

# HALLIBURTON

iCem<sup>®</sup> Service

**EXTRACTION OIL & GAS-EBUS**

**Rinn Valley East N17-20-4C Production**

Sincerely,  
**Meghan Jacobs**

## 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	Rinn Valley East N17-20-4C Production – Job Chart with Events .....	9
3.2	Rinn Valley East N17-20-4C Production – 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 **Rinn Valley East N17-20-4C** 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 47bbls 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 [Ft. Lupton]**

## HALLIBURTON

## Cementing Job Summary

*The Road to Excellence Starts with Safety*

Sold To #: 369404	Ship To #: 3892441	Quote #:	Sales Order #: 0905106414							
Customer: EXTRACTION OIL & GAS		Customer Rep: Manuel Parres								
Well Name: RINN VALLEY EAST	Well #: N17-20-4C	API/UWI #: 05-123-47315-00								
Field: WATTENBERG	City (SAP): FIRESTONE	County/Parish: WELD	State: COLORADO							
Legal Description: SW SE-17-2N-68W-870FSL-1772FEL										
Contractor:		Rig/Platform Name/Num: Patterson 901								
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HX38199		Srv Supervisor: Kendall Broom - H194727								
<b>Job</b>										
Formation Name										
Formation Depth (MD)	Top	Bottom								
Form Type	BHST									
Job depth MD	17508ft									
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		J-55	0	1605	0	
Casing	0	5.5	4.778	20	BTC	P-110	0	17507	0	
Open Hole Section			8.5				1605	17508	7530	
<b>Tools and Accessories</b>										
Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make		
Guide Shoe	5.5				Top Plug	5.5		HES		
Float Shoe	5.5			17508	Bottom Plug	5.5		HES		
Float Collar	5.5				SSR plug set	5.5		HES		
Insert Float	5.5				Plug Container	5.5	1	HES		
Stage Tool	5.5				Centralizers	5.5		HES		
<b>Fluid Data</b>										
Stage/Plug #: 1										
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	
1	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	50	bbl	11.5	3.73		6		
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	ElastiCem	ELASTICEM (TM) SYSTEM	2766	sack	13.2	1.57		8	7.53	

last updated on 9/7/2018 9:42:20 AM

Page 1 of 3

**HALLIBURTON**

*Cementing Job Summary*

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	388	bbl	8.33				
<b>Cement Left In Pipe</b>									
<b>Amount</b>		5 ft			<b>Reason</b>			Shoe Joint	
<b>Mix Water:pH</b>		7		<b>Mix Water Chloride:</b>		0 ppm		<b>Mix Water Temperature:</b>	
								73°F °C	
<b>Plug Bumped?</b>		Yes		<b>Bump Pressure:</b>		3020psi MPa		<b>Floats Held?</b>	
								Yes	
<b>Cement Returns:</b>		47							
<p><b>Comment</b> Pumped 773 bbls Elasticem, Got 47 bbl cement back to surface, Burst the shoe and pumped 5 bbl wet shoe. Checked floats and got 4 bbls back on the truck and the floats held.</p>									

