

# HALLIBURTON

iCem<sup>®</sup> Service

## **CRESTONE PEAK RESOURCES-EBUS**

**For: Sam Mares**

Date: Wednesday, March 15, 2023

## **COSSLETT 1D-22H-H168**

Cosslett East 1D-22H-H168

Job Date: Wednesday, March 15, 2023

Sincerely,

**Nick Roles 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 COSSLETT 1D-22H-H168 Conductor. 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 25bbls 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 Rockies Cement Team**

## 1.2 Job Overview

Job Details	
<b>API #:</b>	05-123-51951
<b>County:</b>	Weld
<b>Field:</b>	Wattenberg
<b>Legal Discription:</b>	SENE SEC 22 TOWN 1N RANGE 68W

Job Times			
	Date (mm/dd/yyyy)	Time (hh:mm)	Time Zone
<b>Requested Time On Location:</b>	03/15/2023	02:00	MTN
<b>Called Out Time:</b>	03/14/2023	19:00	MTN
<b>Arrived On Location:</b>	03/15/2023	00:00	MTN
<b>Job Started:</b>	03/15/2023	02:00	MTN
<b>Job Completed:</b>	03/15/2023	04:20	MTN
<b>Departed Location:</b>	03/15/2023	05:00	MTN

	Description	Units	Value
1	Surface temperature at the time of the job	degree F	40
2	Mud type (OBM, WBM, Synthetic, Water, Brine)	-	WBM
3	Mud density	ppg	8.8
4	Casing set depth (shoe)	ft	585
5	TVD	ft	585
6	Float collar depth	ft	538.4
7	Length of rate hole	ft	10
8	Previous casing shoe depth	ft	145
9	Pre-job mud circulation time	hh:mm	01:15

10	Pre-job mud circulation rate	bpm	5
11	Pre-job mud circulation volume	bbls	150
12	Pre-job mud circulation pressure	psi	50
13	Annual flow before the start of job	Y/N	N
14	Pipe movement during cement job	Y/N	N
15	Calculated displacement	bbls	83
16	Job displaced by	Rig/HES	HES
17	Estimated returns % during job	%	50
18	Fluid returns to surface	Spacer/Cement, bbls	Cement
19	Final circulation pressure, rate prior to plug bump	psi @ bpm	110
20	Number of Centralizers	-	15
21	Number of plugs	-	2

### 1.3 Water Field Test

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	Recorded Value	Unit	Acceptable Limit	Potential Problems if Values Exceed the Limit
<b>pH</b>	7		6.0 - 8.0	Chemicals in water can cause severe retardation
<b>Temperature</b>	65	F	60 - 80 F	
<b>Chlorides</b>	1000	ppm	3000 ppm	Can shorten thickening time

### 1.4 Actual Pump Schedule

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	Density (ppg)	Volume (bbls)	Yield (ft <sup>3</sup> /sk)	Water Requirement (gal/sk)	Bulk Sacks (sks)	Total Water (gals)
<b>Spacer Fluid</b>						
<b>Cap Cement</b>	14.2	121	1.15	5.74	591	3392
<b>Lead Cement</b>	14.2	67	1.15	5.74	327	1877
<b>Tail Cement</b>	NA					
<b>Top Plug</b>	2					
<b>Displacement Fluid</b>	8.33	83				

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq No.	Activity	Graph Label	Date	Time	Source	Dwnhole Density (ppg)	Cmb Pump Rate (bbl/mi n)	Pump B Pressure (psi)	Cmb Stg Total (bbl)	Comments
Event	1	Call Out	Call Out	3/14/2023	19:00:00	USER					Called out by service coordinator for OL time of 0200.
Event	2	Arrive at Location from Service Center	Arrive at Location from Service Center	3/15/2023	00:00:00	USER					Upon arrival to location, signed in with onsite safety personnel. Met with company man and discussed job specific requirements and specifications.
Event	3	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	3/15/2023	01:15:00	USER					Held pre rig up JSA for hazards, hazard hunt with crew, and discussed plan for spotting equipment and rigging up lines for job. Discussed muster points and closest emergency location as well as coordinates.

