

# HALLIBURTON

iCem<sup>®</sup> Service

## **NOBLE ENERGY INC-EBUS**

Date: Thursday, December 28, 2017

### **Bison Ridge Y22-771 Production**

Job Date: Saturday, December 23, 2017

Sincerely,

Adam McKay

## Legal Notice

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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 **Bison Ridge Y22-771** 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]**

## HALLIBURTON

## Cementing Job Summary

*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 345242		<b>Ship To #:</b> 3822221		<b>Quote #:</b>		<b>Sales Order #:</b> 0904519845					
<b>Customer:</b> NOBLE ENERGY INC - EBUS				<b>Customer Rep:</b> WOODIE BEARDSLEY							
<b>Well Name:</b> BISON RIDGE			<b>Well #:</b> Y22-771			<b>API/UWI #:</b> 05-123-45372-00					
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> KEENESBURG		<b>County/Parish:</b> WELD			<b>State:</b> COLORADO				
<b>Legal Description:</b> NE SW-10-2N-64W-2230FSL-2055FWL											
<b>Contractor:</b> H & P DRLG					<b>Rig/Platform Name/Num:</b> H & P 517						
<b>Job BOM:</b> 7523 7523											
<b>Well Type:</b> HORIZONTAL OIL											
<b>Sales Person:</b> HALAMERICA\HB70026					<b>Srvc Supervisor:</b> Vitali Neverdasov						
<b>Job</b>											
<b>Formation Name</b>											
<b>Formation Depth (MD)</b>		<b>Top</b>			<b>Bottom</b>						
<b>Form Type</b>					<b>BHST</b>		<b>230 degF</b>				
<b>Job depth MD</b>		<b>17074ft</b>			<b>Job Depth TVD</b>		<b>7200</b>				
<b>Water Depth</b>					<b>Wk Ht Above Floor</b>						
<b>Perforation Depth (MD)</b>		<b>From</b>			<b>To</b>						
<b>Well Data</b>											
<b>Description</b>	<b>New / Used</b>	<b>Size in</b>	<b>ID in</b>	<b>Weight lbm/ft</b>	<b>Thread</b>	<b>Grade</b>	<b>Top MD ft</b>	<b>Bottom MD ft</b>	<b>Top TVD ft</b>	<b>Bottom TVD ft</b>	
Casing		9.625	8.921	36		J-55	0	2033	0	0	
Open Hole Section			8.5				2033	17095	0	0	
Casing	0	5.5	4.778	20	BUTTRESS	P-110	2033	17074	0	0	
Open Hole Section			8.5				6780	17095	0	0	
<b>Fluid Data</b>											
<b>Stage/Plug #: 1</b>											
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>			<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft<sup>3</sup>/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
1	11.5 lb/gal Tuned Spacer III w/ Chems	Tuned Spacer III			80	bbl	11.5	3.73		4.5	
	34.70 gal/bbl	FRESH WATER									
	0.60 gal/bbl	DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)									
	149.34 lbm/bbl	BARITE, BULK (100003681)									
	0.60 gal/bbl	MUSOL A, 330 GAL TOTE - (790828)									
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>			<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft<sup>3</sup>/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
2	ElastiCem Cap	ELASTICEM (TM) SYSTEM			150	sack	13.2	1.57		4.5	7.53
	0.80 %	SCR-100 (100003749)									
	7.53 Gal	FRESH WATER									

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*Cementing Job Summary*

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
3	ElastiCem w/ SCBL	ELASTICEM (TM) SYSTEM	572	sack	13.2	1.6		8	7.69
0.45 %		SCR-100 (100003749)							
7.69 Gal		FRESH WATER							
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
4	NeoCem NT1	NeoCem TM	1157	sack	13.2	2.04		6	9.75
9.75 Gal		FRESH WATER							
0.08 %		SCR-100 (100003749)							
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
5	Displacement	Displacement	372	bbl	8.33				
Cement Left In Pipe		Amount	Reason		Shoe Joint				
		49							
Comment: ESTIMATED CEMENT TOP: TOT- 6780'. TOL - 1797'.									

