

HALLIBURTON

iCem[®] Service

BISON IV OPERATING

Ft. Lupton District, CO

For: Todd Wolff <twolff@bisonog.com>

Date: Thursday, October 24, 2024

Fox Creek

WELD

Fox Creek 12-63-25-24-4N

Job Date: Thursday, October 24, 2024

so 909656406

Sincerely,

Georgii Kamenskii

DISCLAIMER/LIMITATION OF LIABILITY

THERE ARE NO REPRESENTATIONS OR WARRANTIES BY HALLIBURTON, EXPRESS OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR PURPOSE IN CONNECTION WITH THIS REPORT OR THE SOFTWARE USED TO GENERATE IT. CUSTOMER ACKNOWLEDGES THAT IT IS ACCEPTING THE REPORT AND CONTENTS THEREOF "AS IS". IN NO EVENT WILL HALLIBURTON, ITS AFFILIATES OR SUPPLIERS, NOR THEIR RESPECTIVE OFFICERS, DIRECTORS OR EMPLOYEES BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES (INCLUDING, WITHOUT LIMITATION, LOSS OF DATA, PROFITS, BUSINESS, PRODUCTION OR USE OF HARDWARE, OR SOFTWARE), FORESEEABLE OR NOT. CUSTOMER ACCEPTS FULL RESPONSIBILITY FOR ANY INVESTMENT MADE BASED ON RESULTS FROM THE SOFTWARE AND REPORT CONTENTS. ANY INTERPRETATIONS, ANALYSES OR MODELING OF ANY DATA, INCLUDING, BUT NOT LIMITED TO CUSTOMER DATA, AND ANY RECOMMENDATION OR DECISIONS BASED UPON SUCH INTERPRETATIONS, ANALYSES OR MODELING ARE OPINIONS BASED UPON INFERENCES FROM MEASUREMENTS AND EMPIRICAL RELATIONSHIPS AND ASSUMPTIONS, WHICH INFERENCES AND ASSUMPTIONS ARE NOT INFALLIBLE, AND WITH RESPECT TO WHICH PROFESSIONALS IN THE INDUSTRY MAY DIFFER. ACCORDINGLY, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY, CORRECTNESS OR COMPLETENESS OF ANY SUCH INTERPRETATION, RECOMMENDATION, MODELING OR OTHER PRODUCTS OF THE SOFTWARE PRODUCT. AS SUCH, ANY INTERPRETATION, RECOMMENDATION, MODELING OR REPORT RESULTING FROM THE SOFTWARE FOR THE PURPOSE OF ANY DRILLING, WELL TREATMENT, PRODUCTION OR FINANCIAL DECISION WILL BE AT THE SOLE RISK OF CUSTOMER WITH NO RELIANCE BY ANY THIRD PARTY (REGARDLESS OF NEGLIGENCE, BREACH OF CONTRACT OR WARRANTY, OR ANY OTHER CAUSE). SIMULATION AND 3D DISPLACEMENT RESULTS ARE NOT INTENDED AS AND SHOULD NOT BE USED AS A REPLACEMENT FOR BOND LOGS IN DETERMINING TOP OF CEMENT. CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DECISIONS CONCERNING USE OF THE REPORT AND RELATED SERVICES. UNDER NO CIRCUMSTANCES WILL HALLIBURTON, ITS AFFILIATES OR SUPPLIERS NOR THEIR RESPECTIVE OFFICERS, DIRECTORS OR EMPLOYEES BE LIABLE FOR ANY DAMAGES OR LOSS.

Table of Contents

1.0	Cementing Job Summary	4
1.1	Executive Summary	4
1.2	Job Overview	5
1.3	Water Field Test	7
1.4	Actual Pump Schedule.....	7
2.0	Real-Time Job Summary	8
2.1	Job Event Log.....	8
3.0	Attachments.....	11
3.1	Real Time Graphs.....	11

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Fox Creek 12-63-25-24-4N 5.5 CMT Production**. 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.

- **Quality of circulation – Prejob 100% , While pumping Cement 100%, While Pumping Displacement 100%**
- **Final Circulating Pressure 2250PSI and Pump Rate 4BPM**
- **Returns to Surface 57 bbls of CMT**

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 Rockies Cement Team

1.2 Job Overview

Job Details	
API #:	05-123-50373
City, County:	WELD
SO#:	909656406

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	10/23/24	1900
Called Out Time:	10/23/24	1300
Arrived On Location:	10/23/24	1800
Job Started:	10/23/24	2142
Job Completed:	10/24/24	0112
Departed Location:	10/24/24	0240

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	65
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	9
4	Casing set depth (shoe)	ft	19,577
5	TVD	ft	7,600
6	Float collar depth	ft	19,529.36
7	Length of rate hole	ft	30
8	Previous casing shoe depth	ft	1518
9	Pre-job mud circulation time	hh:mm	3:00
10	Pre-job mud circulation rate	bpm	10

