

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Booth C35-750 Production

Job Date: Friday, January 20, 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 **Booth C35-750 - 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 8.4 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 442 bbl. of treated freshwater displacement. Plug was landed at 2,400 psi and bumped to 2,900 psi. Pressure was bled off and 5.5 bbl. of fluid was returned to the truck. Approximately 70 bbl. of spacer was returned to surface indicating a top of cement around 974'.

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 #:	05-123-48927-00
City, County:	Kersey, Weld

	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	01/19/2023	19:00
Called Out Time:	01/19/2023	13:00
Arrived On Location:	01/19/2023	17:30
Job Started:	01/20/23	04:55
Job Completed:	01/20/23	10:21
Departed Location:	01/20/23	12:00

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	11
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.1
4	Casing set depth (shoe)	ft	19915
5	TVD	ft	6755
6	Float collar depth	ft	19908
7	Length of rate hole	ft	15
8	Previous casing shoe depth	ft	1948
9	Pre-job mud circulation time	hh:mm	03:00
10	Pre-job mud circulation rate	bpm	9.5
11	Pre-job mud circulation volume	bbls	1400

12	Pre-job mud circulation pressure	psi	950
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	N
15	Calculated displacement	bbls	462
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	70
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2400
20	Number of Centralizers	-	243
21	Number of plugs	-	4

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	
Chlorides	0	ppm	3000 ppm	Can shorten thickening time

1.4 Actual Pump Schedule

	Density (ppg)	Volume (bbls)	Yield (ft ³ /sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid	11	120	3.88	24.45	84	4246
Cap Cement	13.2	39.6	1.59	8.07	140	1130
Lead Cement	13.2	212	1.68	8.1	708	5735
Tail Cement	13.2	528	2.05	9.83	1446	14214
Top Plug	1					
Displacement Fluid	8.33	462				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Dwnhole Density (ppg)	Cmb Pump Rate (bbl/min)	Pump A Pressure (psi)	Cmb Stg Total (bbl)	Comments
1	Call Out	1/19/2023	13:00:00					Called out by service coordinator for OL time of 1900.
2	Pre-Convoy Safety Meeting	1/19/2023	17:00:00					Discuss all hazards associated with journey, directions to destination, complete journey management if needed, and ensure all convoy is fit for duty.
3	Depart from Service Center or Other Site	1/19/2023	17:30:00					Depart from service center or other job site.
4	Arrive at Location from Service Center	1/19/2023	18:30:00					Upon arrival to location, signed in with onsite safety personnel. Met with company man and discussed job specific requirements and specifications.
5	Other	1/19/2023	18:45:00					Mix water test results- PH-7, Chlo-0, Temp-65F.
6	Pre-Rig Up Safety Meeting	1/19/2023	21:00:00					Held pre rig up JSA for hazards, hazard hunt with crew, and discussed plan for spotting equipment and rigging up lines for job. Discussed muster points and closest emergency location as well as coordinates.
7	Rig-Up Equipment	1/19/2023	21:15:00					Begin rig up with crew.
8	Rig-Up Completed	1/19/2023	22:30:00					Complete rig up for job to nearest point before red zone.
9	Safety Meeting - Pre Job	1/19/2023	23:30:00					Held job specific hazards as well as confirming job procedure with co man and rest of crew associated with job.

