

# HALLIBURTON

iCem<sup>®</sup> Service

**ANADARKO PETROLEUM CORP - EBUS**

**Butterball 10N-34HZ Production**

Job Date: Sunday, May 28, 2017

Sincerely,

**Fort Lupton District Cement**

## Legal Notice

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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 **Butterball 10N-34HZ** 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.

**8bbls of Tuned Spacer III to surface giving an estimated top of cap cement at 1090ft**

**3bbl wet shoe was pumped after rupturing disc**

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*

<b>Sold To #:</b> 300466		<b>Ship To #:</b> 3786947		<b>Quote #:</b> 0022307029		<b>Sales Order #:</b> 0904047357					
<b>Customer:</b> ANADARKO PETROLEUM CORP-EBUS				<b>Customer Rep:</b> James Adkins							
<b>Well Name:</b> BUTTERBALL			<b>Well #:</b> 10N-34HZ		<b>API/UWI #:</b> 05-123-44413-00						
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> IONE		<b>County/Parish:</b> WELD		<b>State:</b> COLORADO					
<b>Legal Description:</b> NE NW-10-2N-67W-820FNL-2325FWL											
<b>Contractor:</b> NABORS DRLG				<b>Rig/Platform Name/Num:</b> NABORS X22							
<b>Job BOM:</b> 7523 7523											
<b>Well Type:</b> HORIZONTAL GAS											
<b>Sales Person:</b> HALAMERICA\HX41066				<b>Srv Supervisor:</b> Nicholas Roles							
<b>Job</b>											
<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>		15610ft		<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>							
<b>Well Data</b>											
<b>Description</b>	<b>New / Used</b>	<b>Size in</b>	<b>ID in</b>	<b>Weight lbm/ft</b>	<b>Thread</b>	<b>Grade</b>	<b>Top MD ft</b>	<b>Bottom MD ft</b>	<b>Top TVD ft</b>	<b>Bottom TVD ft</b>	
Casing		9.625	8.921	36		J-55	0	1869	0	1869	
Casing		5.5	4.892	17	LTC	HCP110	0	15610	0	7220	
Open Hole Section			7.875				1869	15620	1869	7220	
<b>Tools and Accessories</b>											
<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>	<b>Depth ft</b>		<b>Type</b>	<b>Size in</b>	<b>Qty</b>	<b>Make</b>		
Guide Shoe	5.5					Top Plug	5.5		HES		
Float Shoe	5.5			15610		Bottom Plug	5.5		HES		
Float Collar	5.5			15595		SSR plug set	5.5		HES		
Insert Float	5.5					Plug Container	5.5	1	HES		
Stage Tool	5.5					Centralizers	5.5		HES		
<b>Fluid Data</b>											
<b>Stage/Plug #: 1</b>											
<b>Fluid #</b>	<b>Stage Type</b>	<b>Fluid Name</b>			<b>Qty</b>	<b>Qty UoM</b>	<b>Mixing Density lbm/gal</b>	<b>Yield ft3/sack</b>	<b>Mix Fluid Gal</b>	<b>Rate bbl/min</b>	<b>Total Mix Fluid Gal</b>
1	Tuned Spacer III	Tuned Spacer III			60	bbl	10.5	6.25		6	
0.70 gal/bbl		<b>MUSOL A, 330 GAL TOTE - (790828)</b>									
88.91 lbm/bbl		<b>BARITE, BULK (100003681)</b>									
36.20 gal/bbl		<b>FRESH WATER</b>									

0.70 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)							
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 - Cap Cement	ELASTICEM (TM) SYSTEM	150	sack	13.2	1.57		7	7.53
7.53 Gal		FRESH WATER							
0.90 %		SCR-100 (100003749)							
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	ElastiCem	ELASTICEM (TM) SYSTEM	390	sack	13.2	1.57		7	7.55
0.30 %		SCR-100 (100003749)							
7.55 Gal		FRESH WATER							
0.10 %		SUPER CBL, 50 LB PAIL (100003668)							
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	EconoCem	ECONOCEM (TM) SYSTEM	1040	sack	13.5	1.68		7	7.98
7.98 Gal		FRESH WATER							
0.40 %		HR-5, 50 LB SK (100005050)							
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	Sugar Water and MMCR	Sugar water and MMCR	40	bbl	8.34			7	
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	Biocide Water	Biocide Water	321.8	bbl	8.34			7	
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe	
Comment Got 8bbls spacer back to surface, Estimated TOT-5545', TOL-#2-2017', TOL #1-1090'.									

## 2.0 Real-Time Job Summary

## 2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density (ppg)	Comb Pump Rate (bbl/min)	DS Pump Press (psi)	Comments
Event	1	Call Out	Call Out	5/27/2017	22:30:00	USER				Crew call out for o/l at
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/28/2017	02:45:00	USER				All crew aware of hazards and directions. All fit to drive.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	5/28/2017	03:00:00	USER				Started journey management.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	5/28/2017	03:30:00	USER				Met with company man to discuss job details and procedure. Performed hazard hunt and site assessment.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/28/2017	03:45:00	USER				All hse present. Discussed bulk and iron placement and all red zone areas. Caution taped high pressure zones.
Event	6	Other	Other	5/28/2017	04:00:00	USER				Water Test- PH-6 Chlo-0 Temp-60 Cement temp-70
Event	7	Safety Meeting - Pre Job	Safety Meeting - Pre Job	5/28/2017	08:30:00	USER	8.57	0.00	10.00	Discussed job associated hazards, contingencies and job procedure with all job associated personnel.
Event	8	Start Job	Start Job	5/28/2017	09:15:00	COM4	8.56	0.00	0.00	TD-15620', TP-15610' 5.5" 17#, FC-15595', TVD-7220', OH-7 7/8", SURF-1869' 9.625" 36#, MUD-9.2#
Event	9	Test Lines	Test Lines	5/28/2017	09:21:43	COM4	8.58	0.00	1318.00	Pumped 5bbls fresh water to fill lines, shutdown, closed manifold, performed

