

# HALLIBURTON

iCem<sup>®</sup> Service

**NOBLE ENERGY INC-EBUS**

Ft. Lupton District, CO

**Gig-Em State Y9-761 Production**

Job Date: Monday, February 27, 2023

Sincerely,

**Meghan Van Zyl**

## Legal Notice

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### Disclaimer:

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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 **Gig-Em State Y9-761 - 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 13.22 ppg at 7.98 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 382 bbl. of treated freshwater displacement. Plug was landed at 2,550 psi and bumped to 3,000 psi. Pressure was bled off and 6 bbl. of fluid was returned to the truck. Approximately 57 bbl. of spacer was returned to surface indicating a top of cement around 998'.

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

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Job Details	
API #:	05-123-51732-00
City, County:	Keenesburg, Weld

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	2/27/2023	0800
Called Out Time:	2/27/2023	0200
Arrived On Location:	2/27/2023	0730
Job Started:	2/27/2023	1053
Job Completed:	2/27/2023	1522
Departed Location:	2/27/2023	1700

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	35
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	Obm
3	Mud density	ppg	10
4	Casing set depth (shoe)	ft	17359.4
5	TVD	ft	6979
6	Float collar depth	ft	17352.4
7	Length of rate hole	ft	9.6
8	Previous casing shoe depth	ft	2057 36#
9	Pre-job mud circulation time	hh:mm	1:20
10	Pre-job mud circulation rate	bpm	10
11	Pre-job mud circulation volume	bbls	723

12	Mud circulation pressure at start of cement	psi	1000
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	402.6
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100%
18	Fluid returns to surface	Spacer/Cement, bbls	57/0
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2550
20	Number of Centralizers	-	216
21	Number of bottom plugs	-	3

### 1.3 Water Field Test

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	Recorded Value	Unit	Acceptable Limit	Potential Problems if Values Exceed the Limit
<b>pH</b>	7		6.0 - 8.0	Chemicals in water can cause severe retardation
<b>Temperature</b>	67	F	60 - 80 F	Can can pre-mature setting of cement
<b>Chlorides</b>	Less 200	ppm	3000 ppm	Can shorten thickening time

### 1.4 Actual Pump Schedule

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	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
<b>Spacer Fluid</b>	11.5	120	3.88	24.45		
<b>Cap Cement</b>	13.2	39.65	1.59	8.07	140	
<b>Lead Cement</b>	13.2	220.82	1.68	8.1	738	
<b>Tail Cement</b>	13.2	414.76	2.05	9.83	1136	
<b>Top Plug</b>	Yes					
<b>Displacement Fluid</b>	8.33	402				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Call Out	2/27/2023	02:00:00	CREW CALLED OUT 1/4/2023 2000 HRS. REQUESTED ON LOCATION 1/5/2022 0200 HRS.
2	Pre-Convoy Safety Meeting	2/27/2023	05:30:00	DISCUSS ROUTE AND HAZARDS OF DRIVING
3	Crew Leave Yard	2/27/2023	06:00:00	CREW LEAVES YARD
4	Arrive At Loc	2/27/2023	07:30:00	ARRIVE AT LOCATION. MEET WITH CUSTOMER. TD 17369', 17# P-110 SHOE 17359.4', F/C 17352.4', 8.5" HOLE, TVD 6979', 36# J-55 SHOE 2057', OBM 10 PPG, 67 DEGREE MIX WATER, PH 7, CHLORIDES LESS THAN 200 PPM. MAX PSI 3500 PSI. 216 CENTRALIZERS FROM 17276' TO 934'
5	Pre-Rig Up Safety Meeting	2/27/2023	07:40:00	DISCUSS RIG-UP AND ANY HAZARDS THAT MAY EXIST
6	Rig-Up Equipment	2/27/2023	07:45:00	RIG-UP EQUIPMENT
7	Pre-Job Safety Meeting	2/27/2023	10:15:00	DISCUSS JOB PROCEDURES AND HAZARDS OF JOB, PRESSURE AND HAZARDS OF HES EQUIPMENT. RIG CIRCULATES 10 BPM/1000 PSI
8	Start Job	2/27/2023	10:53:03	BEGIN RECORDING DATA
9	Test Lines	2/27/2023	10:54:56	TEST HES LINES TO 5600 PSI.
10	Pressure Test	2/27/2023	11:05:52	TEST RIG MANUAL VALVE TO 1800 PSI
11	Drop Bottom Plug	2/27/2023	11:15:15	CITADEL 1000 PSI BOTTOM PLUG BY DAVE
12	Pump Spacer 1	2/27/2023	11:16:58	120 BBLS TUNED PRIME SPACER. 11.5 PPG, 3.88 YIELD, 24.45 GAL/SACK. MIX D-AIR ON FLY

