

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

United States of America, COLORADO

For: Chris McMullen

Date: Saturday, March 09, 2019

Challenger 7N

WELD,

Job Date: Saturday, March 09, 2019

Sincerely,

Luke Kosakewich and Crew

Legal Notice

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The Road to Excellence Starts with Safety

Sold To #: 304535		Ship To #: 3839562		Quote #:		Sales Order #: 0905535818					
Customer: PDC ENERGY-EBUS				Customer Rep: Chris McMullen							
Well Name: CHALLENGER			Well #: 7N		API/UWI #: 05-123-45897-00						
Field: WATTENBERG		City (SAP): KERSEY		County/Parish: WELD		State: COLORADO					
Legal Description: SE NW-8-4N-64W-1418FNL-2431FWL											
Contractor: ENSIGN DRLG				Rig/Platform Name/Num: ENSIGN 152							
Job BOM: 7523 7523											
Well Type: HORIZONTAL OIL											
Sales Person: HALAMERICA\HX38199				Srv Supervisor: Luke Kosakewich							
Job											
Formation Name											
Formation Depth (MD)		Top		Bottom							
Form Type				BHST							
Job depth MD		14060ft		Job Depth TVD		7236ft					
Water Depth				Wk Ht Above Floor							
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			0	1675	0	1675	
Casing		5.5	4.778	20			0	13934	0	13934	
Open Hole Section			8.5				1675	6828	1675	6828	
Open Hole Section			8.5				6828	14060	6828	14060	
Tools and Accessories											
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make		
Guide Shoe				1		Top Plug	5.5	1	Weatherford		
Float Shoe	5.5	1	Weatherford	13934		Bottom Plug	5.5	1	Weatherford		
Float Collar	5.5	2	Weatherford	13920		SSR plug set					
Wet Shoe Sub	5.5	1	Weatherford	13906		Plug Container	5.5	1	HES		
Stage Tool						Centralizers	5.5	202	HES		
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	12.5 lb/gal Tuned Spacer III	Tuned Spacer III			150	bbl	12.5	2.71		6	

Fluid #	Stage Type	Fluid Name	Qty	Qty UoM	Mixing Density lbm/gal	Yield ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal
2	Gasstop B1	GASSTOP (TM) SYSTEM	625	sack	13.2	1.55		8	7.61
3	ElastiCem	ELASTICEM (TM) SYSTEM	1038	sack	14.4	1.7		8	7.3
4	MMCR Displacement	MMCR Displacement	20	bbl	8.34			5	
5	Displacement fluid		288	bbl	8.34			8	

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5	Displacement fluid		288	bbl	8.34			8	

Cement Left In Pipe	Amount	0 ft	Reason	Wet Shoe	
Mix Water:	pH 7	Mix Water Chloride:	230 < ppm	Mix Water Temperature:	80 °F
Plug Bumped?	Yes/No	Bump Pressure:	#### psi MPa	Floats Held?	Yes/No

Comment There were full returns throughout the job. Bumped the plug 500 psi. over 2,400 psi. at 3 bpm. Bump pressure was 2,900 psi. Held pressure for a minute. Pressure held. Pressured up to 3,630 psi. to shift the sleeve. Pumped 5 bbls. of fresh water at 5 bpm. for a wet shoe. Bled off pressure to check floats. Floats held. Got 2 bbls. of fluid back to the truck. Circulated 30 bbls. of spacer no cement to surface. Estimated top of cement based on volumes is TOT 6,828', TOL 2,650, and TOS 0'.

1.0 Real-Time Job Summary

1.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DS Pump Press (psi)	Comb Pump Rate (bbl/min)	DH Density (ppg)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	3/9/2019	02:00:00	USER					Crew was called out at 02:00 for an on location time of 08:00.
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	3/9/2019	07:00:00	USER					Crew held a pre journey safety meeting and JSA.
Event	3	Depart Shop for Location	Depart Shop for Location	3/9/2019	07:15:00	USER					Started journey management with dispatch and left location.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	3/9/2019	08:00:00	USER					Crew performed a site assessment, safety meeting and hazard hunt on location. Checked in with the customer and discussed the job procedures, rig up and well bore schematics. The rig was running casing.
Event	5	Other	Other	3/9/2019	08:05:00	USER					Well bore: MD: 14,060', TP: 5.5" 20 # set at 13,934', FC: 13,920, & 13,919', WSS: 13,906', TVD: 7,238', SC: 9.625" 36 # set at 1,675', OH: 8.5", Centralizers: 202, Mud # 11 ppg. Viscosity 44, Water test: PH: 7, Chlorides: 0, Temp: 80 Degrees.
Event	6	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	3/9/2019	08:40:00	USER					Held a pre rig up safety meeting with my crew.
Event	7	Rig-Up Equipment	Rig-Up Equipment	3/9/2019	08:45:00	USER					The crew rigged up all lines, hoses and equipment for the job.

