

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS

MT FED Heath 8W-20-13 Production

Sincerely,
Meghan Jacobs

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 **MT Fed Heath 8W-20-13** 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 53 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 #: 3691211		Quote #:		Sales Order #: 0905741371				
Customer: EXTRACTION OIL & GAS-EBUS				Customer Rep: Colby Hansen						
Well Name: MT FED HEATH			Well #: 8W-20-13		API/UWI #: 05-123-42173-00					
Field: WATTENBERG		City (SAP): GREELEY		County/Parish: WELD		State: COLORADO				
Legal Description: NE NW-9-5N-65W-1020FNL-1753FWL										
Contractor: PATTERSON-UTI ENERGY				Rig/Platform Name/Num: PATTERSON 340						
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HX38199				Srv Supervisor: Nicholas Roles						
Job										
Formation Name										
Formation Depth (MD)		Top		Bottom						
Form Type					BHST					
Job depth MD		17238ft			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	1605	0	1605
Casing	0	5.5	4.892	17	BTC	P-110	0	17258	0	6875
Open Hole Section			8.75				1588	17278	1605	6875
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	5.5			17258		Top Plug	5.5	1	NCS	
Float Shoe	5.5					Bottom Plug	5.5	1	NCS	
Float Collar	5.5			17249		SSR plug set	5.5		HES	
Insert Float	5.5					Plug Container	5.5	1	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 ft3/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		7		
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	584	sack	13.2	1.57		8	7.66	
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	1.56		8	7.69	
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	1551	sack	13.2	1.57		8	7.66	
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			10		
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	381	bbl	8.33			10		
1 gal/bbl		D-AIR 3000L, 5 GAL PAIL (101007444)								
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe		
Mix Water:		pH 06	Mix Water Chloride:			0 ppm		Mix Water Temperature:		60 °F °C
Cement Temperature:		65 °F °C	Plug Displaced by:			8.33 lb/gal		Disp. Temperature:		60 °F °C
Plug Bumped?		Yes	Bump Pressure:			2450psi MPa		Floats Held?		Yes
Cement Returns:		53 bbl m3	Returns Density:			## lb/gal kg/m3		Returns Temperature:		## °F °C
Comment Est TOT-6601', TOL-2410' Got 53bbbls cap cement to surface.										

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	6/3/2019	21:00:00	USER				Called out by Service Coordinator for O/L at 0200
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	6/3/2019	23:45:00	USER				Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	6/4/2019	00:00:00	USER				Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	6/4/2019	01:00:00	USER				Upon arrival met with company man to discuss job details and calculations, performed hazard hunt and site assessment.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	6/4/2019	01:15:00	USER				Discussed rigging up hazards and procedure according to HMS.
Event	6	Other	Other	6/4/2019	04:00:00	USER				Water test- PH-6, Chlor-0, Temp-65. Cement temp-70.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	6/4/2019	06:00:00	USER	0.00	8.25	0.00	Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.
Event	8	Start Job	Start Job	6/4/2019	06:18:03	COM4	0.00	8.25	0.00	TD-17278', OH-8.5", TP-17258' 5.5" 17#, TVD-6875', SURF-1605' 9.625" 36#, MUD-10.4#
Event	9	Drop Bottom Plug	Drop Bottom Plug	6/4/2019	06:20:24	COM4	1.90	8.31	297.00	Dropped by HES Supervisor, witnessed by company man.
Event	10	Test Lines	Test Lines	6/4/2019	06:21:25	COM4	0.00	8.33	309.00	Pumped 5bbls fresh water to fill lines at 3bpm 280psi, shut manifold, and performed 500psi k/o function test, followed with 5th gear stall at 1620psi, proceeded to bring pressure to 4500psi, Pressure stabilized and held with no leaks.
Event	11	Pump Spacer 1	Pump Spacer 1	6/4/2019	06:26:39	COM4	0.00	8.31	10.00	Pumped 50bbls of 12.5# 2.74y 16.6g/s FDP Spacer with 10g D-air at 7bpm 6770psi.
Event	12	Check Weight	Check Weight	6/4/2019	06:37:56	COM4	7.00	12.70	677.00	Weight verified with pressurized mud scales.