11	Pre-job mud circulation volume	bbls	1250
12	Mud circulation pressure at start of cement	psi	500
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	433.5
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	95
18	Fluid returns to surface	Spacer/Cement, bbls	57 CMT
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2250
20	Number of Centralizers	-	360
21	Number of bottom plugs	-	2
22	Number of trucks used preparing/during job	-	12
23	Add hours? If Yes, put #	Y/N and hours	NO
24	NPT? If Yes, put #	Y/N and hours	NO

1.3 Water Field Test

	Recorded Value	Unit	Acceptable Limit	Potential Problems if Values Exceed the Limit
pH	7		6.0 - 8.0	Chemicals in water can cause severe retardation
Temperature	65	F	60 - 80 F	Can can pre-mature setting of cement
Chlorides	500	ppm	3000 ppm	Can shorten thickening time

1.4 Actual Pump Schedule

Stage 1

	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid	11.5	80	2.4	15.2		2844
Cap Cement						
Lead Cement	12.5	420.6	2,01	10.18	1175	11961
Tail Cement	13.2	446.3	1.7	8.12	1475	11977
Top Plug	1					
Displacement Fluid	8.33	433.5				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Graph Label	Date	Time	Comments
1	Call Out	Call Out	10/23/2024	13:00:00	Call out
2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/23/2024	17:00:00	Pre-Convoy Safety Meeting
3	Crew Leave Yard	Crew Leave Yard	10/23/2024	17:10:00	Crew Leave Yard
4	Arrive at Location from Service Center	Arrive at Location from Service Center	10/23/2024	18:30:00	Arrive at Location from Service Center
5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	10/23/2024	18:40:00	Pre-Rig Up Safety Meeting, Be aware of your surroundings, Use two spotters one in front and one in back of vehicle, Utilize hearing protection, Have good communication and make sure Line of Fire is clear before swinging hammer Identify points were hand/finger can get crushed
6	Rig-Up Equipment	Rig-Up Equipment	10/23/2024	18:50:00	Rig Up equipment as far as possible, Rig running casing
7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	10/23/2024	21:18:19	Safety Meeting-Pre job, Eyes on task Use impact gloves Have good communication to identify pinch points between steel hoses, iron and drill pipe and while making up the hammer unions. Identify points were hand/finger can get crushed
8	Start Job	Start Job	10/23/2024	21:40:43	Start of cement job.

9	Test Lines	Test Lines	10/23/2024	21:41:02	Filled Hes lines and pressure tested lines to 6500PSI.
10	Drop Bottom Plug	Drop Bottom Plug	10/23/2024	21:42:00	Dropped bottom plug with customer.
11	Pump Spacer 1	Pump Spacer 1	10/23/2024	21:46:36	Pumped 80BBLS of 11.5PPG Tuned Prime Spacer. Pumped at a rate of 8BPM with a pressure of 500PSI.
12	Drop Bottom Plug	Drop Bottom Plug	10/23/2024	22:04:43	Dropped 2nd bottom plug with customer.
13	Pump Lead Cement	Pump Lead Cement	10/23/2024	22:08:51	Pumped 1175s / 420.6BBLS of 12.5PPG Elasticem Lead cement. Pumped at a rate of 8BPM with a pressure of 650PSI. Pre job calculated 57.7BBLS of lead to surface.
14	Pump Tail Cement	Pump Tail Cement	10/23/2024	23:02:55	Pumped 1475s / 446.5BBLS of 13.2PPG Neocem Tail cement. Pumped at a rate of 8BPM with a pressure of 850PSI. Pre job calculated TOT cement was at 8,631.29FT.
15	Drop Top Plug	Drop Top Plug	10/24/2024	00:17:03	Dropped Top plug with Mark.
16	Pump Displacement	Pump Displacement	10/24/2024	00:17:08	Pumped 433.5BBLS of fresh water displacement. Added 20G BE-9, 10 MC MX throughout. Put 10G of MMCR to first 20BBLS.
17	Bump Plug	Bump Plug	10/24/2024	01:08:12	BUMPED PLUG. 2250 FCP. 2750BPM pressure. 57 BBLS of cement to surface. 4BBLS back after checking floats. Floats held.
18	End Job	End Job	10/24/2024	01:11:07	END OF JOB. 57BBLS of cement to surface.
19	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	10/24/2024	01:45:00	Pre-Rig Down Safety Meeting
20	Rig-Down Equipment	Rig-Down Equipment	10/24/2024	01:55:00	Rig-Down Equipment
21	Depart Location Safety Meeting	Depart Location Safety Meeting	10/24/2024	02:20:00	Depart Location Safety Meeting, Verify all equipment has been thoroughly pre-tripped. All safety and quality issues should be resolved before proceeding.

22	Crew Leave Location	Crew Leave Location	10/24/2024	02:30:00	Crew leave loaction
----	---------------------	---------------------	------------	----------	---------------------

3.0 Attachments

3.1 Real Time Graphs

