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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 **Mab 15-14HZ 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.

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 #: 300466	Ship To #: 3932201	Quote #: 0022582823	Sales Order #: 0905713725
Customer: ANADARKO PETROLEUM CORP-EBUS		Customer Rep: Tyler Humphrey	
Well Name: MAB		Well #: 15-14HZ	API/UWI #: 05-123-49250-00
Field: WATTENBERG	City (SAP): IONE	County/Parish: WELD	State: COLORADO
Legal Description: SW SE-15-1N-66W-683FSL-2171FEL			
Contractor:		Rig/Platform Name/Num: Akita 522	
Job BOM: 7523 7523			
Well Type: HORIZONTAL GAS			
Sales Person: HALAMERICA/HX41066		Srvc Supervisor: Nicholas Roles	

**Job**

<b>Formation Name</b>			
<b>Formation Depth (MD)</b>	<b>Top</b>		<b>Bottom</b>
<b>Form Type</b>			<b>BHST</b>
<b>Job depth MD</b>	18642ft		<b>Job Depth TVD</b>
<b>Water Depth</b>			<b>Wk Ht Above Floor</b>
<b>Perforation Depth (MD)</b>	<b>From</b>		<b>To</b>

**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		J-55	0	1881	0	1881
Casing		5.5	4.892	17	LTC	HCP110	0	18642	0	7471
Open Hole Section			7.875				1894	18653	1881	7471

**Tools and Accessories**

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	5.5			18642	Top Plug	5.5	1	WTF
Wet Shoe Sub	5.5			18632	Bottom Plug	5.5	1	WTF
Float Collar	5.5				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 ft <sup>3</sup> /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
1	FDP-C1337-18	SBM FDP-C1337-18 CEMENT SPACER SYS	80	bbl	10.5	6.17		6	

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	Gasstop B1	GASSTOP (TM) SYSTEM	640	sack	13.2	1.56		8	7.71	
3	EconoCem	ECONOCEM (TM) SYSTEM	1150	sack	13.5	1.68		8	7.99	
4	Biocide Water and MMCR	Biocide Water and MMCR	20	bbl	8.34			8		
0.50 gal/bbl		<b>MICRO MATRIX CEMENT RETARDER, 5 GAL PAIL (100003781)</b>								
5	Biocide Water	Biocide Water	412	bbl	8.34			10		
<b>Cement Left In Pipe</b>		<b>Amount</b>	0 ft			<b>Reason</b>		<b>Wet Shoe</b>		
Mix Water:		7 pH	Mix Water Chloride:			0 ppm		Mix Water Temperature:		60 °F °C
Cement Temperature:		60 °F °C	Plug Displaced by:			8.33 lb/gal		Disp. Temperature:		60 °F °C
Plug Bumped?		Yes	Bump Pressure:			3050 psi MPa		Floats Held?		Yes
Cement Returns:		0 bbl m3	Returns Density:			## lb/gal kg/m3		Returns Temperature:		## °F °C
<b>Comment</b> Got 0bbls spacer back to pits. Estimated TOT-7509', TOL-1797', TOS-127'										

## 2.0 Real-Time Job Summary

### 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comments
Event	1	Call Out	Call Out	5/28/2019	14:00:00	USER	Called out by Service Coordinator for O/L at 2100
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/28/2019	18:30:00	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	5/28/2019	18:45:00	USER	Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	5/28/2019	19:00:00	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	5/28/2019	19:15:00	USER	Discussed rigging up hazards and procedure according to HMS.
Event	6	Other	Other	5/28/2019	20:00:00	USER	Water test- PH-6, Chlor-0, Temp-58. Cement temp-60.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/28/2019	23:15:00	USER	Held safety meeting with all job associated personnel to discuss job procedure, hazards and stop work authority.

