

# HALLIBURTON

iCem<sup>®</sup> Service

**ANADARKO PETROLEUM CORP - EBUS**

**For: BOB BALKENBUSH**

Date: Tuesday, July 15, 2014

**SPOTTED 4C-23HZ**

NRC

Case 1

Sincerely,

**AARON SMITH**

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## 1.1 Executive Summary

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Halliburton appreciates the opportunity to perform the cementing services on the **Spotted 4C-23HZ** cement **Surface** 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**

	<b>Date</b>	<b>Time</b>	<b>Time Zone</b>
<b>Called Out</b>	5/28	1100	MST
<b>On Location</b>	5/28	1710	MST
<b>Job Started</b>	5/28	1803	MST
<b>Job Completed</b>	5/28	2212	MST
<b>Departed Location</b>	5/28	2300	MST

## 1.2 Cementing Job Summary

*The Road to Excellence Starts with Safety*

<b>Sold To #:</b> 300466		<b>Ship To #:</b> 3508004		<b>Quote #:</b>		<b>Sales Order #:</b> 0901378242	
<b>Customer:</b> ANADARKO PETROLEUM CORP - EBUS				<b>Customer Rep:</b> BOB BALKENBUSH			
<b>Well Name:</b> SPOTTED			<b>Well #:</b> 4C-23HZ		<b>API/UWI #:</b> 05-123-39430-00		
<b>Field:</b> WATTENBERG		<b>City (SAP):</b> IONE		<b>County/Parish:</b> WELD		<b>State:</b> COLORADO	
<b>Legal Description:</b> SW SW-23-2N-67W-275FSL-850FWL							
<b>Contractor:</b>				<b>Rig/Platform Name/Num:</b> MAJOR 29			
<b>Job BOM:</b> 7521							
<b>Well Type:</b> HORIZONTAL GAS							
<b>Sales Person:</b> HALAMERICA\HX46524				<b>Srvc Supervisor:</b> Aaron Smith			

### 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>	1308ft	<b>Job Depth TVD</b>	
<b>Water Depth</b>		<b>Wk Ht Above Floor</b>	6
<b>Perforation Depth (MD)</b>		<b>To</b>	

### Well Data

	<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	0	9.625	8.921	36		J-55	0	1297	0	1297
Open Hole Section			13.5				0	1308	0	1308

### Tools and Accessories

<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	9.625	1				Top Plug	9.625	1	HES
Float Shoe	9.625	1	SSII	1297		Bottom Plug	9.625		HES
Float Collar	9.625	1	SSII	1257		SSR plug set	9.625		HES
Insert Float	9.625	1				Plug Container	9.625	1	HES
	9.625	1				Centralizers	9.625	12	HES

### Miscellaneous Materials

<b>Gelling Agt</b>	<b>Conc</b>	<b>Surfactant</b>	<b>Conc</b>	<b>Acid Type</b>	<b>Qty</b>				
<b>Treatment Fld</b>	<b>Conc</b>			<b>Sand Type</b>					

## 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	Mud Flush III (Powder)	Mud Flush III	12	bbl	8.4				
42 gal/bbl									

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
2	Lead Cement	SWIFTCEM (TM) SYSTEM	489	sack	14.2	1.537		6	7.63

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
3	Displacement	Displacement	97	bbl	8.33				

		Amount	40 ft							

**Comment** 68 SKS G NEAT CEMENT 15.8 PPG, 1.15 YIELD, 5.00 GAL/SK TOP OUT CEMENT

## 1.3 Planned Pumping Schedule

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1. **Fill Lines with Water**
2. **Pressure Test Lines to 2500psi**
3. **Pump 10 Fresh Water Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 3 bpm
4. **Pump Mud Flush III Spacer**
  - a. Density = 8.4 lb/gal
  - b. Volume = 12 bbl
  - c. Rate = 3 bpm
5. **Pump Fresh Water Spacer**
  - a. Density = 8.33 lb/gal
  - b. Volume = 10 bbl
  - c. Rate = 3 bpm
6. **Pump SwiftCem**
  - a. Density = 14.2 ppg
  - b. Yield = 1.54 ft<sup>3</sup>/sk
  - c. Water Requirement = 7.63 gal/sk
  - d. Volume = 489 sks (134 bbls)
  - e. Rate = 5 bpm
7. **Drop Top Plug**
8. **Start Displacement**
9. **Pump Displacement Water**
  - a. Density = 8.33 lb/gal
  - b. Volume = 97 bbls
  - c. Rate = 4 bpm
10. Land Plug – Anticipated Final Circulation Pressure 400 psi

