSH III USED FOR 20 BBLS
Event	18	Pump Lead Cement	11/3/2017	07:44:28	COM5	12.5	8.0	550	301	870 SKS NEOCEM CMT 12.5 PPG, 1.94 FT3/SK, 9.6GAL/SK, WITH 90 LBS TUF-FIBER THROUGHOUT
Event	19	Check weight	11/3/2017	07:46:09	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	20	Other	11/3/2017	08:03:07	USER					STARTED SEEING ISSUES WITH DOWNHOLE DENSO
Event	21	Other	11/3/2017	08:08:13	USER					DOWN HOLE DENSO READING 0. ADDED RECIRC FOR CHART
Event	22	Slow Rate	11/3/2017	08:22:39	USER					SLOWED TO END LEAD SILO
Event	23	Pump Tail Cement	11/3/2017	08:27:27	COM5	13.3	6.0	330	81.6	265 SKS THERMACEM CMT 13.3 PPG, 1.73 FT3/SK, 7.81 GAL/SK.
Event	24	Check weight	11/3/2017	08:28:57	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	25	Check weight	11/3/2017	08:36:53	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	26	Slow Rate	11/3/2017	08:39:04	USER					SLOWED TO END CEMENT
Event	27	Check weight	11/3/2017	08:47:56	COM5					WEIGHT VERIFIED VIA PRESSUREIZED MUD SCALES
Event	28	Shutdown	11/3/2017	08:49:55	USER					END OF CEMENT
Event	29	Clean Pump And Lines	11/3/2017	08:53:26	COM5					BROKE IRON ON FLOOR AND BLEW DOWN FROM FLOOR TO PIT CLOSED GROUND MANIFOLD TO FLOOR. THEN HOOKED BACK UP FOR POSITIVE DISPLACEMENT. WASHED UP TRUCK AND LINE TO PIT
Event	30	Drop Top Plug	11/3/2017	08:58:40	COM5					VERIFIED BY FLAG INDICATOR
Event	31	Pump Displacement	11/3/2017	08:59:46	COM5	8.4	10.0	2326	144.3	1 GAL MMCR IN FIRST 10 BBLS, 3 LBS BE-6 IN FIRST 30 BBLS, 1 50 LB. BAG KCL THROUGHOUT DISPLACEMENT
Event	32	Other	11/3/2017	09:13:05	USER					HIT KICKOUT AT 2500 PSI. RESET AND GOT BACK INTO IT.
Event	33	Slow Rate	11/3/2017	09:17:01	USER	8.4	4.0	1670	10	SLOWED TO BUMP PLUG

Event	34	Bump Plug	11/3/2017	09:19:45	COM5	8.4	4.0	1800	154.3	PLUG BUMPED
Event	35	Check Floats	11/3/2017	09:21:50	USER			2420		FLOATS HELD 1.5 BBL FLOW BACK TO TRUCK
Event	36	End Job	11/3/2017	09:22:53	USER					GOOD RETURNS ON LEAD CEMENT. HAD INTEMITTENT RETURNS ON TAIL AND THROUGHOUT DISPLACEMENT. CHARGED 3 ADD HRS ON TICKET
Event	37	Post-Job Safety Meeting (Pre Rig-Down)	11/3/2017	09:45:00	USER					ALL HES EMPLOYEES PRESENT
Event	38	Pre-Convoy Safety Meeting	11/3/2017	10:45:00	USER					ALL HES EMPLOYEES PRESENT
Event	39	Crew Leave Location	11/3/2017	11:00:00	USER					THANK YOU FOR CHOOSING HALLIBURTON CEMENT, DUSTIN HYDE AND CREW