Event	8	Start Job	Start Job	5/28/2019	23:39:33	COM4	TD-18653', TP-18642' 5.5" 17#, WS-18632', TVD-7471', OH-7.875", SURF-1881' 9.625" 36#, MUD-9.4#
Event	9	Test Lines	Test Lines	5/28/2019	23:42:42	COM4	Pumped 5bbls fresh water to fill lines, shutdown, closed manifold, performed 500psi k/o function test, continued with 5th gear stall at 2100psi, proceeded to bring pressure to 6500psi. Pressure stabilized and held with no leaks.
Event	10	Pump Spacer 1	Pump Spacer 1	5/28/2019	23:48:35	COM4	
Event	11	Shutdown	Shutdown	5/28/2019	23:50:33	COM4	Lost prime on pump and shutdown to re-prime and get spacer to weight.
Event	12	Pump Spacer 1	Pump Spacer 1	5/29/2019	00:00:19	COM4	Pumped 80bbls of 10.5# 6.17Y 39.6g/s FDP Spacer with 60g Musol A, 60g Dual Spacer B and 10g D-Air .8G of Biocide at 6bpm 520psi.
Event	13	Pump Lead Cement	Pump Lead Cement	5/29/2019	00:17:39	COM4	Pumped 640sk or 178bbls of 13.2# 1.56y 7.71g/s Gasstop with 1600G of Latex and 20G of D-Air at 8bpm 566psi.
Event	14	Drop Bottom Plug	Drop Bottom Plug	5/29/2019	00:18:14	COM4	Weight verified with pressurized mud scales.
Event	15	Check Weight	Check Weight	5/29/2019	00:29:12	COM4	Weight verified with pressurized mud scales.
Event	16	Check Weight	Check Weight	5/29/2019	00:44:38	COM4	Weight verified with pressurized mud scales.
Event	17	Pump Tail Cement	Pump Tail Cement	5/29/2019	00:46:00	COM4	Pumped 1150sk or 344bbls of 13.5# 1.68Y 7.99G/S Econocem at 8bpm 805psi.

Event	18	Check Weight	Check Weight	5/29/2019	00:49:02	COM4	Weight verified with pressurized mud scales.
Event	19	Check Weight	Check Weight	5/29/2019	01:09:52	COM4	Weight verified with pressurized mud scales.
Event	20	Check Weight	Check Weight	5/29/2019	01:18:50	COM4	Weight verified with pressurized mud scales.
Event	21	Shutdown	Shutdown	5/29/2019	01:34:50	COM4	Shutdown, rig blew down iron with air, followed with 5bbls fresh water through pumps and lines.
Event	22	Drop Top Plug	Drop Top Plug	5/29/2019	01:44:48	COM4	Dropped by HES supervisor, witnessed by company man.
Event	23	Pump Displacement	Pump Displacement	5/29/2019	01:44:52	COM4	Pumped 432bbls fresh water with 10g MMCR in first 20bbls, followed with 4.2g biocide throughout at 10bpm.
Event	24	Bump Plug	Bump Plug	5/29/2019	02:55:45	COM4	Slowed down at 410bbls away to 3bpm, Shutdown at 413 due to frac tanks being out of water. Rigged up hoses to day tank to finish displacement. Final Circulating Pressure- 2100psi, Bump Pressure- 3050psi. Once pressure lined out and held for 10min test.
Event	25	Pressure Up Well	Pressure Up Well	5/29/2019	03:04:51	COM4	Pressured up with fresh water to 4800psi to shear pins and pumped 3bbls at 3bpm 2050psi, for wet shoe.
Event	26	Other	Other	5/29/2019	03:08:25	COM4	Released pressure and got 3bbls back to truck. Floats held.

Event	27	End Job	End Job	5/29/2019	03:10:22	COM4	Got Obbls spacer back to pits. Estimated TOT-7509', TOL-1797', TOS-127'
Event	28	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/29/2019	03:15:00	USER	Discussed rigging down hazards and procedure according to HMS with all HES personnel
Event	29	Safety Meeting - Departing Location	Safety Meeting - Departing Location	5/29/2019	04:15:00	USER	Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	30	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	5/29/2019	04:30:00	USER	Pre journey management prior to departure.

3.0 Attachments

3.1 Job Chart

