

1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Ranger 7-20HZ** 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

Sold To #: 300466		Ship To #: 3934047		Quote #: 0022591086		Sales Order #: 0905760872	
Customer: ANADARKO PETROLEUM CORP-EBUS				Customer Rep: Alan Madsen			
Well Name: RANGER			Well #: 7-20HZ			API/UWI #: 05-123-49357-00	
Field: WATTENBERG		City (SAP): DACONO		County/Parish: WELD		State: COLORADO	
Legal Description: NE NW-7-1N-67W-824FNL-1589FWL							
Contractor: PRECISION DRLG				Rig/Platform Name/Num: PRECISION 461			
Job BOM: 7523 7523							
Well Type: HORIZONTAL GAS							
Sales Person: HALAMERICA\HX41066				Srvc Supervisor: Michael Loughran			
Job							

Formation Name			
Formation Depth (MD)	Top		Bottom
Form Type			BHST
Job depth MD	19074ft		Job Depth TVD
Water Depth			Wk Ht Above Floor 5
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		9.625	8.921	36		J-55	0	1882	0	1882
Casing		5.5	4.892	17	LTC	HCP110	0	19074	0	7796
Open Hole Section			7.875				1882	19084	1882	7796

Tools and Accessories									
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make
Guide Shoe	5.5					Top Plug	5.5	1	
Float Shoe	5.5			19074		Bottom Plug	5.5	1	
Float Collar	5.5					SSR plug set	5.5		
Insert Float	5.5					Plug Container	5.5	1	HES
Stage Tool	5.5					Centralizers	5.5		

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	80	bbl	10.5	6.17		6		
0.75 gal/bbl		MUSOL(R) A, 5 GAL PAIL (100064220)								
90.94 lbm/bbl		BARITE, BULK (100003681)								
0.75 gal/bbl		DUAL SPACER SURFACTANT B, 5 GAL PAIL (100003665)								
1 lbm/bbl		FE-2 (100001615)								

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		6	7.73
0.90 %		SCR-100 (100003749)							
5.23 Gal		FRESH WATER							
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	EconoCem	ECONOCEM (TM) SYSTEM	1400	sack	13.5	1.68		6	7.99
0.10 %		SA-1015, 50 LB SACK (102077046)							
8 Gal		FRESH WATER							
0.31 %		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
4	Biocide Water and MMCR	Biocide Water and MMCR	20	bbl	8.34			8	
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
5	Biocide Water	Biocide Water	422	bbl	8.34			8	
Cement Left In Pipe		Amount	0 ft		Reason			Wet Shoe Joint	
Mix Water:		pH 7	Mix Water Chloride:## ppm			Mix Water Temperature:		## °F °C	
Cement Temperature:			Plug Displaced by:			8.33 lb/gal		Disp. Temperature:	
Plug Bumped?		Yes	Bump Pressure:			2650 psi		Floats Held?Yes	
Cement Returns:		## bbl m3	Returns Density:			## lb/gal kg/m3		Returns Temperature:## °F °C	
Comment									

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)	DS Pump Press (psi)	Pump Stg Tot (bbl)	DH Density (ppg)	Comments
Event	1	Call Out	Call Out	6/13/2019	11:00:00	USER					Crew called out for on location time of 1500 hrs 6/13/2019
Event	2	Arrive At Loc	Arrive At Loc	6/13/2019	14:40:00	USER					Arrive at location, Rig on bottom, Rig circs 10.5 bbl/min/1520 psi, Meet with customer, TP 19074 27# P-110, Top WSS 19,049, TD 19084, 7.875 Hole, 1892' 9.625 J-55 36#, 3rd party top and bottom plug provided by customer, 9.5 OBM, Water 75 Deg., PH 7, Chlorides and sulfates less than 200 ppm
Event	3	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	6/13/2019	14:50:00	USER					Pre rig up safety meeting
Event	4	Rig-Up Equipment	Rig-Up Equipment	6/13/2019	15:00:00	USER					Rig up all service lines and iron to buffer zone
Event	5	Pre-Job Safety Meeting	Pre-Job Safety Meeting	6/13/2019	17:15:00	USER					Discuss job procedures, Discuss job hazards and hazards of Halliburton Equipment.
Event	6	Start Job	Start Job	6/13/2019	17:57:32	COM4	0.00	-1.00	0.00	7.73	Begin recording data
Event	7	Test Lines	Test Lines	6/13/2019	18:02:48	COM4	0.00	6010.00	1.90	7.88	Pressure test to 6000 psi
Event	8	Pump Spacer 1	Pump Spacer 1	6/13/2019	18:05:09	COM4	0.00	44.00	1.90	7.75	80 bbls FDP-C1337-18, with Musol and Dual spacer B,

											10.5 ppg, 6.17 yield, 39.6 gal/sack
Event	9	Drop Bottom Plug	Drop Bottom Plug	6/13/2019	18:23:32	USER	0.00	61.00	84.30	10.44	Drop Bottom Plug
Event	10	Pump Lead Cement	Pump Lead Cement	6/13/2019	18:24:15	COM4	0.00	31.00	84.30	10.47	640 sacks Gasstop, Lead, 177.82 bbls, 13.2 ppg, 1.56 yield, 7.73 gal/sack
Event	11	Pump Tail Cement	Pump Tail Cement	6/13/2019	18:59:19	COM4	6.00	272.00	205.00	13.02	1200 sacks EconoCem, 359.05 bbls, 13.5, 1.68 yield, 7.99 gal/sack
Event	12	Shutdown	Shutdown	6/13/2019	19:48:43	COM4	0.00	25.00	366.00	1.50	Shutdown
Event	13	Clean Lines	Clean Lines	6/13/2019	19:51:07	USER	0.00	0.00	366.00	0.55	Clean pumps and lines. Blow air from plug container manifold to wash up tank then isolate clean iron to clean pumps
Event	14	Drop Top Plug	Drop Top Plug	6/13/2019	19:57:31	COM4	3.40	35.00	380.40	8.27	Verified by CM
Event	15	Pump Displacement	Pump Displacement	6/13/2019	19:58:09	USER	0.00	-9.00	0.00	6.99	442 bbls Fresh water displacement with 20 gal mmcr in first 20 bbls. 5 gal customer provided biocide throughout displacement. Full returns throughout.

3.0 Attachments

3.1 Anadarko Petroleum Ranger 7-20HZ-Custom Results.png