13	Shutdown	2/27/2023	11:38:32	SHUTDOWN
14	Drop Bottom Plug	2/27/2023	11:41:51	CITADEL 1000 PSI BOTTOM PLUG BY DAVE
15	Pump Cap Cement	2/27/2023	11:43:35	140 SACKS ECONOCEM SBM CEM CAP CEMENT, 39.65 BBLS., 13.2 PPG, 1.59 YIELD, 8.07 GAL/SACK. TOCC=998' PRE-JOB CALCULATIONS
16	Pump Lead Cement	2/27/2023	11:50:42	738 SACKS ELASTICEM SBMCEM LEAD CEMENT., 220.82 BBLS., 13.2 PPG, 1.68 YIELD, 8.1 GAL/SACK. TOLC=1825' PRE-JOB CALCULATIONS
17	Pump Tail Cement	2/27/2023	12:18:12	1136 SACKS NEOCEM TAIL CEMENT., 414.76 BBLS., 13.2 PPG, 2.05 YIELD, 9.83 GAL/SACK. TOTC=7197' PRE-JOB CALCULATIONS
18	Shutdown	2/27/2023	13:11:31	SHUTDOWN
19	Clean Lines	2/27/2023	13:15:49	CLEAN PUMPS AND LINES APPROX 19 BBLS. SEND MMCR/DYE TIL DYE VISUAL AT WASH UP TANK.
20	Shutdown	2/27/2023	13:23:28	SHUTDOWN. RIG CLOSES IBOP
21	Drop Bottom Plug	2/27/2023	13:27:36	CITADEL 1500 PSI BOTTOM PLUG BY DAVE
22	Pump Spacer 2	2/27/2023	13:27:42	PUMP 3 BBLS MMCR WATER
23	Shutdown	2/27/2023	13:29:28	SHUTDOWN
24	Drop Top Plug	2/27/2023	13:31:55	CITADEL 3000 PSI TOP PLUG BY DAVE
25	Pump Displacement	2/27/2023	13:32:20	PUMP 402.6 BBLS FRESH WATER DISPLACEMENT. 1ST 17 BBLS HAS 10 GALLONS MICRO MATRIX CEMENT RETARDER. REMAINING DISPLACEMENT HAS 20 GALLONS BELLACIDE 300W AND 10 GALLONS MC MX 820/6
26	Slow Rate	2/27/2023	14:15:00	SLOW RATE AT 375 BBLS TO 2 BPM
27	Bump Plug	2/27/2023	14:26:18	FCP 2550 PSI/2 BPM BUMP PRESSURE 3000 PSI/57 BBLS SPACER TO SURFACE
28	Check Floats	2/27/2023	14:31:24	FLOATS HOLD, 5.5 BBLS BACK
29	Pressure Up Well	2/27/2023	14:33:38	PRESSURE UP WELL AT 1 BPM.

30	Other	2/27/2023	14:40:10	DISC RUPTURES AT 3910 PSI
31	Bump Plug	2/27/2023	14:42:39	FCP 2600 PSI/1 BPM, BUMP PRESSURE 3200 PSI
32	Check Floats	2/27/2023	14:47:11	FLOATS HOLD, 5.5 BBLS BACK. START 30 MINUTES IN FLOW TEST
33	Other	2/27/2023	15:20:02	.5 BBLS BACK AFTER 30 MINUTE IN-FLOW TEST
34	End Job	2/27/2023	15:22:24	STOP RECORDING DATA. FLUSH RIG STACK
35	Pre-Rig Down Safety Meeting	2/27/2023	15:40:00	DISCUSS HAZARDS OF RIG-DOWN AND ANY OTHER HAZARDS THAT MAY EXIST
36	Rig-Down Equipment	2/27/2023	15:45:00	RIG-DOWN EQUIPMENT
37	Rig-Down Completed	2/27/2023	16:30:00	RIG-DOWN COMPLETED
38	Crew Leave Location	2/27/2023	17:00:00	CREW DEPARTS LOCATION. THANK YOU FOR CHOOSING HALLIBURTON.

3.0 Attachments

3.1 Real Time iCem Job Chart