**Calculated Total Displacement = 97 bbls**



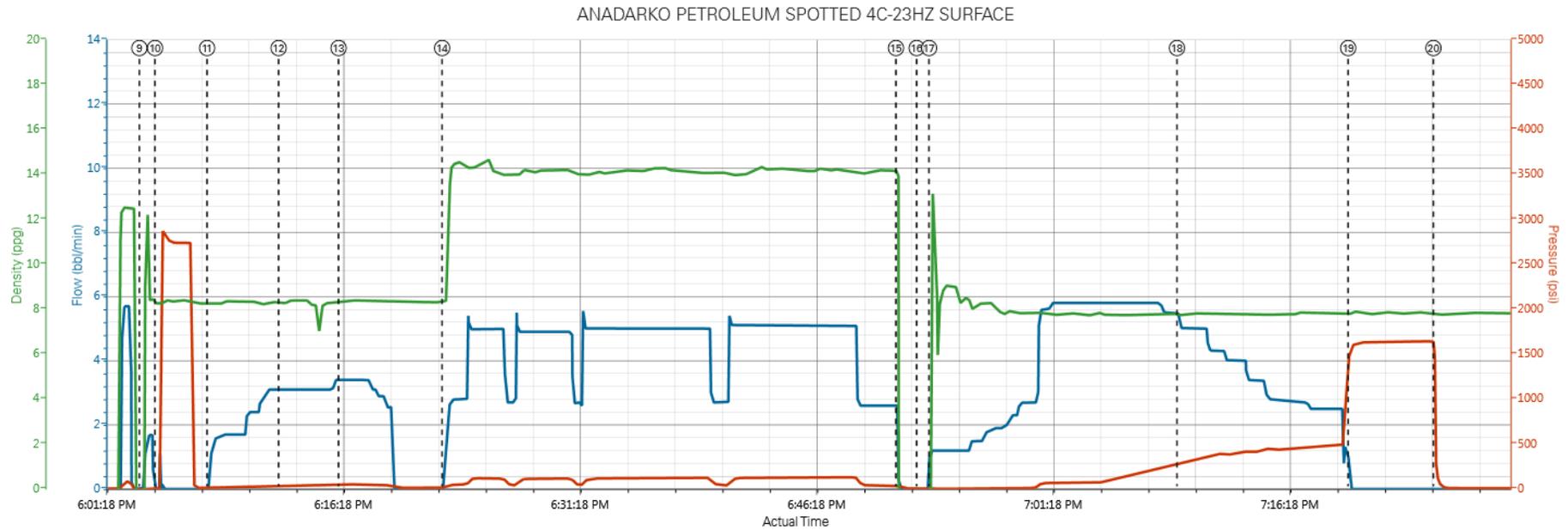
## 1.4 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	Comb Pump Rate (bbl/min)	PS Pump Press (psi)	DH Density (ppg)	Comment
Event	1	Call Out	Call Out	5/28/2014	11:00:00	USER				CALLED OUT BY ARC FOR ON LOCATION @ 1700
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	5/28/2014	15:30:00	USER				JOURNEY MANAGEMENT MEETING PRIOR TO DEPARTURE
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	5/28/2014	15:45:00	USER				
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	5/28/2014	17:10:00	USER				WITH ALL EQUIPMENT AND MATERIALS
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	5/28/2014	17:15:00	USER				RIG-UP JSA WITH HES CREW
Event	6	Rig-Up Equipment	Rig-Up Equipment	5/28/2014	17:18:00	USER				RIGGED UP ALL EQUIPEMENT AND SURFACE LINES
Event	7	Rig-Up Completed	Rig-Up Completed	5/28/2014	17:35:00	USER				
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	5/28/2014	17:45:00	USER				WITH CUSTOMER REP AND RIG CREW
Event	9	Start Job	Start Job	5/28/2014	18:03:30	COM7				
Event	10	Test Lines	Test Lines	5/28/2014	18:04:30	COM7				@2500 PSI
Event	11	Pump Spacer 1	Pump Spacer 1	5/28/2014	18:07:48	COM7	3.00	8.00	8.35	10 BBLS FRESH WATER
Event	12	Pump Spacer 2	Pump Spacer 2	5/28/2014	18:12:20	COM7	3.10	44.00	8.32	12 BBLS MUD FLUSH
Event	13	Pump Spacer 1	Pump Spacer 1	5/28/2014	18:16:08	COM7	3.40	49.00	8.35	10 BBLS FRESH WATER
Event	14	Pump Cement	Pump Cement	5/28/2014	18:22:42	COM7	5.0	16.00	14.2	134 BBLS/489 SKS @14.2 PPG, 1.54 YIELD, 7.63 GAL/SK
Event	15	Shutdown	Shutdown	5/28/2014	18:51:28	COM7				
Event	16	Drop Top Plug	Drop Top Plug	5/28/2014	18:52:47	COM7				PRE-LOADED HWE TOP PLUG IN PLUG CONTAINER, VERIFIED BY CUSTOMER REP
Event	17	Pump Displacement	Pump Displacement	5/28/2014	18:53:34	COM7	4.00	13.00	8.33	97 BBLS FRESH WATER

