

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS

For: H&P 318

RWF 443-11 Surface

API # 05-045-24281

Job Date: Thursday, December 26, 2019

Sincerely,

Rock Springs Engineering

Legal Notice

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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	12/26/19	17:00	MST
On Location	12/26/19	23:00	MST
Job Started	12/27/19	02:00	MST
Job Completed	12/27/19	03:00	MST
Departed Location	12/27/19	04:30	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	29
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	WBM
3	Actual mud density	lb/gal	9.3
4	Time circulated before job	HH:MM	1:00
5	Mud volume circulated	Bbls	600
6	Rate at which well was circulated	Bpm	10
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	140
9	Time from end mud circulation to start of job	HH:MM	0:05
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	77.3
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	15
16	Units of gas detected while circulating	Units	0
17	Was lost circulation experienced at any time ?	Y/N	N

1.3 Water Analysis Report

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	67	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

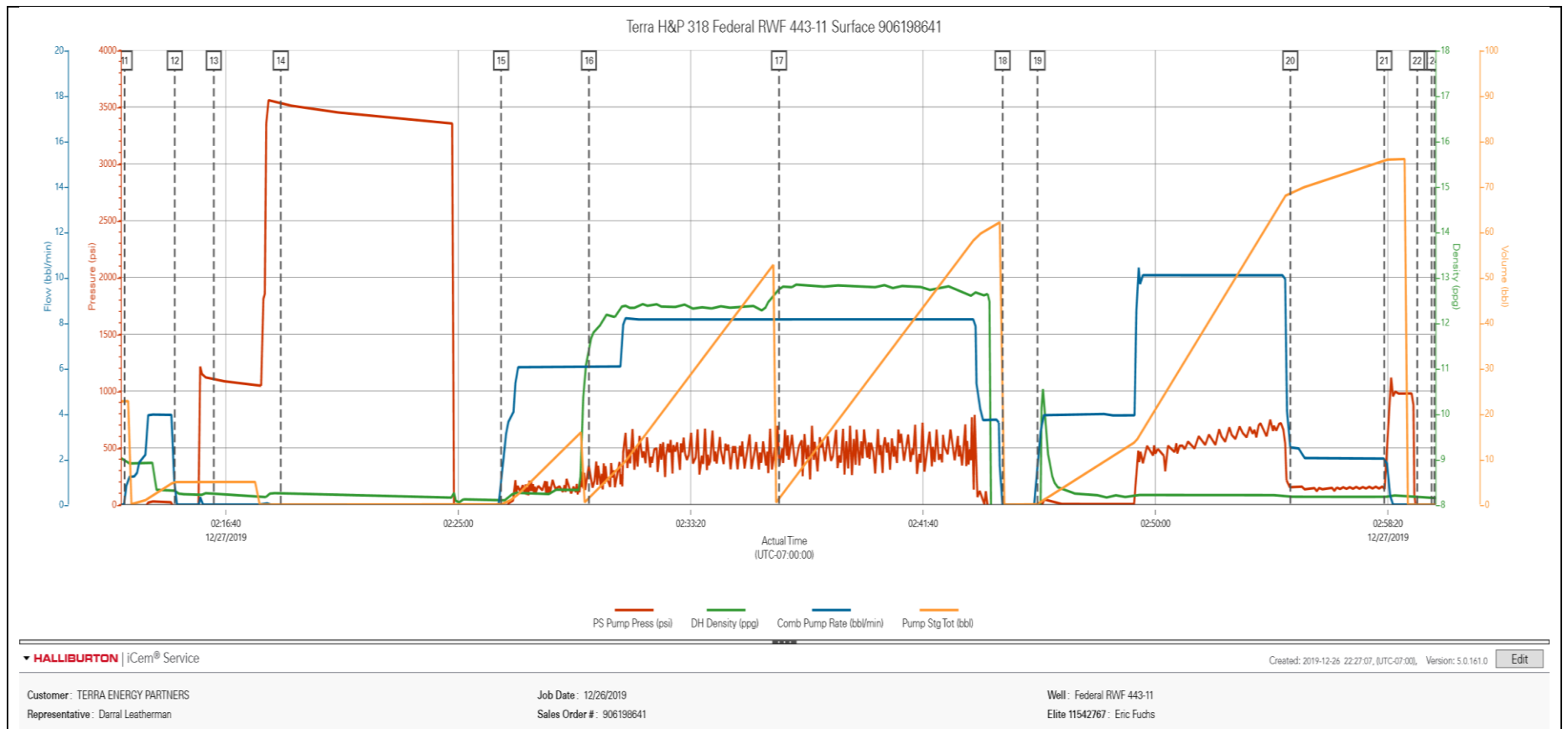
2.1 Job Event Log

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	12/26/2019	17:00:00	USER					Crew requested on location at 23:00 on 12/26/2019
Event	2	Pre-Convoy Safety Meeting	12/26/2019	21:00:00	USER					Talked with HES crew about the hazards of driving to location.
Event	3	Depart from Service Center or Other Site	12/26/2019	21:20:00	USER					Crew departs for location.
Event	4	Arrive At Loc	12/26/2019	21:45:00	USER					Well Info: TD_ 1045.3 Total Pipe_ 1045.3' of 9 5/8" 30 lb/ft Shoe Track_ 44.5' Previous Casing_ 108' of 18" ID conductor casing Open Hole_ 13 1/2 Well fluid_ 9.3 lb/gal WBM
Event	5	Assessment Of Location Safety Meeting	12/26/2019	22:00:00	USER					talked with HES crew about the hazards of spotting in equipment,
Event	6	Pre-Rig Up Safety Meeting	12/26/2019	22:05:00	USER					Talked with HES crew about the hazards of rigging up Bulk, Water and Iron lines.
Event	7	Rig-Up Equipment	12/26/2019	22:15:00	USER					Rig-up Equipment and check mud scales on 8.33 lb/gal water.
Event	8	Casing on Bottom	12/27/2019	01:30:00	USER					Rig circulated at 10 bpm with 140 psi, no losses, and no gas.
Event	9	Pre-Job Safety Meeting	12/27/2019	01:45:00	USER					We talked with HES and rig crews about the hazards of rigging up the floor, and pumping the job.
