

HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, COLORADO

Gig-Em State Y9-719 Production

Job Date: Friday, March 24, 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 **Gig-Em State Y9-719 - 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 13.20 ppg at 8.52 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 381 bbl. of treated freshwater displacement. Plug was landed at 2,550 psi and bumped to 3,050 psi. Pressure was bled off and 5.5 bbl. of fluid was returned to the truck. Approximately 61 bbl. of spacer was returned to surface indicating a top of cement around 1081'.

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 #:	05-123-51838
City, County:	Keenesburg, Weld

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	3-23-23	21:00
Called Out Time:	3-23-23	15:00
Arrived On Location:	3-23-23	19:00
Job Started:	3-23-23	23:03
Job Completed:	3-24-23	03:15
Departed Location:	3-24-23	05:00

	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
4	Casing set depth (shoe)	ft	17300
5	TVD	ft	6967
6	Float collar depth	ft	17293
7	Length of rate hole	ft	15
8	Previous casing shoe depth	ft	2059
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	1050

12	Mud circulation pressure at start of cement	psi	1200
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	N
15	Calculated displacement	bbls	401
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	61
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2550
20	Number of Centralizers	-	214
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	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	11.5	120	3.88	24.45	173	4245
Cap Cement	13.2	39.6	1.59	8.07	140	1129
Lead Cement	13.2	221.1	1.68	8.1	739	5985
Tail Cement	13.2	408.2	2.05	9.83	1118	10989
Top Plug						
Displacement Fluid	8.4	401				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Call Out	3/23/2023	15:00:00	CREW CALLED OUT, REQUESTED ON LOCATION @ 21:00
2	Depart Yard Safety Meeting	3/23/2023	17:45:00	PRE JOURNEY SAFETY MEETING WITH ALL HES PERSONNEL, DISCUSS ROUTE AND HAZARDS ASSOCIATED WITH THE JOURNEY
3	Crew Leave Yard	3/23/2023	18:00:00	ALL HES EMPLOYEES IN ROUTE TO LOCATION
4	Arrive at Location from Service Center	3/23/2023	19:00:00	CREW ON LOCATION, RECIEVED NUMBERS FROM CO REP, TD 17315, TP 17300.3, SJ 19.7, CSG 5.5 17#, PREV CSG 9 5/8 36# @ 2059, HOLE 8.5, MUD 10.4, TVD 6967, 214 CENTRALIZERS, WATER TEST, TEMP 65, PH 7, CHLORIDES 0
5	Assessment Of Location Safety Meeting	3/23/2023	19:15:00	ASSESSMENT OF LOCATION SAFETY MEETING WITH ALL HES EE'S TO DISCUSS SITE SPECIFIC HAZARDS
6	Safety Meeting - Pre Rig-Up	3/23/2023	19:30:00	PRE RIG UP SAFETY MEETING WITH ALL HES EE'S TO DISCUSS HAZARDS BEFORE RIGGING UP
7	Safety Meeting - Pre Job	3/23/2023	22:30:00	PRE JOB SAFETY MEETING WITH ALL HES EE'S, RIG HANDS AND CO REP TO DISCUSS HAZARDS DURING JOB
8	Start Job	3/23/2023	23:03:41	START RECORDING DATA
9	Drop Bottom Plug	3/23/2023	23:04:24	LAUNCH BOTTOM PLUG
10	Test Lines	3/23/2023	23:06:44	TEST LINES TO 7050 PSI, TEST IBOP TO 1850 PSI
11	Pump Spacer 1	3/23/2023	23:17:09	PUMP 120 BBLs TUNED PRIME SPACER 11.5 PPG, 6 BPM 700 PSI
12	Drop Bottom Plug	3/23/2023	23:38:59	LAUNCH BOTTOM PLUG

13	Pump Cap Cement	3/23/2023	23:39:43	MIX AND PUMP 140 SKS 39.6 BBLS CAP CEMENT 13.2 PPG, 1.59 FT3/SK, 8.07 GAL/SK, 1129 MIX GAL, 8.5 BPM 1050 PSI, CALCULATED TOCC 1081
14	Pump Lead Cement	3/23/2023	23:44:49	MIX AND PUMP 694 SKS 207.7 BBLS LEAD CEMENT 13.2 PPG, 1.68 FT3/SK, 8.1 GAL/SK, 5985 MIX GAL, 9 BPM 1100 PSI, CALCULATED TOLC 1907
15	Pump Tail Cement	3/24/2023	00:11:14	MIX AND PUMP 1118 SKS 408.2 BBLS TAIL CEMENT 13.2 PPG, 2.05 FT3/SK, 9.83 GAL/SK, 10989 MIX GAL 9 BPM 1700 PSI, CALCULATED TOTC 7300
16	Shutdown	3/24/2023	01:02:34	SHUTDOWN, WASH PUMPS AND LINES TO TANK
17	Drop Top Plug	3/24/2023	01:20:41	LAUNCH TOP PLUG
18	Pump Displacement	3/24/2023	01:20:53	PUMP 401 BBLS TREATED WATER DISPLACEMENT, FIRST 20 BBLS W/MMCR, 10 GAL MCMX AND 20 GAL BELLACIDE THROUGHOUT, 10 BPM 3300 PSI, RECEIVED 61 BBLS SPACER TO SURFACE, FULL RETURNS THROUGHOUT JOB
19	Bump Plug	3/24/2023	02:21:15	BUMP BOTTOM PLUG AT 2550 PSI TOOK TO 3020 PSI
20	Check Floats	3/24/2023	02:25:40	CHECK FLOATS, FLOATS HELD TOOK 5.5 BBLS BACK
21	Other	3/24/2023	02:37:06	BURST PLUG AT 4525 PSI, PUMP 5 BBL WET SHOE
22	Check Floats	3/24/2023	02:42:31	CHECK FLOATS, TOOK 4.5 BBLS BACK TO TRUCK
23	Other	3/24/2023	02:43:25	30 MIN FLOW CHECK, TOOK .5 BBL BACK
24	End Job	3/24/2023	03:15:47	STOP RECORDING DATA, USED 933 BBLS FRESH WATER FOR JOB
25	Safety Meeting - Pre Rig-Down	3/24/2023	03:18:00	PRE RIG DOWN SAFETY MEETING WITH ALL HES EE'S TO DISCUSS HAZARDS ASSOCIATED WITH RIGGING DOWN
26	Depart Location Safety Meeting	3/24/2023	04:30:00	PRE DEPARTURE SAFETY MEETING WITH ALL HES EE'S TO DISCUSS ROUTES AND HAZARDS ASSOCIATED WITH THE JOURNEY
27	Crew Leave Location	3/24/2023	05:00:00	THANK YOU FOR USING HALLIBURTON, KYLE BATH AND CREW.

3.0 Attachments

3.1 Real Time iCem Job Chart

