

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS

For:

Date: Saturday, March 07, 2015

6

Interemndiate

Job Date: Saturday, February 07, 2015

Sincerely,

Sebastian Estenssoro

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Thornton 6**, cement **Intermediate** 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.

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 Brighton

Job Times

	Date	Time
Requested Time On Location:		
Called Out Time:	2/7/2015	1700
Arrived On Location At:		2100
Job Started At:	2/8/2015	0020
Job Completed At:		0302
Departed Location At:		

1.2 Planned Pumping Schedule

Event	Pressure (psi)	Rate (bpm)	Volume (bbl)	Sacks	Density (ppg)	Yield (ft3/sk)	WR (gal/sk)
START JOB							
FILL LINES			2		8.3		
PRESSURE TEST	4000						
WATER SPACER		2	10		8.3		
TUNED SPACER		4	40		11.5	3.76	24.2
LEAD CEMENT		6	160	475	12.7	1.89	9.99
TAIL CEMENT		6	100	335	13.8	1.67	7.73
DROP TOP PLUG							
DISPLACEMENT		8	312.2		10		
SLOW RATE		4					
BUMP PLUG							
CHECK FLOATS							
END JOB							

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Cementing Job Summary*The Road to Excellence Starts with Safety*

Sold To #: 369404		Ship To #: 3592904		Quote #:		Sales Order #: 0902117025				
Customer: EXTRACTION OIL & GAS				Customer Rep: JOE SCILEPPI						
Well Name: THORNTON		Well #: 6		API/UWI #: 05-123-40269-00						
Field: WATTENBERG		City (SAP): AULT		County/Parish: WELD		State: COLORADO				
Legal Description: NW SW-8-7N-66W-1325FSL-330FWL										
Contractor: H & P DRLG				Rig/Platform Name/Num: H & P 280						
Job BOM: 7522										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HB60191				Srv Supervisor: JOE SCILEPPI						
Job										
Formation Name										
Formation Depth (MD)		Top		Bottom						
Form Type				BHST		225 degF				
Job depth MD		7953ft		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	BTC	J-55	0	812	0	0
Casing	0	7	6.276	26	BTC	P-110	0	7953	0	0
Open Hole Section			8.75				812	7973	0	0
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	7			7953		Top Plug	7		HES	
Float Shoe	7					Bottom Plug	7		HES	
Float Collar	7					SSR plug set	7		HES	
Insert Float	7					Plug Container	7		HES	
Stage Tool	7					Centralizers	7		HES	
Miscellaneous Materials										
Gelling Agt		Conc		Surfactant		Conc	Acid Type		Qty	Conc
Treatment Fld		Conc		Inhibitor		Conc	Sand Type		Size	Qty
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	Fresh Water	Fresh Water	10	bbl	8.33	0		6		
42 gal/bbl		FRESH WATER								
Fluid Data										
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	

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Cementing Job Summary

2	11.5 lb/gal Tuned Spacer III	Tuned Spacer III	40	bbl	11.5	3.76	24.2	6		
149.34 lbm/bbl		BARITE, BULK (100003681)								
36.20 gal/bbl		FRESH WATER								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
3	Lead Cement	ECONOCEM (TM) SYSTEM	475	sack	12.7	1.89		6	9.99	
9.99 Gal		FRESH WATER								
61.10 lbm		TYPE I / II CEMENT, BULK (101439798)								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
4	Tail Cement	EXPANDACEM (TM) SYSTEM	335	sack	13.8	1.67		6	7.73	
0.10 %		HR-5, 50 LB SK (100005050)								
7.73 Gal		FRESH WATER								
Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
5	Displacement	Displacement	312.2	bbl	8.33					
Cement Left in Pipe		Amount	42 ft		Reason			Shoe Joint		
Mix Water:		pH ##	Mix Water:## ppm		Mix Water Temperature:## °F °C			Chloride:		
Cement Temperature:## °F °C		Plug Displaced by:## lb/gal kg/m3 XXXX				Disp. Temperature:## °F °C				
Plug Bumped?		Yes/No	Bump Pressure:#### psi MPa				Floats Held? Yes/No			
Cement Returns:## bbl m3		Returns Density:## lb/gal kg/m3				Returns Temperature:## °F °C				
Comment										

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1.3 Job Overview

		Units	Description
1	Surface temperature at time of job	°F	46
2	Mud type (OBM, WBM, SBM, Water, Brine)	-	WBM
3	Actual mud density	lb/gal	10
7	Time circulated before job	HH:MM	01:00
10	Pipe movement during hole circulation	Y/N	N
12	Time from end mud circulation to start of job	HH:MM	00:20
13	Pipe movement during cementing	Y/N	N
14	Calculated displacement	bbls	302.2
15	Job displaced by	Rig/HES	HES
16	Annular flow before job	Y/N	Y
17	Annular flow after job	Y/N	N
18	Length of rat hole	ft	20
19	Units of gas detected while circulating	units	0
20	Was lost circulation experienced at any time?	Y/N	N

