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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 15-13HZ** 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 #: 3932313	Quote #: 0022582485	Sales Order #: 0905707956
Customer: ANADARKO PETROLEUM CORP-EBUS		Customer Rep:	
Well Name: MAB		Well #: 15-13HZ	API/UWI #: 05-123-49232-00
Field: WATTENBERG	City (SAP): IONE	County/Parish: WELD	State: COLORADO
Legal Description: SW SE-15-1N-66W-668FSL-2171FEL			
Contractor:		Rig/Platform Name/Num: Akita 522	
Job BOM: 7523 7523			
Well Type: HORIZONTAL GAS			
Sales Person: HALAMERICA/HX41066		Srvc Supervisor: Prince Perez	

**Job**

Formation Depth (MD)	Top	0'	Bottom	18,741'
Job depth MD	18,731'		Job Depth TVD	7,538'
Water Depth			Wk Ht Above Floor	5'

**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	1858	0	1858
Casing		5.5	4.892	17	LTC	HCP110	0	18731	0	7538
Open Hole Section			7.875				1858	18741	1858	7538

**Tools and Accessories**

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	5.5	1		18,731	Top Plug	5.5	1	HES
Float Shoe	5.5				Bottom Plug	5.5	1	HES
Float Collar	5.5	1		18,726.7	SSR plug set	5.5		
Insert Float	5.5				Plug Container	5.5	1	HES
Stage Tool	5.5				Centralizers	5.5	391	

**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	Spacer	SBM FDP-C1337-18 CEMENT SPACER SYS	80	bbl	10.5	6.17	39.6	5	2,883

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
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2	Lead	GASSTOP (TM) SYSTEM	640	sack	13.2	1.56	7.61	5	4,870
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	Tail	ECONOCEM (TM) SYSTEM	1,160	sack	13.5	1.68	7.99	8	9,268
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	Displacement	Biocide Water and MMCR	20	bbl	8.34				
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	Displacement	Fresh Water w/Biocide	414.5	bbl	8.34				

<b>Cement Left In Pipe</b>	<b>Amount</b>	0 ft	<b>Reason</b>	<b>Wet Shoe</b>	
Mix Water:	pH 7	Mix Water Chloride:	<300 ppm	Mix Water Temperature:	50 °F
Cement Temperature:	## °F	Plug Displaced by:	8.33 lb/gal	Disp. Temperature:	50 °F
Plug Bumped?:	Yes	Bump Pressure:	2,400 psi	Floats Held?:	Yes
Cement Returns:	0 bbl	Returns Density:	9.5 lb/gal	Returns Temperature:	## °F

**Comment**

Pumped 80 bbls of Tuned Spacer III with 60 gallons of Dual B and Musol A, 20 gallons of Dair, and .8 of a gallon of biocide.

Pumped 177.8 bbls of Gasstop cement with 1600 gallons of FDP Latex.

Pumped 347.1 bbls of Econocem.

Pumped 434.5 bbls of fresh water displacement with MMCR in the first 20 bbls and Biocide throughout.

Pumped a 3 bbl wet shoe.

1 bbl back on the floats.

## 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	5/23/2019	12:00:00	USER	CREW CALLED OUT AT 12:00, REQUESTED ON LOCATION 18:00. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660, 10866497, 10866799, AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/23/2019	16:30:00	USER	CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Shop	Crew Leave Shop	5/23/2019	16:40:00	USER	STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	5/23/2019	16:50:00	USER	END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9/58" 36 LB/FT @ 1,858'; 5.5" CASING: 17 LB/FT TOTAL 18,731.1', 7 7/8" HOLE, TD 18,741', 4.4' SHOE TRAC, TVD- 7,538'. PUMP FRESH WATER DISPLACEMENT. CASING LANDED @ 19:30 5/23/2019.

