

# HALLIBURTON

iCem® Service

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

United States of America, COLORADO

**United B S16-20-14N**

Surface Casing

Sincerely,

**Thomas Haas and Crew**

## Legal Notice

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### Disclaimer:

All information in this report is provided subject to the terms and conditions which govern the services provided by Halliburton. Halliburton personnel use their best efforts in gathering information and their best judgment in interpreting it, but any interpretation, research, analysis or recommendation furnished by Halliburton are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and empirical relationships and assumptions are not infallible, and with respect to which professionals in the industry may differ. iCem 3D Displacement results are used to understand how fluids intermix during a cement job. Simulation and 3D displacement results are not intended as and should not be used as a replacement for bond logs in determining top of cement. Current 3D model calculations are known to model more volume than the input volume for standard cases due to known calculation improvements required. For rotational cases, the modeled volume will be impacted by the same calculations impacting the standard cases, as well as additional constraints imposed to make the calculation time required operationally feasible. Therefore, until further notice, 3D displacement results should not be used for replacement of a bond log, or used as an identifier of top of cement. HALLIBURTON IS UNABLE TO GUARANTEE THE ACCURACY OF ANY CHART INTERPRETATION, RESEARCH ANALYSIS, OR JOB RECOMMENDATION and any interpretation or recommendation is not for use of or reliance upon by any third party. The customer has full responsibility for any of its decisions which are based on the information provided in this report.

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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 United B S16-20-14N surface casing. 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 25 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> 3909337		<b>Quote #:</b>		<b>Sales Order #:</b> 0906524164					
<b>Customer:</b> EXTRACTION OIL & GAS-EBUS					<b>Customer Rep:</b> Manny Parras						
<b>Well Name:</b> UNITED B			<b>Well #:</b> S16-20-14N			<b>API/UWI #:</b> 05-014-20814-00					
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> BROOMFIELD		<b>County/Parish:</b> BROOMFIELD			<b>State:</b> COLORADO				
<b>Legal Description:</b> NE NE-9-1S-68W-489FNL-928FEL											
<b>Contractor:</b> ENSIGN DRLG					<b>Rig/Platform Name/Num:</b> ENSIGN 147						
<b>Job BOM:</b> 7521 7521											
<b>Well Type:</b> HORIZONTAL OIL											
<b>Sales Person:</b> HALAMERICA\HX41066					<b>Srvc 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>		1630ft			<b>Job Depth TVD</b>			1630			
					<b>Wk Ht Above Floor</b>			4			
<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			0	1630	0	1630	
Open Hole Section			13.5				0	1635	0	1635	
<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>Float Shoe</b>	9.625	1	Topco	1630		<b>Top Plug</b>	9.625	1	HES		
<b>Float Collar</b>	9.625	1	Topco	1586							
						<b>Plug Container</b>	9.625	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	Water with dye	Water with dye			10	bbl	8.34			4	

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																								
2	SwiftCem	SWIFTCEM (TM) SYSTEM	550	sack	13.5	1.74	9.17	8	5032																								
9.17 Gal		FRESH WATER																															
0.1250 lbm		POLY-E-FLAKE (101216940)																															
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	Displacement	Displacement	123	bbl	8.34			10																									
<table border="1"> <thead> <tr> <th>Cement Left In Pipe</th> <th>Amount</th> <th>Reason</th> <th>Shoe Joint</th> </tr> </thead> <tbody> <tr> <td></td> <td>44 ft</td> <td></td> <td></td> </tr> <tr> <td><b>Mix Water:</b></td> <td>pH 7</td> <td><b>Mix Water Chloride:</b> &lt;300 ppm</td> <td><b>Mix Water Temperature:</b> 63 °F</td> </tr> <tr> <td><b>Cement Temperature:</b></td> <td></td> <td><b>Plug Displaced by:</b> 8.33 lb/gal Fresh Water</td> <td><b>Disp. Temperature:</b> 63 °F</td> </tr> <tr> <td><b>Plug Bumped?</b></td> <td>Yes</td> <td><b>Bump Pressure:</b> 580 psi</td> <td><b>Floats Held?</b> Yes</td> </tr> <tr> <td><b>Cement Returns:</b></td> <td>25 bbl</td> <td><b>Returns Density:</b></td> <td><b>Returns Temperature:</b></td> </tr> </tbody> </table>										Cement Left In Pipe	Amount	Reason	Shoe Joint		44 ft			<b>Mix Water:</b>	pH 7	<b>Mix Water Chloride:</b> <300 ppm	<b>Mix Water Temperature:</b> 63 °F	<b>Cement Temperature:</b>		<b>Plug Displaced by:</b> 8.33 lb/gal Fresh Water	<b>Disp. Temperature:</b> 63 °F	<b>Plug Bumped?</b>	Yes	<b>Bump Pressure:</b> 580 psi	<b>Floats Held?</b> Yes	<b>Cement Returns:</b>	25 bbl	<b>Returns Density:</b>	<b>Returns Temperature:</b>
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<b>Comment</b> Plug bumped at calculated, final circulating pressure of 580 psi, floats held, .5 bbl back, 25 bbl of cement to surface.																																	