Event	10	Rig-Up Completed	12/27/2019	02:10:00	USER					Rig-up completed
Event	11	Start Job	12/27/2019	02:13:02	USER	-68.76	8.95	0.00	22.68	Start job, pump 5 bbls water ahead ti fill lines
Event	12	Shutdown	12/27/2019	02:14:50	USER	-72.53	8.31	0.00	4.97	Shutdown to line out valves for pressure test.
Event	13	Pressure Test	12/27/2019	02:16:14	USER	1101.28	8.24	0.00	4.98	Low pressure kick out test to 500 psi.

Event	14	Pressure Test	12/27/2019	02:18:38	USER	3528.09	8.25	0.00	0.01	Pressure test HES iron to 3500 psi. Good test no leaks.
Event	15	Pump Water	12/27/2019	02:26:32	USER	-76.31	8.08	1.15	0.04	Pump 20 bbls water spacer at 6 bpm.
Event	16	Pump Lead Cement	12/27/2019	02:29:41	USER	344.19	11.44	6.06	1.41	Mix and pump 125 sacks of VariCem RS1 lead cement at 12.3 lb/gal 2.38 cuft/sack and 13.74 gals/sack at 8 bpm.
Event	17	Pump Tail Cement	12/27/2019	02:36:30	USER	343.25	12.75	8.14	1.43	Mix and pump 150 sacks of VariCem RS1 tail cement at 12.8 lb/gal 2.11 cuft/sack and 11.74 gals/sack at 8 bpm.
Event	18	Shutdown	12/27/2019	02:44:31	USER	-87.62	0.37	0.00	0.00	Shutdown/ drop top plug.
Event	19	Pump Displacement	12/27/2019	02:45:46	USER	-84.79	0.03	1.64	0.11	Pump 77.3 bbls Displacement at 10 bpm.
Event	20	Slow Rate	12/27/2019	02:54:50	USER	176.37	8.17	2.47	68.70	Slow rate last 10 bbls.
Event	21	Bump Plug	12/27/2019	02:58:12	USER	136.77	8.17	2.04	75.74	Bring pressure to 500 psi over FCP of 450 psi.
Event	22	Check Floats	12/27/2019	02:59:23	USER	-87.62	8.15	0.00	0.00	Floats held with .5 bbls back to the truck.
Event	23	End Job	12/27/2019	02:59:54	USER	-97.05	8.14	0.00	0.00	End Job
Event	24	Pre-Rig Down Safety Meeting	12/27/2019	03:00:00	USER					Talked with HES and rig crews about the hazards of rigging down water, bulk, iron, and the floor.
Event	25	Rig-Down Equipment	12/27/2019	03:05:00	USER					Start rigging down.
Event	26	Rig-Down Completed	12/27/2019	04:00:00	USER					Finish rigging down.
Event	27	Pre-Convoy Safety Meeting	12/27/2019	04:15:00	USER					Talked with HES crew about the hazards of driving off location.
Event	28	Crew Leave Location	12/27/2019	04:20:00	USER					HES crew left location.
Event	29	Job Complete	12/27/2019	04:30:00	USER					This job was completed safely by Jason Ertl and Crew. 15 bbls cement to surface. Est top of tail cement at 438'. Thanks for choosing Halliburton Cementing.

3.0 Attachments

3.1 Terra H&P 318 Federal RWF 443-11 Surface.png



3.2 Terra H&P 318 Federal RWF 443-11 Surface .png

