



Terra Energy Partners

Well Name: FEDERAL #PA 424-13

API #: 05-045-24196

Job Type: Production

Date Job Completed: 6/11/2020

Quote #: QUO-45689

Execution #: EXC-26230



Terra Energy Partners

Attention: Mr. Lynn Cass | (970) 263-2716 | LCass@terraep.com

Terra Energy Partners | 4828 Loop Central Dr., Suite 900 | Houston, TX 77081

Dear Mr. Cass,

Thank you for the opportunity to provide cementing services on this well. BJ Services strives to achieve complete customer satisfaction. If you have any questions regarding the services or data provided, please contact BJ Services at any time.

Sincerely,

Zen Keith
Field Engineer | (307) 757-7178 | zen.keith@bjsservices.com

Field Office 28730 US-6, Rifle, CO 81650
Phone: (970) 632-2412

Sales Office 999 18th St. Suite 1200 Denver, CO 80202
Phone: (281) 408-2361

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Eugene Castaneda	FORMATION	
CLIENT FIELD REPRESENTATIVE		RIG	H&P 318
DISTRICT	Rifle, CO	COUNTY	GARFIELD
SERVICE	Cementing	STATE / PROVINCE	CO

WELL GEOMETRY

TYPE	ID (in)	OD (in)	WEIGHT (lb/ft)	MD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	8.92	9.63	36.00	1,126.00		J-55	ST&C
Open Hole	8.75			8,723.87	45.00		
Casing	4.00	4.50	11.60	9,849.87		P-110	LT&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	9,849.87
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	7560.00
Top Plug Size	4.500	Max Casing Pressure - Operated (psi)	6048.00
Centralizers Used	No	Pipe Movement	Rotation & Reciprocation
Landing Collar Depth (ft)	9,821	Job Pumped Through	Manifold
		Top Connection Thread	8rd
		Top Connection Size	4.5

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	10 sec SGS	6
Circulation Time (min)	60.00	10 min SGS	15
Circulation Rate (bpm)	10.00	30 min SGS	29
Circulation Volume (bbls)	600.00	Flare Prior to / during the Cement Job	No
Lost Circulation Prior to Cement Job	No	Gas Present	No

TEMPERATURE

Ambient Temperature (°F)	82.00
Mix Water Temperature (°F)	63.00

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	PLN TOP FLD (ft)	LENGTH (ft)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer	Water	8.3000			5,736.00				10.0000
Spacer	Mud Flush	8.4000			5,585.00				20.0000
Spacer	Water	8.3000			5,866.00				10.0000
Lead Slurry	BJCem P100.3.02R	12.7000	1.9801	11.09	5,950.00	1,024.00	231	457.0000	81.2000
Tail Slurry	BJCem P70.6.01R	13.5000	1.8305	9.11	6,974.00	2,947.00	720	1317.0000	234.4000
Displacement	Displacement	8.3000			0.00			0.0000	153.5000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer	Mud Flush	MUD REMOVAL, SAPP	10.0000	PPB
Spacer	Mud Flush	SPACER SURFACTANT, SS-201	0.5000	GPB
Lead Slurry	BJCem P100.3.02R	FLUID LOSS, FL-66	0.5000	BWOB
Lead Slurry	BJCem P100.3.02R	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	BJCem P100.3.02R	DISPERSANT, CD-31	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem P100.3.02R	RETARDER, R-3	0.4000	BWOB
Lead Slurry	BJCem P100.3.02R	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem P100.3.02R	IntegraGuard GW-86	0.1000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, CLASS G	70.0000	PCT
Tail Slurry	BJCem P70.6.01R	SAND, S-8, Silica Flour, 200 Mesh	25.0000	BWOB
Tail Slurry	BJCem P70.6.01R	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P70.6.01R	EXTENDER, BENTONITE	6.0000	BWOB
Tail Slurry	BJCem P70.6.01R	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	BJCem P70.6.01R	FLUID LOSS, FL-24	0.4000	BWOB

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Tail Slurry	BJCem P70.6.01R	BONDING AGENT, BA-90	10.0000	PCT
Tail Slurry	BJCem P70.6.01R	RETARDER, R-3	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, FLY ASH (POZZOLAN)	20.0000	PCT

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
6/11/2020 11:06:00 PM	Water	5.00	10.00	800.00		
6/11/2020 11:08:00 PM	Mud Flush	5.30	20.00	850.00		
6/11/2020 11:12:00 PM	Water	5.30	10.00	950.00		
6/11/2020 11:14:00 PM	BJCem P100.3.02R	6.20	81.20	1145.00		
6/11/2020 11:26:00 PM	BJCem P70.6.01R	8.00	234.40	1890.00		
6/12/2020 12:10:00 AM	Displacement	10.00	153.50	3464.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	800.00	3464.00	1516.50
Rate (bpm)	5.00	10.00	6.63

