

HALLIBURTON

iCem[®] Service

EXTRACTION OIL & GAS-EBUS

Date: Tuesday, November 12, 2019

Livingston S20-25-4N Production

Job Date: Saturday, October 19, 2019

Sincerely,
Tyler Hill

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 **Livingston S20-25-4N** 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.

Approximately 80bbls of cement were returned to surface. Float equipment bridged off while pumping cement, toe-sleeve was opened and pumping was resumed.

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 Ft. Lupton

The Road to Excellence Starts with Safety

Sold To #: 369404		Ship To #: 3904664		Quote #:		Sales Order #: 0906039609				
Customer: EXTRACTION OIL & GAS-EBUS					Customer Rep: Danny Herrera					
Well Name: LIVINGSTON			Well #: S20-25-4N			API/UWI #: 05-014-20799-00				
Field: WATTENBERG		City (SAP): BROOMFIELD		County/Parish: BROOMFIELD			State: COLORADO			
Legal Description: NE SE-7-1S-68W-2330FSL-1222FEL										
Contractor: PATTERSON-UTI ENERGY					Rig/Platform Name/Num: PATTERSON 901					
Job BOM: 7523 7523										
Well Type: HORIZONTAL OIL										
Sales Person: HALAMERICA\HX38199					Srv Supervisor: Prince Perez					
Job										
Formation Depth (MD)		Top 0'		Bottom		21,585'				
Job depth MD		2,1571ft		Job Depth TVD		8,112'				
Water Depth				Wk Ht Above Floor		5'				
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	1661	0	1661
Casing		5.5	4.892	17			0	21571	0	0
Open Hole Section			8.75				1661	11509	1661	11509
Open Hole Section			8.5				11509	21585	0	0
Tools and Accessories										
Type	Size in	Qty	Make	Depth ft		Type	Size in	Qty	Make	
Guide Shoe	5.5	1		21,571		Top Plug	5.5	1	HES	
Float Shoe	5.5					Bottom Plug	5.5	1	HES	
Float Collar	5.5	1		21,554		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 ft ³ /sack	Mix Fluid Gal	Rate bbl/min	Total Mix Fluid Gal	
1	Spacer	TUNED PRIME CEMENT SPACER SYS	50	bbl	11.5	3.74	23.7	5	1,779	

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	Cap	ELASTICEM (TM) SYSTEM	805	sack	12.5	1.79	9.07	8	7,301	
3	Lead	GASSTOP (TM) SYSTEM	615	sack	13.2	1.59	7.7	8	4,735	
4	Tail	ELASTICEM (TM) SYSTEM	1,985	sack	13.2	1.56	1.56	8	15,126	
5	Displacement	MMCR Displacement	20	bbl	8.33			8		
6	Displacement	Displacement	480	bbl	8.33			8		
Cement Left In Pipe		Amount	0 ft		Reason			Shoe Joint		

Mix Water:	pH 7	Mix Water Chloride:	<300 ppm	Mix Water Temperature:	62 °F
Cement Temperature:	## °F	Plug Displaced by:	8.33 lb/gal	Disp. Temperature:	62 °F
Plug Bumped?	No	Bump Pressure:	NA	Floats Held?	No
Cement Returns:	80 bbl	Returns Density:	## lb/gal	Returns Temperature:	## °F

Comment

Pumped 50 bbls of Tuned Prime Spacer with 25 gallons of D-Air.

Pumped 256.6 bbls of Elasticem (cap).

Pumped 174.2 bbls of Gasstop cement with 1538 gallons of FDP Latex.

Pumped 551.1 bbls of Elasticem.

Pumped 500.1 bbls of fresh water displacement with MMCR in the first 20 bbls.

Pumped a 5 bbl wet shoe.

Floats did not hold. Held for three hours then bled off pressure. 5 bbls back.