Event	13	Pump Lead Cement	Pump Lead Cement	6/4/2019	06:39:22	COM4	7.00	0.04	618.00	Pumped 585sks or 164bbbls of 13.2# 1.57y 7.66g/s Elasticem at 8bpm 700psi.
Event	14	Check Weight	Check Weight	6/4/2019	06:41:11	COM4	7.00	0.04	738.00	Weight verified with pressurized mud scales.
Event	15	Check Weight	Check Weight	6/4/2019	06:48:38	COM4	7.00	0.04	417.00	Weight verified with pressurized mud scales.
Event	16	Check Weight	Check Weight	6/4/2019	06:56:39	COM4	8.00	0.04	559.00	Weight verified with pressurized mud scales.
Event	17	Pump Cement	Pump Cement	6/4/2019	07:02:39	COM4	8.00	0.04	553.00	Pumped 615sks or 171bbbls of 13.2# 1.56y 7.68g/s GasStop with 1538g FDP Latex and 30g of D-Air at 8bpm 653psi.
Event	18	Check Weight	Check Weight	6/4/2019	07:11:23	COM4	8.00	13.24	653.00	Weight verified with pressurized mud scales.
Event	19	Check Weight	Check Weight	6/4/2019	07:16:55	COM4	8.00	13.41	677.00	Weight verified with pressurized mud scales.
Event	20	Pump Tail Cement	Pump Tail Cement	6/4/2019	07:25:26	COM4	8.00	13.19	626.00	Pumped 1570sks or 439bbbls of 13.2# 1.57y 7.66g/s Elasticem at 8bpm 550psi.
Event	21	Check Weight	Check Weight	6/4/2019	07:29:02	COM4	7.90	13.15	1307.00	Weight verified with pressurized mud scales.
Event	22	Check Weight	Check Weight	6/4/2019	07:39:34	COM4	8.00	13.18	549.00	Weight verified with pressurized mud scales.
Event	23	Check Weight	Check Weight	6/4/2019	07:49:02	COM4	8.00	13.29	548.00	Weight verified with pressurized mud scales.
Event	24	Check Weight	Check Weight	6/4/2019	08:14:55	COM4	8.00	13.19	714.00	Weight verified with pressurized mud scales.
Event	25	Shutdown	Shutdown	6/4/2019	08:24:29	COM4	0.00	15.24	98.00	Rig blew down iron, followed with 10bbbls fresh water through pumps and lines.
Event	26	Drop Top Plug	Drop Top Plug	6/4/2019	08:32:45	COM4	0.00	8.14	11.00	Dropped by HES Supervisor, witnessed by company man.
Event	27	Pump Displacement	Pump Displacement	6/4/2019	08:32:48	COM4	0.00	8.13	11.00	Pumped 401bbbls fresh water at 10bpm.
Event	28	Bump Plug	Bump Plug	6/4/2019	09:22:33	COM4	0.00	8.09	2399.00	Slowed down at 380bbbls away to 3bpm, final circulating pressure-2050psi. Bump pressure-2450psi.
Event	29	Pressure Up Well	Pressure Up Well	6/4/2019	09:22:52	COM4	0.00	8.09	2442.00	Pressured up to burst plug at 3200psi, continued to pump 5bbls at 5bpm 2150psi.
Event	30	Other	Other	6/4/2019	09:25:38	COM4	0.00	8.08	1782.00	Released pressure and got 3bbls back. Floats held.
Event	31	End Job	End Job	6/4/2019	09:26:56	COM4	0.00	8.05	6.00	Est TOT-6601', TOL-2410' Got 53bbbls cap cement to surface.

Event	32	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	6/4/2019	09:30:00	USER	0.00	8.07	8.00	Discussed rigging down hazards and procedure according to HMS with all HES personnel
Event	33	Safety Meeting - Departing Location	Safety Meeting - Departing Location	6/4/2019	11:45:00	USER				Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	34	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	6/4/2019	12:00:00	USER				Pre journey management prior to departure.

3.0 Attachments

3.1 MT FED Heath 8W-20-13 Production – Job Chart

