

# HALLIBURTON

iCem<sup>®</sup> Service

## **NOBLE ENERGY INC-EBUS**

**Foose State A17-637 Production**

Job Date: Wednesday, November 08, 2023

Sincerely,

**Meghan Van Zyl**

## Legal Notice

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## 1.0 Cementing Job Summary

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### 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **Foose State A17-637 - 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 13.19 ppg at 6.47 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 384 bbl. of treated freshwater displacement. Plug was landed at 2,400 psi and pressured up to 3,000 psi. Approximately 80 bbl. of spacer was returned to surface indicating a top of cement around 848'.

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 #:	05-123-52161
City, County:	GREELEY, WELD
SO#:	908963857

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	11/7/23	18:00
Called Out Time:	11/7/23	12:00
Arrived On Location:	11/7/23	17:15
Job Started:	11/7/23	20:00
Job Completed:	11/8/23	1:30
Departed Location:	11/8/23	3:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	32
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.4H
4	Casing set depth (shoe)	ft	17409.6
5	TVD	ft	6856
6	Float collar depth	ft	17402.6
7	Length of rate hole	ft	12
8	Previous casing shoe depth	ft	1905
9	Pre-job mud circulation time	hh:mm	2:00
10	Pre-job mud circulation rate	bpm	10.5

11	Pre-job mud circulation volume	bbls	1260
12	Mud circulation pressure at start of cement	psi	1500
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	403.7
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	SPACER,80 BBLS
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2400 PSI @ 2 BPM
20	Number of Centralizers	-	210
21	Number of bottom plugs	-	2
22	Number of trucks used preparing/during job	-	3
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
<b>pH</b>	6		6.0 - 8.0	Chemicals in water can cause severe retardation
<b>Temperature</b>	75	F	60 - 80 F	Can can pre-mature setting of cement
<b>Chlorides</b>	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)
<b>Spacer Fluid</b>	12	120	2.29	14.04		4158
<b>Cap Cement</b>	13.2	39.6	1.56	7.79	140	1118
<b>Lead Cement</b>	13.2	217	1.66	7.82	734	5737
<b>Tail Cement</b>	13.2	421.4	1.98	9.51	1195	11365
<b>Top Plug</b>						
<b>Displacement Fluid</b>	8.4	403.7				

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Summit Crew Notified Date/Time	11/7/2023	12:00:19	Crew called out for CHEVRON Production
2	Pre-Convoy Safety Meeting	11/7/2023	14:45:20	Discussed route and possible hazards
3	Depart Location for Service Center or Other Site	11/7/2023	14:55:21	Depart yard w/ 2 pump, 2 660, 1 pickups and 5 personnel.
4	Arrive at Location from Service Center	11/7/2023	17:15:22	Requested on location @ 1800
5	Safety Meeting - Assessment of Location	11/7/2023	17:30:23	Discussed location and possible hazards. Water test: Temp - 80, Chlorides - 0, PH - 6, Sulfates - <200. 8 1/2 TD @ 17421'. Production casing set @ 17409.6'. 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 @ 1905'. Mud Weight - 10.4ppg
6	Safety Meeting - Pre Rig-Up	11/7/2023	17:45:28	Discussed rig up and possible hazards.
7	Rig-up Lines	11/7/2023	17:50:28	Rig up equipment
8	Casing on Bottom	11/7/2023	18:30:29	
9	Circulate Well	11/7/2023	18:50:30	Rig circulating well 10.7 bpm @ 1500 psi
10	Safety Meeting - Pre Job	11/7/2023	19:45:03	Discussed job and possible hazards with everyone on location.
11	Start Job	11/7/2023	20:50:23	
12	Pump Spacer 1	11/7/2023	20:52:03	Pumped 3 bbls of FW
13	Pressure Test	11/7/2023	20:55:04	Test lines to 6500 psi. Test IBOP to 1850 psi
14	Drop Bottom Plug	11/7/2023	21:05:07	

15	Pump Spacer 1	11/7/2023	21:07:08	Pumped 120 bbls of 12 ppg of Tuned Spacer. 2.31 cuft/sk and 14.14 gal/sk. Verified weight with pressurized mud scales.
16	Check Weight	11/7/2023	21:17:47	
17	Drop Bottom Plug	11/7/2023	21:32:18	
18	Pump Lead Cement	11/7/2023	21:34:19	Pumped 39.6 bbls of 13.2 ppg Elasticem. 140 sks, 1.59 cuft/sk, and 7.98 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 848.63'
19	Pump Lead Cement	11/7/2023	21:47:20	Pumped 217 bbls of 13.2 ppg Isobond cmt. 734 sks, 1.66 cuft/sk, and 7.82 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 1675.35'
20	Check Weight	11/7/2023	21:48:05	
21	Pump Tail Cement	11/7/2023	22:21:25	Pumped 421.4 bbls of 13.2 ppg Elasticem. 1195 sks, 1.98 cuft/sk, and 9.51 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 6958.62'
22	Check Weight	11/7/2023	22:26:01	
23	Shutdown	11/7/2023	23:35:15	
24	Drop Top Plug	11/7/2023	23:42:16	3rd party rupture plug
25	Pump Displacement	11/7/2023	23:43:17	Pumped 403.7 bbls of displacement. First 20 bbl w/ MMCR and 383.7 bblsw/ MX 820-6 & BELLACIDE
26	Bump Plug	11/8/2023	00:37:05	Bump plug from 2400 - 3000 psi
27	Check Floats	11/8/2023	00:42:06	Floats are good. Got 5.5 bbls back.
28	Bump Plug	11/8/2023	00:45:08	Bump plug to rupture. Plug ruptured @ 2485 psi
29	Other	11/8/2023	00:54:09	Pumped 5 bbls and shutdown.
30	Release Casing Pressure	11/8/2023	00:56:11	Release pressure. Got 4 bbls back and monitor influx for 30 minutes. Got ½ bbl back.
35	End Job	11/8/2023	01:29:48	Got 80 bbls of spacer back to surface.

3.0 Attachments

3.1 Real Time iCem Job Chart

