HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, CO

Foose State A17-656 Production

Job Date: Wednesday, November 15, 2023

Sincerely,

Meghan Van Zyl

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Foose State A17-656 - 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.

Job was pumped per design with an average cement density of 13.16 ppg at 6.3 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 383 bbl. of treated freshwater displacement. Plug was landed at 2411 psi and pressured up to 2,950 psi. Approximately 54 bbl. of spacer was returned to surface indicating a top of cement around 832'.

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 #:	05-123-52159
City, County:	WELD, Greeley

Job Times		
	Date (mm/dd/yyyy)	**Time (hh:mm)**
Requested Time On Location:	11/15/2023	14:00
Called Out Time:	11/15/2023	8:00
Arrived On Location:	11/15/2023	13:00
Job Started:	11/15/2023	16:38
Job Completed:	11/15/2023	22:00
Departed Location:	11/15/2023	23:30

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	70
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.5
4	Casing set depth (shoe)	ft	17,435.8
5	TVD	ft	6,850
6	Float collar depth	ft	17,428.8
7	Length of rate hole	ft	15FT
8	Previous casing shoe depth	ft	1,912
9	Pre-job mud circulation time	hh:mm	2:00
10	Pre-job mud circulation rate	bpm	10
11	Pre-job mud circulation volume	bbls	750

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	N
15	Calculated displacement	bbls	403.34
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	95
18	Fluid returns to surface	Spacer/Cement, bbls	54 SPACER
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2411
20	Number of Centralizers	-	
21	Number of bottom plugs	-	2

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	1200	ppm	3000 ppm	Can shorten thickening time

1.4 Actual Pump Schedule

	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid	12	120	2.29	14.04		4130
Cap Cement	13.2	39.64	1.59	7.98	140	1117
Lead Cement	13.2	220.256	1.66	7.82	745	5825
Tail Cement	13.2	417.523	1.98	9.51	1184	11259
Top Plug	1					
Displacement Fluid	8.33	403				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Call Out	11/15/2023	08:00:00	Call out
2	Pre-Rig Down Safety Meeting	11/15/2023	11:30:00	Pre-Rig Down Safety Meeting
3	Rig-Down Equipment	11/15/2023	11:35:00	Rig-Down Equipment
4	Depart Location Safety Meeting	11/15/2023	11:45:00	Depart Location Safety Meeting, Verify all equipment has been thoroughly pre-tripped. All safety and quality issues should be resolved before proceeding.
5	Crew Leave Location	11/15/2023	11:55:00	Crew leave location
6	Pre-Convoy Safety Meeting	11/15/2023	12:00:00	Pre-Convoy Safety Meeting
7	Crew Leave Yard	11/15/2023	12:05:00	Crew Leave Yard
8	Arrive at Location from Service Center	11/15/2023	13:00:00	Arrive at Location from Service Center
9	Pre-Rig Up Safety Meeting	11/15/2023	13:10:00	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
10	Rig-Up Equipment	11/15/2023	13:15:00	Rig Up equipment as far as possible, Rig running casing

11	Safety Meeting - Pre Job	11/15/2023	16:00:00	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
12	Start Job	11/15/2023	16:38:47	Begin Recording.
13	Test Lines	11/15/2023	16:41:33	Sent bbls of fresh water ahead. Pressure tested HES lines to 6500PSI. Tested rig's IBOP valve to 1800Psi.
14	Drop Bottom Plug	11/15/2023	16:55:50	Dropped Bottom plug with John Drahota.
15	Pump Spacer 1	11/15/2023	16:58:03	Pumped 120Bbls of 12PPG Tuned Prime Spacer. Pumped at a rate of 5.5BPM with a pressure of 530PSI. Pre job calculated 72.191BBLs of spacer to surface.
16	Drop Bottom Plug	11/15/2023	17:25:44	Dropped Bottom plug with John.
17	Pump Cap Cement	11/15/2023	17:27:25	Pumped 140S / 39.645B of 13.2PPG Econocem Cap cement. Pumped at a rate of 4Bpm with a pressure of 350PSI. Pre job TOC cement was at 832.615FT.
18	Check Weight	11/15/2023	17:39:10	Checked weight with Pressurized mud scales.
19	Pump Lead Cement	11/15/2023	17:40:56	Pumped 745S / 220.25Bbls of 13.2PPG Elasticem Lead Cement. Pumped at a rate of 8BPM with a pressure of 780PSI. Pre job calculated TOL cement was at 1804.183FT.
20	Check Weight	11/15/2023	17:50:15	Checked weight with pressurized mud scales.
21	Pump Tail Cement	11/15/2023	18:17:36	Pumped 1184S / 417.5Bbls of Neocem Tail cement. Pumped at a rate of 7.3BPM with a pressure of 1400PSI. Pre job calculated TOT cement was at 7,202.467Ft.
22	Check Weight	11/15/2023	18:21:53	Checked weight with pressurized mud scales.
23	Shutdown	11/15/2023	19:29:11	Shutdown to Wash pumps and lines. Washed up with 20Bbls of freshwater.
24	Pump Displacement	11/15/2023	19:46:31	Pumped 404BBLs of freshwater displacement. Added 10 Gallons of MMCR the first 20Bbls. Added 20 Gallons of Bellacide, 10 Gallons of MXMC corrosion inhibitor throughout remaining Displacement.

25	Bump Plug	11/15/2023	20:41:55	Bumped plug. 500Psi of FCP. FCP = 2411PSI. BMP = 2950PSI.
26	Other	11/15/2023	20:46:51	Checked Floats. Floats held. 7BBls back to truck.
27	Other	11/15/2023	20:49:40	Pressured up well to burst and pump a 4BBL wet shoe. Pressure increased and leveled out at 2450PSI.
28	Other	11/15/2023	21:00:21	Check floats again. 4Bbls back. At this point we did a 30 minute inflow test.
29	Other	11/15/2023	21:28:40	Half of a bbls back to truck during 30 minute test.
30	End Job	11/15/2023	21:31:34	END JOB. END RECORDING. 54 BBLS of Spacer to surface.

3.0 Attachments

3.1 Real Time iCem Job Chart