

# HALLIBURTON

iCem<sup>®</sup> Service

**NOBLE ENERGY INC-EBUS**

United States of America, COLORADO

Date: Monday, October 16, 2017

**Hullabaloo State Y21-716 Production**

Job Date: Saturday, October 14, 2017

Sincerely,

Adam McKay

## 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 **Hullabaloo State Y21-716** cement **Production** casing job. 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.

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 [Ft. Lupton]**

*The Road to Excellence Starts with Safety*

Sold To #: 345242		Ship To #: 3819711		Quote #:		Sales Order #: 0904347725																																																	
Customer: NOBLE ENERGY INC - EBUS				Customer Rep: Dave & Jim																																																			
Well Name: HULLABALOO STATE		Well #: Y21-716		API/UWI #: 05-123-45232-00																																																			
Field: WATTENBERG		City (SAP): KEENESBURG		County/Parish: WELD		State: COLORADO																																																	
Legal Description: NE NE-16-2N-64W-445FNL-892FEL																																																							
Contractor: Noble				Rig/Platform Name/Num: H&P 524																																																			
Job BOM: 7523 7523																																																							
Well Type: HORIZONTAL OIL																																																							
Sales Person: HALAMERICA\HB70026				Srvc Supervisor: Bryan Kraft																																																			
<b>Job</b>																																																							
<table border="1"> <tr> <td colspan="2">Formation Name</td> <td colspan="2"></td> <td colspan="2"></td> <td colspan="2"></td> </tr> <tr> <td>Formation Depth (MD)</td> <td>Top</td> <td></td> <td>Bottom</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Form Type</td> <td></td> <td></td> <td>BHST</td> <td></td> <td>230 degF</td> <td></td> <td></td> </tr> <tr> <td>Job depth MD</td> <td>17390ft</td> <td></td> <td>Job Depth TVD</td> <td>7101ft</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Water Depth</td> <td></td> <td></td> <td>Wk Ht Above Floor</td> <td>4ft</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Perforation Depth (MD)</td> <td>From</td> <td></td> <td>To</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>								Formation Name								Formation Depth (MD)	Top		Bottom					Form Type			BHST		230 degF			Job depth MD	17390ft		Job Depth TVD	7101ft				Water Depth			Wk Ht Above Floor	4ft				Perforation Depth (MD)	From		To				
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<b>Well Data</b>																																																							
Description	New / Used	Size in	ID in	Weight lbm/ft	Thread	Grade	Top MD ft	Bottom MD ft	Top TVD ft	Bottom TVD ft																																													
Casing		9.625	8.921	36		J-55	0	2018	0	2018																																													
Casing	0	5.5	4.778	20	BTC	P-110	0	17390	0	7101																																													
Open Hole Section			8.5				2019	17414	2018	7101																																													
<b>Tools and Accessories</b>																																																							
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make																																														
Guide Shoe						Top Plug	5.5	1	HES																																														
Float Shoe	5.5	1	HES	17390		Bottom Plug	5.5	2	HES																																														
Float Collar	5.5	1	HES	17344		SSR plug set																																																	
Insert Float						Plug Container																																																	
Stage Tool						Centralizers																																																	
<b>Fluid Data</b>																																																							
Stage/Plug #: 1																																																							
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal																																														
1	Spacer	TUNED SPACER III	80	bbl	11.5	3.78	23.5	4	2793																																														
34.70 gal/bbl		FRESH WATER																																																					
0.60 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)																																																					
0.60 gal/bbl		MUSOL A, 330 GAL TOTE - (790828)																																																					
147.42 lbm/bbl		BARITE, BULK (100003681)																																																					

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
2	Cap Cement	ELASTICEM (TM) SYSTEM	150	sack	13.2	1.57	7.53	8	1130	
7.53 Gal		FRESH WATER								
0.80 %		SCR-100 (100003749)								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
3	Lead Cement	ELASTICEM (TM) SYSTEM	582	sack	13.2	1.6	7.69	8	4476	
7.69 Gal		FRESH WATER								
0.25 %		SCR-100 (100003749)								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
4	Tail Cement	NEOCEM TM	1192	sack	13.2	2.04	9.75	8	11622	
9.75 Gal		FRESH WATER								
0.08 %		SCR-100 (100003749)								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft3/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
5	Displacement	MMCR & BIOCIDE FRESH WATER	385	bbl	8.33			8	16170	
0.50 gal/bbl		MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)								
Cement Left In Pipe		Amount	46 ft			Reason			Shoe Joint	
Mix Water:		pH 7.0	Mix Water Chloride:			<300 ppm		Mix Water Temperature:		53 °F
Cement Temperature:		N/A	Plug Displaced by:			8.3 lb/gal Fresh Water		Disp. Temperature:		53 °F
Plug Bumped?		Yes	Bump Pressure:			1890 psi		Floats Held?		Yes
Cement Returns:		N/A	Returns Density:			N/A		Returns Temperature:		N/A
Comment: The plug bumped @ calculated displacement @ 1890 PSI, shutdown for 5 minutes @ 2430 PSI. The floats held and received 4.5 BBLS back to the truck. No spacer returned to surface.										

## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	10/13/2017	20:00:00	USER				CREW CALLED OUT AT 20:00 10/13/2017, REQUESTED ON LOCATION 2:00 10/14/2017. CREW PICKED UP CEMENT, CHEMICALS (50 GAL MUSOL A, 50 GAL DUAL SPACER B, 20 GAL D-AIR, 10 GAL MMCR), 100 LBS SUGAR, PLUG CONTAINER AND MANIFOLD FROM FORT LUPTON, CO. BULK 660: 11610427/10679720, BULK 660: 11764737/11764054, PUMP ELITE 11897034/11645460.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/14/2017	00:00:00	USER				DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Yard	Crew Leave Yard	10/14/2017	00:15:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive At Loc	Arrive At Loc	10/14/2017	01:00:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 9.625" 36# J-55 @ 2018', 5.5" CASING: 20# @ 17390.4', 46.23' SHOE JOINT, 8.5" OPEN HOLE, TVD @ 7101', 9.4 PPG WELL FLUID, FRESH WATER DISPLACEMENT.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	10/14/2017	01:15:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	10/14/2017	01:20:00	USER				CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	10/14/2017	06:10:00	USER				MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Start Job	Start Job	10/14/2017	06:45:19	USER				BEGIN RECORDING JOB DATA.
Event	9	Drop Bottom Plug	Drop Bottom Plug	10/14/2017	06:51:17	USER				PLUG LEFT LANDING JOINT, VERIFIED BY CO.MAN.
Event	10	Test Lines	Test Lines	10/14/2017	06:53:47	USER	8.52		4551.73	PRESSURE TESTED IRON TO 4500 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 600 PSI, 5TH GEAR STALL OUT @ 1930 PSI.
Event	11	Pump Spacer	Pump Tuned Spacer @ 11.5 ppg	10/14/2017	07:01:07	USER	11.46	4.27	189.83	PUMP 80 BBLS OF TUNED SPACER @ 11.5 LB/GAL, ADDED 50 GAL MUSOL A, 50 GAL DUAL SPACER B, 20 GAL D-AIR, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.

Event	12	Drop Bottom Plug	Drop Bottom Plug	10/14/2017	07:26:56	USER				PLUG LEFT LANDING JOINT, VERIFIED BY CO.MAN.
Event	13	Pump Cement	Pump Cap Cement @ 13.2 ppg	10/14/2017	07:28:30	USER	13.35	4.95	221.06	PUMP 150 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.57 YIELD, 7.53 GAL/SK, 42 BBLS, CALCULATED TOC @ 1750', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	14	Pump Lead Cement	Pump Lead Cement @ 13.2 ppg	10/14/2017	07:36:46	USER	13.24	5.99	506.86	PUMP 582 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.6 YIELD, 7.69 GAL/SK, 166 BBLS, CALCULATED TOL @ 2733', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	15	Pump Tail Cement	Pump Tail Cement @ 13.2 ppg	10/14/2017	07:57:52	USER	13.21	8.01	898.67	PUMP 1192 SKS OF NEOCEM @ 13.2 LB/GAL, 2.04 YIELD, 9.75 GAL/SK, 434 BBLS, CALCULATED TOT @ 6802', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	16	Shutdown	Shutdown	10/14/2017	08:54:21	USER				SHUTDOWN TO WASH PUMPS/LINES AND DROP TOP PLUG.
Event	17	Drop Top Plug	Drop Top Plug	10/14/2017	08:58:26	USER				PLUG LEFT LANDING JOINT, VERIFIED BY CO. MAN.
Event	18	Pump Displacement	Pump Fresh Water Displacement	10/14/2017	09:07:18	USER	8.24	9.96	488.88	BEGIN CALCULATED DISPLACEMENT OF 385 BBLS WITH FRESH WATER. MMCR & BIOCIDES ADDED TO 1ST 20 BBLS, BIOCIDES ADDED THROUGH REST OF DISPLACEMENT.
Event	19	Shutdown	Shutdown	10/14/2017	09:32:23	USER				PRESSURE KICKED THE ELECTRONIC KICKOUTS OUT. RESET KICKOUTS AND RESUMED PUMPING AT A LOWER RATE.
Event	20	Bump Plug	Bump Plug	10/14/2017	09:51:35	USER	8.36	3.06	1851.68	PLUG BUMPED AT CALCULATED DISPLACEMENT. PRESSURED 500 PSI OVER FINAL CIRCULATING PRESSURE OF 1890 PSI. NO SPACER TO SURFACE.
Event	21	Shutdown	Shutdown	10/14/2017	09:51:55	USER				SHUTDOWN FOR 5 MINUTE @ 2400 PSI.
Event	22	Check Floats	Check Floats	10/14/2017	09:57:18	USER				RELEASED PRESSURE, FLOATS HELD, 4.5 BBLS BACK.
Event	23	End Job	End Job	10/14/2017	10:04:35	COM5				STOP RECORDING JOB DATA.
Event	24	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	10/14/2017	10:10:00	USER				DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	25	Rig-Down Completed	Rig-Down Completed	10/14/2017	11:30:00	USER				ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL, AND LOCATION WAS CLEAN.
Event	26	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/14/2017	11:45:00	USER				DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	27	Crew Leave Location	Crew Leave Location	10/14/2017	12:00:00	USER				THANK YOU FOR USING HALLIBURTON - BRYAN KRAFT AND CREW.



3.0 Attachments

3.1 Hullabaloo State Y21-716.png



