

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS

Ft. Lupton District, CO

Date: Thursday, May 30, 2019

Interchange B N35-20-6N Production

Job Date: Tuesday, May 21, 2019

Sincerely,

Bryce Hinsch

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 **Interchange B N35-20-6N** 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 56 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

Sold To #: 369404	Ship To #: 3901402	Quote #:	Sales Order #: 0905702537
Customer: EXTRACTION OIL & GAS-EBUS		Customer Rep: Manny	
Well Name: INTERCHANGE B		Well #: N35-20-6N	API/UWI #: 05-014-20777-00
Field: WATTENBERG	City (SAP): BROOMFIELD	County/Parish: BROOMFIELD	State: COLORADO
Legal Description: NE SW-10-1S-68W-2496FSL-1637FWL			
Contractor: PATTERSON-UTI ENERGY		Rig/Platform Name/Num: PATTERSON 901	
Job BOM: 7523 7523			
Well Type: HORIZONTAL OIL			
Sales Person: HALAMERICA\HX38199		Srvc Supervisor: Steven Markovich	

Job

Formation Name			
Formation Depth (MD)	Top		Bottom
Form Type	BHST		
Job depth MD	18476ft		Job Depth TVD
Water Depth			Wk Ht Above Floor
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	0	9.625	8.921	36			0	1660	0	1660
Casing	0	5.5	4.892	17	BTC	P-110	0	18476	0	7840
Open Hole Section			8.75				1660	18480	1660	7840

Tools and Accessories

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	5.5			18615	Top Plug	5.5		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				Centralizers	5.5		HES

Fluid Data

Stage/Plug #: 1

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft/sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	FDP-C1337-18	SBM FDP-C1337-18 CEMENT SPACER SYS	50	bbl	12.5	2.74		6	
5 lbm/bbl		SEM-94P, 35 LB SACK - (1023987)							
205.22 lbm/bbl		BARITE, BULK (100003681)							

5 lbm/bbl		SEM-93P, 35 LB SACK - (1023977)							
1 lbm/bbl		FE-2 (100001615)							
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	ElastiCem	ELASTICEM (TM) SYSTEM	585	sack	13.2	1.6		8	7.75
0.75 %		SCR-100 (100003749)							
7.75 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	GasStop	ELASTICEM (TM) SYSTEM	615	sack	13.2	1.6		8	7.73
0.75 %		SCR-100 (100003749)							
5.13 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
4	ElastiCem	ELASTICEM (TM) SYSTEM	1718	sack	13.2	1.57		8	7.66
0.75 %		SCR-100 (100003749)							
7.66 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
5	MMCR Displacement	MMCR Displacement	20	bbl	8.33			8	
0.50 gal/bbl		MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)							
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
6	Displacement	Displacement	408	bbl	8.33			8	
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe	
Mix Water:		pH 7	Mix Water Chloride:		00 ppm	Mix Water Temperature:		61 °F °C	

Comment Pump 428bbbls of H2O. First 20bbbls with MMCR2 Pumped at 10bbl/min and slowed rate as pressure increase. Spacer to surface at 322bbbls away, Cement to surface at 372bbbls away bringing 56bbbls of cement to surface. Bumped plug at 428bbbls away. Final lift pressure was 2400psi. Brought pressure 500psi over and held. WSS burst at 3106psi and pumped a 5bbl wet shoe. Attempted to check floats a few times and floats did not hold. Estimated Top of Tail Cement 6712' Estimated Top of Lead Cement 2416' Pumped 5bbbls back in and shut in the well. Recommended that we wait 8 hours on cement. Driller informed me he was instructed to open the well at 0630 to see if the flow stopped and it did not. Customer rep came to me shortly after about my recommended time again and explained 8 hours from the time we shut down. After the recommended time lapsed we attempted to open the well. There was 2100psi on the gage. Opened the 2" half way and it was a mixture of what seemed liked charged gas and water. After a few mins shut it in and made a call to Vaughn. I was instructed to open it all the way and let it flow and see if it would hold. After a few bbls flow stopped, then immediately started flowing again at about a rate of 2bbbls a min. Shut in the well again and rigged pump truck back up. Opened well to see if floats would hold. We brought back 7bbbls and it didn't stop so we shut it back in and waited then opened it back up to 10bbbls back. Spoke with Vaughn and company reps and we decided to see how much would come back. We ended up bringing 20bbbls on to the truck and shut the well in Company reps decided to pump the 20bbbls of well fluid back into the well at 2bbl/min. Pressure increased from 1700psi to a little over 2250psi before we shut down. Went to verify that the backside was full. Pumped OBM with the rig to verify, after 10bbbls of mud pump we gained flow at the shakers and 2' on wellhead. Then shut down and 20bbbls and watched flow. Opened release line to check flow. After 3bbbls back floats held.

