

HALLIBURTON

iCem[®] Service

NOBLE ENERGY INC-EBUS

Date: Tuesday, October 02, 2018

Wells Ranch BB09-649 Production

Job Date: Friday, September 21, 2018

Sincerely,

Adam McKay

Legal Notice

Disclaimer:

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Wells Ranch BB09-649** 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.

Formation caused a slower run in hole speed with casing and during displacement was evident with some erratic pressure spikes.

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 #: 3805889		Quote #:		Sales Order #: 0905143841				
Customer: NOBLE ENERGY INC-EBUS				Customer Rep:						
Well Name: WELLS RANCH			Well #: BB09-649		API/UWI #: 05-123-44958-00					
Field: WATTENBERG		City (SAP): GILL		County/Parish: WELD		State: COLORADO				
Legal Description: NW SW-11-5N-63W-2297FSL-235FWL										
Contractor: H & P DRLG				Rig/Platform Name/Num: H & P 321						
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB70026				Srv Supervisor: Prince Perez						
Job										
Formation Depth (MD)		Top	0'	Bottom	16,987'					
				BHST	230 degF					
Job depth MD		16,972.4'		Job Depth TVD	6,600'					
				Wk Ht Above Floor	5'					
Well Data										
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	0	9.625	8.921	36			0	1938	0	1938
Casing	0	5.5	4.778	20			0	16972	0	6600
Open Hole Section			8.5				1938	16987	1938	6600
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	5.5	1		16,972		Top Plug	5.5	1	HES	
Float Shoe	5.5	1				Bottom Plug	5.5	1	HES	
Float Collar	5.5	1		16,926.1						
						Plug Container	5.5	1	HES	
						Centralizers	5.5	182		
Fluid Data										
Stage/Plug #: 1										

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
1	Spacer	Tuned Spacer III	120	bbl	11.5	3.78	23.5	6	4,189
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	140	sack	13.2	1.68	8.04	6	1,126
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	ELASTICEM (TM) SYSTEM	357	sack	13.2	1.68	8.06	8	2,877
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	NeoCem TM	1,222	sack	13.2	2.04	9.75	8	11,915
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	Fresh Water	376	bbl	8.33			7	
Cement Left In Pipe		Amount	46 ft		Reason			Shoe Joint	

Mix Water:	pH 7	Mix Water Chloride:	<300 ppm	Mix Water Temperature:	60 °F
Cement Temperature:	## °F	Plug Displaced by:	8.34 lb/gal	Disp. Temperature:	60 °F
Plug Bumped?	Yes	Bump Pressure:	2,028 psi	Floats Held?	Yes
Cement Returns:	0 bbl	Returns Density:	## lb/gal	Returns Temperature:	## °F

Comment

Pumped 120 bbls of Tuned Spacer III with 75 gallons of Musol, 75 gallons of Dual B and 20 gallons of D-air.

Pumped 42 bbls of Cap Cement.

Pumped 107 bbls of Elasticem w/SCBL.

Pumped 444 bbls of Neocem.

Pumped 376 bbls of Displacement with MMCR in the first 20 bbls and 15 gallons of Aldacide through.

2 bbls of spacer back.

4.5 bbls back on floats.

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)	PS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	9/21/2018	02:30:00	USER				CREW CALLED OUT AT 2:30, REQUESTED ON LOCATION 8:30. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660 12649238, 10866489, AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	9/21/2018	06:30:00	USER				CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Shop	Crew Leave Shop	9/21/2018	06:40:00	USER				STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	9/21/2018	08:20:00	USER				END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9.625" 36 LB/FT @ 1,938', 5.5" CASING: 20 LB/FT TOTAL 16,972.4', 8 1/2" HOLE, TD 16,987', 46.3' SHOE TRAC, TVD- 6,600'. PUMP FRESH WATER DISPLACEMENT. CASING LANDED @ 15:00 09/21/2018.
Event	5	Safety Meeting - Assessment of Location	Safety Meeting - Assessment of Location	9/21/2018	08:30:00	USER				HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	9/21/2018	08:40:00	USER				RIG UP BULK AND MIXING EQUIPMENT.
Event	7	Rig-Up Completed	Rig-Up Completed	9/21/2018	16:30:00	USER				
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	9/21/2018	17:00:00	USER				MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	9	Start Job	Start Job	9/21/2018	18:42:59	COM4				BEGIN RECORDING JOB DATA.
Event	10	Drop Bottom Plug	Drop Bottom Plug	9/21/2018	18:45:00	USER				PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	11	Test Lines	Test Lines	9/21/2018	18:49:17	COM4	8.23		5274.00	PRESSURE TESTED IRON TO 4,700 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 646 PSI, 5TH GEAR STALL OUT @ 2,450 PSI. 4,700 PRESSURE TEST KICKED OUT @ 5,180 PSI
Event	12	Test Lines	Test Lines	9/21/2018	18:57:56	COM4	8.18		2515.00	PRESSURE TESTED IRON TO 2,500 PSI. KICKOUTS SET @ 2,500 PSI, KICKED OUT @ 2,380, HELD FOR 5 MINUTES.
Event	13	Pump Spacer 1	Pump Spacer 1	9/21/2018	19:00:47	COM4	11.38	3.00	203.00	PUMP 120 BBLs OF TUNED SPACER III @ 11.5 LB/GAL, 3.78 CUFT/SK,

