

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS-EBUS

For: H&P 318

Date: Wednesday, January 01, 2020

RWF 22-12 Surface

API# 05-045-24279

Job Date: Wednesday, January 01, 2020

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	01/01/2020	05:00	MST
On Location	01/01/2020	10:00	MST
Job Started	01/01/2020	13:00	MST
Job Complete	01/01/2020	14:00	MST
Depart Location	01/01/2020	15:00	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	30
2	Mud type (OBM, WBM, SBM, Water, Brine)	lb/gal	WBM
3	Actual mud density	lb/gal	9.6
4	Time circulated before job	HH:MM	0:30
5	Mud volume circulated	Bbls	300
6	Rate at which well was circulated	Bpm	10
7	Pipe movement during hole circulation	Y/N	N
8	Rig pressure while circulating	Psi	200
9	Time from end mud circulation to start of job	HH:MM	0:10
10	Pipe movement during cementing	Y/N	N
11	Calculated displacement	Bbls	77.5
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	10
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	62	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

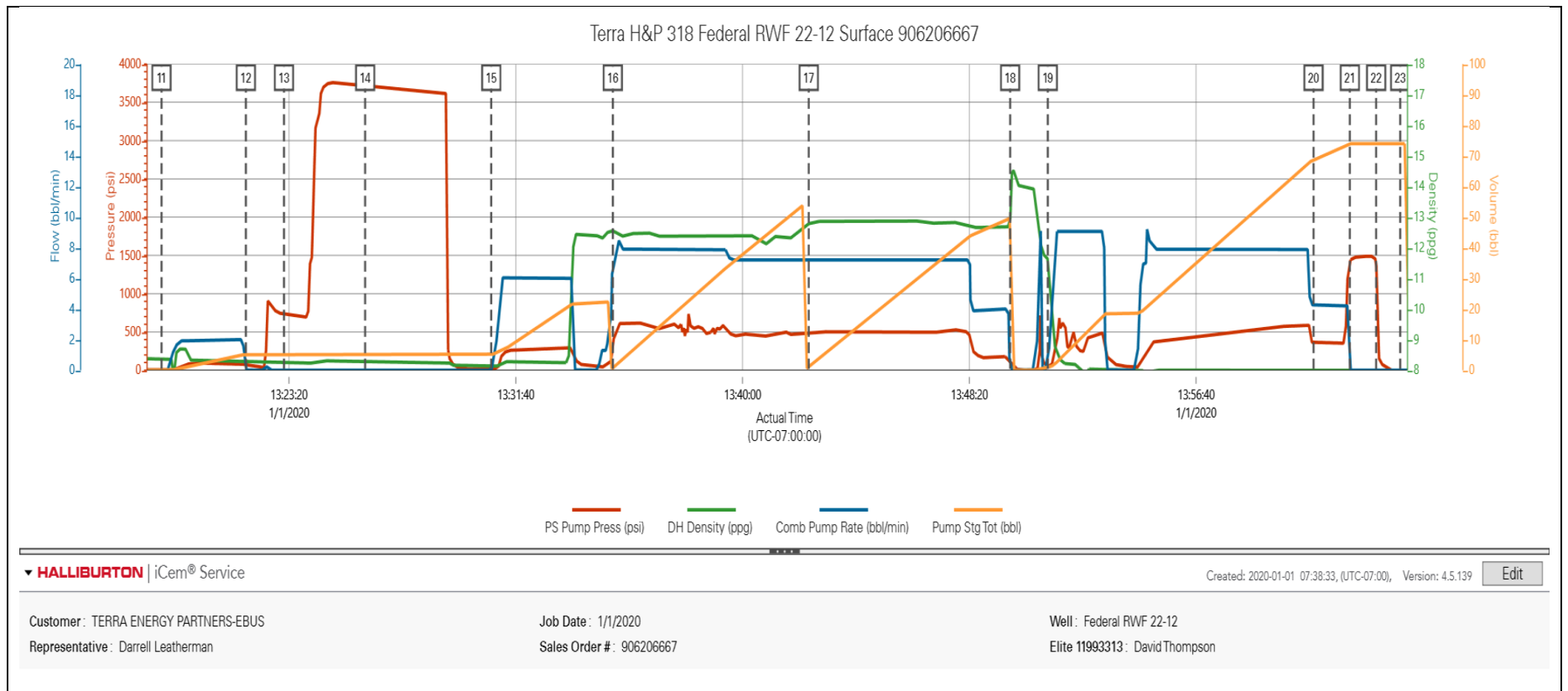
2.1 Job Event Log

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	1/1/2020	05:00:00	USER					Crew requested on location at 10:00 on 01/01/2020
Event	2	Pre-Convoy Safety Meeting	1/1/2020	07:50:00	USER					Talked with HES crew about the hazards of driving to location.
Event	3	Depart from Service Center or Other Site	1/1/2020	08:00:00	USER					Crew departs for location.
Event	4	Arrive At Loc	1/1/2020	08:30:00	USER					Well Info: TD_ 1052' Total Pipe_1045.97' 9 5/8" 36 lb/ft Shoe Track_43.13 Previous Casing_ 108' of 18" ID Open Hole_ 13.5" Well fluid_ 9.6 lb/gal WBM
Event	5	Assessment Of Location Safety Meeting	1/1/2020	08:40:00	USER					Talked with HES crew about the hazards of spotting in equipment on location.
Event	6	Pre-Rig Up Safety Meeting	1/1/2020	08:45:00	USER					Talked with HES crew about the hazards of rigging up Bulk, Water and Iron lines.
Event	7	Rig-Up Equipment	1/1/2020	08:50:00	USER					Rig-up Equipment and check mud scales on 8.33 lb/gal water.
Event	8	Casing on Bottom	1/1/2020	12:30:00	USER					Rig circulated at 10 bpm with 200 psi no losses and no gas.
Event	9	Pre-Job Safety Meeting	1/1/2020	12:45:00	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	1/1/2020	13:00:00	USER					Rig-up completed
