

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS-EBUS

Rock Springs District, WY

For: H&P 318

Date: Thursday, February 20, 2020

FEDERAL RWF 424-1 Production

API# 05-045-24276

Job Date: Thursday, February 20, 2020

Sincerely,

Rock Springs Engineering

Legal Notice

Disclaimer:

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services for this cementing services job. A pre-job safety meeting was held before the job where details of the job were discussed, potential safety hazards were reviewed, and environmental compliance procedures were outlined.

Halliburton maintains a continuous quality improvement process and appreciates any comments or suggestions that you may have. Halliburton again thanks you for the opportunity to perform service work on this well. We hope to be your solutions provider for future projects.

Respectfully,

Halliburton, Rock Springs

Job Times

	Date	Time	Time Zone
Called Out	2/19/2020	17:00	MST
On Location	2/20/2020	03:00	MST
Job Started	2/20/2020	08:46	MST
Job Complete	2/20/2020	11:00	MST
Depart Location	2/20/2020	12:00	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	20
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	WBM
3	Actual mud density	lb/gal	12.9
4	Time circulated before job	HH:MM	2:00
5	Mud volume circulated	Bbls	960
6	Rate at which well was circulated	Bpm	10
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	1200
9	Time from end mud circulation to start of job	HH:MM	00:10
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	147.5
12	Job displaced by	Rig/HES	HES
13	Annular flow before job	Y/N	N
14	Annular flow after job	Y/N	N
15	Length of rat hole	Ft	4
16	Units of gas detected while circulating	Units	910
17	Was lost circulation experienced at any time ?	Y/N	N

1.3 Planned Pumping Schedule

Description	Stage No.	Density (ppg)	Rate (bbl/min)	Yield (ft ³ /sack)	Water Req. (gal/sack)	Volume (bbl)	Bulk Cement (sacks)	Duration (min)
10 lb/gal Base Production Mud	1	10.00	8.00			0.00		0.00
Water	2	8.33	6.00			10.00		1.67
Mud Flush	3	8.40	6.00			20.00		3.33
ThermaCem TEP Deep Tail (2591582/1)	4	13.30	8.00	1.7943	8.498	402.67	1260.00	50.33
Top Plug/Start Displacement								
Water - 0.1 gal/bbl MMCR, 0.1 gal/bbl BE-6	5	8.40	10.00			10.00		1.00
Water - 0.1 gal/bbl BE-6	6	8.40	10.00			20.00		2.00
Water	7-1	8.33	10.00			100.00		10.00
Water	7-2	8.33	4.00			19.04		4.76
Total:						581.71		73.09

1.4 Water Analysis Report

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	8	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	65	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