## 2.0 Real-Time Job Summary

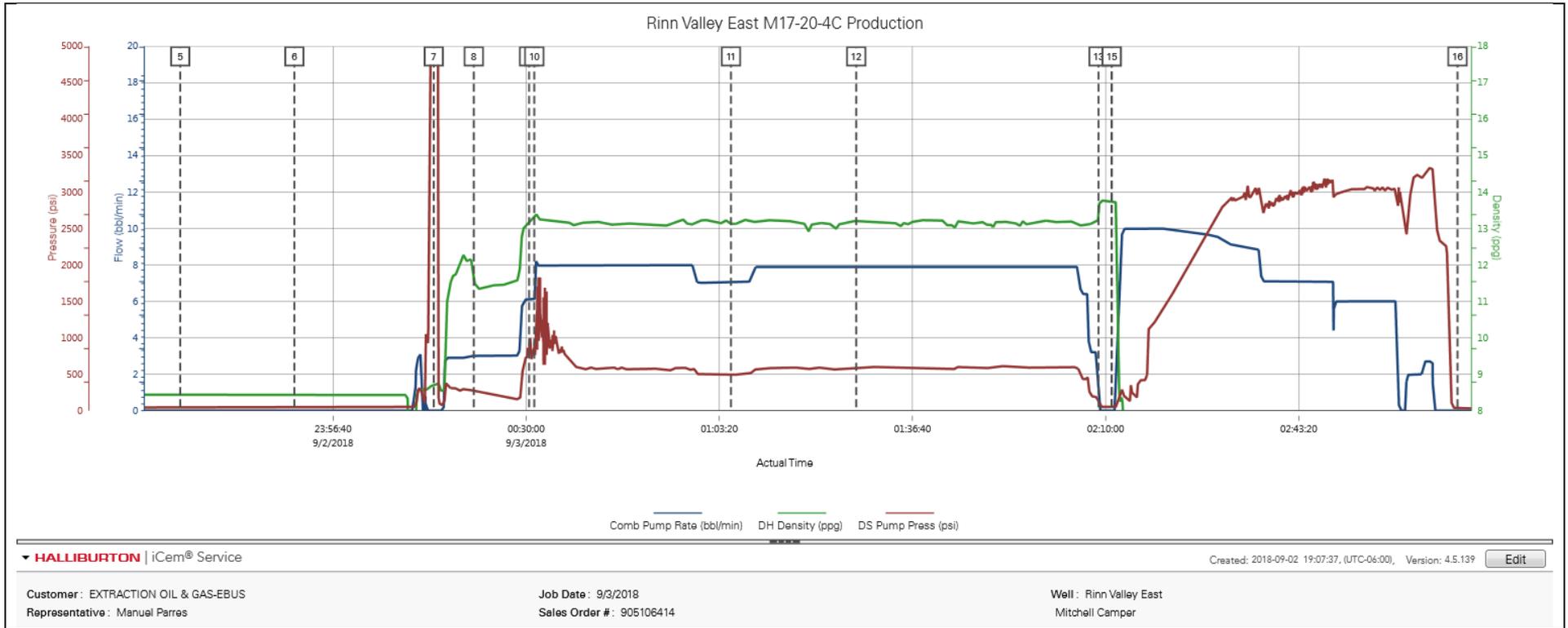
### 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	DH Density (ppg)	DS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	9/2/2018	12:30:00	USER				Called crew out to be on location at 1930
Event	2	Depart Shop for Location	Depart Shop for Location	9/2/2018	15:30:00	USER				Held a safety meeting before leaving for location
Event	3	Arrive At Loc	Arrive At Loc	9/2/2018	16:30:00	USER				Arrive at location and met with the company man
Event	4	Rig-up Lines	Rig-up Lines	9/2/2018	17:00:00	USER				Held a hazard hunt before spotting in trucks and rigging up
Event	5	Start Job	Start Job	9/2/2018	23:30:18	COM5	0.00	8.44	45.00	
Event	6	Safety Meeting	Safety Meeting	9/2/2018	23:50:00	USER	0.00	8.44	48.00	Held a safety meeting with the rig to discuss the operation and safety
Event	7	Test Lines	Test Lines	9/3/2018	00:14:03	COM5	0.00	8.70	4909.00	Filled lines with 3 bbls water. Tested lines to 4700 psi, with the 500 psi kick out and the 5th gear stall out.
Event	8	Pump Spacer 1	Pump Spacer 1	9/3/2018	00:20:57	COM5	3.00	11.52	280.00	Pumped 50 bbl Tuned Spacer, 11.5#, 3.73 yield, 23.4 gal/sks. Pumped at 3 bpm and 180 psi. Dual Spacer and Musol were added on the fly.
Event	9	Pump Lead Cement	Pump Lead Cement	9/3/2018	00:30:31	COM5	6.10	13.16	804.00	Pumped 773 bbls Elasticem. 2766 sks, 13.2#, 1.57 yield, 7.53 gal/sks, Pumped at 8 bpm and 686 psi
Event	10	Check Weight	Check Weight	9/3/2018	00:31:24	COM5	6.10	13.35	792.00	Verified weight with the pressurized scale
Event	11	Check Weight	Check Weight	9/3/2018	01:05:20	COM5	7.10	13.12	492.00	Verified weight with the pressurized scale.
Event	12	Check Weight	Check Weight	9/3/2018	01:26:57	COM5	7.90	13.22	559.00	Verified weight with the pressurized scale
Event	13	Shutdown	Shutdown	9/3/2018	02:08:47	COM5	0.00	13.63	110.00	
Event	14	Drop Top Plug	Drop Top Plug	9/3/2018	02:11:01	COM5	0.00	13.74	47.00	KLX dropped the plug witnessed by the company man.
Event	15	Pump Displacement	Pump Displacement	9/3/2018	02:11:04	COM5	0.00	13.74	47.00	Pumped 388 bbls. Bumped plug 3020 psi. Pressured up and burst the shoe and pumped a 5 bbl wet shoe.

Event	16	End Job	End Job	9/3/2018	03:10:44	COM5	0.00	7.75	29.00	
Event	17	Rig Down Lines	Rig Down Lines	9/3/2018	03:15:00	USER	0.00	-0.72	27.00	Held a safety meeting before rigging down lines
Event	18	Depart Location	Depart Location	9/3/2018	04:30:00	USER				Held a safety huddle before leaving location

3.0 Attachments

3.1 Rinn Valley East N17-20-4C Production – Job Chart with Events



3.2 Rinn Valley East N17-20-4C Production – Job Chart without Events