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	152.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	152.00	Amt of Spacer to Surface	0.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	1.50
Bump Plug Pressure (psi)	3464.00	Total Volume Pumped (bbls)	508.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	Full	Lost Circulation During Cement Job	No

BJ Cementing Event Log

Long String - Rifle, CO - Eugene Castaneda

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	06/11/2020 12:30	Callout					Crew got called for job.
2	06/11/2020 16:00	Other (See comment)					Crew did pre-trips and got equipment job ready.
3	06/11/2020 17:00	STEACS Briefing					STEACS briefing for convoy.
4	06/11/2020 17:15	Depart for Location					Departed yard.
5	06/11/2020 17:45	Arrive on Location					Arrived on location.
6	06/11/2020 18:00	STEACS Briefing					STEACS briefing for rig up.
7	06/11/2020 18:15	Rig Up					Crew spotted equipment and rigged up what needed to be rigged up.
8	06/11/2020 19:15	Rig					Rig running casing.
9	06/11/2020 22:30	STEACS Briefing					STEACS briefing for job procedure.
10	06/11/2020 23:00	Other (See comment)					Fill lines.
11	06/11/2020 23:02	Pressure Test				5000.00	Test lines.
12	06/11/2020 23:06	Pump Spacer	8.3000	5.00	10.00	800.00	Pumped 10 bbl freshwater spacer.
13	06/11/2020 23:08	Pump Spacer	8.4000	5.30	20.00	850.00	Pumped 20 bbl mud flush spacer.
14	06/11/2020 23:12	Pump Spacer	8.3000	5.30	10.00	950.00	Pumped 10 bbl freshwater spacer.
15	06/11/2020 23:14	Pump Lead Cement	12.7000	6.20	40.00	1145.00	Pumping lead 40 bbl gone, good returns.
16	06/11/2020 23:20	Pump Lead Cement	12.7000	6.20	81.00	900.00	Pumped a total of 81 bbl lead, good returns.
17	06/11/2020 23:26	Pump Tail Cement	13.5000	7.00	50.00	1360.00	Pumping tail 50 bbl gone, good returns.
18	06/11/2020 23:32	Pump Tail Cement	13.5000	8.00	100.00	1680.00	Pumping tail 100 bbl gone, good returns.
19	06/11/2020 23:39	Pump Tail Cement	13.5000	8.00	150.00	1560.00	Pumping tail 150 bbl gone, good returns.

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 424-13 / 05-045-24196

Well MD: 9849.87

Quote #: QUO-45689-J0T7W7

Plan #: ORD-26230-X0Y2H7

Execution #: EXC-26230-X0Y2H702



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
20	06/11/2020 23:45	Pump Tail Cement	13.5000	8.00	200.00	1345.00	Pumping tail 200 bbl gone, good returns.
21	06/11/2020 23:51	Pump Tail Cement	13.5000	5.00	234.00	600.00	Pumped a total of 234 bbl tail, good returns.
22	06/11/2020 23:57	Wash Pumps and Lines					Washed pump and lines and release top plug.
23	06/12/2020 00:10	Pump Displacement	8.3000	10.00	50.00	1305.00	Pumping displacement 50 bbl gone, good returns.
24	06/12/2020 00:15	Pump Displacement	8.3000	10.00	100.00	2635.00	Pumping displacement 100 bbl gone, good returns.
25	06/12/2020 00:21	Pump Displacement	8.3000	10.00	140.00	3300.00	Pumping displacement 140 bbl gone, good returns.
26	06/12/2020 00:25	Pump Displacement	8.3000	4.00	140.00	2180.00	Pumping displacement 140 bbl gone, decrease rate, good returns.
27	06/12/2020 00:25	Pump Displacement	8.3000	4.00	150.00	2450.00	Pumping displacement 150 bbl gone, good returns.
28	06/12/2020 00:28	Land Plug	8.3000	4.00	152.00	3464.00	Land plug at calculated displacement.
29	06/12/2020 00:28	Other (See comment)					Released pressure 1.5 bbl back floats held.
30	06/12/2020 00:33	STEACS Briefing					STEACS briefing for rig down.
31	06/12/2020 00:40	Rig Down					Crew rigged down what needed to be rigged down.
32	06/12/2020 01:15	Filling Out Ticket					Filling out ticket.
33	06/12/2020 01:45	STEACS Briefing					STEACS briefing for convoy.
34	06/12/2020 01:55	Depart for Location					Depart location.