# TERRA - WARE SR 412-12 - 4 1/2" PRODUCTION



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

- |   |                          |                      |                     |                         |   |
|---|--------------------------|----------------------|---------------------|-------------------------|---|
| ① Call Out                              | ⑧ Rig-Up Equipment       | ⑮ Pump H2O Spacer    | 22 Slow Rate        | 29 Clean Pump And Lines | 36 End Job                                |
| ② Pre-Convoy Safety Meeting             | ⑨ Rig-up Lines           | ⑯ Other              | 23 Pump Tail Cement | 30 Drop Top Plug        | 37 Post-Job Safety Meeting (Pre Rig-Down) |
| ③ Crew Leave Yard                       | ⑩ Pre-Job Safety Meeting | ⑰ Pump Mud Flush III | 24 Check weight     | 31 Pump Displacement    | 38 Pre-Convoy Safety Meeting              |
| ④ Arrive At Loc                         | ⑪ Other                  | ⑱ Pump Lead Cement   | 25 Check weight     | 32 Other                | 39 Crew Leave Location                    |
| ⑤ Assessment Of Location Safety Meeting | ⑫ Start Job              | ⑲ Check weight       | 26 Slow Rate        | 33 Slow Rate            |   |
| ⑥ Spot Equipment                        | ⑬ Prime Lines            | 20 Other             | 27 Check weight     | 34 Bump Plug            |   |
| ⑦ Pre-Rig Up Safety Meeting             | ⑭ Test Lines             | 21 Other             | 28 Shutdown         | 35 Check Floats         |   |

