

HALLIBURTON

iCem[®] Service

PDC ENERGY-EBUS

Date: Friday, September 01, 2017

Josephine 190-214 Production

Job Date: Tuesday, August 22, 2017

Sincerely,

Justin Lansdale

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Josephine 190-214** 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 #: 304535	Ship To #: 3797099	Quote #:	Sales Order #: 0904242568
Customer: PDC ENERGY-EBUS		Customer Rep: Shane Paris	
Well Name: JOSEPHINE		Well #: 190-214	API/UWI #: 05-123-44675-00
Field: WATTENBERG	City (SAP): KERSEY	County/Parish: WELD	State: COLORADO
Legal Description: SW NE-19-5N-64W-1819FNL-2149FEL			
Contractor: ENSIGN DRLG		Rig/Platform Name/Num: ENSIGN 158	
Job BOM: 7523 7523			
Well Type: HORIZONTAL OIL			
Sales Person: HALAMERICA/H139013		Srvc Supervisor: Nicholas Roles	

Job

Formation Name			
Formation Depth (MD)	Top		Bottom
Form Type	BHST		
Job depth MD	12810ft		Job Depth TVD
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	1678		1678
Casing		5.5	4.778	20			0	12811		12811
Open Hole Section			8.5				1678	12814	1678	12814

Tools and Accessories

Type	Size in	Qty	Make	Depth ft	Type	Size in	Qty	Make
Guide Shoe	5.5				Top Plug	5.5		HES
Float Shoe	5.5			12810	Bottom Plug	5.5		HES
Float Collar	5.5				SSR plug set	5.5		HES
Insert Float	5.5				Plug Container	5.5	1	HES
Stage Tool	5.5				Centralizers	5.5		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	Mud Flush III (Powder)	Mud Flush III	50	bbl	8.4			4.5	
42 gal/bbl		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	
2	12.0 lb/gal Tuned Spacer III	Tuned Spacer III	50	bbl	12	3.16		5		
35.20 gal/bbl		FRESH WATER								
176.58 lbm/bbl		BARITE, BULK (100003681)								
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	13.2# ElastiCem	ELASTICEM (TM) SYSTEM	2158	sack	13.2	1.57		6	7.53	
7.53 Gal		FRESH WATER								
61.10 lbm		TYPE I / II CEMENT, BULK (101439798)								
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 fluid		284	bbl	8.33			8		
Cement Left In Pipe		Amount	0ft	Reason				Wet Shoe		
Comment Got 25bbls cement to surface.										

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	8/22/2017	00:00:00	USER	Called out by Service Coordinator for O/L at 0500
Event	2	Depart Yard Safety Meeting	Depart Yard Safety Meeting	8/22/2017	03:45:00	USER	Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	3	Depart from Service Center or Other Site	Depart from Service Center or Other Site	8/22/2017	04:00:00	USER	Journey Management prior to departure
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	8/22/2017	05:00:00	USER	Upon arrival met with company man to discuss job details and calculations. Rig had 800' casing left to run.
Event	5	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	8/22/2017	05:15:00	USER	Performed hazard hunt and site assessment with crew.
Event	6	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	8/22/2017	05:30:00	USER	Discussed rigging up hazards and procedure according to HMS.
Event	7	Other	Other	8/22/2017	07:00:00	USER	Water test- PH-6, Chlor-0, Temp-65. Cement temp-70.
Event	8	Start Job	Start Job	8/22/2017	11:06:57	COM4	T
Event	9	Test Lines	Test Lines	8/22/2017	11:09:43	COM4	Pumped 5bbls fresh water to fill lines, closed manifold and performed 500psi k/o function test, proceeded to perform 5th gear stall at 1450psi, continued to bring pressure up to 5000psi. Pressure stabilized and held with no leaks.
Event	10	Pump Spacer 1	Pump Spacer 1	8/22/2017	11:15:35	COM4	Pumped 50bbls fresh water with 200lbs Mud Flush III with 5g of D-air at 4.5bpm 720psi.
Event	11	Pump Spacer 2	Pump Spacer 2	8/22/2017	11:28:34	COM4	Pumped 50bbls 12# 3.16y 20g/s Tuned Spacer III at 5bpm 736psi.
Event	12	Check Weight	Check weight	8/22/2017	11:33:13	COM4	Weight verified with pressurized mud scales.

Event	13	Pump Cement	Pump Cement	8/22/2017	11:40:40	USER	Pumped 2158sks or 603.4bbls 13.2# 1.57y 7.53g/s Elasticem at 8bpm 560psi.
Event	14	Other	Other	8/22/2017	11:44:53	USER	Had mixing issues with first 2 silos or about 1500sks. Cleared up on the third silo.
Event	15	Check Weight	Check weight	8/22/2017	12:05:57	COM4	Weight verified with pressurized mud scales.
Event	16	Check Weight	Check weight	8/22/2017	12:12:11	COM4	Weight verified with pressurized mud scales.
Event	17	Check Weight	Check weight	8/22/2017	12:51:49	COM4	Weight verified with pressurized mud scales.
Event	18	Check Weight	Check weight	8/22/2017	12:54:00	COM4	Weight verified with pressurized mud scales.
Event	19	Shutdown	Shutdown	8/22/2017	13:28:42	COM4	Rig blew down iron to wash up pit, once clean, pumped 5bbls fresh water to clean through pumps and lines.
Event	20	Drop Top Plug	Drop Top Plug	8/22/2017	13:43:10	COM4	Dropped by HES supervisor, witnessed by company man.
Event	21	Pump Displacement	Pump Displacement	8/22/2017	13:43:15	COM4	Pumped 285bbls fresh water with 15g MMCR in first 30bbls, 15g staclear and 5g biocide throughout.
Event	22	Bump Plug	Bump Plug	8/22/2017	14:28:08	COM4	Slowed down to 4bpm at 265bbls away, final circulating pressure-2465psi, bump pressure-2965psi
Event	23	Pressure Up Well	Pressure Up Well	8/22/2017	14:32:54	COM4	Pressured up to sheer at 4480psi, continued to pump 5bbls at 4bpm 2531psi.
Event	24	End Job	End Job	8/22/2017	14:37:00	COM4	Got 25bbls cement to surface.

Event	25	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	8/22/2017	14:45:00	USER	Discussed rigging down hazards and procedure according to HMS.
Event	26	Depart Location Safety Meeting	Depart Location Safety Meeting	8/22/2017	16:45:00	USER	Held meeting with all personnel in convoy to discuss directions and hazards associated with drive, all fit to drive.
Event	27	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	8/22/2017	17:00:00	USER	Pre journey management prior to departure.