2.0 Real-Time Job Summary

2.1 Job Event Log

Type	Seq. No.	Activity	Graph Label	Date	Time	Source	DH Density <i>(ppg)</i>	Comb Pump Rate <i>(bbl/min)</i>	PS Pump Press <i>(psi)</i>	Pump Stg Tot <i>(bbl)</i>	Comments
Event	1	Call Out	Call Out	10/18/2019	17:00:00	USER					CREW CALLED OUT AT 17:00, REQUESTED ON LOCATION 23:00. CREW PICKED UP CEMENT, CHEMICALS, AND PLUG CONTAINER FROM FT. LUPTON, CO. BULK 660, 10679720, AND PUMP 11189145.
Event	2	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/18/2019	21:00:00	USER					CREW DISCUSSED ROUTES, HAZARDS, AND COMMUNICATION WITH CREW.
Event	3	Crew Leave Shop	Crew Leave Shop	10/18/2019	21:10:00	USER					STARTED JOURNEY MANAGEMENT.
Event	4	Arrive at Location from Service Center	Arrive at Location from Service Center	10/18/2019	21:45:00	USER					END JOURNEY MANAGEMENT. MEET WITH CO. MAN TO DISCUSS JOB; SURFACE CASING- 9/58" 36 LB/FT @ 1,661', 5.5" CASING: 17 LB/FT TOTAL 21,571', 8 1/2" HOLE FROM 11,509' TO 21,585', 8 3/4" FROM 0' TO 11,509', TD 21585', 17' SHOE TRAC, TVD- 8,112'. PUMP FRESH WATER DISPLACEMENT. CASING LANDED @ 23:30 10/19/2019.
Event	5	Safety Meeting - Assessment of Location	Safety Meeting - Assessment of Location	10/18/2019	21:55:00	USER					HAZARD HUNT. DISCUSSED POSSIBLE HAZARDS

										ASSOCIATED WITH LOCATION, RIG UP AND WEATHER.	
Event	6	Rig-Up Equipment	Rig-Up Equipment	10/18/2019	22:00:00	USER					RIG UP BULK AND MIXING EQUIPMENT. USED FLEX HOSE ON THE RIG FLOOR PER COMPANY REQUEST. DISCUSSED WITH CREW POSSIBLE OUTCOME IF WE HAVE TO PRESSURE UP PAST 5,000 PSI AND DECIDED TO LEAVE EXTRA IRON BY THE CATWALK TO REPLACE THE FLEX HOSE IF WE NEED TO PUMP AT A HIGHER PRESSURE.
Event	7	Rig-Up Completed	Rig-Up Completed	10/19/2019	00:20:00	USER	8.35	0.00	0.00	0.00	
Event	8	Pre-Job Safety Meeting	Pre-Job Safety Meeting	10/19/2019	00:30:00	USER	8.34	0.00	-1.00	0.00	MEETING WITH HALLIBURTON AND RIG PERSONNEL. COMMUNICATED POTENTIAL SAFETY HAZARDS AND JOB DETAILS.
Event	9	Start Job	Start Job	10/19/2019	01:02:28	COM4	8.33	0.00	0.00	0.00	BEGIN RECORDING JOB DATA.
Event	10	Test Lines	Test Lines	10/19/2019	01:18:19	COM4	8.55	0.00	4694.00	4.80	PRESSURE TESTED IRON TO 4,700 PSI. KICKOUTS SET @ 500 PSI, KICKED OUT @ 300 PSI, 5TH GEAR STALL OUT @ 1,830 PSI. 4,700 PRESSURE TEST KICKED OUT @ 4,480 PSI
Event	11	Drop Bottom Plug	Drop Bottom Plug	10/19/2019	01:21:07	COM4	8.40	0.00	43.00	4.80	LOADED BY THE COMPANY MAN.
Event	12	Pump Spacer 1	Pump Spacer 1	10/19/2019	01:21:27	COM4	8.40	0.00	46.00	0.00	PUMP 50 BBLS OF TUNED PRIME SPACER @ 11.5

LB/GAL, 3.74 CUFT/SK, 23.7 GALL/SK. 25 GALS D-AIR. 50 BBLs CALCULATED TO RETURN TO SURFACE. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 5 BBLs/MIN @ 400 PSI.

Event	13	Pump Cap Cement	Pump Cap Cement	10/19/2019	01:32:44	COM4	12.58	5.30	300.00	0.00	PUMPED 805 SKS OF ELASTICEM @ 12.5 LB/GAL, 1.79 FT3/SK, 9.07 GAL/SK. 256.6 BBLs. HOC CALCULATED @ 4,505.9'. 49 BBLs CALCULATED TO SURFACE. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLs/MIN @ 550 PSI
Event	14	Pump Lead Cement	Pump Lead Cement	10/19/2019	02:12:28	COM4	13.42	7.30	781.00	320.80	PUMPED 615 SKS OF GASSTOP CEMENT @ 13.2 LB/GAL, 1.59 FT3/SK, 7.7 GAL/SK. 174.2 BBLs. 1,538 GALLONS OF FDP LATEX. HOL CALCULATED @ 3,870.2', TOL CALCULATED @ 4,505.9'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLs/MIN @ 700 PSI
Event	15	Pump Tail Cement	Pump Tail Cement	10/19/2019	02:36:26	COM4	13.18	4.90	257.00	170.00	PUMP 1,985 SKS OF ELASTICEM @ 13.2 LB/GAL, 1.56 FT3/SK, 7.62 GAL/SK, 551.5 BBLs. HOT CALCULATED @ 13,194.9', TOT CALCULATED @ 8,376.1'. DENSITY VERIFIED BY PRESSURIZED MUD SCALES. PUMP RATE 8 BBLs/MIN @ 750 PSI.