▼ **HALLIBURTON** | iCem® Service

Created: 2017-11-02 23:07:17, Version: 4.2.393

Edit

Customer: TEP ROCKY MOUNTAIN LLC

Job Date: 11/3/2017

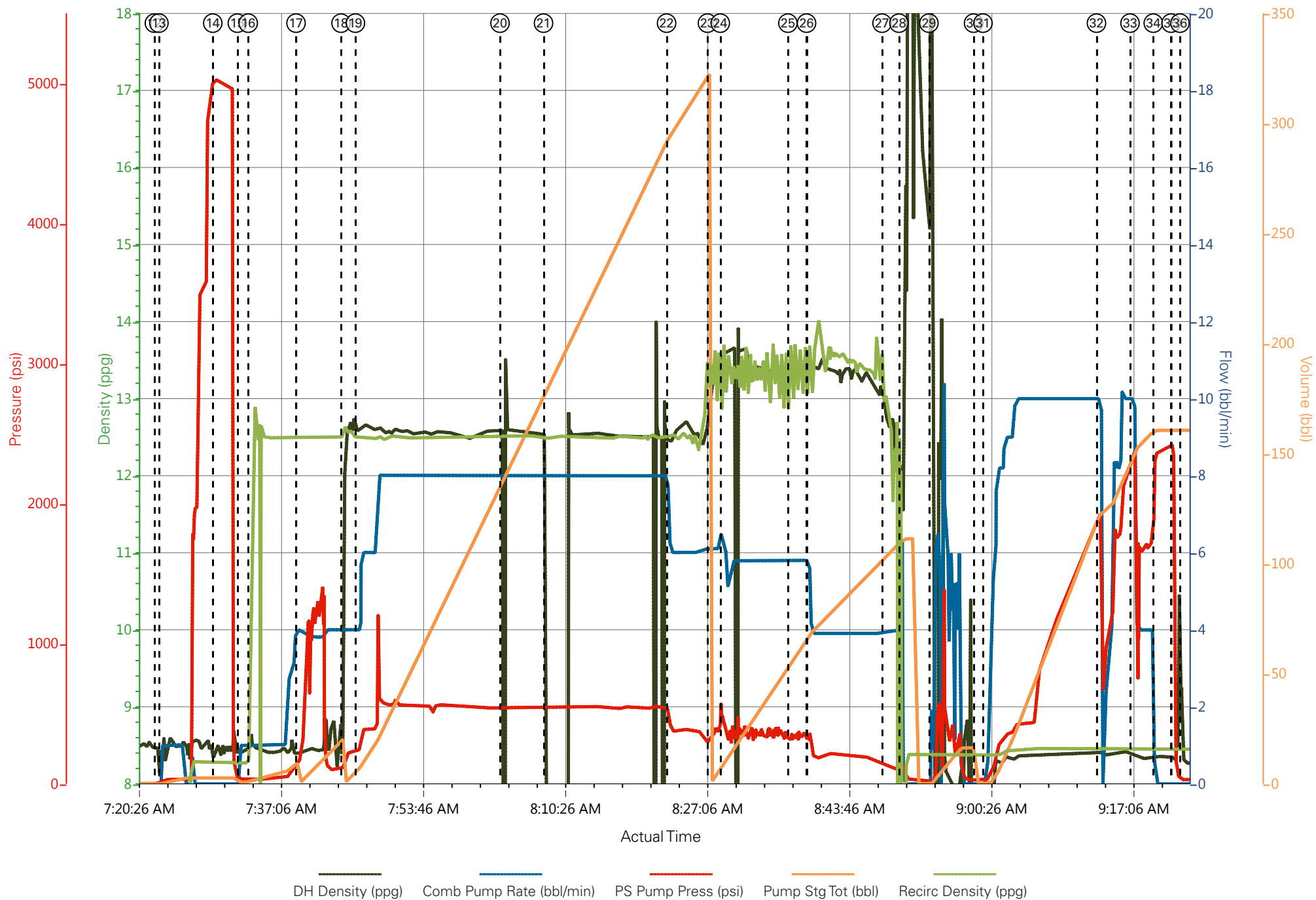
Well: WARE SR 412-12

Representative: NATHAN BURR

Sales Order #: 904404221

ELITE 4: BLOSSOM / HYDE

# TERRA - WARE SR 412-12 - 4 1/2" PRODUCTION



### Job Information

<b>Request/Slurry</b>	2427184/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	29/OCT/2017
<b>Submitted By</b>	Aaron Katz	<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>	SR 412-12

### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9977 ft	<b>BHST</b>	118°C / 245°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9711 ft	<b>BHCT</b>	79°C / 175°F
<b>Pressure</b>	6092 psi				

### Drilling Fluid Information

<b>Mud Supplier Name</b>	<b>Mud Trade Name</b>	<b>Density</b>
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### Cement Information - Lead Design

