



# Terra Energy Partners

**Well Name: FEDERAL #PA 433-13**

**API #: 05-045-24195**

**Job Type: Production**

Date Job Completed: 7/5/2020

**Quote #:** QUO-46092

**Execution #:** EXC-26378



## Terra Energy Partners

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

SERVICE SUPERVISOR	Paul Linn III	FORMATION	
CLIENT FIELD REPRESENTATIVE	Craig Borgstede	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	0.00	0.00	9,970.00	45.00		
Casing	4.00	4.50	11.60	9,963.95		P-110	LT&C

## HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	9,932.95
Top Plug Provided By	Non BJ	Pipe Movement	None
Top Plug Size	4.500	Job Pumped Through	Manifold
Centralizers Used	Yes	Top Connection Thread	8 RND
Centralizers Quantity	30.00	Top Connection Size	4.5
Centralizers Type	Bow		
Landing Collar Depth (ft)	9,933		

## CIRCULATION PRIOR TO JOB

Well Circulated By	Rig
Circulation Prior to Job	Yes
Circulation Time (min)	90.00
Circulation Rate (bpm)	10.75
Circulation Volume (bbls)	967.50
Lost Circulation Prior to Cement Job	No
Mud Density In (ppg)	9.80
Mud Density Out (ppg)	9.80

## TEMPERATURE

Ambient Temperature (°F)	70.00	Slurry Cement Temperature (°F)	78.40
Mix Water Temperature (°F)	68.60	Flow Line Temperature (°F)	

## 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			5,831.00				10.0000
Spacer	Mud Flush	8.4000			5,554.00				20.0000
Spacer	Water	8.3000			5,866.00				10.0000
Lead Slurry	BJCem P100.3.02R	12.7000	1.9801	11.09	6,013.00	1,024.00	231	457.0000	81.2000
Tail Slurry	BJCem P70.6.01R	13.5000	1.8305	9.11	7,037.00	2,947.00	720	1317.0000	234.4000
Displacement	Displacement	8.3000			0.00			0.0000	154.5000

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	IntegraSeal POLI	0.2500	LBS/SK
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	RETARDER, R-3	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	SAND, S-8, Silica Flour, 200 Mesh	25.0000	BWOB
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
Tail Slurry	BJCem P70.6.01R	FLUID LOSS, FL-24	0.4000	BWOB
Tail Slurry	BJCem P70.6.01R	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P70.6.01R	CEMENT, CLASS G	70.0000	PCT
Tail Slurry	BJCem P70.6.01R	BONDING AGENT, BA-90	10.0000	PCT
Tail Slurry	BJCem P70.6.01R	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	BJCem P70.6.01R	EXTENDER, BENTONITE	6.0000	BWOB

## TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)
7/4/2020 11:55:00 PM	Water	6.00	10.00	906.00
7/5/2020 12:00:00 AM	Mud Flush	6.00	20.00	934.00
7/5/2020 12:04:00 AM	Water	6.00	10.00	934.00
7/5/2020 12:05:00 AM	BJCem P100.3.02R	8.00	81.20	1976.00
7/5/2020 12:15:00 AM	BJCem P70.6.01R	8.00	234.40	1411.00
7/5/2020 12:53:00 AM	Displacement	10.00	153.96	805.00

## MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	491.00	0.00	1419.00
Rate (bpm)	2.00	10.00	8.00

## DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	153.96	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	0.50
Bump Plug Pressure (psi)	2337.00	Total Volume Pumped (bbls)	505.00
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

