

# HALLIBURTON

iCem<sup>®</sup> Service

## **NOBLE ENERGY INC-EBUS**

Date: Monday, May 21, 2018

### **Larson AA19-630 Production**

Job Date: Saturday, May 05, 2018

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 **Larson AA19-630** 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 #: 3827960		Quote #:		Sales Order #: 0904822887	
Customer: NOBLE ENERGY INC - EBUS				Customer Rep: Gary Stapleton			
Well Name: LARSON			Well #: AA19-630		API/UWI #: 05-123-45553-00		
Field: WATTENBERG		City (SAP): GILL		County/Parish: WELD		State: COLORADO	
Legal Description: SE SE-24-6N-64W-1147FSL-275FEL							
Contractor: H & P DRLG				Rig/Platform Name/Num: H & P 517			
Job BOM: 7523 7523							
Well Type: HORIZONTAL OIL							
Sales Person: HALAMERICA\HB70026				Srvc Supervisor: Nicholas Roles			

**Job**

Formation Name			
Formation Depth (MD)	Top	Bottom	
Form Type		BHST	230 degF
Job depth MD	17819ft	Job Depth TVD	
Water Depth		Wk Ht Above Floor	
Perforation Depth (MD)	From	To	

**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		9.625	8.921	36		J-55	0	1946	0	1946
Casing	0	5.5	4.778	20	BUTTRESS	P-110	0	17819	0	6634
Open Hole Section			8.5				1946	6863	1946	6634
Open Hole Section			8.5				6863	17834	0	

**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	11.5 lb/gal Tuned Spacer III w/ Chems	Tuned Spacer III	120	bbl	11.5	3.73		8		
	34.70 gal/bbl	<b>FRESH WATER</b>								
	0.60 gal/bbl	<b>DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)</b>								
	149.34 lbm/bbl	<b>BARITE, BULK (100003681)</b>								
	0.60 gal/bbl	<b>MUSOL A, 330 GAL TOTE - (790828)</b>								
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	ElastiCem Cap	ELASTICEM (TM) SYSTEM	150	sack	13.2	1.57		8	7.53	

7.53 Gal		<b>FRESH WATER</b>								
0.90 %		<b>SCR-100 (100003749)</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 ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>	
3	ElastiCem w/ SCBL	ELASTICEM (TM) SYSTEM	479	sack	13.2	1.6		8	7.69	
7.69 Gal		<b>FRESH WATER</b>								
0.45 %		<b>SCR-100 (100003749)</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 ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>	
4	NeoCem NT1	NeoCem TM	1234	sack	13.2	2.04		8	9.75	
9.75 Gal		<b>FRESH WATER</b>								
0.08 %		<b>SCR-100 (100003749)</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 ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>	
5	Displacement	Displacement	394	bbl	8.33			10		
Cement Left In Pipe		<b>Amount</b>	43'		<b>Reason</b>			<b>Shoe Joint</b>		
<b>Comment</b> Got 0bbls spacer to surface. Estimated TOL#1-2490', TOL#2-3517',TOT-6863'										

