HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Foose State A17-618 Production
Job Date: Tuesday, October 31, 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 A17-618 – 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 13.28 ppg at 7.89 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 391 bbl. of treated freshwater displacement. Plug was landed at 2,450 psi and pressured up to 3,000 psi. Approximately 65 bbl. of spacer was returned to surface indicating a top of cement around 881'.

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 #:	05-123-52163
City, County:	GREELEY, WELD
SO#:	908946076

Job Times		
	Date (mm/dd/yyyy)	**Time (hh:mm)**
Requested Time On Location:	10/30/23	19:30
Called Out Time:	10/30/23	13:30
Arrived On Location:	10/30/23	18:30
Job Started:	10/30/23	23:30
Job Completed:	10/31/23	4:00
Departed Location:	10/31/23	4:50

	Description	**Units**	**Value**
1	Surface temperature at the time of the job	degree F	20
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.7
4	Casing set depth (shoe)	ft	17739
5	TVD	ft	6854
6	Float collar depth	ft	17736.1
7	Length of rate hole	ft	12
8	Previous casing shoe depth	ft	1913
9	Pre-job mud circulation time	hh:mm	2:00
10	Pre-job mud circulation rate	bpm	11.5

11	Pre-job mud circulation volume	bbls	1380
12	Mud circulation pressure at start of cement	psi	1477
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	411.5
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	SPACER/65 BBLS
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2450 PSI @ 2 BPM
20	Number of Centralizers	-	214
21	Number of bottom plugs	-	2
22	Number of trucks used preparing/during job	-	2
23	Add hours? If Yes, put #	Y/N and hours	N
24	NPT? If Yes, put #	Y/N and hours	N

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	69	F	60 - 80 F	Can can pre-mature setting of cement
Chlorides	0	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	295	4148
Cap Cement	13.2	39	1.56	7.79	140	1092
Lead Cement	13.2	225.4	1.65	7.82	767	6006
Tail Cement	13.2	426	1.98	9.51	1208	11487
Top Plug						
Displacement Fluid	8.4	411.5				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Summit Crew Notified Date/Time	10/30/2023	13:00:53	Crew called out for CHEVRON Production
2	Pre-Convoy Safety Meeting	10/30/2023	17:15:54	Discussed route and possible hazards
3	Depart Location for Service Center or Other Site	10/30/2023	17:30:55	Depart yard w/ 1 pump, 1 660, 1 pickup and 3 personnel.
4	Arrive at Location from Service Center	10/30/2023	18:30:56	Requested on location @ 1930
5	Safety Meeting - Assessment of Location	10/30/2023	18:40:57	Discussed location and possible hazards. Water test: Temp - 60, Chlorides - 0, PH - 6, Sulfates - <200. 8 1/2 TD @ 17755'. Production casing set @ 17739'. 5.5" 17# P110 - ST - 7' .0232 bbl/ft. CSG/OH - .0408 bbl/ft. CSG/CSG - .0479 bbl/ft 9 5/8" 36# J55 set @ 1913'. Mud Weight - 10.7ppg
6	Safety Meeting - Pre Rig-Up	10/30/2023	18:50:06	Discussed rig up and possible hazards.
7	Rig-up Lines	10/30/2023	19:00:08	Rig up equipment
8	Casing on Bottom	10/30/2023	21:00:28	
9	Circulate Well	10/30/2023	21:30:31	Rig circulating well 11.5 bpm @ 1477 psi
10	Safety Meeting - Pre Job	10/30/2023	23:15:31	Discussed job and possible hazards with everyone on location.
11	Start Job	10/30/2023	23:45:25	
12	Pump Spacer 1	10/30/2023	23:45:32	Pumped 3 bbls of FW
13	Pressure Test	10/30/2023	23:48:33	Test lines to 6500 psi. Test IBOP to 1850 psi

14	Check Weight	10/30/2023	23:54:51	
15	Drop Bottom Plug	10/31/2023	00:03:53	
16	Pump Spacer 1	10/31/2023	00:04:02	Pumped 120 bbls of 12 ppg of Tuned Spacer. 2.29 cuft/sk and 14.04 gal/sk. Verified weight with pressurized mud scales.
17	Drop Bottom Plug	10/31/2023	00:24:47	
18	Check Weight	10/31/2023	00:26:09	
19	Pump Lead Cement	10/31/2023	00:27:54	Pumped 39 bbls of 13.2 ppg Elasticem. 140 sks, 1.56 cuft/sk, and 7.79 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 881.68'
20	Pump Lead Cement	10/31/2023	00:34:21	Pumped 225.4 bbls of 13.2 ppg Isobond cmt. 767 sks, 1.65 cuft/sk, and 7.82 gal/sk. Verifed weight with pressurized mud scales. Estimated TOC @ 1695.88'
21	Check Weight	10/31/2023	00:43:21	
22	Pump Tail Cement	10/31/2023	01:00:38	Pumped 426 bbls of 13.2 ppg Elasticem. 1208 sks, 1.98 cuft/sk, and 9.51 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 7179.42'
23	Check Weight	10/31/2023	01:13:04	
24	Shutdown	10/31/2023	02:00:49	
25	Drop Top Plug	10/31/2023	02:17:13	3rd party rupture plug
26	Pump Displacement	10/31/2023	02:17:27	Pumped 411.5 bbls of displacement. First 20 bbl w/ MMCR and 391.5 bblsw/ MX 820-6 & BELLACIDE
27	Bump Plug	10/31/2023	03:06:36	Bump plug from 2450 - 3000 psi
28	Check Floats	10/31/2023	03:12:56	Floats are good. Got 5.5 bbls back.
29	Bump Plug	10/31/2023	03:18:42	Bump plug to rupture. Plug rupture @ 2621 psi
30	Other	10/31/2023	03:21:50	Pumped 4 bbls and shutdown.

31	Release Casing Pressure	10/31/2023	03:23:16	Release pressure and monitor for 30 minutes. Got 4.5 bbls back. Got 1/2 bbl back during influx monitor.
32	End Job	10/31/2023	03:54:10	Got 65 bbls of Tuned Spacer back to surface.
33	Pre-Rig Down Safety Meeting	10/31/2023	04:15:29	
34	Rig-Down Equipment	10/31/2023	04:30:07	
35	Depart Location Safety Meeting	10/31/2023	04:55:09	
36	Depart Location	10/31/2023	05:00:11	Thank you for using Halliburton cement. Andrew Glover and crew.

3.0 Attachments

3.1 Real Time iCem Job Chart