Event	18	Other	Spacer Returns to Surface	5/28/2014	19:09:17	COM7	5.10	286.00	7.73	@ 70 BBLS DISPLACEMENT 27 BBLS TO SURFACE
Event	19	Bump Plug	Bump Plug	5/28/2014	19:20:08	COM7				
Event	20	Other	Check Floats	5/28/2014	19:25:32	COM7				FLOATS HELD, .5 BBLS BACK
Event	21	Wait on HES Materials to Arrive - Start Time	Wait on HES Materials to Arrive - Start Time	5/28/2014	19:34:23	USER				WAITING ON TOP OUT CEMENT TO ARRIVE
Event	22	Wait on HES Materials to Arrive - End Time	Wait on HES Materials to Arrive - End Time	5/28/2014	21:07:00	USER				BULK WITH TOP OUT CEMENT ARRIVED ON LOCATION
Event	23	Start Job	Start Job	5/28/2014	21:15:40	COM7				
Event	24	Pump Cement	Pump Cement	5/28/2014	21:50:31	COM7				14 BBLS/68 SKS TOP OUT CEMENT @ 15.8 PPG, 1.15 YIELD, 5.00 GAL/SK
Event	25	Shutdown	Shutdown	5/28/2014	22:04:58	COM7				
Event	26	End Job	End Job	5/28/2014	22:12:38	COM7				
Event	27	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	5/28/2014	22:18:00	USER				RIG-DOWN JSA WITH HES CREW
Event	28	Rig-Down Equipment	Rig-Down Equipment	5/28/2014	22:30:00	USER				RIGGED DOWN ALL EQUIPMENT
Event	29	Rig-Down Completed	Rig-Down Completed	5/28/2014	22:45:00	USER				
Event	30	Depart Location Safety Meeting	Depart Location Safety Meeting	5/28/2014	22:50:00	USER				JOURNEY MANAGEMENT MEETING PRIOR TO DEPARTURE
Event	31	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	5/28/2014	23:00:10	USER				THANKS AARON SMITH AND CREW

## 2.0 Custom Graphs

### 2.1 Custom Graph



Comb Pump Rate (bb/min) PS Pump Press (psi) DH Density (ppg)

- ① Call Out n/a;n/a;n/a
- ② Depart from Service Center or Other Site n/a;n/a;n/a
- ③ Pre-Rig Up Safety Meeting n/a;n/a;n/a
- ④ Rig-Up Equipment n/a;n/a;n/a
- ⑤ Start Job 0;-13;-1.73
- ⑥ Test Lines 0;3;8.27
- ⑦ Pump Spacer 1 0;8;8.35
- ⑧ Pump Spacer 2 3.1;44;8.32
- ⑨ Pump Spacer 1 3.4;49;8.35
- ⑩ Pump Cement 0;16;8.37
- ⑪ Shutdown 0;32;0.21
- ⑫ Drop Top Plug 0;5;-13

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Customer: ANADARKO PETROLEUM CORP - EBUS      Job Date: 5/28/2014 5:38:20 PM      Well: SPOTTED 4C-23HZ  
 Representative: AARON SMITH      Sales Order #: 901378242

