



Terra Energy Partners

Well Name: FEDERAL #PA 21-24

API #: 05-045-24202

Job Type: Production

Date Job Completed: 6/1/2020

Quote #: QUO-45454

Execution #: EXC-26184



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@bjservices.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			8,869.11	45.00		
Casing	4.00	4.50	11.60	9,995.11		P-110	LT&C

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	9,960.89
Top Plug Provided By	Rig	Pipe Movement	Rotation & Reciprocation
Top Plug Size	4.5	Job Pumped Through	Manifold
Centralizers Used	No	Top Connection Thread	8rd
Landing Collar Depth (ft)	9,961	Top Connection Size	4.25

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	10 sec SGS	4
Circulation Time (min)	60.00	10 min SGS	14
Circulation Rate (bpm)	10.00	30 min SGS	28
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)	60.00	Slurry Cement Temperature (°F)	
Mix Water Temperature (°F)	64.50	Flow Line Temperature (°F)	

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			5,931.00				10.0000
Spacer	Mud Flush	8.4000			5,896.00				20.0000
Spacer	Water	8.3000			5,866.00				10.0000
Lead Slurry	BJCem P100.3.02R	12.7000	1.9801	11.09	6,048.00	1,025.00	231	457.0000	81.3000
Tail Slurry	BJCem P70.6.01R	13.5000	1.8305	9.11	7,073.00	2,946.00	719	1316.0000	234.3000
Displacement	Displacement	8.3000			0.00			0.0000	155.0000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	Mud Flush	MUD REMOVAL, SAPP	10.0000	PPB
Spacer / Pre Flush / Flush	Mud Flush	SPACER SURFACTANT, SS-201	0.5000	GPB
Lead Slurry	BJCem P100.3.02R	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem P100.3.02R	DISPERSANT, CD-31	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	RETARDER, R-3	0.4000	BWOB
Lead Slurry	BJCem P100.3.02R	FLUID LOSS, FL-66	0.5000	BWOB
Lead Slurry	BJCem P100.3.02R	IntegraGuard GW-86	0.1000	BWOB
Lead Slurry	BJCem P100.3.02R	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem P100.3.02R	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P70.6.01R	BONDING AGENT, BA-90	10.0000	PCT
Tail Slurry	BJCem P70.6.01R	EXTENDER, BENTONITE	6.0000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, FLY ASH (POZZOLAN)	20.0000	PCT
Tail Slurry	BJCem P70.6.01R	CEMENT, CLASS G	70.0000	PCT
Tail Slurry	BJCem P70.6.01R	FLUID LOSS, FL-24	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	IntegraSeal POLI	0.2500	LBS/SK
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	RETARDER, R-3	0.4000	BWOB

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
6/1/2020 10:43:00 AM	Water	6.00	10.00	950.00		
6/1/2020 10:45:00 AM	Mud Flush	6.00	20.00	1150.00		
6/1/2020 10:48:00 AM	Water	6.00	10.00	1180.00		
6/1/2020 11:02:00 AM	BJCem P100.3.02R	6.20	81.30	1480.00		
6/1/2020 11:15:00 AM	BJCem P70.6.01R	6.20	234.30	1000.00		
6/1/2020 12:08:00 PM	Displacement	10.00	155.00	4400.00		

Client: Terra Energy Partners, LLC

Well: FEDERAL #PA 21-24

Well API: 05-045-24202

Start Date: 6/1/2020

End Date: 6/1/2020

Field Ticket #: FT-26184-C9Y8K90202-84690



MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	950.00	4400.00	1693.33
Rate (bpm)	6.00	10.00	6.73

