

# HALLIBURTON

iCem<sup>®</sup> Service

## **EXTRACTION OIL & GAS-EBUS**

United States of America, COLORADO

Date: Thursday, May 02, 2019

### **Interchange B N35-20-2C Production**

Sincerely,  
**Tyler Hill**

## Legal Notice

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### Disclaimer:

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## Table of Contents

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1.0	Cementing Job Summary .....	4
1.1	Executive Summary .....	4
2.0	Real-Time Job Summary .....	8
2.1	Job Event Log .....	8
3.0	Attachments.....	12
3.1	Extraction Production Interchange B N35-20-2C-Custom Results.png .....	12

## 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 **Interchange B N35-20-2C** 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.

**Approximately 51 bbls of cement were returned to surface.**

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 Fort Lupton**

*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 369404		<b>Ship To #:</b> 3954713		<b>Quote #:</b>		<b>Sales Order #:</b> 0905661260					
<b>Customer:</b> EXTRACTION OIL & GAS-EBUS					<b>Customer Rep:</b> Danny Herrera						
<b>Well Name:</b> INTERCHANGE B			<b>Well #:</b> N35-20-2C			<b>API/UWI #:</b> 05-014-20846-00					
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> BROOMFIELD		<b>County/Parish:</b> BROOMFIELD			<b>State:</b> COLORADO				
<b>Legal Description:</b> NE SW-10-1S-68W-2479FSL-1567FWL											
<b>Contractor:</b> PATTERSON-UTI ENERGY					<b>Rig/Platform Name/Num:</b> PATTERSON 901						
<b>Job BOM:</b> 7523 7523											
<b>Well Type:</b> HORIZONTAL OIL											
<b>Sales Person:</b> HALAMERICA\HX38199					<b>Srv Supervisor:</b> Thomas Haas						
<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>Job depth MD</b>		18607ft			<b>Job Depth TVD</b>		8112				
<b>Water Depth</b>					<b>Wk Ht Above Floor</b>		5				
<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	0	9.625	8.921	36			0	1642	0	1642	
Casing	0	5.5	4.892	17	BTC	P-110	0	18607	0	8112	
Open Hole Section			8.75				1642	18618	1642	8112	
<b>Tools and Accessories</b>											
<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>	<b>Depth ft</b>		<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>		
						<b>Top Plug</b>	5.5	1	NCS		
<b>Float Shoe</b>	5.5	1	NCS	18607		<b>Bottom Plug</b>	5.5	1	NCS		
<b>Float Collar</b>	5.5	1	NCS	18602							
						<b>Plug Container</b>	5.5	1	HES		
<b>Fluid Data</b>											
<b>Stage/Plug #:</b> 1											
<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>
1	FDP-C1337-18	SBM FDP-C1337-18 CEMENT SPACER SYS			50	bbbl	12.5	2.74	16.6	8	1710
5 lbm/bbl		<b>SEM-94P, 35 LB SACK - (1023987)</b>									

205.22 lbm/bbl		<b>BARITE, BULK (100003681)</b>							
5 lbm/bbl		<b>SEM-93P, 35 LB SACK - (1023977)</b>							
1 lbm/bbl		<b>FE-2 (100001615)</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>
2	ElastiCem	ELASTICEM (TM) SYSTEM	585	sack	13.2	1.6	7.75	8	4533
0.75 %		<b>SCR-100 (100003749)</b>							
7.75 Gal		<b>FRESH WATER</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	GasStop	ELASTICEM (TM) SYSTEM	615	sack	13.2	1.6	7.7	8	4736
0.75 %		<b>SCR-100 (100003749)</b>							
5.10 Gal		<b>FRESH WATER</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	ElastiCem	ELASTICEM (TM) SYSTEM	1710	sack	13.2	1.57	7.66	8	12968
0.75 %		<b>SCR-100 (100003749)</b>							
7.66 Gal		<b>FRESH WATER</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	MMCR Displacement	MMCR Displacement	20	bbl	8.33			8	
0.50 gal/bbl		<b>MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)</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>
6	Displacement	Displacement	412	bbl	8.33			8	
<b>Cement Left In Pipe</b>	<b>Amount</b>	N/A		<b>Reason</b>				<b>Shoe Joint</b>	

Mix Water:	pH 7	Mix Water Chloride:	<300 ppm	Mix Water Temperature:	57 °F
Cement Temperature:	N/A	Plug Displaced by:	8.33 lb/gal F.W.	Disp. Temperature:	54 °F
Plug Bumped?	Yes	Bump Pressure:	2390 psi	Floats Held?	Yes
Cement Returns:	51 bbl	Returns Density:	N/A	Returns Temperature:	N/A
<b>Comment</b> Plug bumped at calculated displacement, final circulating pressure of 2390 psi, wet shoe disk burst at 3168 psi, floats held, 3 bbl back to the truck. 51 bbl cement to surface.					

## 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>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	Call Out	5/1/2019	14:00:00	USER					CREW CALLED OUT AT 14:00 5/1/2019, REQUESTED ON LOCATION 20:00 5/1/2019. CREW PICKED UP CEMENT, CHEMICALS (20 GAL D-AIR, 1538 GAL FDP LATEX, 10 GAL MMCR), 100 LBS SUGAR, AND PLUG CONTAINER FROM FORT LUPTON, CO. BULK 660: 11062210/10679720 Bulk 660: 11592293/11023106 SOFT SIDE: 11005806/12051673 PUMP ELITE: 11897034/11645460.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/1/2019	17:45:00	USER					DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW
Event	3	Crew Leave Yard	Crew Leave Yard	5/1/2019	18:00:00	USER					STARTED JOURNEY MANAGEMENT.
Event	4	Arrive At Loc	Arrive At Loc	5/1/2019	19:00:00	USER					END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 9.625" 36# @ 1642', CASING: 5.5" 17# @ 18607', 5' SHOE JOINT, 8.5" OPEN HOLE, TVD @ 8112', 10 PPG WELL FLUID, FRESH WATER DISPLACEMENT.

Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/1/2019	19:10:00	USER					HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	5/1/2019	19:20:00	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	5/2/2019	02:00:00	USER	9.15	0.00	-2.00	0.00	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Start Job	Start Job	5/2/2019	02:46:50	COM4	8.57	0.00	-3.00	0.00	START JOB DATA RECORDING.
Event	9	Drop Bottom Plug	Drop Bottom Plug	5/2/2019	02:47:08	USER	8.82	0.50	24.00	0.00	PLUG LEFT LANDING JOINT, VERIFIED BY COMPANY MAN.
Event	10	Test Lines	Test Lines	5/2/2019	02:48:12	COM4	8.75	0.00	64.00	1.50	PRESSURE TESTED LINES TO 5000 PSI, 500 PSI KICK OUT AT 800 PSI, 5TH GEAR STALL AT 1700 PSI.
Event	11	Pump Spacer 1	Pump Spacer 1	5/2/2019	02:51:15	COM4	8.63	0.00	86.00	0.00	PUMP 50 BBLS OF FDP SPACER @ 12.5 LB/GAL, ADDED 5 GAL D-AIR, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	12	Pump Cap Cement	Pump Cap Cement	5/2/2019	03:01:37	COM4	13.04	8.20	435.00	0.10	PUMP 585 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.6 YIELD, 7.75 GAL/SK, 166.7 BBLS, CALCULATED TOC @ SURFACE, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.

Event	13	Pump Lead Cement	Pump Lead Cement	5/2/2019	03:23:28	COM4	13.15	8.40	486.00	181.00	PUMP 615 SKS OF GASSTOP @ 13.2 LB/GAL, 1.6 YIELD, 7.7 GAL/SK, 175.3 BBLs, CALCULATED TOL 2594', MIX WATER MIXED WITH 1538 GAL OF LATEX AND 20 GAL D-AIR, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	14	Pump Tail Cement	Pump Tail Cement	5/2/2019	03:43:17	COM4	13.11	8.40	552.00	165.70	PUMP 1710 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.57 YIELD, 7.66 GAL/SK, 478.1 BBLs, CALCULATED TOT @ 6891', DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	15	Other	Bottom Plug Landed	5/2/2019	03:51:13	USER	13.16	8.40	810.00	66.40	BOTTOM PLUG LANDED, DISK RUPTURED AT 1300 PSI.
Event	16	Shutdown	Shutdown	5/2/2019	04:47:54	COM4	14.38	0.00	104.00	511.80	SHUTDOWN TO WASH PUMPS/LINES AND DROP TOP PLUG.
Event	17	Drop Top Plug	Drop Top Plug	5/2/2019	04:55:09	COM4	-0.38	0.00	8.00	524.80	PLUG LEFT PLUG CONTAINER, VERIFIED BY COMPANY MAN.
Event	18	Pump Displacement	Pump Displacement	5/2/2019	04:55:14	COM4	-0.38	0.00	7.00	524.80	BEGIN PUMPING CALCULATED DISPLACEMENT OF 432 BBL FRESH WATER, 10 GAL OF MMCR ADDED TO THE FIRST 20 BBL.
Event	19	Cement Returns to Surface	Cement Returns to Surface	5/2/2019	05:44:26	USER	8.47	7.30	2891.00	392.10	CEMENT RETURNED TO SURFACE 381 BBL INTO DISPLACEMENT, 51 BBL OF CEMENT TO SURFACE.

Event	20	Bump Plug	Bump Plug	5/2/2019	05:52:01	USER	8.45	0.00	2418.00	434.80	PLUG BUMPED AT CALCULATED DISPLACEMENT, FINAL CIRCULATING PRESSURE OF 2390 PSI.
Event	21	Other	Rupture Disk	5/2/2019	05:52:41	USER	8.45	0.80	2524.00	434.80	PRESSURE UP TO RUPTURE WET SHOE DISK, DISK RUPTURED AT 3168 PSI.
Event	22	Other	Wet Shoe	5/2/2019	05:53:30	USER	8.47	5.00	2622.00	436.80	PUMP A 5 BBL WET SHOE.
Event	23	Check Floats	Check Floats	5/2/2019	05:54:27	USER	8.44	0.00	2248.00	441.00	RELEASED PRESSURE BACK TO THE TRUCK, FLOATS HELD, RECIEVED 3 BBL BACK.
Event	24	End Job	End Job	5/2/2019	05:55:51	COM4	8.42	0.00	17.00	441.00	END JOB DATA RECORDING.
Event	25	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/2/2019	06:00:00	USER	8.40	0.00	21.00	441.00	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	26	Rig-Down Completed	Rig-Down Completed	5/2/2019	07:00:00	USER					ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL.
Event	27	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/2/2019	08:45:00	USER					DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	28	Crew Leave Location	Crew Leave Location	5/2/2019	09:00:00	USER					THANK YOU FOR USING HALLIBURTON - THOMAS HAAS AND CREW.

## 3.0 Attachments

### 3.1 Extraction Production Interchange B N35-20-2C-Custom Results.png

