HALLIBURTON

iCem® Service

AXIS EXPLORATION

Jamaso 4-65 5-6-9

Sincerely,

Alexandria Dionigi

Legal Notice

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1.0 Cementing Job Summary

1.1 Executive Summary

Halliburton appreciates the opportunity to perform the cementing services on the **Jamaso 4-65 5-6-9** cement **5 ½" 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.

Approximately 56 bbls of cement were returned to surface.

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 #: 369404	**Ship To #:** 3891770	**Quote #:**	**Sales Order #:** 0905855174
Customer: AXIS EXPLORATION		**Customer Rep:** Justin Humphries	
Well Name: JAMASO 4-65	**Well #:** 5-6-9		**API/UWI #:** 05-005-07373-00
Field: WILDCAT	**City (SAP):** AURORA	**County/Parish:** ARAPAHOE	**State:** COLORADO
Legal Description: SW NW-4-4S-65W-2450FNL-1188FWL			
Contractor: PATTERSON-UTI ENERGY		**Rig/Platform Name/Num:** PATTERSON 340	
Job BOM: 7523 7523			
Well Type: HORIZONTAL OIL			
Sales Person: HALAMERICA\HX38199		**Srvc Supervisor:** Nicholas Cummins	

Job

Formation Name				
Formation Depth (MD)	**Top**	2640ft	**Bottom**	18055ft
Form Type			**BHST**	
Job depth MD	18040ft		**Job Depth TVD**	7981ft
Water Depth			**Wk Ht Above Floor**	4 ft
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	0	9.625	8.921	36			0	2640	0	2640
Casing	0	5.5	4.892	17	BTC	P-110	0	18040	0	7981
Open Hole Section			8.75				2640	18055	2640	7981

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	1		18040		**Bottom Plug**	5.5		
Float Collar	5.5	1		18035		**SSR plug set**	5.5		
Insert Float	5.5					**Plug Container**	5.5	1	
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	Tuned Prime Spacer	SBM FDP-C1337-18 CEMENT SPACER SYS	50	bbl	12.5	2.74	16.6	6	1710

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	ELASTICEM (TM) SYSTEM	603	sack	13.2	1.59	7.89	8	4758

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	GasStop	ELASTICEM (TM) SYSTEM	615	sack	13.2	1.59	7.89	8	4852

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	ElastiCem	ELASTICEM (TM) SYSTEM	1643	sack	13.2	1.59	7.89	8	12963

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	MMCR Displacement	MMCR Displacement	20	bbl	8.33			9	
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	Displacement	Displacement	398	bbl	8.33				

Cement Left In Pipe	Amount	5 ft	Reason	Shoe Joint
Mix Water:	pH 7	**Mix Water Chloride:**	<400 ppm	**Mix Water Temperature:** 68 °F
Cement Temperature:	N/A	**Plug Displaced by:**	8.33 lb/gal	**Disp. Temperature:** 68 °F
Plug Bumped?	Yes	**Bump Pressure:**	2500 psi	**Floats Held?** Yes
Cement Returns:	56 bbl	**Returns Density:**	N/A	**Returns Temperature:** N/A

Comment

50 bbls Spacer
171 bbls Cap cement
174 bbls Latex cement
465 bbls Tail cement
418 bbls displacement first 20 bbls MMCR
Plug bumped
Disc Burst 3,160 psi
Floats held 3 bbls back
Estimated 50 bbls of spacer to surface
Estimated 56 bbls of cap cement to surface
Estimated top of Latex Cement 2,410’
Estimated top of Tail Cement 6,643’

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DS Pump Press (psi)	DH Density (ppg)	Comb Pump Rate (bbl/min)	Pump Stg Tot (bbl)	Comments
Event	1	Call Out	Call Out	7/24/2019	20:00:00	USER					The crew was called out on 7/24/19 at 2000. The customer requested HES on location at 0330 on 7/25/19.
Event	2	Depart from Service Center or Other Site	Depart from Service Center or Other Site	7/25/2019	00:30:00	USER					The crew held a pre journey safety meeting discussing the route and potential hazards while driving The supervisor called in a journey. The crew departed service center.
Event	3	Arrive at Location from Service Center	Arrive at Location from Service Center	7/25/2019	01:30:00	USER					The crew arrived on location safely. The rig was still running casing. The supervisor met with the Company man and received numbers. TD 18,055', TP 18,040' 5 1/2" 17# P-110, FC ST 5', PC 2,640' 9 5/8" 36# J-55, TVD 7,981', OH 8 1/2", Mud 9.9 ppg.
Event	4	Assessment Of Location Safety Meeting	Assessment Of Location Safety Meeting	7/25/2019	01:35:00	USER					Crew discussed all potential hazards on location.
Event	5	Pre-Rig Up Safety Meeting	Pre-Rig Up Safety Meeting	7/25/2019	01:55:00	USER					Crew held a safety meeting discussing the rig up procedure. Also all potential hazards associated with

