HALLIBURTON

iCem® Service

TERRA ENERGY PARTNERS-EBUS

Rock Springs District, CO

For: H&P 318

Date: Saturday, February 08, 2020

RWF 32-12 Production

GARFIELD, CO
API# 05-045-24282
Job Date: Saturday, February 08, 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	02/07/2020	08:00	MST
On Location	02/07/2020	22:00	MST
Job Started	02/08/2020	01:42	MST
Job Completed	02/08/2020	03:26	MST
Departed Location	02/08/2020	04:30	MST

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1.2 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	35
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	12.9
4	Time circulated before job	HH:MM	01:30
5	Mud volume circulated	Bbls	900
6	Rate at which well was circulated	Bpm	10
7	Pipe movement during hole circulation	Y/N	Y
8	Rig pressure while circulating	Psi	1000
9	Time from end mud circulation to start of job	HH:MM	0:10
10	Pipe movement during cementing	Y/N	Y
11	Calculated displacement	Bbls	138.2
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	0
16	Units of gas detected while circulating	Units	1700
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 (ft³/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	393.09	1230.00	49.14
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			90.00		9.00
Water	7-2	8.33	4.00			20.47		5.12
					Total:	563.56		71.25

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1.4   Water Analysis Report

CEMENT MIX WATER REQUIREMENTS

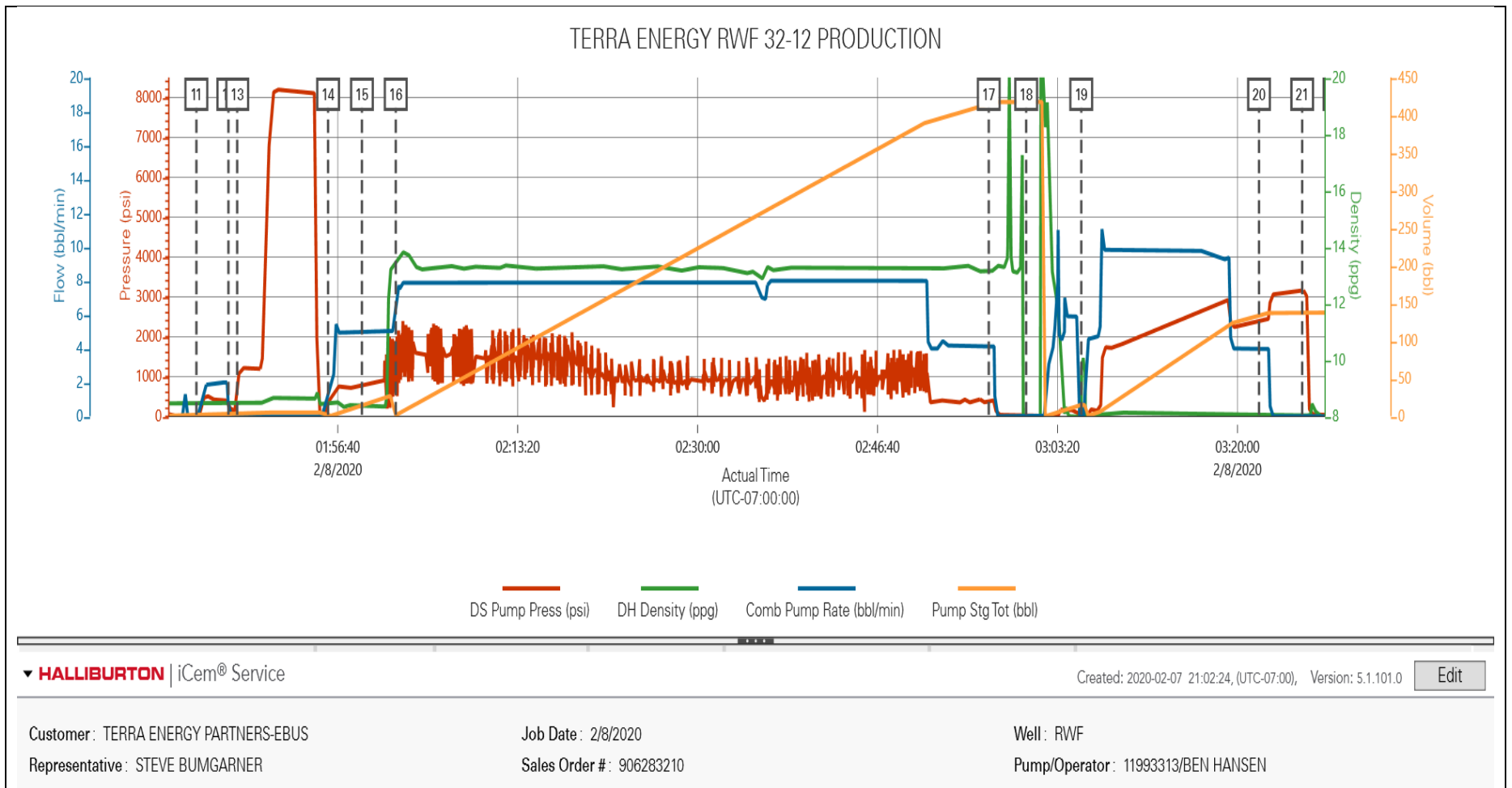| Item	Recorded Test Value	Units	Max. Acceptable Limit	Potential Problems in Exceeding Limit
pH	7	----	6.0 - 8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Temperature	72	ºF	50-80 ºF	High temps will accelerate; Low temps may risk 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 (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	2/7/2020	08:00:00	USER					CALLED OUT TO BE ON LOCATION AT 22:00
Event	2	Pre-Convoy Safety Meeting	2/7/2020	12:45:00	USER					DISCUSS HAZARDS OF TRAVELING TO LOCATION
Event	3	Crew Leave Yard	2/7/2020	13:00:00	USER					
Event	4	Arrive At Loc	2/7/2020	18:30:00	USER					
Event	5	Assessment Of Location Safety Meeting	2/7/2020	18:40:00	USER					DISCUSS HAZARDS OF SPOTTING EQUIPMENT
Event	6	Other	2/7/2020	18:50:00	USER					SPOT HES EQUIPMENT
Event	7	Pre-Rig Up Safety Meeting	2/7/2020	19:00:00	USER					DISCUSS HAZARDS OF RIGGING UP HES EQUIPMENT
Event	8	Rig-Up Equipment	2/7/2020	19:10:00	USER					
Event	9	Rig-Up Completed	2/7/2020	20:30:00	USER					WAIT ON CUSTOMER TO RUN 8948.9' OF 4.5", 11.6LB/FT, P-110 CASING, SJ 31.35', OH 8.75" TO 8948', MW 12.9LB/GAL, PREVIOUS CSG 9.625", 36LB/FT SET AT 1042'
Event	10	Pre-Job Safety Meeting	2/8/2020	01:15:00	USER					DISCUSS HAZARDS AND PROCEDURE WITH CUSTOMER AND RIG CREW
Event	11	Pump Water	2/8/2020	01:43:34	USER	9.00	8.44	0.00	0.20	FILL LINES WITH 5BBLS OF H2O
Event	12	Shutdown	2/8/2020	01:46:32	USER	332.00	8.50	0.00	5.00	LINE-UP HES VALVES TO PRESSURE TEST
Event	13	Pressure Test	2/8/2020	01:47:21	USER	1038.00	8.45	0.00	5.00	500PSI KICKOUT/8000PSI IRON TEST
Event	14	Pump Water	2/8/2020	01:55:46	USER	374.00	8.46	1.00	0.40	PUMP 5BBLS OF H2O
Event	15	Pump Spacer	2/8/2020	01:58:54	USER	754.00	8.37	5.00	14.00	MIX AND PUMP 20BBLS OF MUDFLUSH III AT 5BBLS/MIN