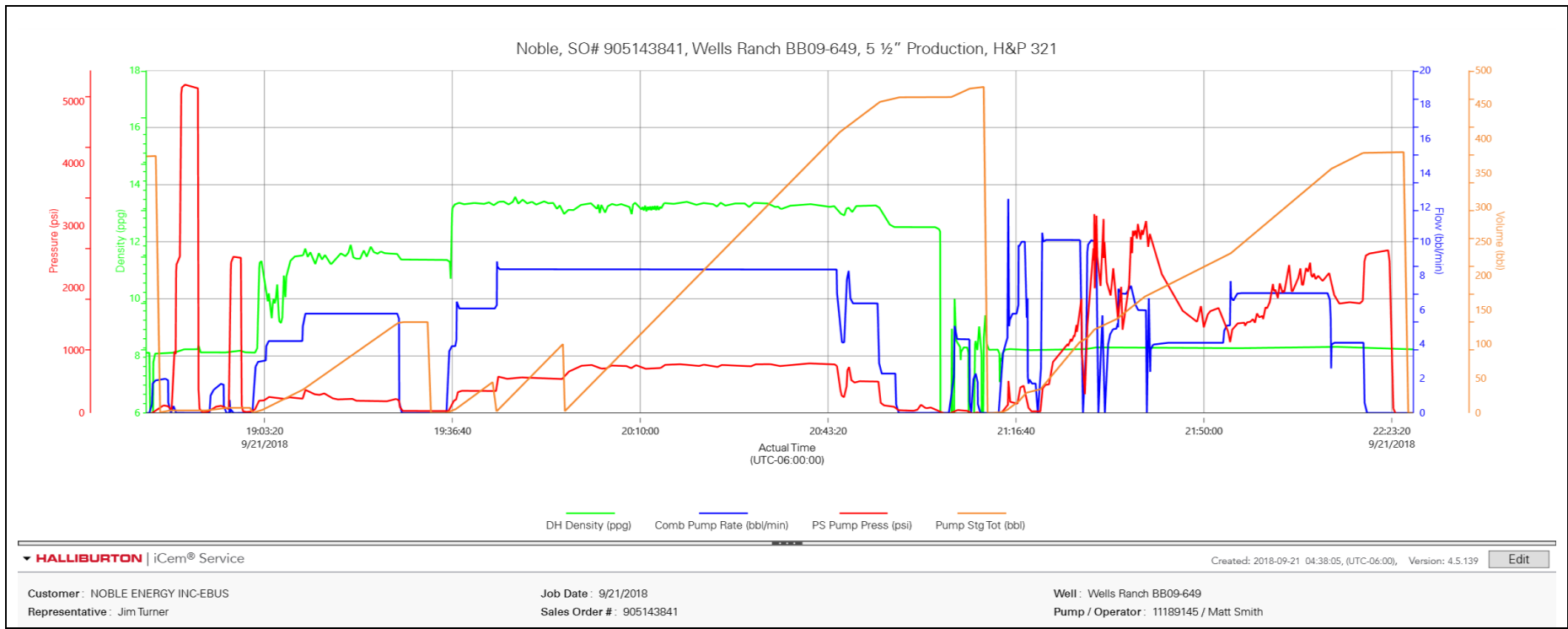
23.5 GALL/SK. 20 GALS D-AIR, 75 GALS DUAL B, 75 GALS OF MUSOL A.
5.42 BBLS CALCULATED TO RETURN TO SURFACE. DENSITY VERIFIED
BY PRESSURIZED MUD SCALES. PUMP RATE 6 BBLS/MIN @ 320 PSI.

