HALLIBURTON

iCem® Service

GREAT WESTERN OIL & GAS LLC - EBUS

For: Great Western

Date: Monday, March 04, 2019

Ottesen LE 06-351HNX Re-Cement #2

Job Date: Wednesday, February 27, 2019

Sincerely,

Ryan Keeran

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Ottesen LE 06-351HNX** cement **re-cement** 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.

Circulation was obtained as we started the re-cement job and then went away while we were in displacement

There was indication of lift pressure as well which gave us hope that we got cement lifted above the Niobrara

The downhole densometer on the truck was not working properly so all cement was verified with pressurized mud scale and the recirc density.

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

Sold To #: 346459	**Ship To #:** 3913336	**Quote #:**	**Sales Order #:** 0905519365
Customer: GREAT WESTERN OPERATING CO LLC-EBUS		**Customer Rep:** MARK TIBBS	
Well Name: OTTESEN LE	**Well #:** 6-351HNX		**API/UWI #:** 05-123-48287-00
Field: WATTENBERG	**City (SAP):** IONE	**County/Parish:** WELD	**State:** COLORADO
Legal Description: NW SE-33-1N-66W-1410FSL-1668FEL			
Contractor:		**Rig/Platform Name/Num:**	
Job BOM: 14099 14099			
Well Type: HORIZONTAL OIL			
Sales Person: HALAMERICA\H139013		**Srvc Supervisor:** Lance Carpenter	

Job

Formation Name				
Formation Depth (MD)	**Top**		**Bottom**	
Form Type			**BHST**	
Job depth MD	9940ft		**Job Depth TVD**	7321
Water Depth			**Wk Ht Above Floor**	5
Perforation Depth (MD)	From		**To**	

Well Data

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		9.625	8.921	36			0	1862		
Casing		5.5	4.892	17			0	9990		
Open Hole Section			8.5				1862	11148		

Tools and Accessories

Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make
Guide Shoe	5.5					**Top Plug**	5.5	1	HES
Float Shoe	5.5					**Bottom Plug**	5.5		HES
Float Collar	5.5					**SSR plug set**	5.5		HES
Insert Float	5.5					**Plug Container**	5.5		HES
Stage Tool	5.5			9990		**Centralizers**	5.5		HES

Fluid Data

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	14.4 ppg ElastiCem	ELASTICEM (TM) SYSTEM	335	sack	14.4	1.69		4	7.69
	7.69 Gal	**FRESH WATER**							

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	16.5 ppg GasStop	GASSTOP (TM) SYSTEM	406	sack	16.6	1.38		4	5.11
3.34 Gal		**FRESH WATER**							

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	WBM		227	bbl	8.3				

Cement Left In Pipe	**Amount**	200 ft	Reason		
Mix Water:	pH 6.5	**Mix Water Chloride:**	300 ppm	Mix Water Temperature:	**## °F °C**
Cement Temperature:	## °F °C	**Plug Displaced by:**	## lb/gal kg/m3 XXXX	Disp. Temperature:	**## °F °C**
Plug Bumped?	No	**Bump Pressure:**	3750 psi	Floats Held?	**Yes/No**
Cement Returns:	## bbl m3	**Returns Density:**	## lb/gal kg/m3	Returns Temperature:	**## °F °C**

Comment JOB WENT WELL. VOLUMES WERE CHECKED AND DENSITIES MUD CUPPED. DOWNHOLE DENSOMETER HAD AN ISSUE BUT ALL CEMENT WAS SCALED. PARTIAL RETURNS AT THE BEGINNING OF THE JOB BUT LOST THEM DURING DISPLACEMENT. DISPLACEMENT VOLUME 227.5 BBL LEAVING 150' ABOVE THE PERFS AND 1.5 BBL ON TOP OF THE PLUG. PRESSURE INDICATED SOME CEMENT LIFT