										500psi k/o function test, followed by 5th gear stall at 1717psi, proceeded to bring pressure to 7500psi. Held well, no leaks.
Event	10	Check Weight	Check Weight	5/28/2017	09:31:12	COM4	8.57	0.00	23.00	Weight verified with pressurized mud scales.
Event	11	Pump Spacer 1	Pump Spacer 1	5/28/2017	09:32:37	COM4	8.56	1.20	36.00	Pumped 60bbls of 10.5# 6.25Y 40.6g/s Tuned Spacer III with 40g Musol A, 40g Dual Spacer B, 20g D-Air and at 6bpm 600psi.
Event	12	Drop Bottom Plug	Drop Bottom Plug	5/28/2017	10:00:02	COM4	10.47	0.00	20.00	Dropped by HES supervisor, witnessed by company man.
Event	13	Check Weight	Check Weight	5/28/2017	10:03:11	COM4	10.49	0.00	21.00	Weight verified with pressurized mud scales.
Event	14	Pump Lead Cement	Pump Lead Cement	5/28/2017	10:05:44	COM4	12.86	3.50	367.00	Pumped 150sks or 41.9bbls of 13.2# 1.57y 7.53g/s Elasticem w/o CBL at 7bpm 800psi.
Event	15	Check Weight	Check Weight	5/28/2017	10:07:22	COM4	13.32	6.00	756.00	Weight verified with pressurized mud scales.
Event	16	Pump Lead Cement	Pump Lead Cement	5/28/2017	10:12:19	COM4	13.23	7.10	753.00	Pumped 390sks or 109bbls of 13.2# 1.57y 7.55g/s Elasticem w/ CBL with at 7bpm 576psi.
Event	17	Check Weight	Check Weight	5/28/2017	10:24:04	COM4				Weight verified with pressurized mud scales.
Event	18	Pump Tail Cement	Pump Tail Cement	5/28/2017	10:29:31	COM4	13.28	7.10	646.00	Pumped 1040sks or 311bbls of 13.5# 1.68Y 7.98G/S Econocem at 7bpm 565psi.
Event	19	Check Weight	Check Weight	5/28/2017	10:30:39	COM4	13.46	7.10	722.00	Weight verified with pressurized mud scales.
Event	20	Check Weight	Check Weight	5/28/2017	10:53:15	COM4	13.57	7.00	876.00	Weight verified with



										pressurized mud scales.
Event	21	Other	Other	5/28/2017	11:15:43	COM4	14.51	0.00	84.00	Shutdown, rig blew down iron with air, followed with 5bbls fresh water through pumps and lines.
Event	22	Drop Top Plug	Drop Top Plug	5/28/2017	11:26:22	COM4	8.25	0.00	-3.00	Dropped by HES supervisor, witnessed by company man.
Event	23	Pump Displacement	Pump Displacement	5/28/2017	11:26:26	COM4	8.25	0.00	-3.00	Pumped 361.8bbls fresh water with 10g MMCR in first 20bbls, followed with 5g biocide throughout at 7bpm 2750psi.
Event	24	Bump Plug	Bump Plug	5/28/2017	12:24:06	COM4	8.35	0.00	2840.00	Slowed down to 3bpm at 340bbls away. Final Circulating pressure- 2460psi, Bump pressure 2995psi.
Event	25	Pressure Up Well	Pressure Up Well	5/28/2017	12:25:10	COM4	8.36	0.00	2968.00	Held 3000psi on well for 15min casing test.
Event	26	Check Floats	Check Floats	5/28/2017	12:41:48	USER	8.37	0.00	3281.00	Released pressure and got 4bbls back. Floats held.
Event	27	Pressure Up Well	Pressure Up Well	5/28/2017	12:47:36	COM4	8.44	0.00	4430.00	Pressured up to burst top plug, Burst at 5500psi, followed with 3bbls fresh water for wet shoe at 3bpm 2530psi.
Event	28	Check Floats	Check Floats	5/28/2017	12:51:10	USER	8.34	0.00	496.00	Released pressure and got 3bbls back. Checked flow for 10min. Floats held.
Event	29	End Job	End Job	5/28/2017	13:01:48	COM4				Got 8bbls spacer back to surface, Estimated TOT- 5545', TOL-#2-2017', TOL #1-1090'.
Event	30	Safety Meeting - Pre Rig-Down	Safety Meeting - Pre Rig-Down	5/28/2017	13:10:00	USER	1.08	2.10	7.00	All HSE present. Discussed red zone areas and trapped

							pressure hazards. Watch for suspended loads and rig down procedures, including hand placement, lifting techniques, and swing radius.
Event	31	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	5/28/2017	14:45:00	USER	All HSE present and fit to drive. Aware of directions and hazards.
Event	32	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	5/28/2017	15:00:00	USER	Pre journey managment prior to departure.

## 3.0 Job Chart

### 3.1 Anadarko Butterball 10N-34HZ Production Job Chart