10	Start Job	1/20/2023	04:55:07	8.86	0.00	2.01	0.00	TD-19930', TP-19915' 5.5" 17#, FC-19908', TVD-6755', SURF-1948' 9.625" 36#, OH-8.5" MUD-10.1#
11	Drop Bottom Plug	1/20/2023	04:58:31	9.03	1.62	170.99	0.42	Dropped by HES supervisor, witnessed by company man.
12	Pump Spacer 1	1/20/2023	05:28:59	8.72	0.00	-2.47	0.00	Pumped 120bbls Tuned Prime 11.5# 3.88y 24.45g/s with 20g D-Air at 8bpm 340psi
13	Check Weight	1/20/2023	05:53:21	11.17				Weight verified with pressurized mud scales.
14	Shutdown	1/20/2023	06:04:24	11.82	0.00	75.60	122.93	
15	Drop Bottom Plug	1/20/2023	06:04:45	11.81	0.00	40.61	122.93	Dropped by HES supervisor, witnessed by company man.
16	Pump Cap Cement	1/20/2023	06:08:56	11.74	0.00	40.63	0.00	Pumped 140sks or 39.4bbls Elasticem w/o CBL 13.2# 1.59y 8.07g/s at 9bpm 580psi.
17	Check Weight	1/20/2023	06:12:51	13.08	4.00	253.34	13.09	Weight verified with pressurized mud scales.
18	Pump Lead Cement	1/20/2023	06:19:01	13.14	5.73	419.31	0.10	Pumped 708sks or 212bbls Elasticem w/CBL 13.2# 1.68y 8.1g/s at 9bpm 612psi.
19	Check Weight	1/20/2023	06:29:37	13.10	9.03	738.86	102.59	Weight verified with pressurized mud scales.
20	Pump Tail Cement	1/20/2023	06:42:54	13.10	9.13	846.82	0.08	Pumped 1446sks or 528bbls 13.2# 2.05y 9.83g/s Neocem at 9bpm 900psi.
21	Check Weight	1/20/2023	06:45:37	13.31	9.17	1079.68	25.23	Weight verified with pressurized mud scales.
22	Check Weight	1/20/2023	07:15:47	13.18	9.19	1634.60	298.04	Weight verified with pressurized mud scales.
23	Clean Lines	1/20/2023	07:50:02	13.59	0.00	68.73	0.00	Shutdown, washed up through pumps and down wash up line to pits until clean water was seen. Pumped total of 20bbls to clean truck and lines. Pumped 4bbls green dye/MMCR water to establish MMCR at CRT.
24	Drop Top Plug	1/20/2023	08:03:41	7.70	0.00	33.20	21.54	Dropped 1500psi top plug by HES supervisor, witnessed by company Man.

25	Pump Displacement	1/20/2023	08:03:46	7.70	0.00	32.45	0.00	Pumped 3bbls MMCR water, Shutdown.
26	Drop Top Plug	1/20/2023	08:06:24	7.81	0.00	44.51	3.28	Dropped 3000psi top plug by HES supervisor, witnessed by company Man.
27	Other	1/20/2023	08:10:29	7.79	0.00	61.36	3.62	Shutdown, wait on rig, packer cup leaking and needed to change out.
28	Pump Displacement	1/20/2023	08:20:32	7.71	0.00	26.68	3.62	Pumped 462bbls fresh water with 10g MMCR in remaining 17bbls (20bbls total), 10gal MCMX and 20gal Bellacide throughout.
29	Bump Plug	1/20/2023	09:25:57	7.93	0.00	2961.59	455.05	Slowed down to 2bpm at 440bbls away, final circulating pressure- 2400psi, Bump pressure-2900psi. Held for 5min casing test.
30	Other	1/20/2023	09:30:51	7.92	0.00	3022.21	455.05	Released pressure and got 6bbls fresh water to truck, floats held.
31	Other	1/20/2023	09:34:10	7.74	0.00	14.21	455.05	Pumped 5.5bbls back into well took 1bbl to pressure up to burst. Burst 1500psi plug at 2bpm 3540psi. Pumped 3bbls to bump 3000psi top plug at 2bpm
32	Bump Plug	1/20/2023	09:40:26	7.96				Bumped 3000psi top plug, final circulating pressure- 2100psi, bump pressure-2650psi. Held pressure for 5min casing test.
33	Other	1/20/2023	09:49:32	7.74	0.00	5.39	9.25	Released pressure and got 6bbls fresh water to truck, floats held.
34	Other	1/20/2023	09:49:35	7.74	0.00	4.51	9.25	Held for additional 30min inflow check, 1/2bbl back.
35	End Job	1/20/2023	10:21:55	7.62	0.00	-9.95	9.25	Got 70bbls spacer to surface. Estimated TOCap-974', TOL-1801', TOT-6974'.
36	Pre-Rig Down Safety Meeting	1/20/2023	10:35:00	7.68	0.00	30.45	9.54	Held safety meeting with crew prior to rig down, discussed possibility of trapped pressure, swing radius, slips trips and falls, pinch points and risks associated with rig down.

37	Rig Down Lines	1/20/2023	10:45:00	7.78	1.06	63.50	10.00	Begin rig down
38	Pre-Convoy Safety Meeting	1/20/2023	11:45:00					Held safety meeting with convoy, discussed trip hazards, directions and all crew fit for duty prior to departure.
39	Rig-Down Completed	1/20/2023	11:45:00					Rig down complete with no injuries, spills or damage to equipment.
40	Depart Location for Service Center or Other Site	1/20/2023	12:00:00					Depart location, if applicable journey will be submitted.

3.0 Attachments

3.1 Real Time iCem Job Chart

