



# Terra Energy Partners

Well Name: FEDERAL PA 34-23

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API #: 05-045-24303

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Job Type: Surface

Date Job Completed: 9/16/2020

Quote #: QUO-47105

Execution #: EXC-26823



# 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

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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

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# BJ Cementing Treatment Report

<b>SERVICE SUPERVISOR</b>	Francisco Castillo	<b>FORMATION</b>	
<b>CLIENT FIELD REPRESENTATIVE</b>	Craig Borgstede	<b>RIG</b>	H&P 318
<b>DISTRICT</b>	Rifle, CO	<b>COUNTY</b>	GARFIELD
<b>SERVICE</b>	Cementing	<b>STATE / PROVINCE</b>	CO

## WELL GEOMETRY

TYPE	ID (in)	OD (in)	WEIGHT (lb/ft)	MD (ft)	EXCESS (%)	GRADE	THREAD
Open Hole	13.50			1,135.00	16.00		
Casing	8.92	9.63	36.00	1,128.50		J-55	ST&C

## HARDWARE

<b>Bottom Plug Used?</b>	No	<b>Tool Type</b>	Float Collar
<b>Top Plug Used?</b>	Yes	<b>Tool Depth (ft)</b>	1,084.00
<b>Top Plug Provided By</b>	Non BJ	<b>Max Casing Pressure - Rated (psi)</b>	3520.00
<b>Top Plug Size</b>	9.625	<b>Max Casing Pressure - Operated (psi)</b>	2816.00
<b>Centralizers Used</b>	Yes	<b>Pipe Movement</b>	None
<b>Centralizers Type</b>	Bow	<b>Job Pumped Through</b>	Manifold
<b>Landing Collar Depth (ft)</b>	1,084	<b>Top Connection Thread</b>	8rd
		<b>Top Connection Size</b>	9.625

## CIRCULATION PRIOR TO JOB

<b>Well Circulated By</b>	Rig	<b>YP Mud In</b>	4
<b>Circulation Prior to Job</b>	Yes	<b>Solids Present at End of Circulation</b>	No
<b>Circulation Time (min)</b>	30.00	<b>10 sec SGS</b>	4
<b>Circulation Rate (bpm)</b>	10.00	<b>10 min SGS</b>	4
<b>Circulation Volume (bbls)</b>	300.00	<b>30 min SGS</b>	4
<b>Lost Circulation Prior to Cement Job</b>	No	<b>Flare Prior to / during the Cement Job</b>	No
<b>Mud Density In (ppg)</b>	9.40	<b>Gas Present</b>	No
<b>PV Mud In</b>	3		

## TEMPERATURE

Ambient Temperature (°F)	61.00	Slurry Cement Temperature (°F)	71.00
Mix Water Temperature (°F)	67.00	Flow Line Temperature (°F)	87.00

## FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H <sub>2</sub> O REQ (gals/sk)	PLN TOP FLD (ft)	LENGTH (ft)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer	Water	8.3000			0.00				20.0000
Lead Slurry	BJCem S100	12.3000	2.3392	13.42	0.00	500.00	122	284.0000	50.5000
Tail Slurry	BJCem S100	12.8000	2.0771	11.46	500.00	600.00	173	360.0000	64.0000
Displacement	Displacement	8.3000			0.00			0.0000	84.0000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Lead Slurry	BJCem S100	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Lead Slurry	BJCem S100	IntegraSeal POLI	0.2500	LBS/SK
Lead Slurry	BJCem S100	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Lead Slurry	BJCem S100	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Lead Slurry	BJCem S100	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	BJCem S100	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem S100	CEMENT, ASTM TYPE III	100.0000	PCT
Tail Slurry	BJCem S100	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem S100	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Tail Slurry	BJCem S100	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Tail Slurry	BJCem S100	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Tail Slurry	BJCem S100	IntegraSeal POLI	0.2500	LBS/SK

## TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
9/16/2020 2:20:00 PM	Water	8.00	20.00	585.00		
9/16/2020 2:34:00 PM	BJCem S100	8.00	50.50	805.00		
9/16/2020 2:40:00 PM	BJCem S100	8.00	64.00	815.00		
9/16/2020 2:46:00 PM	Displacement	9.50	84.00	917.00		

## MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	585.00	917.00	780.50
Rate (bpm)	8.00	9.50	8.38

## DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	19.00
Calculated Displacement Vol (bbls)	84.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	84.00	Amt of Spacer to Surface	20.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	0.50
Bump Plug Pressure (psi)	1051.00	Total Volume Pumped (bbls)	220.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Full	Lost Circulation During Cement Job	No



# BJ Cementing Event Log

Surface - Rifle, CO - Francisco Castillo

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	09/16/2020 08:30	Callout					ON LOCATION AT 10:30 HRS
2	09/16/2020 09:30	Depart for Location					LEAVE THE YARD
3	09/16/2020 09:50	Arrive on Location					ARRIVE ON LOCATION
4	09/16/2020 11:30	Rig Up					RIG UP MEETING, RIG UP
5	09/16/2020 13:50	STEACS Briefing					PRE-JOB SAFETY MEETING
6	09/16/2020 14:18	Pressure Test				3200.00	PRESSURE TEST LINES
7	09/16/2020 14:20	Pump Spacer	8.3400	8.00	20.00	585.00	WATER SPACER
8	09/16/2020 14:34	Pump Lead Cement	12.3000	8.00	50.50	805.00	LEAD 122 SKS / 50.5 BBLs AT 12.3 PPG
9	09/16/2020 14:40	Pump Tail Cement	12.8000	8.00	64.00	815.00	TAIL 173 SKS / 64 BBLs AT 12.8 PPG
10	09/16/2020 14:45	End Pumping					SHUTDOWN, DROP PLUG
11	09/16/2020 14:46	Pump Displacement	8.3400	9.50	74.00	917.00	DISPLACEMENT
12	09/16/2020 14:55	Pump Displacement	8.3400	3.00	10.00	347.00	SLOW RATE
13	09/16/2020 14:58	Land Plug					LAND PLUG, CIRCULATED 19 BBLs CEMENT TO SURFACE
14	09/16/2020 15:00	Check Floats					FLOATS HELD, 0.5 BBL FLOW BACK
15	09/16/2020 15:15	Rig Down					RIG DOWN MEETING, RIG DOWN
16	09/16/2020 16:00	Leave Location					JM MEETING, LEAVE LOCATION



# TERRA PA 34-23 SURFACE