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

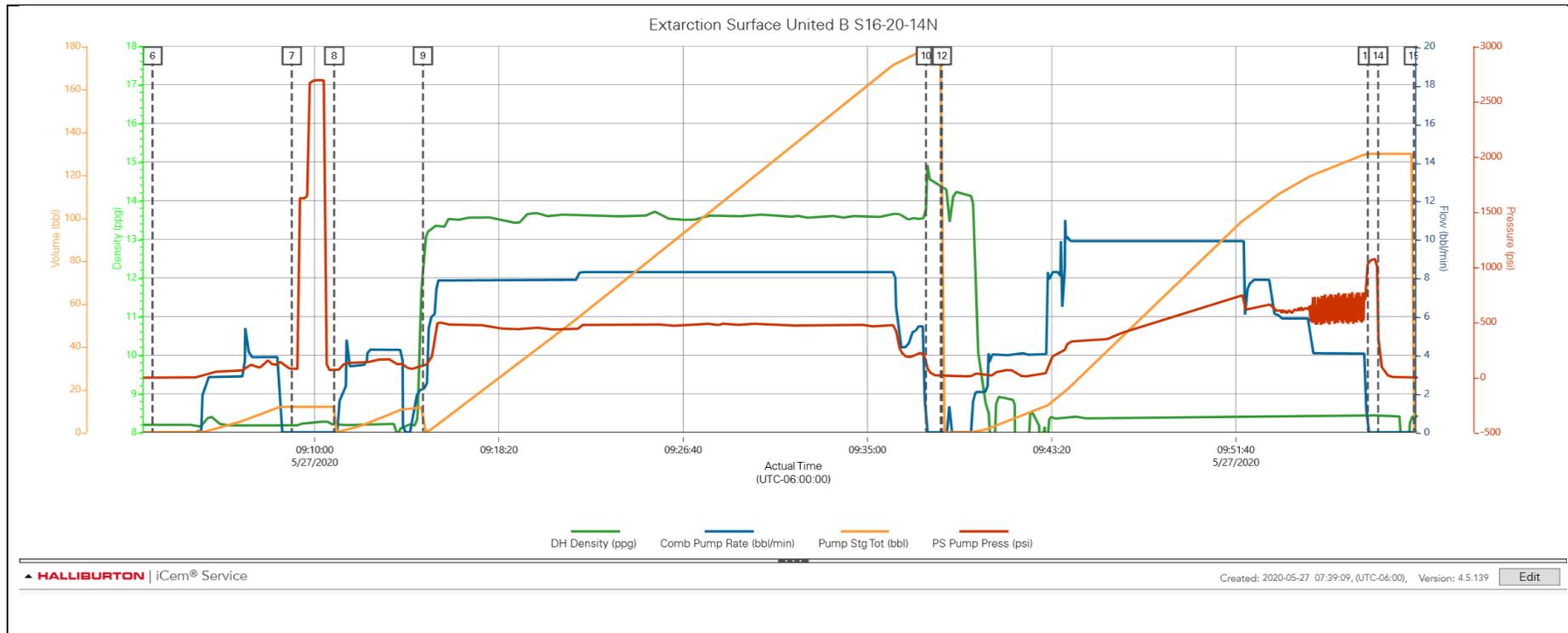
Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	Pump Stg Tot <i>(bbl)</i>	PS Pump Press <i>(psi)</i>	Comments
Event	1	Call Out	Call Out	5/27/2020	01:00:00	USER					CREW CALLED OUT AT 1:00 5/27/2020, REQUESTED ON LOCATION 10:00 5/27/2020. CREW PICKED UP CEMENT, 100 LBS SUGAR, AND PLUG CONTAINER FROM FORT LUPTON, CO. BULK 660: 11562546/11633848 PUMP RED TIGER: 12645765.
Event	2	Arrive At Loc	Arrive At Loc	5/27/2020	07:00:00	USER					CREW HAULED CEMENT IN BETWEEN JOBS. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING: 9.625" 36# @ 1630', 44' SHOE TRACK, OH 13.5", 8.7 PPG WELL FLUID, FRESH WATER DISPLACEMENT.
Event	3	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/27/2020	08:30:00	USER	8.20	0.00	0.00	-6.00	HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	4	Rig-Up Equipment	Rig-Up Equipment	5/27/2020	08:45:00	USER	8.19	0.00	0.00	-5.00	CREW STAGED EQUIPMENT AND RIGGED UP BULK, IRON, AND WATER HOSES TO PERFORM JOB.