Event	8	Safety Meeting	Safety Meeting	3/9/2019	15:15:00	USER	-1.00	0.00	0.30	0.00	Halliburton cement crew held a pre cement job safety meeting and JSA with third party personnel and rig crew.
Event	9	Start Job	Start Job	3/9/2019	15:55:14	COM5	0.00	0.00	8.56	15.40	Pumped 1.5 bbls. of fresh water of calculated volume at 3 bpm. to fill lines.
Event	10	Test Lines	Test Lines	3/9/2019	15:56:56	COM5	234.00	0.00	10.72	15.90	Pressure tested lines to 6,500 psi. with a 500 psi. electronic kick out test.
Event	11	Pump Spacer 1	Pump Spacer 1	3/9/2019	16:02:59	COM5	82.00	0.00	10.72	0.00	Pumped 150 bbls. of Tuned Spacer III mixed at 12.5 ppg.,Yield: 2.73 ft3/sks, 16.6 gal/sks. Density was verified by pressurized scales.
Event	12	Shutdown	Shutdown	3/9/2019	16:30:59	COM5	31.00	0.00	12.43	144.50	Shutdown to batch up and weigh lead cement. Also to drop the bottom plug.
Event	13	Drop Bottom Plug	Drop Bottom Plug	3/9/2019	16:33:03	USER	7.00	0.00	12.43	144.50	Dropped the bottom plug, which was witnessed by the customer.
Event	14	Pump Lead Cement	Pump Lead Cement	3/9/2019	16:34:04	COM5	7.00	0.00	12.43	144.50	Pumped 173 bbls. (625 sks.) of Elasticem mixed at 13.2 ppg.,Yield: 1.55 ft3/sks, 7.61 gal/sks. Density was verified by pressurized scales.
Event	15	Pump Tail Cement	Pump Tail Cement	3/9/2019	17:00:01	COM5	545.00	8.00	13.23	0.10	Pumped 314 bbls. (1038 sks.) of Elasticem mixed at 14.4 ppg.,Yield: 1.7 ft3/sks, 7.3 gal/sks. Density was verified by pressurized scales.
Event	16	Shutdown	Shutdown	3/9/2019	17:49:15	COM5	74.00	0.00	1.41	343.60	Loaded the top plug and the customer representative was a witness.

Event	17	Clean Lines	Clean Lines	3/9/2019	17:51:34	USER	11.00	0.00	0.64	343.60	Washed pumps and lines until clean. The rig blew down the wash up line.
Event	18	Drop Top Plug	Drop Top Plug	3/9/2019	18:05:47	COM5	4.00	0.00	8.44	361.00	Halliburton dropped the top plug, which was witnessed by the customer.
Event	19	Pump Displacement	Pump Displacement	3/9/2019	18:05:54	COM5	5.00	0.00	8.44	0.00	Pumped 308 bbls. of fresh water with MMCR in the first 20 bbls. of displacement and biocide was added throughout the rest of displacement.
Event	20	Bump Plug	Bump Plug	3/9/2019	18:53:13	COM5	2394.00	3.10	8.47	300.80	Bumped the plug 500 psi. over 2,400 psi. at 3 bpm. Final pressure was 2,900 psi. Held for a minute. Pressure held.
Event	21	Pressure Up Well	Pressure Up Well	3/9/2019	18:55:43	COM5	3374.00	2.10	8.48	302.20	Pressured up the well to 3,630 psi. to shift the sleeve. Pumped 5 bbls. of fresh water at 5 bpm. for a wet shoe. Circulated 30 bbls. of spacer and no cement to surface. Estimated tops of cement based on volumes are TOT is 6,828', TOL is 2,650' and TOS is 0'.
Event	22	Check Floats	Check Floats	3/9/2019	18:58:28	USER	1848.00	0.00	8.44	307.40	Bled off pressure to check floats. Floats held. Got 2 bbls. of fluid back to the truck.
Event	23	End Job	End Job	3/9/2019	19:26:03	COM5	18.00	0.00	8.22	0.00	End of RTD data acquisition. Washed and blew down all pumps and lines until clean and dry.

Event	24	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	3/9/2019	19:30:00	USER	7.00	0.00	8.45	0.00	Halliburton cement crew held a pre rig down safety meeting and JSA.
Event	25	Rig-Down Equipment	Rig-Down Equipment	3/9/2019	19:35:00	USER	42.00	1.70	8.45	0.10	Rigged down all lines, hoses and equipment.
Event	26	Safety Meeting - Departing Location	Safety Meeting - Departing Location	3/9/2019	21:45:00	USER					Held a pre journey safety meeting with crew.
Event	27	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	3/9/2019	22:00:00	USER					Started journey management with dispatch and left location.