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>	DS Pump Press <i>(psi)</i>	Comb Pump Rate <i>(bbl/min)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Check Floats	Call Out	5/20/2019	08:00:00	USER					Job called out with an on location time of 1400.
Event	2	Crew Leave Yard	Crew Leave Yard	5/20/2019	12:30:00	USER					JSA with HES crew on driving safety and route to rig.
Event	3	Arrive at Location from Service Center	Arrive at Location from Service Center	5/20/2019	13:30:00	USER					Arrived on location, rig was still running casing. 10,000 to run.
Event	4	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	5/20/2019	13:45:00	USER					JSA with HES and rig crew on job safety and procedure.
Event	5	Start Job	Start Job	5/20/2019	18:59:31	COM4	8.52	-42.00	0.00	22.80	TD 18480' TP 18476' FC 18470.9' WSS 18462.5' 5 1/2" 17# Production Casing, 8 1/2" Open hole, 9 5/8" 36# Surface Casing is set at 1656', TVD 7840'.
Event	6	Other	Other	5/20/2019	19:25:11	COM4	8.57	-42.00	0.00	22.80	Start mixing latex.
Event	7	Test Lines	Test Lines	5/20/2019	23:10:33	COM4	8.52	94.00	0.00	2.40	Set kick outs to 500psi and check low pressure kick outs. Increase pressure to 500psi and hold.
Event	8	Drop Bottom Plug	Drop Bottom Plug	5/20/2019	23:11:00	USER	8.53	950.00	0.00	2.40	Plug loaded into HES head. Plug loaded and dropped in front of company rep.
Event	9	Check Weight	Check Weight	5/20/2019	23:20:40	COM4	8.36	3.00	0.00	2.40	Weight verified by pressurized lines.

Event	10	Pump Spacer 1	Pump Spacer 1	5/20/2019	23:21:57	COM4	8.35	3.00	0.00	2.40	Pump 50bbbls of 12.5ppg 2.74yield FDP Spacer. Pumped at 8bbbl/min 869psi.
Event	11	Pump Lead Cement	Pump Lead Cement	5/20/2019	23:29:06	COM4	12.77	722.00	8.00	49.00	Pump 167bbbls (585sks) of 13.2ppg 1.6yield Lead Cement. Pumped at 8bbbl/min 776psi.
Event	12	Check Weight	Check Weight	5/20/2019	23:29:14	COM4	12.89	712.00	8.00	1.10	Weight verified by pressurized lines.
Event	13	Pump Cement	Pump Cement	5/20/2019	23:52:52	COM4	13.19	600.00	8.00	0.10	Pump 176bbbls (615sks) of 13.2ppg 1.6yield Cement with Latex. Pumped at 8bbbl/min 691psi.
Event	14	Check Weight	Check Weight	5/20/2019	23:58:04	COM4	13.29	749.00	8.10	41.70	Weight verified by pressurized lines.
Event	15	Pump Tail Cement	Pump Tail Cement	5/21/2019	00:17:24	COM4	13.27	740.00	8.10	197.70	Pump 480bbbls (1718sks) of 13.2ppg 1.57yield Tail Cement. Pumped at 8bbbl/min 751psi.
Event	16	Check Weight	Check Weight	5/21/2019	00:21:54	COM4	13.05	714.00	8.10	36.30	Weight verified by pressurized lines.
Event	17	Shutdown	Shutdown	5/21/2019	01:22:45	COM4	13.29	222.00	0.10	519.70	Shutdown and clean pumps and lines.
Event	18	Drop Top Plug	Drop Top Plug	5/21/2019	01:37:27	COM4	8.18	11.00	0.00	532.60	Plug loaded into HES head. Plug loaded and dropped in front of company rep.
Event	19	Pump Displacement	Pump Displacement	5/21/2019	01:37:32	COM4	8.18	11.00	0.00	532.60	Pump 428bbbls of H2O. First 20bbbls with MMCR2 Pumped at 10bbbl/min and slowed rate as pressure increase. Spacer to surface at 322bbbls away, Cement to surface at 372bbbls away bringing 56bbbls of cement to surface.