## 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>	DS Pump Press <i>(psi)</i>	Comments
Event	1	Call Out	Call Out	5/4/2018	22:00:00	USER				Called out by Service Coordinator for O/L at 0330
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	5/5/2018	01:15:00	USER				Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	5/5/2018	01:30:00	USER				Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	5/5/2018	02:30:00	USER				Upon arrival met with company man to discuss job details and calculations, performed hazard hunt and site assessment. Rig had 1000' casing left to run.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/5/2018	02:45:00	USER				Discussed rigging up hazards and procedure according to HMS.
Event	6	Other	Other	5/5/2018	03:30:00	USER				Water test- PH-6, Chlor-0, Temp-60.
Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	5/5/2018	05:15:00	USER				Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.
Event	8	Start Job	Start Job	5/5/2018	05:38:46	COM4				TD-17834', TP-17819' 5.5" 20#, FC-17776', TVD-6634', SURF-1946' 9.625" 36#, OH-8.5" MUD-9.5#
Event	9	Drop Bottom Plug	Drop Bottom Plug	5/5/2018	05:39:55	COM4				Dropped by HES supervisor, witnessed by company man.
Event	10	Test Lines	Test Lines	5/5/2018	05:42:17	COM4	8.55		4737.00	Pumped 5bbls fresh water to fill lines, closed 2" lo torc, performed 500psi k/o function test, followed with 5th gear stall at 1320psi, Performed 3000psi test on Rig Kelly Line. Held pressure, no leaks. proceeded to bring pressure to 4500psi, held pressure, no leaks.
Event	11	Pump Spacer 1	Pump Spacer 1	5/5/2018	05:56:19	COM4	11.43	4.00	481.00	Pumped 120bbls Tuned Spacer III 11.5# 3.78y 23.5g/s with 70g Musol A, 70g Dual Spacer B and 20g D-Air at 8bpm 810psi.
Event	12	Check Weight	Check Weight	5/5/2018	05:59:32	USER	11.51	5.70	556.00	Weight verified with pressurized mud scales.
Event	13	Pump Lead Cement	Pump Lead Cement	5/5/2018	06:12:40	COM4	11.44	6.90	426.00	Pumped 150sks or 41.9bbls Elasticem w/o CBL 13.2# 1.53y

7.53g/s at 8bpm 900psi.

Event	14	Check Weight	Check Weight	5/5/2018	06:14:54	USER	13.39	8.00	839.00	Weight verified with pressurized mud scales.
Event	15	Pump Cement	Pump Cement	5/5/2018	06:18:19	COM4	13.16	8.00	841.00	Pumped 479sks or 136.5bbls Elasticem w/CBL 13.2# 1.6y 7.69g/s at 8bpm 600psi.
Event	16	Drop Bottom Plug	Drop Bottom Plug	5/5/2018	06:28:49	USER	13.30	7.70	758.00	Dropped by HES supervisor, witnessed by company man. Forgot to drop at begining of lead, Shutdown and dropped 60bbls into.
Event	17	Pump Tail Cement	Pump Tail Cement	5/5/2018	06:40:29	COM4	13.17	8.00	837.00	Pumped 1234sks or 448bbls 13.2# 2.04y 9.75g/s Neocem at 8bpm 1240psi.
Event	18	Check Weight	Check Weight	5/5/2018	06:50:19	COM4	13.19	8.20	1265.00	Weight verified with pressurized mud scales.
Event	19	Check Weight	Check Weight	5/5/2018	07:22:32	COM4	13.19	8.20	1253.00	Weight verified with pressurized mud scales.
Event	20	Shutdown	Shutdown	5/5/2018	07:42:41	COM4				Shutdown, rig blew air through lines to pits, followed with 5bbls fresh water through pumps and lines.
Event	21	Drop Top Plug	Drop Top Plug	5/5/2018	07:50:52	COM4				Dropped by HES supervisor, witnessed by company man.
Event	22	Pump Displacement	Pump Displacement	5/5/2018	07:50:54	COM4	8.23	10.10	610.00	Pumped 394bbls fresh water with 10g MMCR in first 20bbls, 15g Algicide throughout.
Event	23	Bump Plug	Bump Plug	5/5/2018	08:34:26	COM4	8.19	3.10	1911.00	Slowed down to 3bpm at 375bbls away, final circulating pressure- 2200psi, Bump pressure-2900psi.
Event	24	Check Floats	Check Floats	5/5/2018	08:39:56	USER				Released pressure and got 5.5bbls fresh water to truck, floats held.
Event	25	End Job	End Job	5/5/2018	08:43:18	COM4				Got 0bbls spacer to surface. Estimated TOL#1-2490', TOL#2-3517',TOT-6863'
Event	26	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig-Down	5/5/2018	08:50:00	USER				All HSE present. Discussed red zone areas and trapped pressure hazards. Watch for suspended loads and rig down procedures, including hand placement, lifting techniques, and swing radius.
Event	27	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/5/2018	10:15:00	USER				All HSE present and fit to drive. Aware of directions and hazards.
Event	28	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	5/5/2018	10:30:00	USER				Pre journey managment prior to departure.

Attachments

## 2.2 Larson AA19-630-Custom Results.png