1.4 Water Field Test

Item	Recorded Value	Units	Max Acceptable Limit	Potential Problems in Exceeding Limit
pH	5	-	6.0-8.0	Chemicals in the water can cause severe retardation
Chlorides	0	ppm	3000 ppm	Can shorten thickening time of cement
Sulfates	<200	ppm	1500 ppm	Will greatly decrease the strength of cement
Total Hardness		ppm	500 mg/L	High concentrations will accelerate the set of the cement
Calcium		ppm	500 ppm	High concentrations will accelerate the set of the cement
Total Alkalinity		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all (typically occurs @ pH \geq 8.3).
Bicarbonates		ppm	1000 ppm	Cement is greatly retarded to the point where it may not set up at all
Potassium		ppm	5000 ppm	High concentrations will shorten the pump time of cement (indicates the presence of chlorides, therefore if Potassium levels are measured as high, so should the chlorides)
Iron	0	ppm	300 ppm	High concentrations will accelerate the set of the cement
Temperature		°F	50-80 °F	High temps will accelerate; Low temps may risk freezing in cold weather

Submitted Respectfully by:

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)	PS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	2/7/2015	17:00:00	USER				
Event	2	Crew Leave Yard	Crew Leave Yard	2/7/2015	20:00:00	USER				
Event	3	Arrive At Loc	Arrive At Loc	2/7/2015	21:30:00	USER				RIG HAD ABOUT 20 JOINTS LEFT UPON ARRIVAL.
Event	4	Rig-up Lines	Rig-up Lines	2/7/2015	22:30:00	USER				
Event	5	Rig-Up Completed	Rig-Up Completed	2/7/2015	23:40:00	USER				
Event	6	Pre-Job Safety Meeting	Pre-Job Safety Meeting	2/8/2015	00:00:00	USER	0.00	0.07	-10.00	JSA WITH ALL INVOLVED PERSONS.
Event	7	Start Job	Start Job	2/8/2015	00:20:46	COM5	0.00	8.51	-6.00	
Event	8	Test Lines	Test Lines	2/8/2015	00:28:35	COM5	0.00	8.82	225.00	TESTED LINES TO 4000 PSI NO VISIBLE LEAKS
Event	9	Pump Spacer 1	Pump Spacer 1	2/8/2015	00:32:51	COM5	0.00	8.94	80.00	10 BBL FRESH WATER PUMPED AT 3 BPM AND 950 PSI
Event	10	Pump Spacer 2	Pump Spacer 2	2/8/2015	00:36:08	COM5	4.80	8.36	774.00	40 BBL TUNE SPACER MIXED @ 11.5 PPG WITH FRESH WATER. PUMPED AT 3 BPM AND 500 PSI.
Event	11	Drop Bottom Plug	Drop Bottom Plug	2/8/2015	00:46:23	COM5	0.00	11.97	356.00	SHUT DOWN AND DROPPED PLUG. PLUG PRE LAODED WITNESSED BY COMPANY REP.
Event	12	Pump Lead Cement	Pump Lead Cement	2/8/2015	00:51:53	COM5	0.00	12.00	101.00	475 SKS OR 160 BBL ECONOCEM MIXED @ 12.7 PPG WITH FRESH WATER. PUMPED AT 6 BPM AND 549 PSI
Event	13	Check Weight	Check weight	2/8/2015	00:54:22	COM5	5.90	12.46	758.00	
Event	14	Check Weight	Check weight	2/8/2015	01:15:42	COM5	6.30	12.79	303.00	
Event	15	Check Weight	Check weight	2/8/2015	01:19:56	COM5	6.90	12.79	296.00	
Event	16	Check Weight	Check weight	2/8/2015	01:20:16	COM5	6.90	12.81	293.00	
Event	17	Pump Tail Cement	Pump Tail Cement	2/8/2015	01:22:48	COM5	6.40	13.11	255.00	335 SKS OR 99.6 BBL EXPANDACEM MIXED @ 13.8 PPG WITH FRESH WATER. PUMPED AT 6 BPM AND 390 PSI.
Event	18	Check Weight	Check weight	2/8/2015	01:25:27	COM5	6.60	13.86	371.00	

Event	19	Check Weight	Check weight	2/8/2015	01:35:33	COM5	6.40	13.92	358.00	
Event	20	Shutdown	Shutdown	2/8/2015	01:39:12	COM5	0.00	11.47	51.00	
Event	21	Drop Top Plug	Drop Top Plug	2/8/2015	01:42:13	COM5	0.00	12.76	3.00	PLUG PRE LOADED WITNESSED BY COMPANY REP.
Event	22	Pump Displacement	Pump Displacement	2/8/2015	01:42:26	COM5	0.00	12.75	3.00	20 BBL WATER 262.2 BBL MUD @ 10 PPG, AND 20 BBL WATER. PUMPED AT 8 BPM AND 916 PSI., PUMPED 10BBLs OVER CALCULATED PER COMPANY REP'S REQUEST
Event	23	Other	Other	2/8/2015	02:38:00	USER	0.00	8.25	40.00	DID NOT BUMP PLUG, CHECKED FLOATS AT 1600PSI WITH 1BBL BACK TO TRUCK
Event	24	Shutdown	Shutdown	2/8/2015	02:42:51	COM5	0.00	8.26	-7.00	
Event	25	End Job	End Job	2/8/2015	03:02:28	COM5	0.00	-0.11	-10.00	

3.0 Job Chart