Event	20	Bump Plug	Bump Plug	5/21/2019	02:39:54	COM4	8.31	2379.00	3.50	459.70	Bumped plug at 428bbbls away. Final lift pressure was 2400psi. Brought pressure 500psi over and held.
Event	21	Other	Other	5/21/2019	02:41:43	COM4	8.31	2819.00	0.00	460.30	Kicked in pumps to burst WSS.
Event	22	Other	Other	5/21/2019	02:42:02	COM4	8.36	3106.00	2.00	460.80	WSS burst at 3106psi and pumped a 5bbl wet shoe.
Event	23	Check Floats	Check Floats	5/21/2019	02:43:33	USER	8.31	2491.00	4.60	467.30	Opened release line to check floats and after 5bbls back shut it in as floats did not hold.
Event	24	Other	Other	5/21/2019	02:45:25	USER	8.33	1674.00	0.00	468.30	pumped 5bbls back into well.
Event	25	Check Floats	Check Floats	5/21/2019	02:47:40	USER	8.35	2362.00	3.60	475.30	Opened release line to check floats and after 5bbls back shut it in as floats did not hold again.
Event	26	Other	Other	5/21/2019	02:50:44	COM4	8.31	735.00	0.10	475.60	Pumped the 5bbls back into the well.
Event	27	Check Floats	Check Floats	5/21/2019	02:52:12	USER	8.42	1023.00	0.00	483.30	Opened release line to check floats and after 5bbls back shut it in as floats did not hold again.
Event	28	Other	Other	5/21/2019	02:58:18	USER	8.32	1697.00	0.00	483.30	Pumped the 5bbls back into the well.
Event	29	Check Floats	Check Floats	5/21/2019	03:00:20	USER	8.34	264.00	0.00	490.90	Opened release line to check floats and after 5bbls back shut it in as floats did not hold again.
Event	30	Other	Other	5/21/2019	03:08:51	USER	8.25	21.00	0.00	490.90	Pumped 5bbls back in and shut in the well. Recommended that we wait 8 hours on cement.

Event	31	End Job	End Job	5/21/2019	03:13:30	COM4	8.28	20.00	0.00	499.80	Thank you, Steve Markovich and crew.
Event	32	Other	Other	5/21/2019	07:00:00	USER					Driller informed me he was instructed to open the well at 0630 to see if the flow stopped and it did not. Customer rep came to me shortly after about my recommended time again and explained 8 hours from the time we shut down.
Event	33	Open Well	Open Well	5/21/2019	12:00:00	USER					After the recommended time lapsed we attempted to open the well. There was 2100psi on the gage. Opened the 2" half way and it was a mixture of what seemed liked charged gas and water. After a few mins shut it in and made a call to Vaughn. I was instructed to open it all the way and let it flow and see if it would hold. After a few bbls flow stopped, then immediately started flowing again at about a rate of 2bbls a min. Shut in the well again and rigged pump truck back up.
Event	34	Open Well	Open Well	5/21/2019	13:14:00	USER					Opened well to see if floats would hold. We brought back 7bbls and it didn't stop so we shut it back in and waited then opened it back up to 10bbls back. Spoke with Vaughn and company reps and we decided to see how much would come back. We ended up bringing 20bbls on to the truck and shut the well in

Event	35	Pump Water	Pump Water	5/21/2019	13:30:00	USER	Company reps decided to pump the 20bbls of well fluid back into the well at 2bbl/min. Pressure increased from 1700psi to a little over 2250psi before we shut down.
Event	36	Open Well	Open Well	5/21/2019	13:44:00	USER	Went to verify that the backside was full. Pumped OBM with the rig to verify, after 10bbls of mud pump we gained flow at the shakers and 2' on wellhead. Then shut down and 20bbls and watched flow.
Event	37	Check Floats	Check Floats	5/21/2019	14:15:00	USER	Opened release line to check flow. After 3bbls back floats held.

3.0 Attachments

3.1 Extraction Interchange B N35-20-6N Production Chart

