



# **Terra Energy Partners, LLC**

## **TWO-STAGE/MULTI-STAGE CEMENT POST JOB**

### **REPORT**

**RG 443-18-297 05-103-12461**  
**S:18 T:2S R:97W Rio Blanco CO**

CallSheet #: 76178  
Proposal #: 51796



**TWO-STAGE/MULTI-STAGE CEMENT Post Job Report**

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

Terra Energy Partners, LLC

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

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Dear Mr. Lynn Cass,

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

Sincerely,

**Zen Keith**

Field Engineer | (307) 757-7178 | zen.keith@americacementing.com

**Field Office**      28730 US-6, Rifle, CO 81650  
Phone: (970) 657-1187

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# 1 Job Details & Summary

## Geometry

Type	Function	OD (in)	ID (in)	Weight (lb/ft)	Thread	Top (ft)	Bottom (ft)	Excess (%)
Open Hole	Outer	n/a	14.75	n/a	n/a	0	1524	70
Open Hole	Outer	n/a	14.75	n/a	n/a	1524	3282	40
Casing	Inner	9.625	8.921	36	STC	0	3282	0

## Equipment / People

Unit Type	Unit	Power Unit	Employee #1	Employee #2	Mileage
Bulk Trailer	CTF-249				106
Silo	CTS-470				106
Silo	CTS-438				106
Bulk Trailer	CTF-242	TRB-769	Toole, Brittain	Rivas, Saul	106
Cement Pump	CPF-011	TRH-957	Gonzales, Ivan		106
Light Duty Pickups	LDV-062		Linn, Paul		106

## Timing

Event	Date/Time
Call Out	2/19/2021 10:47
Depart Facility	2/19/2021 16:22
On Location	2/19/2021 18:55
Rig Up Iron	2/19/2021 19:22
Job Started	2/20/2021 04:47
Job Completed	2/20/2021 11:33
Rig Down Iron	2/20/2021 12:18
Depart Location	2/20/2021 14:06

## General Job Information

Metrics	Value
Well Fluid Density	9.3 lb/gal
Well Fluid Type	WBM
Rig Circulation Vol	300 bbls
Rig Circulation Time	0.5 hours
Calculated Displacement	250.84 bbls
Actual Displacement	250 bbls
Total Spacer to Surface	40 bbls
Total CMT to Surface	154 bbls
Well Topped Out	No

## Job Details

Metrics	Value
Flare Prior to Job	No
Flare During Job	No
Flare at End of Job	No
Well Full Prior to Job	Yes
Well Fluid Density Into Well	9.3 lb/gal
Well Fluid Density Out of Well	9.3 lb/gal

## Job Details (cont.)

Metrics	Value
BHCT	87 °F
BHST	118 °F

## Circulation

Lost Circulation Experienced	Losses into Spacer	Losses into Cement	Losses into Displacement
Yes	0	0	175

## Circulation Details:

Lost return 175 bbls into displacement on the first stage. After dropping the opening plug it took 15 bbls to get returns back

### Job Execution Information

Stage	Fluid	Product	Function	Density (lb/gal)	Yield (ft <sup>3</sup> /sk)	Water Rq. (gal/sk)	Water Rq. (gal/bbl)	Volume (sks)	Volume (bbl)	Top (ft)
1	1	Water	Flush	8.34			42.00		5.00	1187
1	2	Calcium Chloride Brine	Flush	8.46			41.39		10.00	1211
1	3	Water	Flush	8.34			42.00		10.00	1259
1	4	Reactive Spacer	Flush	10.01			21.00		20.00	1307
1	5	Water	Flush	8.34			42.00		10.00	1404
1	6	Calcium Chloride Brine	Flush	8.46			41.39		10.00	1452
1	7	Water	Flush	8.34			42.00		5.00	1500
1	8	Stage-1 Lead	Lead	12.30	2.33	13.20		515.00	213.97	1524
1	9	Stage-1 Tail	Tail	12.80	2.10	11.34		237.00	88.52	2782
1	10	Stage-1 Displacement	DisplacementFinal	8.34			42.00		251.00	0
2	1	Stage-2 Water	Flush	8.34			42.00		40.00	0
2	2	Stage-2 Cement	Primary	12.30	2.34	13.42		755.00	314.47	0
2	3	Stage-2 Displacement	DisplacementFinal	8.34			42.00		118.00	0