Event	11	Start Job	1/1/2020	13:18:39	COM4	0.00	8.38	0.00	0.00	start job, pump 5 bbls water ahead to fill lines
Event	12	Shutdown	1/1/2020	13:21:45	USER	66.00	8.31	0.00	5.10	Shutdown to line out valves for pressure test.
Event	13	Pressure Test	1/1/2020	13:23:09	USER	729.00	8.27	0.00	5.20	Low pressure kick out test to 500 psi.

Event	14	Pressure Test	1/1/2020	13:26:08	USER	3707.00	8.26	0.00	5.20	Pressure test HES iron to 3500 psi.
Event	15	Pump Water	1/1/2020	13:30:46	USER	13.00	8.14	0.00	5.20	Pump 15 bbls water spacer at 6 bpm.
Event	16	Pump Lead Cement	1/1/2020	13:35:14	USER	372.00	12.57	7.00	0.70	Mix and pump 125 sacks of VariCem RS1 Lead cement at 12.3lb/gal 2.38 cuft/sack and 13.74 gals/sack at 8 bpm.
Event	17	Pump Tail Cement	1/1/2020	13:42:26	USER	502.00	12.79	7.20	1.20	Mix and pump 150 sacks of VariCem RS1 Tail cement at 12.8lb/gal 2.11 cuft/sack and 11.74 gals/sack at 8 bpm.
Event	18	Shutdown	1/1/2020	13:49:50	USER	101.00	12.97	0.00	49.60	Shutdown / Drop top plug.
Event	19	Pump Displacement	1/1/2020	13:51:13	USER	43.00	11.54	1.30	1.00	Pump 77.4 bbls water displacement at 10 bpm.
Event	20	Slow Rate	1/1/2020	14:00:59	USER	355.00	7.98	4.30	68.70	Slow rate last 10 bbls to 4 bpm.
Event	21	Bump Plug	1/1/2020	14:02:19	USER	1439.00	8.00	0.00	74.00	Bump plug 500 psi over FCP of 500.
Event	22	Check Floats	1/1/2020	14:03:17	USER	1361.00	7.99	0.00	74.00	Floats held with 1 bbl back.
Event	23	End Job	1/1/2020	14:04:10	COM4					End job.
Event	24	Pre-Rig Down Safety Meeting	1/1/2020	14:10:00	USER					Talked with HES and rig crews about the hazards of rigging down the floor, water, bulk, and iron lines.
Event	25	Rig-Down Equipment	1/1/2020	14:15:00	USER					Start rigging down
Event	26	Rig-Down Completed	1/1/2020	15:15:00	USER					Rig-down completed
Event	27	Pre-Convoy Safety Meeting	1/1/2020	15:20:00	USER					Talked with HES crew about the hazards of drivving off location.
Event	28	Crew Leave Location	1/1/2020	15:25:00	USER					HES crew left location.
Event	29	Job Complete	1/1/2020	15:30:00	USER					This job was completed safely by Jason Ertl and Crew. Est. top of Tail Cement at 436'. Thanks for choosing Halliburton Cementing.

3.0 Attachments

3.1 Terra H&P 318 Federal RWF 22-12 Surface 906206667.png



3.2 Terra H&P 318 Federal RWF 22-12 Surface 906206667.png

