

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Guttersen Y12-782 Production

Job Date: Tuesday, April 16, 2024

Sincerely,
Chris Yeung

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Table of Contents

1.0	Cementing Job Summary	4
1.1	Executive Summary	4
1.2	Job Overview	5
1.3	Water Field Test	7
1.4	Actual Pump Schedule	7
2.0	Real-Time Job Summary	9
2.1	Job Event Log.....	9
3.0	Attachments.....	12
3.1	Noble H&P 517 Guttersen Y12-782 Production SO 909278001-Custom Results.png.....	12

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Gutteresen Y12-782 - 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 13.15 ppg at 6.65 bbl/min. Cement was displaced with 20 bbls of treated water with retarder and 415 bbls of treated freshwater displacement. Plug was landed at 2,600 psi and bumped to 3,100 psi. Pressure was held for 30 min casing test with 4.5bbls bled back to the pump truck. With 72 bbls of spacer returning to surface, the estimated TOC is 990'.

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 #:	05-123-52456
City, County:	ENESBURG, WELD
SO#:	909278001

Job Times		
	Date (mm/dd/yyyy)	Time (hh:mm)
Requested Time On Location:	4/16/24	6:00
Called Out Time:	4/16/24	0:00
Arrived On Location:	4/16/24	4:45
Job Started:	4/16/24	8:30
Job Completed:	4/16/24	13:10
Departed Location:	4/16/24	14:30

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	55
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	OBM
3	Mud density	ppg	10
4	Casing set depth (shoe)	ft	17911.2
5	TVD	ft	6814
6	Float collar depth	ft	17891.7
7	Length of rate hole	ft	11
8	Previous casing shoe depth	ft	2068
9	Pre-job mud circulation time	hh:mm	2:00

10	Pre-job mud circulation rate	bpm	12
11	Pre-job mud circulation volume	bbls	1440
12	Mud circulation pressure at start of cement	psi	150
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	Y
15	Calculated displacement	bbls	415
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	100
18	Fluid returns to surface	Spacer/Cement, bbls	SPACER,72 BBLS
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	2600 PSI @ 2
20	Number of Centralizers	-	233
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
pH	6		6.0 - 8.0	Chemicals in water can cause severe retardation
Temperature	50	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

Stage 1

	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid	12	120	2.31	14.19	292	4146
Cap Cement	13.2	39.6	1.59	7.98	140	1117
Lead Cement	13.2	245	1.68	7.92	819	6510
Tail Cement	13.2	399	1.98	9.51	1132	10752
Top Plug						
Displacement Fluid	8.3	415				

Stage 2

	Density (ppg)	Volume (bbls)	Yield (ft3/sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
Spacer Fluid						
Cap Cement						
Lead Cement						
Tail Cement						
Top Plug						
Displacement Fluid						

List of materials returned to yard:

2.0 Real-Time Job Summary

2.1 Job Event Log

Seq No.	Activity	Date	Time	Comments
1	Summit Crew Notified Date/Time	4/16/20 24	00:00:5 2	Crew called out for CHEVRON Production
2	Pre-Convoy Safety Meeting	4/16/20 24	02:45:1 3	Discussed route and possible hazards
3	Depart Location for Service Center or Other Site	4/16/20 24	03:00:1 4	Depart yard w/ 1 pump, 2 660, 1 pickup and 4 personnel.
4	Arrive at Location from Service Center	4/16/20 24	04:45:1 6	Requested on location @ 0600
5	Safety Meeting - Assessment of Location	4/16/20 24	04:55:1 8	Discussed location and possible hazards. Water test: Temp - 50, Chlorides - 0, PH - 6, Sulfates - <200. 8 1/2 TD @ 17922'. Production casing set @ 17911.2'. 5.5" 17# P110 - ST - 19.46' .0232 bbl/ft. CSG/OH - .0408 bbl/ft. CSG/CSG - .0479 bbl/ft 9 5/8" 36# J55 set @ 2068'. Mud Weight - 10 ppg
6	Safety Meeting - Pre Rig-Up	4/16/20 24	05:00:2 3	Discussed rig up and possible hazards.
7	Rig-up Lines	4/16/20 24	05:15:2 4	Rig up equipment
8	Casing on Bottom	4/16/20 24	06:30:2 5	

9	Circulate Well	4/16/20 24	07:00:2 6	Rig circulating well 12 bpm @ 1500 psi
10	Safety Meeting - Pre Job	4/16/20 24	08:00:1 1	Discussed job and possible hazards with everyone on location.
11	Start Job	4/16/20 24	08:33:4 6	
12	Pump Spacer 1	4/16/20 24	08:40:1 2	Pumped 3 bbls of FW
13	Pressure Test	4/16/20 24	08:41:1 3	Test lines to 6500 psi. Tested IBOP to 1700 psi
14	Drop Bottom Plug	4/16/20 24	08:57:1 4	
15	Pump Spacer 1	4/16/20 24	08:58:1 5	Pumped 120 bbls of 12 ppg of Tuned Spacer. 2.31 cuft/sk and 14.19 gal/sk. Verified weight with pressurized mud scales.
16	Drop Bottom Plug	4/16/20 24	09:21:2 7	
17	Pump Lead Cement	4/16/20 24	09:23:2 9	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 @ 990.76'
18	Pump Lead Cement	4/16/20 24	09:32:3 0	Pumped 255 bbls of 13.2 ppg Isobond cmt. 819 sks, 1.68 cuft/sk, and 7.92 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 1817.48'
19	Pump Tail Cement	4/16/20 24	10:05:3 1	Pumped 399 bbls of 13.2 ppg Elasticem. 1132 sks, 1.98 cuft/sk, and 9.51 gal/sk. Verified weight with pressurized mud scales. Estimated TOC @ 7773.95'
20	Shutdown	4/16/20 24	11:14:5 2	
21	Drop Top Plug	4/16/20 24	11:16:5 7	3rd party rupture plug

22	Pump Displacement	4/16/20 24	11:17:5 9	Pumped 415 bbls of displacement. First 20 bbl w/ MMCR and 395 bblsw/ MX 820-6 & BELLACIDE
23	Bump Plug	4/16/20 24	12:26:2 6	Bump plug from 2600 - 3100 psi
24	Bump Plug	4/16/20 24	12:29:2 8	Bump plug to rupture. Plug ruptured @ 4535 psi. pumped 5 more bbls after rupture.
25	Other	4/16/20 24	12:34:3 2	
26	Check Floats	4/16/20 24	12:36:5 5	Floats are good. Got 4.5 bbls back. Do 30 minute inflow test.
27	End Job	4/16/20 24	13:03:4 7	Got 72 bbls of Tuned Spacer back to surface.
28	Pre-Rig Down Safety Meeting	4/16/20 24	13:15:3 6	
29	Rig-Down Equipment	4/16/20 24	13:25:3 7	
30	Depart Location Safety Meeting	4/16/20 24	13:55:3 9	
31	Depart Location	4/16/20 24	14:00:4 1	Thank you for using Halliburton cement. Andrew Glover and crew.

3.0 Attachments

3.1 Noble H&P 517 Gutteresen Y12-782 Production SO 909278001-Custom Results.png