### Job Fluid Details

Stage	Fluid	Type	Fluid	Product	Function	Conc.	Uom
1	2	Flush	Calcium Chloride Brine	A-7P	Accelerator	10.00	lb/bbl
1	4	Flush	Reactive Spacer	A-3L	Accelerator	21.00	gal/bbl
1	6	Flush	Calcium Chloride Brine	A-7P	Accelerator	10.00	lb/bbl
1	8	Lead	Stage-1 Lead	ASTM TYPE III	Cement	100.00	%
1	8	Lead	Stage-1 Lead	A-10	Accelerator	5.00	%BWOB
1	8	Lead	Stage-1 Lead	A-2	Accelerator	2.00	lb/sk
1	8	Lead	Stage-1 Lead	FP-24	Defoamer	0.30	%BWOB
1	8	Lead	Stage-1 Lead	IntegraSeal PHENO	LostCirculation	3.00	lb/sk
1	8	Lead	Stage-1 Lead	IntegraSeal POLI	LostCirculation	0.25	lb/sk
1	8	Lead	Stage-1 Lead	R-7C	Retarder	0.30	%BWOB
1	9	Tail	Stage-1 Tail	ASTM TYPE III	Cement	100.00	%
1	9	Tail	Stage-1 Tail	A-10	Accelerator	5.00	%BWOB
1	9	Tail	Stage-1 Tail	A-2	Accelerator	2.00	lb/sk
1	9	Tail	Stage-1 Tail	A-7P	Accelerator	2.00	lb/sk
1	9	Tail	Stage-1 Tail	FP-24	Defoamer	0.30	%BWOB
1	9	Tail	Stage-1 Tail	IntegraSeal PHENO	LostCirculation	3.00	lb/sk
1	9	Tail	Stage-1 Tail	IntegraSeal POLI	LostCirculation	0.25	lb/sk
1	2	Primary	Stage-2 Cement	ASTM TYPE III	Cement	100.00	%
1	2	Primary	Stage-2 Cement	A-10	Accelerator	5.00	%BWOB
1	2	Primary	Stage-2 Cement	A-2	Accelerator	2.00	lb/sk
1	2	Primary	Stage-2 Cement	A-7P	Accelerator	2.00	lb/sk
1	2	Primary	Stage-2 Cement	FP-24	Defoamer	0.30	%BWOB
1	2	Primary	Stage-2 Cement	IntegraSeal POLI	LostCirculation	0.25	lb/sk