Event	5	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/27/2020	08:50:00	USER	8.20	0.00	0.00	-4.00	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	6	Start Job	Start Job	5/27/2020	09:02:40	COM10	8.19	0.00	0.00	-3.00	START JOB DATA RECORDING.
Event	7	Test Lines	Test Lines	5/27/2020	09:08:58	COM10	8.19	0.00	11.90	75.00	PRESSURE TESTED IRON TO 2700 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 480 PSI, 5TH GEAR STALL OUT @1650 PSI.
Event	8	Pump Spacer 1	Pump Spacer 1	5/27/2020	09:10:53	COM10	8.21	0.00	11.90	60.00	PUMP 10 BBL OF FRESH WATER WITH RED DYE.
Event	9	Pump Lead Cement	Pump Lead Cement	5/27/2020	09:14:54	COM10	12.28	2.20	11.90	101.00	PUMP 550 SKS OF SWIFTCEM @ 13.5 LB/GAL, 1.74 YIELD, 9.17 GAL/SK, 170 BBLS, TOL @ SURFACE, DENSITY VERIFIED BY PRESSURIZED MUD SCALES.
Event	10	Shutdown	Shutdown	5/27/2020	09:37:39	COM10	13.78	0.00	178.80	120.00	SHUTDOWN TO DROP TOP PLUG.
Event	11	Drop Top Plug	Drop Top Plug	5/27/2020	09:38:19	COM10	14.36	0.00	178.80	8.00	PLUG LEFT PLUG CONTAINER, VERIFIED BY COMPANY MAN.
Event	12	Pump Displacement	Pump Displacement	5/27/2020	09:38:22	COM10	14.35	0.00	178.80	8.00	BEGIN PUMPING 123 BBL OF FRESH WATER DISPLACEMENT.
Event	13	Bump Plug	Bump Plug	5/27/2020	09:57:38	COM10	8.43	0.00	129.80	1034.00	PLUG BUMPED AT CALCULATED DISPLACEMENT, FINAL CIRCULATING PRESSURE OF 580 PSI. 25 BBL OF CEMENT BACK TO SURFACE.

Event	14	Check Floats	Check Floats	5/27/2020	09:58:06	USER	8.44	0.00	129.80	473.00	RELEASED PRESSURE BACK TO THE TRUCK, FLOATS HELD, .5 BB BACK.
Event	15	End Job	End Job	5/27/2020	09:59:43	COM10	8.43	0.00	0.00	-3.00	END JOB DATA RECORDING.
Event	16	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/27/2020	15:00:00	USER					DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	17	Rig-Down Completed	Rig-Down Completed	5/27/2020	15:10:00	USER					ALL HALLIBURTON ITEMS WERE STOWED FOR TRAVEL.

3.0 Attachments

3.1 Extraction Surface United B S16-20-14N-Custom Results.png



3.2 Extarction Surface United B S16-20-14N-Custom Results (1).png

Extarction Surface United B S16-20-14N						
Description	Actual Time (UTC-06:00:00)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	PS Pump Press (psi)	
6 Start Job	09:02:40	8.19	0.00	0.00	-3.00	
7 Test Lines	09:08:58	8.19	0.00	11.90	75.00	
8 Pump Spacer 1	09:10:53	8.21	0.00	11.90	60.00	
9 Pump Lead Cement	09:14:54	12.28	2.20	11.90	101.00	
10 Shutdown	09:37:39	13.78	0.00	178.80	120.00	
11 Drop Top Plug	09:38:19	14.36	0.00	178.80	8.00	
12 Pump Displacement	09:38:22	14.35	0.00	178.80	8.00	
13 Bump Plug	09:57:38	8.43	0.00	129.80	1034.00	
14 Check Floats	09:58:06	8.44	0.00	129.80	473.00	
15 End Job	09:59:43	8.43	0.00	0.00	-3.00	

▲ HALLIBURTON | iCem® Service Created: 2020-05-27 07:39:09, (UTC-06:00), Version: 4.5.139