Event	16	Pump Cement	2/8/2020	02:02:02	USER	720.00	13.27	6.60	1.50	MIX AND PUMP 1230SKS THERMACEM AT 13.3LB/GAL, 1.79YLD, 8.5GAL/SK AT 8BBLS/MIN
Event	17	Shutdown	2/8/2020	02:56:58	USER	347.00	13.16	4.20	415.20	WASH PUMPS AND LINES TO THE PIT
Event	18	Drop Plug	2/8/2020	03:00:26	USER	-3.00	-0.46	0.00	417.50	DROPPED HES TOP PLUG, WITNESSED BY THE CUSTOMER
Event	19	Pump Displacement	2/8/2020	03:05:32	USER	23.00	8.89	0.00	15.10	DISPLACE 138.2BBLS OF KCL DISPLACEMENT AT 10BBLS/MIN, FIRST 20BBLS WITH BE6 AND MMCR IN THE FIRST 10BBLS
Event	20	Slow Rate	2/8/2020	03:22:00	USER	2384.00	8.04	4.00	133.80	SLOW RATE TO 4BBLS/MIN FOR THE LAST 20BBLS OF DISPLACEMENT
Event	21	Bump Plug	2/8/2020	03:26:00	USER	3160.00	8.04	0.00	137.90	FINAL CIRCULATING PRESSURE 2600PSI BROUGHT 500PSI OVER FINAL CIRCULATING PRESSURE
Event	22	Check Floats	2/8/2020	03:29:00	USER	51.00	-0.16	0.00	137.90	FLOATS HELD GOT 1.5BBLS BACK TO THE PUMP
Event	23	Pre-Rig Down Safety Meeting	2/8/2020	03:30:00	USER					DISCUSS HAZARDS OF RIGGING DOWN HES IRON AND EQUIPMENT
Event	24	Rig-Down Equipment	2/8/2020	03:40:00	USER					
Event	25	Rig-Down Completed	2/8/2020	04:20:00	USER					
Event	26	Pre-Convoy Safety Meeting	2/8/2020	04:25:00	USER					DISCUSS HAZARDS OF LEAVING LOCATION
Event	27	Crew Leave Location	2/8/2020	04:30:00	USER					NO INJURIES OR SPILLS WHILE ON LOCATION, TOP OF CEMENT 1789', TOP OF MUDFLUSH 1423'. THANK YOU FOR USING HALLIBURTON CEMENT

3.0 Attachments

3.1   TERRA ENERGY RWF 32-12-CHART WITH EVENTS.png

TERRA ENERGY RWF 32-12 PRODUCTION

3.2   TERRA ENERGY RWF 32-12-CHART NO EVENTS.png

TERRA ENERGY RWF 32-12 PRODUCTION

Legend: DS Pump Press (psi) — DH Density (ppg) — Comb Pump Rate (bbl/min) — Pump Stg Tot (bbl)

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Created: 2020-02-07 21:02:24, (UTC-07:00),   Version: 5.1.101.0   Edit

Customer: TERRA ENERGY PARTNERS-EBUS	Job Date: 2/8/2020	Well: RWF
Representative: STEVE BUMGARNER	Sales Order #: 906283210	Pump/Operator: 11993313/BEN HANSEN