

HALLIBURTON

iCem[®] Service

TERRA ENERGY PARTNERS-EBUS

Rock Springs District, Colorado

For: Garrett Wade

Date: Wednesday, November 27, 2019

RWF 523-12

Garfield, RWF-523-12

Case 1

Job Date: Wednesday, November 27, 2019

Sincerely,

John Keane

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	11-26-2019	08:30	MST
On Location	11-26-2019	19:00	MST
Job Started	11-26-2019	23:00	MST
Job Complete	11-27-2019	01:00	MST
Depart Location	11-27-2019	02:50	MST

1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	22
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	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	1775
9	Time from end mud circulation to start of job	HH:MM	00:20
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	139
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
16	Units of gas detected while circulating	Units	290
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	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
TEP NeoCem Lead (2597231/1)	4	12.50	8.00	2.0160	10.407	186.68	519.92	23.34
TEP NeoCem Tail (2591582/1)	5	13.30	8.00	1.7943	8.498	210.92	660.00	26.37
Top Plug/Start Displacement								
Water	6-1	8.33	10.00			93.85		9.38
Water	6-2	8.33	4.00			46.54		11.64
Total:						568.00		75.72

*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	7.0	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	72	°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	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Pump Stg Tot <i>(bbl)</i>	PS Pump Press <i>(psi)</i>	Comments
Event	1	Job Called In	11/26/2019	08:30:00	USER					REQUESTED ON LOCATION TIME 20:30
Event	2	Safety Meeting	11/26/2019	10:30:00	USER					WITH HES, 1 IRON TRUCK, 1 ELITE CEMENTING UNIT, 1 660 BULK TRUCK
Event	3	Arrive at Rig	11/26/2019	19:00:00	USER					RIG RUNNING CASING, UPON HES ARRIVAL
Event	4	Assessment Of Location Safety Meeting	11/26/2019	19:30:00	USER					WITH HES, JSA COMPLETED, SDS OFFERED FOR ALL HES MATERIALS
Event	5	Safety Meeting - Pre Rig-Up	11/26/2019	20:00:00	USER					WITH HES, JSA COMPLETED
Event	6	Rig-Up Equipment	11/26/2019	20:30:00	USER					1 LINE RAN TO THE FLOOR, 1 LINE RAN TO THE PIT, 1 4.5 IN. HPPC, WASH-UP MANIFOLD ON THE GROUND
Event	7	Other	11/26/2019	21:00:00	USER					TD 9023 FT, TP 9017.3 FT, HOLE 8.75 IN, CSG 4.5 IN 11.6 LB/FT L-80, SHOE 26.13 FT, SURFACE SET AT 10351FT, 9.625 IN 32.3 LB FT L-80
Event	8	Other	11/26/2019	21:40:00	USER					RIG CIRCULATION, 1775 PSI, 10 BBBL/MIN, 600 BBL, PIPE WAS RECIPROCATED, RATE HOLE LENGTH 6 FT, MWT 12.9 LB/GAL WBM
Event	9	Other	11/26/2019	21:45:00	USER					WATER TEST PH 7. CHLOR 0, TEMP 72 DEG F
Event	10	Start Job	11/26/2019	22:37:17	COM8	8.54	0.00	0.00	2.00	
Event	11	Pre-Job Safety Meeting	11/26/2019	22:40:00	USER	8.39	2.00	4.10	383.00	WITH HES, TEP, AND H&P 318
Event	12	Fill Lines	11/26/2019	23:00:00	USER	8.49	0.00	8.50	354.00	PRIMED LINES WITH 5 BBL FRESH WATER
Event	13	Test Lines	11/26/2019	23:05:38	USER	8.26	0.00	8.60	5852.00	LOW TEST AT 1800 PSI, HGH TEST AT 5650 PSI, PRESSURE HOLDING
Event	14	Pump Fresh Water	11/26/2019	23:11:06	USER	8.23	3.00	0.70	346.00	10 BBL FRESH WATER
Event	15	Mud Flush III Spacer	11/26/2019	23:14:07	USER	8.25	3.90	1.50	682.00	USED 80 LBS MUD FLUSH III, 20 BBL
Event	16	Shutdown	11/26/2019	23:20:22	USER	8.24	3.10	23.40	904.00	WATER FITTING ON THE UPRIGHT TANK BROKE. HAD TO SHUTDOWN