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)	Recirc Density (ppg)	Comments
Event	1	Other	Call Out	2/27/2019	06:00:00	USER					CREW CALLED OUT. ON LOCATION 1200
Event	2	Depart Shop for Location	Depart Shop for Location	2/27/2019	11:30:00	USER					CREW HAS VERIFIED MATERIALS AND CHECKED EQUIPMENT. CREW HAS JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING ROUTE, CONVOY ORDER, FOLLOWING DISTANCE, HAZARDS AND THEN DEPARTS FOR LOCATION
Event	3	Arrive At Loc	Arrive At Loc	2/27/2019	11:45:00	USER					CREW ARRIVES ON LOCATION. LOCATION IS TIGHT. CREW HAS SAFETY MEETING EVALUATING LOCATION, DISCUSSING MULTIPLE SPOTTERS FOR MOVING EQUIPMENT, WELL SITE OPERATIONS, RED ZONES AND BEGIN MOVING EQUIPMENT IN
Event	4	Safety Meeting - Pre Job	Safety Meeting - Pre Job	2/27/2019	14:00:00	USER	0.00	0.00	0.00	0.00	EQUIPMENT SPOTTED IN AND RIGGED UP TO THE WELL HEAD. CREW AND CUSTOMER REP HAVE PRE JOB SAFETY MEETING DISCUSSING ROLES, HAZARDS, CONTINGENCIES, JOB PROCEEDURE, RED ZONES, MUSTER AREAS

Event	5	Start Job	Start Job	2/27/2019	14:22:38	COM6	2.00	6.85	0.00	-0.01	START JOB
Event	6	Test Lines	Test Lines	2/27/2019	14:29:01	COM6	6818.00	7.41	0.00	0.00	OPEN UP TO THE WELL HEAD. 1800 PSI ON THE CASING SIDE. PUMP A COUPLE BBL WATER TO CLEAR LINES.
Event	7	Test Lines	Test Lines	2/27/2019	14:33:32	COM6	7110.00	7.41	0.00	0.00	PRESSURE TEST LINES TO 7000 PSI. HOLD FOR A FEW MINUTES TO ENSURE A GOOD TEST
Event	8	Other	Other	2/27/2019	14:35:00	USER	96.00	7.73	0.00	0.00	LATEX MIX FLUID READY. BEGIN MIXING TAIL CEMENT
Event	9	Circulate Well	Circulate Well	2/27/2019	14:37:00	USER	2166.00	7.55	0.00	0.00	PUMP WATER TO CIRCULATE THE WELL. NO CIRCULATION BUT RATES AND PRESSURES AS FOLLOWS: 2 BPM @ 2950 PSI; 3 BPM @ 3150 PSI; 4 BPM @ 3550 PSI
Event	10	Pump Lead Cement	Pump Lead Cement	2/27/2019	15:40:33	COM6	3544.00	14.31	4.00	14.05	PUMP 100 BBL ELASTICEM LEAD 14.4# 1.69 YIELD 7.69 GAL 335 SACKS
Event	11	Other	Other	2/27/2019	15:52:41	USER	2789.00	14.51	4.50	14.26	DOWNHOLE HPVT BEGINS ACTING UP AND DENSITY BEGINS TO VARY GREATLY. SCALED SLURRY AND MUD CUP DENSITY WAS GOOD. RECIRCULATION DENSTIY SHOWN FOR THE LEAD AND BATCH MIXED TAIL WAS SCALED PRIOR TO PUMPING AT 16.5# AND 16.45#.
Event	12	Pump Tail Cement	Pump Tail Cement	2/27/2019	16:04:26	COM6	2999.00	12.59	5.10	0.00	PUMP 100 BBL GASSTOP TAIL 16.5# 1.38 YIELD 5.11 GAL 406 SACKS
Event	13	Drop Top Plug	Drop Top Plug	2/27/2019	16:24:12	USER	167.00	13.43	0.00	-6.48	DROP TOP PLUG

Event	14	Pump Displacement	Pump Displacement	2/27/2019	16:24:44	COM6	1100.00	13.75	0.50	-6.48	PUMP 226 BBL DISPLACEMENT WATER 8.34#. FIRST 1.5 BBL IS CEMENT ON TOP OF PLUG
Event	15	Shutdown	Shutdown	2/27/2019	17:28:53	USER	3859.00	8.18	0.00	-6.48	SHUTDOWN. INSTANT SHUT-IN PRESSURE 3550 PSI
Event	16	Depart Location	Depart Location	2/27/2019	19:00:00	USER					CREW IS RIGGED DOWN AND READY TO DEPART FROM LOCATION. CREW HAS JOURNEY MANAGEMENT SAFETY MEETING DISCUSSING ROUTE, CONVOY ORDER, FOLLOWING DISTANCE, HAZARDS AND THEN DEPART FROM LOCATION

3.0 Job Chart

3.1 Job Chart