

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS

United States of America, COLORADO

For:

Date: Monday, December 09, 2019

RWF 423-12

4 ½" Production Casing

Post Job Report

Job Date: Monday, December 09, 2019

Sincerely,

Steve Dickenson

Legal Notice

Disclaimer:

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Table of Contents

1.0	Cementing Job Summary	4
1.1	Executive Summary	4
1.2	Job Overview	5
1.3	Planned Pump Schedule	5
1.4	Water Analysis Report	6
2.0	Real-Time Job Summary	7
2.1	Job Event Log	7
3.0	Attachments.....	9
3.1	Terra RWF 423-12 Production-Custom Results.png.....	9
3.2	Terra RWF 423-12 Production no-Custom Results (1).png	10

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	12/8/19	1400	MST
On Location	12/8/19	2200	MST
Job Started	12/9/19	0830	MST
Job Complete	12/9/19	1025	MST
Depart Location	12/9/19	1130	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	55
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	0200
5	Mud volume circulated	Bbls	1200
6	Rate at which well was circulated	Bpm	10
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	1280
9	Time from end mud circulation to start of job	HH:MM	0010
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	138
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	6.25
16	Units of gas detected while circulating	Units	13
17	Was lost circulation experienced at any time ?	Y/N	N

1.3 Planned Pump 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	5.00			0.00		0.00
Water	2	8.33	5.00			10.00		2.00
Mud Flush	3	8.40	5.00			20.00		4.00
ThermaCem (2591582/1)	4	13.30	5.00	1.7943	8.498	393.09	1230.00	78.62
Top Plug/Start Displacement								
Water	5-1	8.33	5.00			119.12		23.82
Water	5-2	8.33	1.00			20.00		20.00
Total:						562.21		128.44

*Pump schedule may include additional rows for displacement if "Automatic Rate Adjustment" was enabled and ECDs approached the fracture gradient.

1.4 Water Analysis Report

CEMENT MIX WATER REQUIREMENTS

Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	6	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	101	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	57	°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