											rigging up all HES equipment and lines.
Event	6	Rig-Up Equipment	Rig-Up Equipment	7/25/2019	02:05:00	USER					The crew rigged up all HES equipment and lines.
Event	7	Rig-Up Completed	Rig-Up Completed	7/25/2019	09:00:00	USER					Rig up completed, no one got hurt.
Event	8	Safety Meeting - Pre Job	Safety Meeting - Pre Job	7/25/2019	09:50:00	USER	5.00	8.22	0.00	0.00	The crew and all personal involved with cement job discussed all potential hazards associated with job. Followed by the job procedure to ensure everyone understood the plan of action
Event	9	Start Job	Start Job	7/25/2019	10:20:19	COM1	7.00	8.30	0.80	14.90	Started recording data from 11512092. Filled lines with 3 bbls of water at 3 bpm, pressure was at 160 psi.
Event	10	Test Lines	Test Lines	7/25/2019	10:22:45	COM1	7.00	8.29	0.00	18.20	Pressure tested all HES lines to 4,700 psi. The pressure test failed due to a washed out 1 in stop.
Event	11	Test Lines	Test Lines	7/25/2019	10:32:21	COM1	107.00	8.22	0.00	19.80	Re pressure tested all HES lines to 4,700 psi. The pressure test passed
Event	12	Pump Spacer 1	Pump Spacer 1	7/25/2019	10:45:09	COM1	20.00	8.47	0.00	0.00	Pumped 50 bbls of spacer a 6 bpm. 12.5 ppg 2.74 yield 16.6 gal/sk. Verified density using pressurized scales.
Event	13	Pump Cement	Pump Cement	7/25/2019	10:57:35	COM1	195.00	12.13	5.10	45.00	Pumped 171 bbls (603sks) of Cap Cement at 8 bpm, pressure was at 650 psi. 13.2 ppg 1.59 yield 7.89 gal/sk. Verified density using pressurized scales.

Event	14	Pump Lead Cement	Pump Lead Cement	7/25/2019	11:20:54	COM1	614.00	13.24	8.20	175.30	Pumped 175 bbls (615 sks) of Lead cement with latex at 8 bpm, pressure was at 750 psi. 13.2 ppg 1.59 yield 7.89 gal/sk. Verified density using pressurized scales.
Event	15	Pump Tail Cement	Pump Tail Cement	7/25/2019	11:45:25	COM1	720.00	13.05	8.20	0.50	Pumped 465 bbls (1400 sks) of Tail cement at 8 bpm, pressure was at 650 psi. 13.2 ppg 1.6 yield 7.66 gal/sk. Verified density using pressurized scales.
Event	16	Clean Lines	Clean Lines	7/25/2019	12:48:49	COM1	3.00	26.32	0.00	465.40	Shutdown and blew air from rig floor to wash up tank. The washed pumps and lines from Elite to wash up tank.
Event	17	Drop Top Plug	Drop Top Plug	7/25/2019	12:53:49	COM1	2.00	7.83	0.00	472.50	Company man verified plug left container.
Event	18	Pump Displacement	Pump Displacement	7/25/2019	12:54:11	COM1	2.00	7.79	0.00	472.50	Pumped the calculated displacement of 418 bbls at 9 bpm. With MMCR in the first 20. We adjusted rate as needed to keep pressures under 2,800 psi.
Event	19	Bump Plug	Bump Plug	7/25/2019	13:51:14	COM1	2473.00	8.31	4.90	417.50	We bumped the plug, final circulating pressure was 2,500 psi. We brought pressure up to 3,000 psi before shutting down. Pressure rose to 3,100 before bursting. Pumped the wet 5 bbl wet shoe then shutdown.
Event	20	Other	Check Floats	7/25/2019	13:55:07	COM1	1967.00	8.28	0.00	423.80	Released pressure back to truck to check floats. The

											floats held, 3 bbls back to the truck.
Event	21	End Job	End Job	7/25/2019	13:56:51	COM1	5.00	8.11	0.00	0.00	Cement job complete. Estimated top 50 bbls of spacer to surface. Estimated 56 bbls of Cap cement to surface. Estimated top of latex cement 2,410'. Estimated top of Tail cement 6,643'.
Event	22	Pre-Rig Down Safety Meeting	Pre-Rig Down Safety Meeting	7/25/2019	13:57:00	USER	4.00	8.11	0.00	0.00	Crew held a safety meeting discussing the rig down procedure. Also all potential hazards associated with rigging down all HES equipment and lines.
Event	23	Rig-Down Equipment	Rig-Down Equipment	7/25/2019	14:23:00	USER					The crew rigged down all HES equipment and lines.
Event	24	Rig-Down Completed	Rig-Down Completed	7/25/2019	15:15:00	USER					Rig down completed no one got hurt.
Event	25	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	7/25/2019	16:00:00	USER					The crew held a pre journey safety meeting discussing the route and potential hazards while driving The supervisor called in a journey.
Event	26	Depart Location for Service Center or Other Site	Depart Location for Service Center or Other Site	7/25/2019	16:04:00	USER					Nick Cummins and crew would like to thank you for your business, and choosing Halliburton Cement! Please feel free to call if you have any questions.

3.0 Attachments

3.1 Jamaso 4-65 5-6-9-Custom Results (1).png