Event	5	Safety Meeting - Assessment of Location	Safety Meeting - Assessment of Location	5/23/2019	17:00:00	USER	HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.
Event	6	Rig-Up Equipment	Rig-Up Equipment	5/23/2019	17:10:00	USER	RIG UP BULK AND MIXING EQUIPMENT.
Event	7	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/23/2019	21:45:00	USER	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	8	Rig-Up Completed	Rig-Up Completed	5/23/2019	22:15:00	USER	
Event	9	Start Job	Start Job	5/23/2019	22:16:28	COM4	BEGIN RECORDING JOB DATA.
Event	10	Test Lines	Test Lines	5/23/2019	22:21:38	COM4	PRESSURE TESTED IRON TO 6,500 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 1,100 PSI, 5TH GEAR STALL OUT @ 1,800 PSI. 6,500 PRESSURE TEST KICKED OUT @ 6,500 PSI
Event	11	Pump Spacer 1	Pump Spacer 1	5/23/2019	22:25:19	COM4	PUMP 80 BBLS OF TUNED SPACER III @ 10.5 LB/GAL, 6.17 CUFT/SK, 39.6 GALL/SK. 20 GALS D-AIR, 60 GALLONS OF DUAL B, 60 GALLONS OF MUSOL A, AND .8 OF A GALLON OF BIOCID. HOS CALCULATED @ 1,670.2'. TOS CALCULATED @ 114.3'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 5 BBLS/MIN @ 420 PSI.

Event	12	Drop Bottom Plug	Drop Bottom Plug	5/23/2019	22:47:24	COM4	PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	13	Pump Lead Cement	Pump Lead Cement	5/23/2019	22:47:30	COM4	PUMPED 640 SKS OF GASSTOP CEMENT @ 13.2 LB/GAL, 1.56 FT3/SK, 7.61 GAL/SK. 177.8 BBLS. HOL CALCULATED @ 5,714.2', TOT CALCULATED @ 1,784.5'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 5 BBLS/MIN @ 540 PSI
Event	14	Pump Tail Cement	Pump Tail Cement	5/23/2019	23:24:12	COM4	PUMP 1,160 SKS OF ECONOCEM @ 13.5 LB/GAL, 1.68 FT3/SK, 7.99 GAL/SK, 347.1 BBLS. HOT CALCULATED @ 11,232.4', TOT CALCULATED @ 7,498.7'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLS/MIN @ 830 PSI.
Event	15	Shutdown	Shutdown	5/24/2019	00:15:31	COM4	SHUTDOWN TO WASH LINES.
Event	16	Drop Top Plug	Drop Top Plug	5/24/2019	00:26:19	COM4	PLUG LEFT CONTAINER, VERIFIED BY CO. MAN.
Event	17	Pump Displacement	Pump Displacement	5/24/2019	00:26:24	COM4	BEGIN CALCULATED DISPLACEMENT OF 434.5 BBLS WITH FRESH WATER. MMCR IN THE FIRST 20 BBLS AND BIOCIDES THROUGHOUT. PUMP RATE 8.5 BPM @ 2,870 PSI. CAUGHT CEMENT @ 50 BBLS INTO DISPLACEMENT. NO SPACER TO SURFACE. SLOW RATE TO 3 BPM @ 415 BBLS INTO DISPLACEMENT.
Event	18	Bump Plug	Bump Plug	5/24/2019	01:26:05	COM4	PLUG BUMPED AT CALCULATED DISPLACEMENT. 2,400 PSI. PRESSURED UP TO 3,000 PSI. HELD PRESSURE FOR 15 MINUTES
Event	19	Shift Tool - Lower	Shift Tool - Lower	5/24/2019	01:39:22	USER	SHEARED @ 4,878 PSI FOLLOWED BY A 3 BBL WET SHOE.
Event	20	Check Floats	Check Floats	5/24/2019	01:40:55	USER	RELEASED PRESSURE, FLOATS HELD, 1 BBLS BACK.
Event	21	End Job	End Job	5/24/2019	01:42:19	USER	STOP RECORDING JOB DATA.

Event	22	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	5/24/2019	01:45:00	USER	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	23	Rig-Down Equipment	Rig-Down Equipment	5/24/2019	01:55:00	USER	RIG DOWN BULK AND MIXING EQUIPMENT.
Event	24	Rig-Down Completed	Rig-Down Completed	5/24/2019	03:40:00	USER	
Event	25	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/24/2019	03:50:00	USER	CREW DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	26	Crew Leave Location	Crew Leave Location	5/24/2019	04:00:00	USER	THANK YOU FOR USING HALLIBURTON – PRINCE PEREZ AND CREW.

3.0 Attachments

3.1 Job Chart