2.0 Real-Time Job Summary

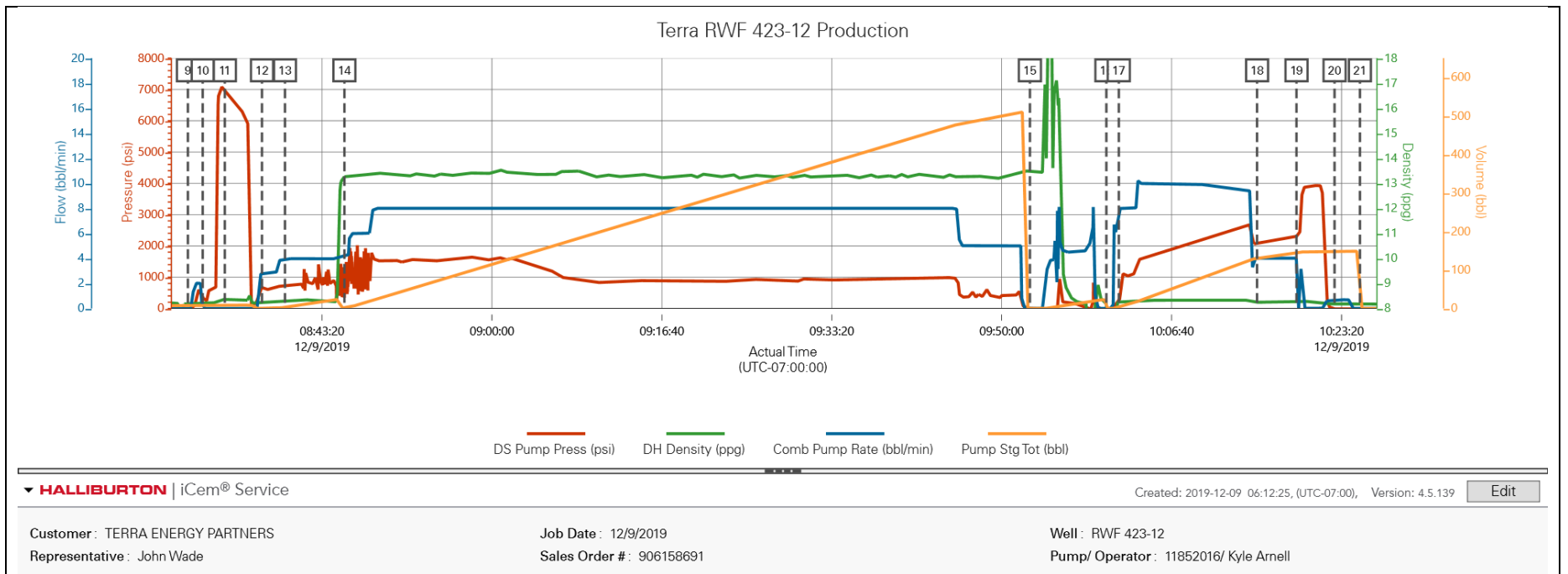
2.1 Job Event Log

Type	Seq. No.	Graph Label	Date	Time	Source	DS Pump Press <i>(psi)</i>	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	12/8/2019	14:00:00	USER					Crew requested on location @ 23:00
Event	2	Pre-Convoy Safety Meeting	12/8/2019	16:50:00	USER					Have a JSA with crew on the hazards of driving to location
Event	3	Crew Leave Yard	12/8/2019	17:00:00	USER					
Event	4	Arrive At Loc	12/8/2019	22:00:00	USER					HD-8937, Casing-4.5 11.6# @8930.75', SJ-29.25' PC- 9.625" 36# @ 1042' Hole 8.75", Mud 12.9#
Event	5	Pre-Rig Up Safety Meeting	12/8/2019	22:15:00	USER					Have a JSA with crew on spotting equipment and rigging up bulk, water, and iron on the ground.
Event	6	Rig-Up Equipment	12/8/2019	22:30:00	USER					
Event	7	Pre-Job Safety Meeting	12/9/2019	07:59:21	USER	1.00	8.29	0.00	0.00	HES has a JSA with rig crew to go over the job and the hazards of rigging up the floor and pumping the job
Event	8	Rig Info	12/9/2019	08:00:14	USER	2.00	8.29	0.00	0.00	Tob-06:00, Rate- 10 bpm, 1280 psi, 13 units of gas, and 0 loses
Event	9	Start Job	12/9/2019	08:30:11	COM7	-4.00	8.21	0.00	7.00	Pump 5 bbl of H2O ahead
Event	10	Pressure Test	12/9/2019	08:31:38	USER	345.00	8.24	0.00	8.70	500 psi low pressure kick out test
Event	11	Pressure Test	12/9/2019	08:33:48	USER	6984.00	8.36	0.00	8.80	Pressure test HES iron to 6984 psi No leaks
Event	12	Pump Water	12/9/2019	08:37:27	USER	660.00	8.25	2.80	1.00	pump 5 bbl of H2O behind
Event	13	Pump Spacer	12/9/2019	08:39:42	USER	735.00	8.29	3.90	3.20	Pump 20 bbl of Mud Flush 4 Bpm
Event	14	Pump Lead Cement	12/9/2019	08:45:32	USER	968.00	13.28	4.30	2.00	Pump 397 bbl (1245 sks) of ThermaCem cement @ 13.3 ppg, 1.79 ft/3, 8.5 gal/sk @ 8 bpm
Event	15	Shutdown	12/9/2019	09:52:46	USER	-3.00	13.47	0.00	0.00	Shutdown/ Wash pumps and lines to the pit
Event	16	Drop Top Plug	12/9/2019	10:00:16	USER	-25.00	8.18	0.00	0.00	Drop top plug witnessed by Co-Man

Event	17	Pump Displacement	12/9/2019	10:01:29	USER	284.00	8.26	8.00	3.40	Pump 138 bbl of H2O displacement @ 10 bpm with 2 gal of MMCR in the first 10 bbl and 3 lbs of BE-6 in the first 30
Event	18	Slow Rate	12/9/2019	10:15:03	USER	2091.00	8.25	4.00	130.10	Slow rate to 4 bpm for the last 10 bbl
Event	19	Bump Plug	12/9/2019	10:18:55	USER	2318.00	8.25	4.00	145.70	Bump plug/ Final circ psi was 2318, brought it up to 3928 psi for 2 min
Event	20	Check Floats	12/9/2019	10:22:39	USER	-14.00	8.18	0.70	147.50	Floats held/ 2 bbl back to the truck
Event	21	End Job	12/9/2019	10:25:08	COM7	-22.00	8.17	0.00	0.00	Full returns throughout entire job. Est top of cement is at 1683 ft
Event	22	Pre-Rig Down Safety Meeting	12/9/2019	10:30:14	USER	-26.00	-0.14	0.00	0.00	JSA with crew on rigging down the equipment and lines
Event	23	Rig Down Equipment	12/9/2019	10:35:31	USER	120.00	8.17	4.30	28.40	
Event	24	Depart Location Safety Meeting	12/9/2019	11:23:39	USER					JSA with the crew on driving back to the yard
Event	25	Crew Leave Location	12/9/2019	11:30:05	USER					Thank you for choosing Halliburton, Steve Dickenson

3.0 Attachments

3.1 Terra RWF 423-12 Production-Custom Results.png



3.2 Terra RWF 423-12 Production no-Custom Results (1).png