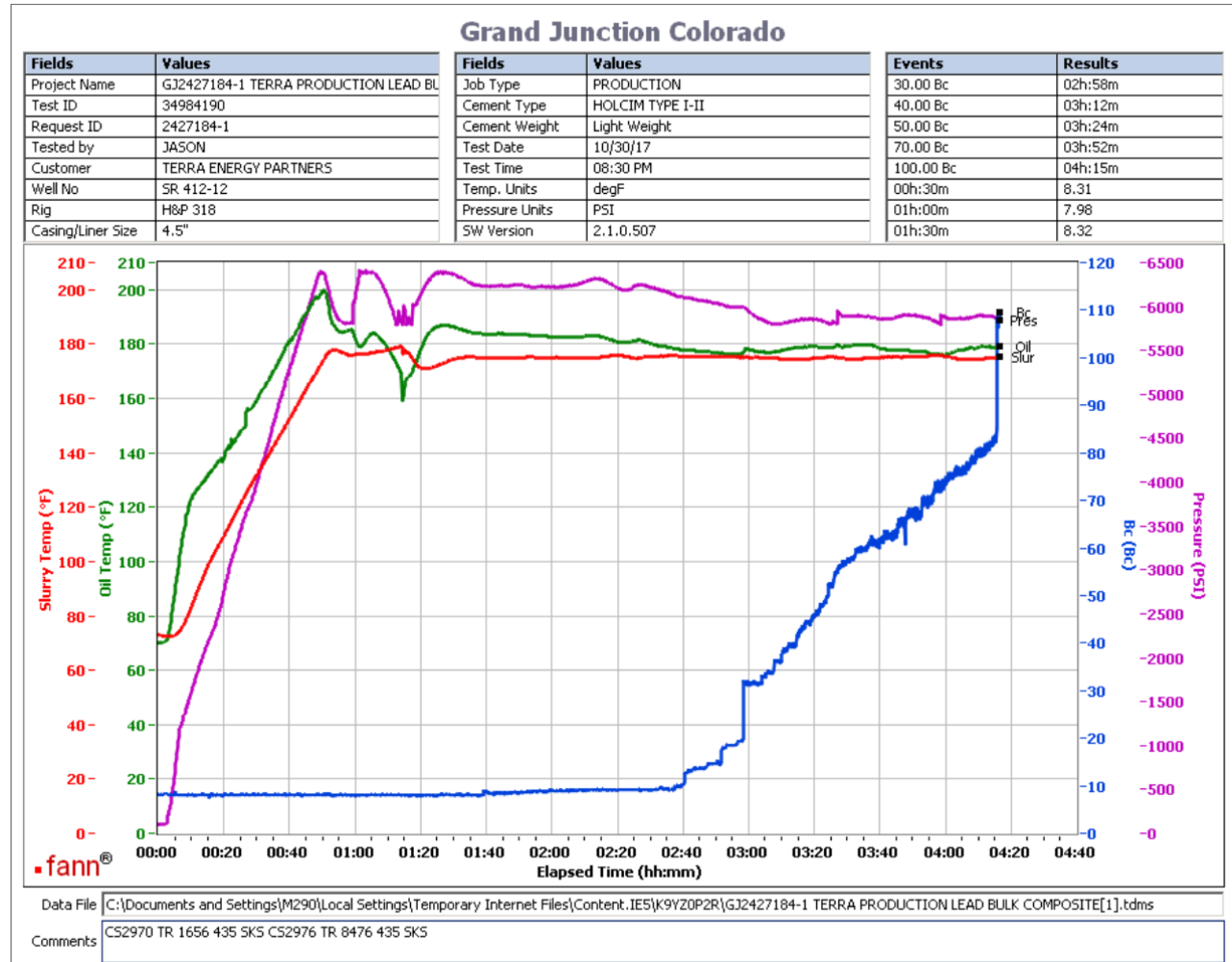
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		NeoCem Lead				Slurry Density	12.5	lbm/gal
						Slurry Yield	1.941	ft3/sack
						Water Requirement	9.623	gal/sack
						Total Mix Fluid	9.623	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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Thickening Time - ON-OFF-ON

30/OCT/2017

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)
175	6092	49	2:58	3:24	3:52	4:15	8	59	15	8



Total sks= 870

CS2970 TR 1656 435 SKS

CS2976 TR 8476 435 SKS

no deflection was observed. 8Bc--- > 8Bc

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# HALLIBURTON

## Rockies, Grand Junction

### Lab Results- Tail

#### Job Information

<b>Request/Slurry</b>	2427185/1	<b>Rig Name</b>	H&P 318	<b>Date</b>	29/OCT/2017
<b>Submitted By</b>	Aaron Katz	<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>	SR 412-12

#### Well Information

<b>Casing/Liner Size</b>	4.5 in	<b>Depth MD</b>	9977 ft	<b>BHST</b>	118°C / 245°F
<b>Hole Size</b>	8.75 in	<b>Depth TVD</b>	9711 ft	<b>BHCT</b>	79°C / 175°F
<b>Pressure</b>	6092 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



