

# HALLIBURTON

iCem<sup>®</sup> Service

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

Date: Saturday, September 08, 2018

### **VT-LDS 2-16-18 Surface**

Job Date: Friday, May 25, 2018

Sincerely,

**Julia Nichols**

## Legal Notice

---

### 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.

Table of Contents

---

1.0    Cementing Job Summary ..... 4

    1.1    Executive Summary .....4

2.0    Real-Time Job Summary ..... 7

    2.1    Job Event Log .....7

3.0    Attachments..... 9

    3.1    Custom Results – Job Chart with Events .....9

    3.2    Custom Results – Job Chart without Events.....10

## 1.0 Cementing Job Summary

---

### 1.1 Executive Summary

---

Halliburton appreciates the opportunity to perform the cementing services on the **VT LDS 2-16-18** cement **Surface** 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 29 barrels 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]**

## HALLIBURTON

## Cementing Job Summary

*The Road to Excellence Starts with Safety*

Sold To #: 369404		Ship To #: 3788963		Quote #:		Sales Order #: 0904877712				
Customer: EXTRACTION OIL & GAS -				Customer Rep: Shawn McIntyre						
Well Name: VT-LDS		Well #: 2-16-18		API/UWI #: 05-123-44419-00						
Field: WATTENBERG	City (SAP): GREELEY	County/Parish: WELD		State: COLORADO						
Legal Description: SW NW-15-5N-85W-1889FNL-602FWL										
Contractor: Shawn McIntyre				Rig/Platform Name/Num: Cartel 11						
Job BOM: 7521 7521										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HX38199				Srvc Supervisor: Adam Covington						
<b>Job</b>										
Formation Name										
Formation Depth (MD)	Top		Bottom							
Form Type			BHST							
Job depth MD	1551ft		Job Depth TVD							
Water Depth			Wk Ht Above Floor							
Perforation Depth (MD)	From		To							
<b>Well Data</b>										
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	8 RD	J-55	0	1551	0	0
Open Hole Section			13.5				0	1552	0	0
<b>Tools and Accessories</b>										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	9.625					Top Plug	9.625	1	HES	
Float Shoe	9.625			1551		Bottom Plug	9.625		HES	
Float Collar	9.625					SSR plug set	9.625		HES	
Insert Float	9.625					Plug Container	9.625	1	HES	
Stage Tool	9.625					Centralizers	9.625		HES	
<b>Fluid Data</b>										
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	Red Dye Spacer	Red Dye Spacer	50	bbl	8.33			3		
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	SwiftCem	SWIFTCEM (TM) SYSTEM	675	sack	13.5	1.74		5	9.2	
9.20 Gal		FRESH WATER								

last updated on 9/8/2018 11:43:46 AM

Page 1 of 3

iCem® Service

(v. 4.5.139)

Created: Saturday, September 08, 2018

HALLIBURTON

*Cementing Job Summary*

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	Fresh Water	Fresh Water	117	bbl	8.33			5	
Cement Left In Pipe		Amount	43 ft		Reason			Shoe Joint	
Mix Water:		pH 7	Mix Water Chloride: 0 ppm			Mix Water Temperature: 67 °F			
Cement Temperature:		67 °F	Plug Displaced by: 8.33 lb/gal			Disp. Temperature: 67 °F			
Plug Bumped?		Yes	Bump Pressure: 524 psi to 1119 psi			Floats Held? Yes			
Cement Returns:		29 bbl	Returns Density: 8.33 lb/gal			Returns Temperature: °F °C			
Comment OH- 13.5, 1552' TP-9 5/8" 1551' SHOE-43'. WATER TEMP 67 DEGREES, 0-CHLORIDES, 7-PH, 0-SULFATES. 29 BBLs OF CEMENT BACK TO SURFACE. GOT 1 BBL BACK TO THE TRUCK. FLOATS HELD.									

## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	PS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Comments
Event	1	Call Out	Call Out	5/24/2018	07:30:00	USER				CALLED OUT BY SERVICE COORDINATOR FOR O/L AT 11:00
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	5/24/2018	08:20:00	USER				MET WITH CREW AND DISCUSSED DIRECTIONS AND SPEED. CALLED IN A JOURNEY BEFORE WE LEFT.
Event	3	Depart Shop for Location	Depart Shop for Location	5/24/2018	08:30:00	USER				JOURNEY MANAGEMENT PRIOR TO DEPARTURE
Event	4	Arrive At Loc	Arrive At Loc	5/24/2018	09:30:00	USER				UPON ARRIVAL MET WITH COMPANY MAN TO DISCUSS JOB DETAILS AND CALCULATIONS, PERFORMED HAZARD HUNT AND SITE ASSESSMENT.
Event	5	Safety Meeting - Pre Rig-Up	Safety Meeting - Pre Rig-Up	5/24/2018	22:00:00	USER				DISCUSSED RIGGING UP HAZARDS AND PROCEDURE ACCORDING TO HMS.
Event	6	Safety Meeting - Pre Job	Safety Meeting - Pre Job	5/25/2018	01:15:00	USER	1.00	8.35	0.00	HELD SAFETY MEETING WITH ALL JOB ASSOCIATED PERSONNEL TO DISCUSS JOB PROCEDURE, HAZARDS AND STOP WORK AUTHORITY. Water test- PH-6, Chlor-0, Temp-65. Cement temp-70.
Event	7	Start Job	Start Job	5/25/2018	01:21:46	COM4	0.00	8.35	0.00	
Event	8	Test Lines	Test Lines	5/25/2018	01:26:15	COM4	2972.00	8.37	0.00	
Event	9	Pump Spacer 1	Pump Spacer 1	5/25/2018	01:30:41	COM4	68.00	8.34	2.90	PUMPED 40 BBLS OF FRESH WATER SPACER (AS PER CO. MAN) AT 3 BPM, 65 PSI.
Event	10	Pump Spacer 2	Pump Spacer 2	5/25/2018	01:43:27	COM4	65.00	8.34	3.00	PUMPED 10 BBLS OF DYE WATER SPACER AT 3 BPM, 65 PSI.
Event	11	Pump Lead Cement	Pump Lead Cement	5/25/2018	01:55:05	COM4	114.00	13.31	5.30	PUMPED 209 BBLS (675 SKS) OF 13.5#, 1.74y, 9.2wr CEMENT AT 5 BPM 150 PSI.
Event	12	Check Weight	Check Weight	5/25/2018	01:55:47	COM4	146.00	13.63	5.00	USED PRESSURIZED MUD SCALES TO WEIGH UP CEMENT. CEMENT SCALED AT 13.5#
Event	13	Check Weight	Check Weight	5/25/2018	02:06:24	COM4	122.00	13.53	5.00	USED PRESSURIZED MUD SCALES TO WEIGH UP CEMENT.