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	154.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	154.00	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	2.00
Bump Plug Pressure (psi)	4400.00	Total Volume Pumped (bbls)	509.00
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	06/01/2020 03:00	Callout					Crew called out.
2	06/01/2020 05:00	Other (See comment)					Crew did pre-trip and got equipment road ready.
3	06/01/2020 05:45	STEACS Briefing					STEACS briefing for convoy.
4	06/01/2020 06:00	Depart for Location					Departed for location.
5	06/01/2020 06:30	Arrive on Location					Arrived at location.
6	06/01/2020 06:40	STEACS Briefing					STEACS briefing for rig up.
7	06/01/2020 06:50	Rig Up					Crew rigged up what needed to be rigged up.
8	06/01/2020 08:00	Rig					Rig running casing.
9	06/01/2020 10:00	STEACS Briefing					STEACS for job procedure.
10	06/01/2020 10:37	Other (See comment)					Fill lines.
11	06/01/2020 10:39	Pressure Test				5000.00	Test lines.
12	06/01/2020 10:43	Pump Spacer	8.3000	6.00	10.00	950.00	Pumped 10 bbl freshwater spacer.
13	06/01/2020 10:45	Pump Spacer	8.4000	6.00	20.00	1150.00	Pumped 20bbl mud flush spacer.
14	06/01/2020 10:48	Pump Spacer	8.3000	6.00	10.00	1180.00	Pumped 10 bbl freshwater spacer.
15	06/01/2020 10:51	Other (See comment)					Shut down had to tighten crossover, it was leaking.
16	06/01/2020 11:02	Pump Lead Cement	12.7000	6.20	50.00	1480.00	Pumping lead 50 bbl gone, good returns.
17	06/01/2020 11:10	Pump Lead Cement	12.7000	5.00	81.00	655.00	Pumped a total of 81 bbl lead, good returns.
18	06/01/2020 11:15	Pump Tail Cement	13.5000	6.20	50.00	950.00	Pumping tail 50 bbl gone, good returns.
19	06/01/2020 11:22	Pump Tail Cement	13.5000	6.20	100.00	1000.00	Pumping tail 100 bbl gone, good returns.

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 21-24 / 05-045-24202

Well MD: 10019

Quote #: QUO-45454-J0Q8T8

Plan #: ORD-26184-C9Y8K9

Execution #: EXC-26184-C9Y8K902



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
20	06/01/2020 11:31	Pump Tail Cement	13.5000	6.20	150.00	890.00	Pumping tail 150 bbl gone, good returns.
21	06/01/2020 11:38	Pump Tail Cement	13.5000	6.20	200.00	850.00	Pumping tail 200 bbl gone, good returns.
22	06/01/2020 11:47	Pump Tail Cement	13.5000	6.00	234.00	910.00	Pumped a total of 234 bbl tail, good returns.
23	06/01/2020 11:50	Wash Pumps and Lines					Shut down wash pump and lines and release top plug.
24	06/01/2020 12:07	Pump Displacement	8.3000	10.00	40.00	1750.00	Pumping displacement 40 bbl gone, caught plug, good returns.
25	06/01/2020 12:12	Pump Displacement	8.3000	10.00	100.00	2870.00	Pumping displacement 100 bbl gone, good returns.
26	06/01/2020 12:18	Pump Displacement	8.3000	10.00	140.00	3770.00	Pumping displacement 140 bbl gone, good returns.
27	06/01/2020 12:23	Pump Displacement	8.3000	4.00	140.00	2570.00	Decreased rate to 4 bbl.
28	06/01/2020 12:23	Land Plug	8.3000	4.00	154.00	4400.00	Landed plug 2870-4400.
29	06/01/2020 12:27	Other (See comment)					Released pressure 2 bbl back
30	06/01/2020 12:32	STEACS Briefing					STEACS briefing for rig down.
31	06/01/2020 12:40	Rig Down					Crew rigged down what needed to be rigged down.
32	06/01/2020 13:15	Filling Out Ticket					Filling out ticket.
33	06/01/2020 14:00	STEACS Briefing					STEACS briefing for convoy.
34	06/01/2020 14:15	Leave Location					Departing location.

