HALLIBURTON

iCem® Service

NOBLE ENERGY INC-EBUS

Ft. Lupton District, Colorado

Borys C22-765 Production

Job Date: Sunday, September 10, 2023

Sincerely,

Meghan Van Zyl

Legal Notice

Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

Table of Contents

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Borys C22-765 - 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 13.09 ppg at 5.89 bbl/min. Cement was displaced with 20 bbl. of treated water with retarder and 434 bbl. of treated freshwater displacement. Plug was landed at 2,370 psi and pressured up to 2,870 psi. Approximately 54 bbl. of spacer was returned to surface indicating a top of cement around 1136'.

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 #:	05-123-48904
City, County:	Kersey, Weld

Job Times		
	Date (mm/dd/yyyy)	**Time (hh:mm)**
Requested Time On Location:	09/10/2023	05:00
Called Out Time:	09/09/2023	23:00
Arrived On Location:	09/10/2023	04:00
Job Started:	09/10/2023	8:13
Job Completed:	09/10/2023	13:50
Departed Location:	09/10/2023	15:30

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	65
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10.1
4	Casing set depth (shoe)	ft	19583.9
5	TVD	ft	6644
6	Float collar depth	ft	19576.9
7	Length of rate hole	ft	13
8	Previous casing shoe depth	ft	1926
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	900

12	Mud circulation pressure at start of cement	psi	1137
13	Annual flow before the start of job	Y/N	Y
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	454
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	54 spacer
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2370
20	Number of Centralizers	-	237
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	69	F	60 - 80 F	Can can pre-mature setting of cement
Chlorides	200	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	2.31	14.14	291	4124
Cap Cement	13.2	39	1.56	7.79	140	1091
Lead Cement	13.2	213	1.65	7.82	725	5669
Tail Cement	13.2	507	1.98	9.51	1440	13694
Top Plug	1					
Displacement Fluid	8.33	454				

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq. No.	Activity	Date	Time	Comments
1	Call Out	9/9/2023	23:00:00	Crew called out at 2300 on 9/9/2023 for a requested-on location time of 0500 on 9/10/2023.
2	Safety Meeting	9/10/2023	02:45:00	Pre convoy safety meeting discussed route to location and hazards of driving at night.
3	Crew Leave Yard	9/10/2023	03:00:00	Crew Leaves yard in convoy at 0300 hrs.
4	Arrive At Loc	9/10/2023	04:00:00	Crew arrived on location at 0400 hrs. Meet with costumer TD 19596', 8.5 OH, TP 19583.9' 5.5' 17#, FC 19576.9'', TVD 6644', P/C 1926' 9.625 36#, OBM WEIGHT 10.1 PPG.
5	Safety Meeting - Pre Rig-Up	9/10/2023	06:00:00	Discuss hazards around rig up area.
6	Rig-Up Completed	9/10/2023	07:00:00	Rig up completed.
7	Safety Meeting - Pre Job	9/10/2023	07:45:00	Pre job safety meeting discussed all hazards prior to job and reviewed job procedure.
8	Start Job	9/10/2023	08:13:29	Start recording data.
9	Test Lines	9/10/2023	08:16:42	Pressure tested HES lines to 6,000 psi & the rig IBOP to 1800 psi.
10	Drop Bottom Plug	9/10/2023	08:42:57	1st bottom plug verified by DSR.
11	Pump Spacer 1	9/10/2023	08:43:14	Pumped 120 bbls (291 sks) of Tuned Prime Spacer @12ppg/2.31ft3/14.14gal/sack. Mix gallons was 4124 gallons Average rate was 5bpm with 500 psi on the line. 54 bbls of spacer to surface.
12	Check Weight	9/10/2023	08:50:53	Weight verified by mud scales.
13	Drop Bottom Plug	9/10/2023	09:11:59	2nd bottom plug verified by DSR.

14	Pump Cap Cement	9/10/2023	09:12:06	Pumped 39 bbls (140 sks) of EconoCem Cap cement @13.2ppg/1.56ft3/7.79gal/sack. Mix gallons was 1091 gallons Average rate was 3bpm with 360 psi. TOCC= 1136'.
15	Check Weight	9/10/2023	09:15:02	Weight verified by mud scales.
16	Pump Lead Cement	9/10/2023	09:19:45	Pumped 213 bbls (725 sks) of ElastiCem Lead cement @13.2ppg/1.65ft3/7.82gal/sack. Mix gallons was 5669 gallons. Average rate was 9bpm with 900 psi on the line. TOLC=1950'.
17	Check Weight	9/10/2023	09:21:30	Weight verified by mud scales.
18	Check Weight	9/10/2023	09:34:01	Weight verified by mud scales.
19	Pump Tail Cement	9/10/2023	09:47:06	Pumped 507 bbls (1440 sks) of NeoCem Tail cement @13.2pp/1.98ft3/9.51gal/sack. Mix gallons was 13,694 gallons. Average rate was 7bpm with 625 psi. TOTC= 7170'.
20	Check Weight	9/10/2023	09:55:34	Weight verified by mud scales.
21	Check Weight	9/10/2023	10:13:33	Weight verified by mud scales.
22	Other	9/10/2023	10:44:18	Trouble mixing off silo after swap slowed rate to maintain density as best as possible averaged out to 13ppg for all of tail cement.
23	Check Weight	9/10/2023	11:19:31	Weight verified by mud scales.
24	Shutdown	9/10/2023	11:41:14	Shutdown to wash up, Washed pump and lines with 15 bbls of freshwater.
25	Drop Top Plug	9/10/2023	11:55:37	Top plug verified by DSR.
26	Pump Displacement	9/10/2023	11:55:39	Pumped 454 bbls of freshwater displacement with 10 gallons of MMCR in first 20 bbls, MC MX 820-6, & bellacide 300w threw out the rest of displacement.
27	Bump Plug	9/10/2023	12:56:28	FCP @2bpm was 2370 psi bumped up to 2870 psi.
28	Other	9/10/2023	13:02:10	6 bbls back floats holding.
29	Other	9/10/2023	13:05:57	No clear burst of plug pumped and additional 4 bbls and shutdown.
30	Other	9/10/2023	13:16:26	4.5 bbls back to pump truck begin 30-minute inflow test.

31	End Job	9/10/2023	13:50:26	Stop recording data. .5 bbl gained after 30- minute test. Pumped 10 bbls threw rig stack.
32	Safety Meeting - Pre Rig-Down	9/10/2023	14:15:00	Discuss blow down and any new hazards that could have come up during job.
33	Rig-Down Completed	9/10/2023	15:15:00	Rig down completed.
34	Pre-Convoy Safety Meeting	9/10/2023	15:25:00	Fit for duty check and check road conditions.
35	Crew Leave Location	9/10/2023	15:30:00	Crew departs location. Thank you for using Halliburton.

3.0 Attachments

3.1 Real Time iCem Job Chart