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	PS Pump Press <i>(psi)</i>	Comments
Event	1	Call Out	Call Out	12/23/2017	01:30:00	USER				ON LOCATION @ 07:00
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	12/23/2017	06:15:00	USER				Journey management meeting held prior to departure
Event	3	Depart Shop for Location	Depart Shop for Location	12/23/2017	06:31:00	USER				CREW LEFT THE YARD
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	12/23/2017	07:03:00	USER				25 Miles to location. Discussed numbers and job procedures with Customer. Rig is running casing.
Event	5	Other	Other	12/23/2017	07:15:00	USER				SPOT TRUCKS
Event	6	Safety Meeting - Pre Rig-Up	Safety Meeting - Pre Rig-Up	12/23/2017	07:21:00	USER				JSA to discuss the hazards of rig-up
Event	7	Rig-up Lines	Rig-up Lines	12/23/2017	07:27:00	USER				RIG UP LINES TO THE BUFFER ZONE
Event	8	Safety Meeting - Pre Job	Safety Meeting - Pre Job	12/23/2017	10:26:00	USER				With all essential personnel, to discuss the hazards of pumping the job, and pump schedule.
Event	9	Start Job	Start Job	12/23/2017	11:12:02	COM4				
Event	10	Test Lines	Test Lines	12/23/2017	11:18:00	USER	8.66	0.00	2805.00	PER CUSTOMER REQUEST TEST KELLY LINE @ 3000 PSI
Event	11	Pressure Test	Pressure Test	12/23/2017	11:22:00	USER	8.66	0.00	5416.00	PRESSURE TEST FROM HES 2" VALVE BACK TO CEMENT TRUCK @ 5503 PSI
Event	12	Drop Bottom Plug	Drop Bottom Plug	12/23/2017	11:27:00	USER				DROP 1ST BUTTOM PLUG
Event	13	Pump Spacer	Pump Spacer	12/23/2017	11:33:00	USER	11.85	3.10	225.00	Batch/ Weight/ Pump 80bbls tuned spacer @ 11.5 ppg with 48 gallons dual spacer B, 48 gallons musol A, 10 gallons de-air.
Event	14	Shutdown	Shutdown	12/23/2017	11:55:00	USER				SHUT DOWN/ DROP 2ND BUTTOM PLUG
Event	15	Pump Cap Cement	Pump Cap Cement	12/23/2017	12:04:33	USER	13.14	2.40	147.00	Batch/ Weight/ pump First lead 150 sks(41.9 bbls) Elasticem no CBL @ 13.2 ppg

Event	16	Pump Lead Cement	Pump Lead Cement	12/23/2017	12:17:49	USER	13.08	5.60	473.00	Pump 2ND Lead cement 572 sks (163 bbls) Elasticem with CBL @ 13.2 PPG.
Event	17	Pump Tail Cement	Pump Tail Cement	12/23/2017	12:39:22	USER	13.06	5.80	651.00	Pump 1157 sks( 420.4 bbls) NeoCem @ 13.2 ppg.
Event	18	Shutdown	Shutdown	12/23/2017	13:18:36	USER				
Event	19	Shutdown	Shutdown	12/23/2017	13:44:14	USER				WASH PUMPS AND LINES
Event	20	Drop Top Plug	Drop Top Plug	12/23/2017	13:57:43	USER				DROP TOP PLUG
Event	21	Pump Displacement	Pump Displacement	12/23/2017	14:07:00	USER	8.42	9.90	686.00	377.7 bbls fresh water. First 20 bbls with MMCR + Biocide. Rest with Biocede. First 180 bbls @ 255 BPM @ 2277 PSI. Rest @ 4.0 BPM . Final circulating pressure 2256 PSI. bump plug 5 BBLs early.
Event	22	Slow Rate	Slow Rate	12/23/2017	14:52:00	USER	8.33	4.00.00	2004.00	Slow rate to 4 bpm
Event	23	Bump Plug	Bump Plug	12/23/2017	14:57:00	USER	8.33	4.00	2047.00	BUMP PLUG/ HOLD PRESSURE FOR CASING TEST
Event	24	Check Floats	Check Floats	12/23/2017	15:01:00	USER				FLOATS HELD
Event	25	End Job	End Job	12/23/2017	15:04:41	COM4				
Event	26	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	12/23/2017	15:04:49	USER				
Event	27	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig-Down	12/23/2017	15:10:00	USER				JSA to discuss the hazards of rig-down
Event	28	Other	Other	12/23/2017	15:20:00	USER				BLOW DOWN CEMENT TRUCK, LINES. RIGGING DOWN
Event	29	Depart Location Safety Meeting	Depart Location Safety Meeting	12/23/2017	15:47:00	USER				Journey management meeting held prior to departure

## 3.0 Attachments

### 3.1 Case 1-Custom Results.png