Event	4	Other	Other	3/15/20 23	01:30:0 0	USER					Mix water test results- PH-7, Chlo-0, Temp- 65F.
Event	5	Rig-Up Equipment	Rig-Up Equipment	3/15/20 23	01:30:0 0	USER					Begin rig up with crew.
Event	6	Rig-Up Completed	Rig-Up Completed	3/15/20 23	01:45:0 0	USER	8.26	0.00	2.85	0.13	Complete rig up for job to nearest point before red zone.
Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	3/15/20 23	01:45:0 0	USER	8.26	0.00	2.85	0.13	Held job specific hazards as well as confirming job procedure with co man and rest of crew associated with job.
Event	8	Start Job	Start Job	3/15/20 23	01:53:0 2	USER	7.75	0.00	-0.94	0.00	TD-595', TP-585' 13.375" 54.5#, FC- 538.4', OH-17.5", Cond.-145' 20# 19.5" ID, MUD-8.7#
Event	9	Test Lines	Test Lines	3/15/20 23	01:54:5 4	NONE	8.33	0.00	24.16	3.06	Pumped 5bbls fresh water to fill lines, shutdown, closed manifold, performed 500psi k/o function test, continued with 5th gear stall at 1350psi, proceeded to bring pressure to 3500psi. Held well, no leaks.

Event	10	Pump Cement	Pump Cement	3/15/20 23	02:07:5 3	USER	8.21	0.00	1.56	0.00	Pumped 591sk or 121bbls of 14.2# 1.15y 5.74g/s SwiftCem at 4bpm 100psi.
Event	11	Check Weight	Check Weight	3/15/20 23	02:20:5 7	NONE	14.21	3.65	137.36	40.39	Weight verified with pressurized mud scales.
Event	12	Check Weight	Check Weight	3/15/20 23	02:33:1 3	NONE	14.09	5.16	240.14	95.84	Weight verified with pressurized mud scales.
Event	13	Shutdown	Shutdown	3/15/20 23	02:39:4 8	NONE	15.18	0.00	146.59	129.32	
Event	14	Drop Top Plug	Drop Top Plug	3/15/20 23	02:42:3 9	NONE	15.02	0.00	11.14	129.32	Dropped by tool hand witnessed by HES supervisor and company man.
Event	15	Pump Displacement	Pump Displacement	3/15/20 23	02:42:4 1	NONE	15.02	0.00	11.08	0.00	Displaced first 10bbls with cement water, followed by 73bbls fresh water, total 83bbl displacement.
Event	16	Bump Plug	Bump Plug	3/15/20 23	03:03:1 7	NONE	8.37	0.00	508.02	85.84	Slowed down to 3bpm at 75bbls away, final circulating pressure-40psi, Bump Pressure 550psi.

Event	17	Other	Other	3/15/20 23	03:04:2 2	NONE	8.37	0.00	538.84	0.00	Inflate packer to 850-1140-1350psi until opened and fell to 911psi, engaged at 1/2bpm to 1500psi.
Event	18	Other	Other	3/15/20 23	03:09:0 2	NONE	8.43	0.00	1275.75	0.41	Released pressure to 600psi, 1/4bbl back.
Event	19	Other	Other	3/15/20 23	03:12:5 7	NONE	8.42	0.00	1272.26	0.65	Brought pressure up to 1475psi, released to 600psi, getting 3/4bbl back.
Event	20	Other	Other	3/15/20 23	03:21:1 8	NONE	7.85	0.00	162.53	1.79	Released pressure and got 1bbls back, floats held.
Event	21	Summit Start Job	Summit Start Job	3/15/20 23	03:28:0 9	USER	-1.01	0.00	-5.59	1.79	Begin 2nd stage DV TOOL-251.7', Upper PACKER-254.3', Lower PACKER-521.7', OH-17.5", Conductor 145' 19.5" ID, MUD-8.7#
Event	22	Other	Other	3/15/20 23	03:32:1 6	NONE	-0.01	0.00	-1.32	1.79	Dropped Bomb Opened Tool at 1bpm to 350psi, 1bbl to open.
Event	23	Pump Cement	Pump Cement	3/15/20 23	03:45:2 9	NONE	8.33	0.00	-3.71	0.00	Pumped 327sks or 67bbl of 14.2# 1.15y 5.74g/s SwiftCem at 5bpm 110psi.

Event	24	Check Weight	Check Weight	3/15/20 23	03:51:3 5	NONE	13.94	2.47	58.89	14.83	Weight verified with pressurized mud scales.
Event	25	Check Weight	Check Weight	3/15/20 23	03:53:1 2	NONE	13.89	4.21	169.66	21.49	Weight verified with pressurized mud scales.
Event	26	Check Weight	Check Weight	3/15/20 23	03:56:5 1	NONE	13.93	4.21	161.66	36.74	Weight verified with pressurized mud scales.
Event	27	Shutdown	Shutdown	3/15/20 23	04:03:4 2	NONE	15.44	0.00	100.19	65.21	
Event	28	Drop Top Plug	Drop Top Plug	3/15/20 23	04:07:0 2	NONE	15.11	0.00	8.91	65.21	Dropped by tool hand witnessed by HES supervisor and company man.
Event	29	Pump Displacement	Pump Displacement	3/15/20 23	04:07:0 4	NONE	15.11	0.00	8.59	0.00	Displaced first 10bbls with cement water, followed by 29bbls fresh water, total of 39bbls Fresh water Displacement.
Event	30	Bump Plug	Bump Plug	3/15/20 23	04:18:1 4	NONE	8.39	0.00	510.35	39.30	Slowed down to 3bpm at 29bbls away, final circulating pressure-110psi, Bump Pressure 620psi.
Event	31	Other	Other	3/15/20 23	04:19:4 4	NONE	8.39	0.00	692.50	39.30	Released pressure and got 0.5bbls back, floats held.