Long String - Rifle, CO - Paul Linn III

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	07/04/2020 15:30	Callout					Call out, on location time of 23:00 07/04/2020
2	07/04/2020 21:03	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
3	07/04/2020 22:09	Depart for Location					Depart from Rifle yard for H&P 318
4	07/04/2020 22:48	Arrive on Location					Arrive on location, rig was circulating
5	07/04/2020 22:55	Spot Units					Did a site assessment and spotted in equipment
6	07/04/2020 23:00	STEACS Briefing					Pre-Rig Up STEACS Briefing with all BJ Services cement crew
7	07/04/2020 23:09	Rig Up					Rig up all ground equipment
8	07/04/2020 23:36	STEACS Briefing					Pre-Job STEACS Briefing with rig crew, company man, and all BJ Services cement crew
9	07/04/2020 23:41	Rig Up					Load plug in plug container, stab plug container, and hook up lines
10	07/04/2020 23:50	Prime Up	8.4000	2.00	5.00	491.00	Fill lines with 5 bbls of fresh water
11	07/04/2020 23:53	Pressure Test				5333.00	Pressure test to 5333 psi, pressure held
12	07/04/2020 23:55	Pump Spacer	8.4000	6.00	10.00	906.00	Pump Water Spacer
13	07/05/2020 00:00	Pump Spacer	8.5000	6.00	20.00	980.00	Pump Mud Flush
14	07/05/2020 00:03	Pump Spacer	8.4000	6.00	10.00	934.00	Pump Water Spacer
15	07/05/2020 00:05	Pump Lead Cement	12.7000	8.00	10.00	1976.00	Pump Lead Cement @ 12.7 ppg 231 sks 1.98 cuft/sk 11.09 gals/sk. For a total of 81.46 bbls of Lead cement requiring 61 bbls of mix water weight verified with mud scale
16	07/05/2020 00:10	Pump Lead Cement	12.7000	8.00	50.00	1362.00	Pump Lead Cement
17	07/05/2020 00:14	Pump Lead Cement	12.7000	8.00	81.00	1140.00	Finished pumping Lead Cement with 81 bbls away

Client: Terra Energy Partners, LLC

Well Name / API: FEDERAL #PA 433-13 / 05-045-24195

Well MD: 9970

Quote #: QUO-46092-P2Q8N4

Plan #: ORD-26378-P3S1K8

Execution #: EXC-26378-P3S1K802



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
18	07/05/2020 00:15	Pump Tail Cement	13.5000	8.00	10.00	1411.00	Pump Tail Cement @ 13.5 ppg 720 sks 1.83 cuft/sk 9.11 gals/sk. For a total of 234.66 bbls of Tail cement requiring 156.17 bbls of mix water, weight verified with mud scale
19	07/05/2020 00:20	Pump Tail Cement	13.5000	8.00	50.00	1406.00	Pump Tail Cement
20	07/05/2020 00:26	Pump Tail Cement	13.5000	8.00	100.00	1419.00	Pump Tail Cement
21	07/05/2020 00:33	Pump Tail Cement	13.5000	8.00	150.00	1476.00	Pump Tail Cement
22	07/05/2020 00:38	Pump Tail Cement	13.5000	7.00	200.00	1148.00	Pump Tail Cement
23	07/05/2020 00:41	Pump Tail Cement	13.5000	5.00	215.00	454.00	Pump Tail Cement
24	07/05/2020 00:43	Pump Tail Cement	13.5000	5.00	231.00	503.00	Finished pumping Tail Cement with 231 bbls away
25	07/05/2020 00:45	Wash Pumps and Lines					Wash pumps & lines to 3-sided tank
26	07/05/2020 00:50	Drop Top Plug					Drop Plug, verified by company man
27	07/05/2020 00:53	Pump Displacement	8.5000	10.00	10.00	805.00	Pump KCL Water Displacement
28	07/05/2020 00:57	Pump Displacement	8.5000	10.00	50.00	1456.00	Pump KCL Water Displacement
29	07/05/2020 01:01	Pump Displacement	8.5000	10.00	100.00	2688.00	Pump KCL Water Displacement
30	07/05/2020 01:05	Pump Displacement	8.5000	10.00	143.00	3371.00	Pump KCL Water Displacement
31	07/05/2020 01:09	Pump Displacement	8.5000	4.00	154.00	2337.00	Pump KCL Water Displacement
32	07/05/2020 01:09	Land Plug				3450.00	Land the plug @ 2337 psi took to 3450 psi
33	07/05/2020 01:12	Check Floats					Check floats, floats held 1/2 bbl back
34	07/05/2020 01:15	STEACS Briefing					Pre-Rig Down STEACS Briefing with rig crew
35	07/05/2020 01:21	Rig Down					Rig Down rig floor
36	07/05/2020 01:33	Wash Pumps and Lines					Wash pumps & lines to 3-sided tank
37	07/05/2020 01:42	STEACS Briefing					Pre-Rig Down STEACS Briefing with all BJ Services cement crew
38	07/05/2020 01:51	Rig Down					Rig Down all equipment
39	07/05/2020 02:27	STEACS Briefing					Pre-Convoy STEACS Briefing with all BJ Services cement crew
40	07/05/2020 02:38	Leave Location					Depart from location for Rifle yard. Thank you for using BJ Services, Andrew Linn, and crew.



Terra PA 433-13 Production