Event	14	Drop Bottom Plug	Drop Bottom Plug	9/21/2018	19:32:09	COM4				PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	15	Pump Cap Cement	Pump Cap Cement	9/21/2018	19:32:23	COM4	13.31	3.90	207.00	PUMPED 140 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.68 FT3/SK, 8.04 GAL/SK. 41.89 BBLS. HOC CALCULATED @ 1,026.7', TOC CALCULATED @ 2,471' DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 6 BBLS/MIN @ 370 PSI
Event	16	Pump Lead Cement	Pump Lead Cement	9/21/2018	19:44:09	COM4	13.30	6.10	348.00	PUMPED 357 SKS OF ELASTICEM W/SCBL @ 13.2 LB/GAL, 1.68 FT3/SK, 8.06 GAL/SK. 106.82 BBLS, HOL CALCULATED @ 2,618.1', TOL CALCULATED @ 3,497.7'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 550 PSI
Event	17	Pump Tail Cement	Pump Tail Cement	9/21/2018	19:56:17	COM4	12.89	8.40	529.00	PUMP 1,222 SKS OF NEOCEM @ 13.2 LB/GAL, 2.04 FT3/SK, 9.75 GAL/SK, 443.98 BBLS. HOT CALCULATED @ 10,856.6', TOT CALCULATED @ 6,115.8'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 800 PSI.
Event	18	Shutdown	Shutdown	9/21/2018	20:55:37	COM4				SHUTDOWN TO WASH LINES.
Event	19	Drop Top Plug	Drop Top Plug	9/21/2018	21:10:50	COM4				PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	20	Pump Displacement	Pump Displacement	9/21/2018	21:11:10	COM4	8.24	10.00	431.00	BEGIN CALCULATED DISPLACEMENT OF 375.76 BBLS WITH FRESH WATER. MMCR IN THE FIRST 20 BBLS AND ALDACIDE THROUGHOUT. PUMP RATE 7 BPM @ 2,300 PSI
Event	21	Bump Plug	Bump Plug	9/21/2018	22:18:36	COM4	8.29	4.10	1808.00	PLUG BUMPED AT CALCULATED DISPLACEMENT. 2,028 PSI PRESSURED 500 PSI OVER BUMP.
Event	22	Check Floats	Check Floats	9/21/2018	22:23:01	USER				RELEASED PRESSURE, FLOATS HELD, 4.5 BBLS BACK.
Event	23	End Job	End Job	9/21/2018	22:25:41	COM4				STOP RECORDING JOB DATA.
Event	24	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	9/21/2018	22:30:00	USER				DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	25	Rig-Down Equipment	Rig-Down Equipment	9/21/2018	22:40:00	USER				RIG DOWN BULK AND MIXING EQUIPMENT.
Event	26	Rig-Down Completed	Rig-Down Completed	9/22/2018	00:20:00	USER				
Event	27	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	9/22/2018	00:30:00	USER				CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.

Event	28	Crew Leave Location	Crew Leave Location	9/22/2018	00:45:00	USER	THANK YOU FOR USING HALLIBURTON – PRINCE PEREZ AND CREW.
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3.0 Attachments

3.1 Noble Wells Ranch BB09-649-Custom Results (2).png



3.2 Noble Wells Ranch BB09-649-Custom Results.png

Description	Actual Time (UTC-06:00:00)	DH Density (ppg)	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	Pump Stg Tot (bbl)	
1 Start Job	18:42:59	8.10	0.00	-14.00	374.00	
2 Test Line:	18:49:17	8.23	0.00	5274.00	3.70	
3 Test Line:	18:57:56	8.18	0.00	2515.00	7.50	
4 Pump Sp	19:00:47	8.13	0.00	22.00	0.00	
5 Drop Top	19:32:09	11.38	0.00	24.00	132.60	
6 Pump Ca	19:32:23	11.37	0.00	24.00	132.60	
7 Pump Le	19:44:09	13.30	6.10	348.00	47.10	
8 Pump Tai	19:56:17	12.89	8.40	529.00	100.60	
9 Shutdow	20:55:37	12.52	0.00	47.00	460.90	
10 Drop Top	21:10:50	5.31	0.00	-19.00	476.00	
11 Pump Di	21:11:10	9.47	0.00	-20.00	476.00	
12 Bump Pl	22:18:36	8.29	0.00	2528.00	380.80	
13 Check Fl	22:23:01	8.25	0.00	2190.00	380.80	
14 End Job	22:25:41	8.23	0.00	-26.00	380.80	

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3.3 Noble Wells Ranch BB09-649-Custom Results (1).png