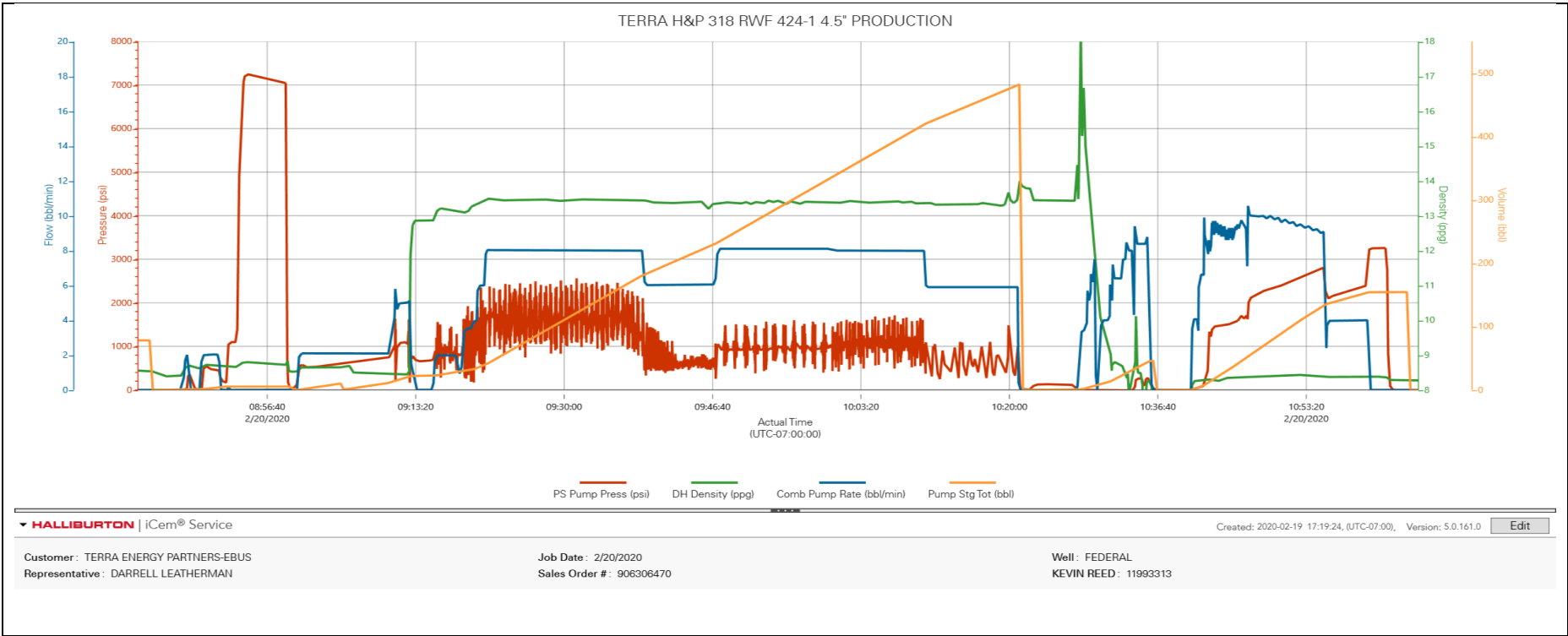
2.1 Job Event Log

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	2/19/2020	17:00:00	USER					CALLED OUT FOR TERRA PRODUCTION ON LOCATION AT 3:00
Event	2	Pre-Convoy Safety Meeting	2/19/2020	18:55:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF DRIVING AND THE DIRECTIONS TO LOCATION
Event	3	Crew Leave Yard	2/19/2020	19:00:00	USER					
Event	4	Arrive At Loc	2/20/2020	03:00:00	USER					STILL RUNNING CASING. TD= 9530, TP 9526.42' 11.6# P-110. HOLE= 8.75", MUD= 12.9#, SHOE= 29.51'
Event	5	Assessment Of Location Safety Meeting	2/20/2020	03:10:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF THE LOCATION.
Event	6	Pre-Rig Up Safety Meeting	2/20/2020	03:20:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF RIGGING UP THE EQUIPMENT.
Event	7	Rig-Up Equipment	2/20/2020	03:30:00	USER					
Event	8	Pre-Job Safety Meeting	2/20/2020	03:40:00	USER					HALLIBURTON CEMENT CREW, RIG CREW AND COMPANY REP. DISCUSSED THE HAZARDS OF THE JOB AND THE JOB PROCEEDURE.
Event	9	Start Job	2/20/2020	08:46:36	COM4					
Event	10	Pump Water	2/20/2020	08:49:12	USER	4.00	8.61	0.50	1.00	PUMP 5 BBLS OF WATER TO FILL PUMPS AND LINES.
Event	11	Shutdown	2/20/2020	08:50:47	USER	460.00	8.72	2.10	4.10	
Event	12	Pressure Test	2/20/2020	08:54:03	USER	7159.00	8.80	0.00	5.20	PRESSURE TESTED HES LINES: 500 PSI LOW KICK OUT, 7000 PSI FOR HIGH PRESSURE.
Event	13	Pump Spacer	2/20/2020	09:00:00	USER	112.00	8.53	0.00	0.00	PUMP 10 BBLS OF H2O SPACER EST. TOP OF WATER SPACER AT: 1642.7'
Event	14	Pump MUDFLUSH Spacer	2/20/2020	09:05:00	USER	602.00	8.65	2.10	0.10	PUMPED 20 BBLS OF MUDFLUSH SPACER AT 8.4 PPG., EST. TOP OF MUDFLUSH AT 1825.5'

Event	15	Pump THERMACEM Cement	2/20/2020	09:12:00	USER	1085.00	8.44	5.00	18.40	PUMPED 1260 SACKS OF THERMACEM CEMENT AT 13.6 PPG., 1.79 ft3/sk., 8.5 GAL/ SACK. AT 8 BPM. EST. TOP OF CEMENT AT 2191.1'
Event	16	Check Weight	2/20/2020	09:13:00	USER	786.00	12.75	1.10	22.30	
Event	17	Shutdown	2/20/2020	10:21:01	USER	52.00	13.48	0.40	482.20	
Event	18	Clean Lines	2/20/2020	10:27:44	USER	-2.00	13.45	0.80	0.10	
Event	19	Drop Top Plug	2/20/2020	10:39:22	USER	-14.00	-0.11	0.00	0.00	COMPANY REP. WITNESSED THE PLUG DROP
Event	20	Pump Displacement	2/20/2020	10:40:38	USER	46.00	8.25	4.10	0.80	PUMP 147.2 BBLS OF KCL DISPLACEMENT AT 10 BPM SLOWED RATE AT 130 BBLS AWAY TO 4 BPM.
Event	21	Slow Rate	2/20/2020	10:56:03	USER	2142.00	8.36	4.00	137.50	SLOW RATE TO 4 BPM
Event	22	Bump Plug	2/20/2020	11:00:00	USER	2392.00	8.36	4.00	153.30	BUMP PLUG WENT 500 PSI OVER FINAL CIRCULATING PRESSURE.
Event	23	Check Floats	2/20/2020	11:02:00	USER	3267.00	8.37	0.00	154.40	FLOATS HELD WITH 2 BBLS BACK TO HALLIBURTON PUMP.
Event	24	End Job	2/20/2020	11:04:53	COM4					FULL RETURNS THROUGHOUT JOB.
Event	25	Pre-Rig Down Safety Meeting	2/20/2020	11:10:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF RIGGING DOWN THE EQUIPMENT
Event	26	Rig-Down Equipment	2/20/2020	11:15:00	USER					
Event	27	Pre-Convoy Safety Meeting	2/20/2020	11:55:00	USER					HALLIBURTON CEMENT CREW DISCUSSED THE HAZARDS OF DRIVING
Event	28	Crew Leave Location	2/20/2020	12:00:00	USER					
Event	29	Job Complete	2/20/2020	12:00:01	USER					NO ACCIDENTS, NO INCIDENTS. THANKS FROM THE ROCK SPRINGS HALLIBURTON CEMENT CREW

3.0 Attachments

3.1 CHART WITHOUT EVENTS.png



3.2 CHART WITH EVENTS.png