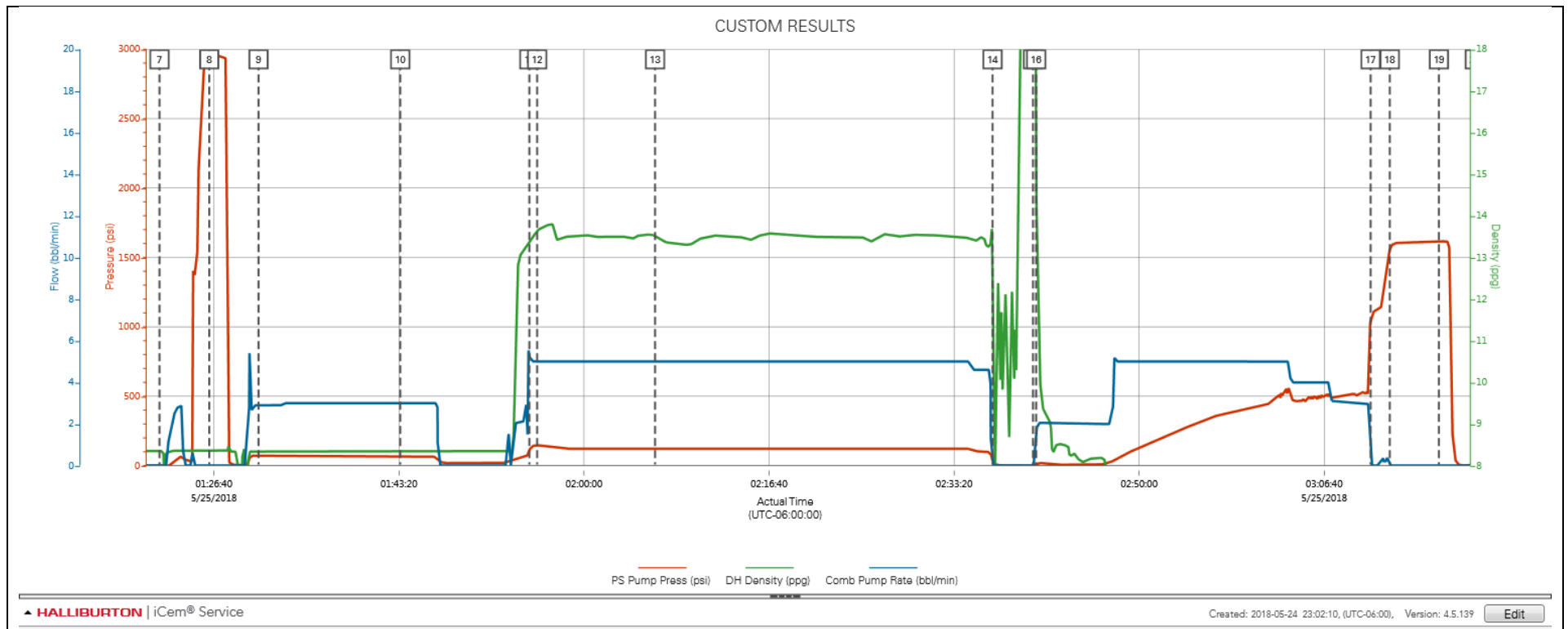
CEMENT SCALED AT 13.5#

Event	14	Shutdown	Shutdown	5/25/2018	02:36:48	USER	33.00	13.03	0.00	SHUTDOWN TO WASH TUB AND GET READY TO DROP AND WASH UP ON TOP OF PLUG.
Event	15	Drop Top Plug	Drop Top Plug	5/25/2018	02:40:26	COM4	0.00	26.64	0.00	ADAM COVINGTON DROPPED HALLIBURTON 9 5/8" TOP PLUG. DRILLER WITNESSED.
Event	16	Pump Displacement	Pump Displacement	5/25/2018	02:40:43	COM4	10.00	15.42	1.40	PUMPED 117 BBLS OF FRESH WATER DISPLACEMENT AT 5 BPM, 120 PSI TO START. HAD OPERATOR SLOW RATE WHEN WE GOT CEMENT TO SURFACE AT 88 BBLS AWAY. THEN SLOW TO 3 BPM ON THE LAST 10 BBLS AWAY. 29 BBLS OF CEMENT TO SURFACE.
Event	17	Bump Plug	Bump Plug	5/25/2018	03:10:51	COM4	1054.00	7.97	0.00	BUMPED HALLIBURTON 9 5/8" TOP PLUG. FCP 524 PSI TOOK TO 1119 PSI.
Event	18	Other	Other	5/25/2018	03:12:34	COM4	1558.00	7.96	0.00	PERFORMED A 1500 PSI PRESSURE TEST FOR 5 MINS AS PER CO. MAN.
Event	19	Check Floats	Check Floats	5/25/2018	03:17:00	USER	1614.00	7.95	0.00	HELD PRESSURE TEST FOR 5 MINS AND BLED OFF. GOT ONE BBL OF WATER BACK TO THE TRUCK. FLOATS HELD.
Event	20	End Job	End Job	5/25/2018	03:20:14	COM4	0.00	7.94	0.00	OH- 13.5, 1552' TP-9 5/8" 1551' SHOE-43'. WATER TEMP 67 DEGREES, 0-CHLORIDES, 7-PH, 0-SULFATES. 29 BBLS OF CEMENT BACK TO SURFACE.
Event	21	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/25/2018	03:30:00	USER	1.00	7.96	0.00	DISCUSSED RIGGING DOWN HAZARDS AND PROCEDURE ACCORDING TO HMS.
Event	22	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/25/2018	04:50:00	USER				HELD MEETING WITH ALL HES EMPLOYEES IN CONVOY TO DISCUSS DIRECTIONS AND HAZARDS ASSOCIATED WITH DRIVING, ALL FIT TO DRIVE.
Event	23	Depart Location	Depart Location	5/25/2018	05:00:00	USER				PRE JOURNEY MANAGEMENT PRIOR TO DEPARTURE.



## 3.0 Attachments

### 3.1 Custom Results – Job Chart with Events



3.2 Custom Results – Job Chart without Events