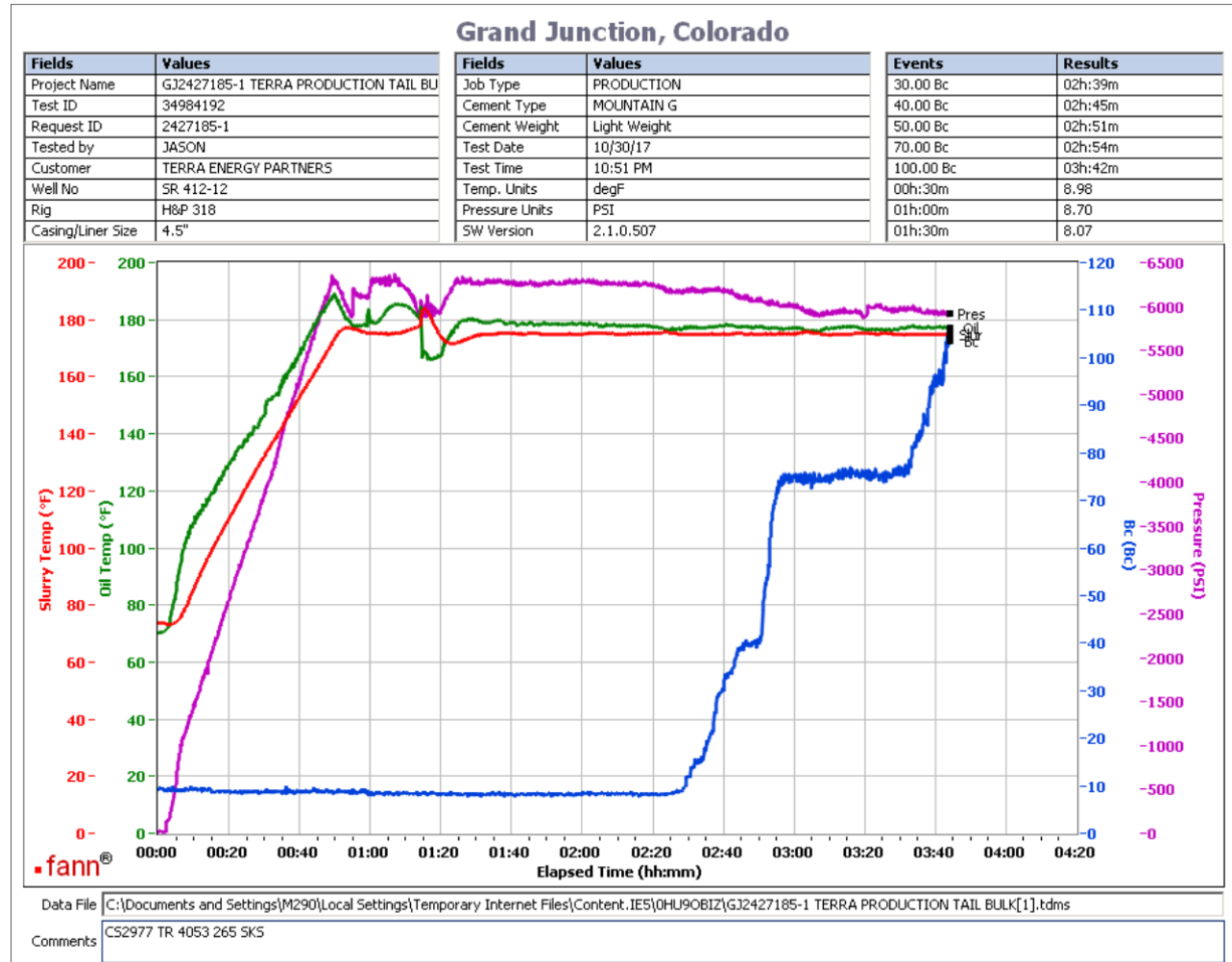
<u>Conc</u>	<u>UOM</u>	<u>Cement/Additive</u>	<u>Sample Type</u>	<u>Sample Date</u>	<u>Lot No.</u>	<b>Cement Properties</b>		
		ThermaCem Tail				Slurry Density	13.3	lbm/gal
						Slurry Yield	1.733	ft3/sack
						Water Requirement	7.799	gal/sack
						Total Mix Fluid	7.799	gal/sack
						Water Source	Fresh Water	
						Water Chloride		

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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)
175	6092	49	2:39	2:51	2:54	3:42	9	59	15	15



265 sks tail  
 CS2977 TR 4053 265 SKS  
 no deflection was observed. 15Bc--- > 15Bc

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