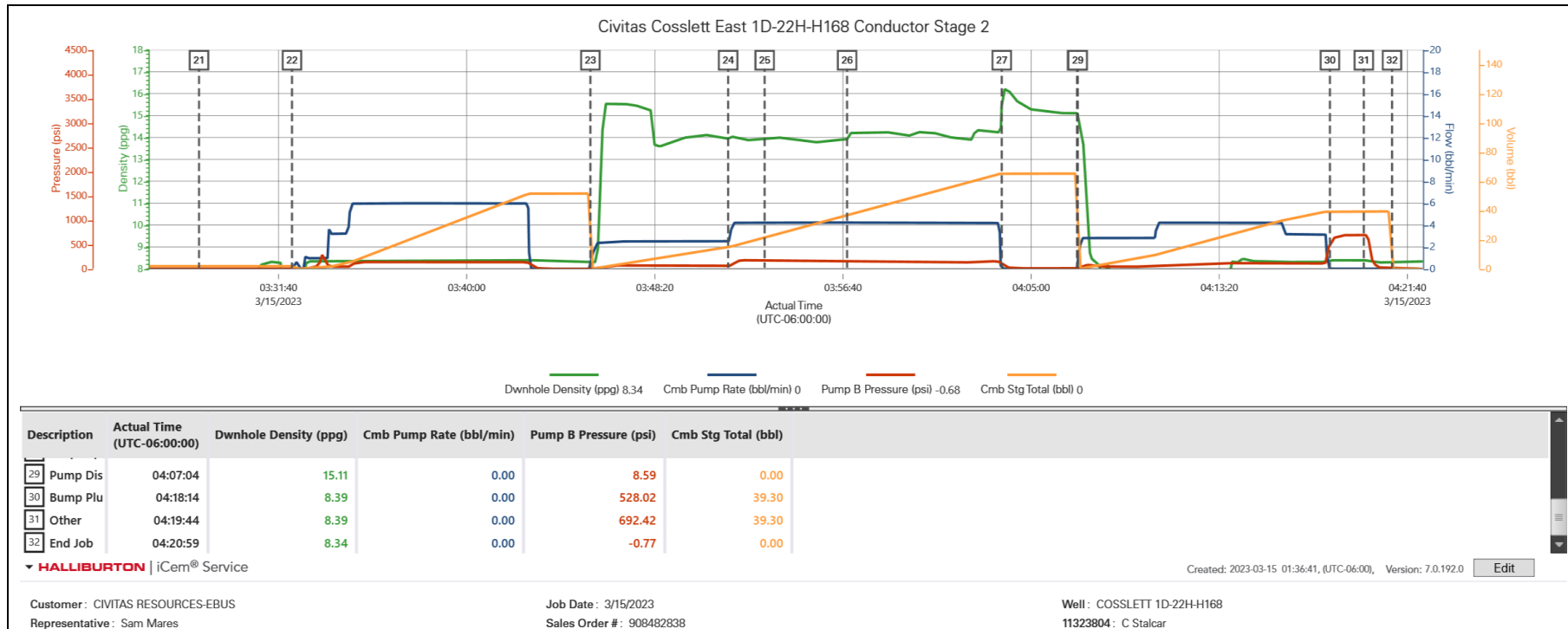
Event	32	End Job	End Job	3/15/20 23	04:20:5 9	NONE	8.34	0.00	-0.77	0.00	Got 25bbls cement to surface.
Event	33	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	3/15/20 23	04:25:0 0	USER					Held safety meeting with crew prior to rig down, discussed possibility of trapped pressure, swing radius, slips trips and falls, pinch points and risks associated with rig down.
Event	34	Rig Down Lines	Rig Down Lines	3/15/20 23	04:35:0 0	USER					Begin rig down
Event	35	Rig-Down Completed	Rig-Down Completed	3/15/20 23	05:00:0 0	USER					Rig down complete with no injuries, spills or damage to equipment.

3.0 Attachments

3.1 Case 1-Custom Results.png



3.2 Stage 2.png



3.3 Stage 1.png