Event	16	Shutdown	Shutdown	10/19/2019	02:47:28	USER	13.22	0.00	3318.00	74.00	50 BBLS AFTER THE PLUG LANDED, PRESSURE ROSE TO 3,300 PSI THEN DECIDED TO SHUT DOWN. DISCUSSED THE NEXT COURSE OF ACTION WITH THE COMPANY MAN AND SERVICE LEADER. WE BROKE OFF THE FLEX HOSE AND SENT UP IRON TO THE RIG FLOOR. BROKE OFF THE PRV ON THE PUMP AND PUT A BULL PLUG.
Event	17	Shift Tool - Lower	Shift Tool - Lower	10/19/2019	03:28:14	USER	13.28	2.30	7319.00	101.20	PRESSURED UP TO 7,300 PSI WHEN PRESSURE FINALLY FELL BACK DOWN TO 400 PSI AND PROCEEDED TO PUMP CEMENT AGAIN.
Event	18	Drop Top Plug	Drop Top Plug	10/19/2019	04:45:10	COM4	8.29	0.00	0.00	0.00	LOADED BY THE COMPANY MAN.
Event	19	Pump Displacement	Pump Displacement	10/19/2019	04:45:13	COM4	8.25	0.00	-1.00	0.00	BEGIN CALCULATED DISPLACEMENT OF 500.1 BBLS WITH FRESH WATER. MMCR IN THE FIRST 20 BBLS. PUMP RATE 8.5 BPM @ 2,860 PSI. CAUGHT CEMENT @ 50 BBLS INTO DISPLACEMENT. SPACER TO SURFACE @ 340 BBLS INTO DISPLACEMENT. 50 BBLS OF TUNED PRIME SPACER TO SURFACE. SLOW RATE TO 4 BPM @ 470 BBLS INTO DISPLACEMENT.
Event	20	Other	Other	10/19/2019	05:49:31	COM4	8.32	4.10	2236.00	0.80	DID NOT BUMP THE PLUG. PUMPED CALCULATED DISPLACEMENT, THEN PUMPED 5 BBLS FOR THE WET SHOE.

Event	21	Pressure Up	Pressure Up	10/19/2019	05:50:00	USER	8.32	4.10	2230.00	2.80	Pumped 5 bbls of water back from checking floats into well.
Event	22	Check Floats	Check Floats	10/19/2019	05:52:21	USER	8.29	0.80	378.00	0.30	Floats did NOT hold. Company rep wanted to bleed back 5 bbls only. If floats werent holding pump the 5 back.
Event	23	Monitor Pressure	Shut-in Montior Pressure 3 hrs	10/19/2019	05:56:37	COM4	8.27	0.00	31.00	0.00	Shut in lo torc on plug container to monitor pressure gauge on plug container manifold for 3 hrs, per customer rep on location.
Event	24	End Job	End Job	10/19/2019	05:57:07	COM4	8.27	0.00	7.00	0.00	STOP RECORDING JOB DATA.
Event	25	Post-Job Safety Meeting (Pre Rig-Down)	Post-Job Safety Meeting (Pre Rig-Down)	10/19/2019	06:00:00	USER	8.26	0.00	-1.00	0.00	DISCUSSED POSSIBLE HAZARDS ASSOCIATED WITH WEATHER, LOCATION AND RIGGING DOWN IRON AND HOSES.
Event	26	Rig-Down Equipment	Rig-Down Equipment	10/19/2019	06:40:00	USER					RIG DOWN BULK AND MIXING EQUIPMENT.
Event	27	Rig-Down Completed	Rig-Down Completed	10/19/2019	07:40:00	USER					
Event	28	Pre-Convoy Safety Meeting	Pre-Convoy Safety Meeting	10/19/2019	07:50:00	USER					CREW DISCUSSED ROUTES HAZARDS AND COMMUNICATION WITH CREW.
Event	29	Crew Leave Location	Crew Leave Location	10/19/2019	08:00:00	USER					THANK YOU FOR USING HALLIBURTON – PRINCE PEREZ AND CREW.

3.0 Attachments

3.1 Extraction Livingston S20-25-4N Production.png