Event	17	Pump Lead Cement	11/26/2019	23:29:00	USER	12.93	4.90	4.10	1473.00	MIXED AT 13.0 LB/GAL, 520 SKS, (NEOCEM), 1.80 FT3/SK, 8.80 GAL/SK, DENSITY VERIFEID USING PRESSURIZED MUD SCALES
Event	18	Pump Tail Cement	11/26/2019	23:51:08	USER	13.45	7.60	4.50	969.00	MIXED AT 13.3 LB/GAL, 660 SKS, (NEOCEM), 1.79 FT3/SK, 8.50 GAL/SK, DENSITY VERIFEID USING PRESSURIZED MUD SCALES
Event	19	Shutdown	11/27/2019	00:25:47	USER	13.25	6.00	249.70	611.00	
Event	20	Clean Lines	11/27/2019	00:33:07	USER	13.43	5.70	2.40	50.00	WASHED PUMPS AND LINES TO THE RESERVE PIT
Event	21	Drop Top Plug	11/27/2019	00:36:08	USER	8.47	0.00	16.90	25.00	PLUG LAUNCHED, CUSTOMER WITNESSED
Event	22	Pump Displacement	11/27/2019	00:37:39	USER	8.02	4.10	1.30	198.00	FRESH WATER, KCL, 3 LBS BE-6, 1 GAL MMCR ADDED
Event	23	Slow Rate	11/27/2019	00:53:00	USER	8.19	4.00	132.40	2338.00	SLOWED AT 130 BBL AWAY TO 4 BBL/MIN
Event	24	Bump Plug	11/27/2019	00:53:58	USER	8.17	4.00	136.30	2326.00	PLUG BUMPED AT CALCULATED DISPLACEMENT, 2308 PSI,
Event	25	Check Floats	11/27/2019	00:56:16	USER	8.17	0.00	137.60	3234.00	FLOATS HOLDING, 1 BBL RETURNED TO THE TRUCK
Event	26	End Job	11/27/2019	01:10:00	USER	8.10	2.10	32.30	49.00	GOOD CIRCULATION, RIG USED 1 GAL MMCR, THE TOP PLUG, 3 LBS BE-6, AND 80 LBS MUD FLUSH, USED 10 GAL D-AIR,NO ADD HOURS
Event	27	Pre-Rig Down Safety Meeting	11/27/2019	01:15:00	USER	-0.38	0.00	43.10	10.00	WITH HES
Event	28	Rig Down Lines	11/27/2019	01:30:00	USER					
Event	29	Pre-Convoy Safety Meeting	11/27/2019	02:40:00	USER					WITH HES
Event	30	Comment	11/27/2019	02:50:00	USER					SPACER 20 BBL MUD FLUSH, 10 BBL FRESH WATER, LEAD CEMENT 167 BBL, TAIL CEMENT 210.4 BBL, FINAL DISPLACEMENT 139 BBL, TOP OF TAIL CEMENT 5178 FT, TOP OF LEAD CEMENT 2125.3 FT
Event	31	Crew Leave Location	11/27/2019	03:00:00	USER					THANKS FOR USING HALLIBURTON, JOHN KEANE AND CREW

TEP - RWF 523-12 - Production



Description	Actual Time	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	PS Pump Press (psi)
HALLIBURTON iCem® Service					

Customer: TERRA ENERGY PARTNERS-EBUS Job Date: 11/27/2019 Well: RWF 523-12
 Representative: GARRETT WADE Sales Order #: 906115735 ELITE 11542767 : JOHN KEANE / KEVIN REED