## 2 Job Logs

Line	Event	Date (MM/DD/YY)	Time (HH:MM)	Density (lb/gal)	Pump Rate (bpm)	Pump Volume (bbls)	Pipe Pressure (psi)	Comment
1	Callout	2/19/2021	10:47					Callout, on location time of 21:00 2/19/2021
2	Safety Meeting	2/19/2021	16:08					Pre-Convoy Safety meeting
3	Depart Location	2/19/2021	16:22					Depart from Rifle yard for H&P 329
4	Arrive On Location	2/19/2021	18:55					Arrive on location, rig was pulling drill pipe
5	Safety Meeting	2/19/2021	19:08					Pre-Rig Up Safety meeting
6	Rig Up Iron	2/19/2021	19:22					Rig up all ground equipment
7	Safety Meeting	2/20/2021	04:20					Pre-Job Safety meeting with rig crew, company man, and American Cementing crew
8	Rig Up Iron	2/20/2021	04:30					Stab swedge and hook up lines
9	Fill Lines	2/20/2021	04:47	8.4	2	5	176	Fill lines with 5 bbls of fresh water
10	Pressure Test Lines	2/20/2021	04:50				3482	Pressure test to 3482 psi
11	Pump Spacer	2/20/2021	04:54	8.6	4	10	351	Pump Calcium Chloride Spacer
12	Pump Spacer	2/20/2021	04:57	8.4	4	10	275	Pump Fresh Water Spacer
13	Pump Spacer	2/20/2021	04:59	9.8	4	20	486	Pump Sodium Silicate Spacer
14	Pump Spacer	2/20/2021	05:04	8.4	4	10	209	Pump Fresh Water Spacer
15	Pump Spacer	2/20/2021	05:06	8.6	4	10	231	Pump Calcium Chloride Spacer
16	Pump Spacer	2/20/2021	05:08	8.4	4	10	253	Pump Fresh Water Spacer
17	Pump Lead Cement	2/20/2021	05:11	12.3	4	5	298	Pump Lead Cement @ 12.3 ppg
18	Pump Lead Cement	2/20/2021	05:16	12.3	8	20	786	Pump Lead Cement
19	Pump Lead Cement	2/20/2021	05:19	12.3	8	50	714	Pump Lead Cement
20	Pump Lead Cement	2/20/2021	05:24	12.3	8	100	671	Pump Lead Cement
21	Pump Lead Cement	2/20/2021	05:32	12.3	8	150	708	Pump Lead Cement
22	Pump Lead Cement	2/20/2021	05:34	12.3	5.5	165	338	Pump Lead Cement
23	Pump Lead Cement	2/20/2021	05:39	12.3	4.5	200	215	Pump Lead Cement
24	Pump Tail Cement	2/20/2021	05:40	12.8	5.5	5	384	Pump Tail Cement @ 12.8 ppg
25	Pump Tail Cement	2/20/2021	05:48	12.8	5.5	50	388	Pump Tail Cement
26	Pump Tail Cement	2/20/2021	05:55	12.8	4.5	84	221	Pump Tail Cement
27	Shutdown	2/20/2021	05:55					Shutdown with 84 bbls of Tail Cement away
28	Drop Top Plug	2/20/2021	05:58					Drop plug, verified by company man
29	Pump Displacement	2/20/2021	06:00	8.4	8	10	432	Pump Fresh Water Displacement
30	Pump Displacement	2/20/2021	06:07	8.4	8	50	419	Pump Fresh Water Displacement
31	Pump Displacement	2/20/2021	06:14	8.4	4.5	100	234	Pump Fresh Water Displacement
32	Pump Displacement	2/20/2021	06:21	8.4	8	150	816	Pump Fresh Water Displacement
33	Pump Displacement	2/20/2021	06:27	8.4	8	200	988	Pump Fresh Water Displacement
34	Pump Displacement	2/20/2021	06:28	8.4	7	210	874	Pump Fresh Water Displacement
35	Pump Displacement	2/20/2021	06:31	8.4	3	231	627	Pump Fresh Water Displacement
36	Pump Displacement	2/20/2021	06:37	8.4	3	250	655	Pump Fresh Water Displacement
37	Land Plug	2/20/2021	06:37				1151	Land the plug @ 655 psi took to 1151 psi
38	Check Floats	2/20/2021	06:42					Check floats, floats held 1 bbl back
39	Drop Opening Plug	2/20/2021	06:50					Drop opening plug, verified by company man
40	Other	2/20/2021	07:03				960	Open DV Tool wirh 960 psi
41	Circulate Well	2/20/2021	07:04	9.3	2	440	39	Circulate the well
42	Pump Spacer	2/20/2021	10:02	8.4	4	40	123	Pump Water Spacer
43	Pump Cement	2/20/2021	10:11	12.3	5.5	5	380	Pump Primary Cement @ 12.3 ppg
44	Pump Cement	2/20/2021	10:20	12.3	5.5	50	338	Pump Primary Cement
45	Pump Cement	2/20/2021	10:30	12.3	5.5	100	357	Pump Primary Cement
46	Pump Cement	2/20/2021	10:48	12.3	5.5	150	350	Pump Primary Cement

Line	Event	Date (MM/DD/YY)	Time (HH:MM)	Density (lb/gal)	Pump Rate (bpm)	Pump Volume (bbls)	Pipe Pressure (psi)	Comment
47	Pump Cement	2/20/2021	10:48	12.3	5.5	200	391	Pump Primary Cement
48	Cement Back to Surface	2/20/2021	10:53					225 bbls of Cement away got cement to surface
49	Pump Cement	2/20/2021	10:56	12.3	5.5	250	421	Pump Primary Cement
50	Pump Cement	2/20/2021	11:01	12.3	5.5	280	405	Pump Primary Cement
51	Drop Closing Plug	2/20/2021	11:03					Drop closing plug, verified by company man
52	Pump Displacement	2/20/2021	11:05	8.4	5.5	10	347	Pump Fresh Water Displacement
53	Pump Displacement	2/20/2021	11:15	8.4	5.5	50	428	Pump Fresh Water Displacement
54	Pump Displacement	2/20/2021	11:20	8.4	5.5	80	561	Pump Fresh Water Displacement
55	Pump Displacement	2/20/2021	11:28	8.4	2.5	99	428	Pump Fresh Water Displacement
56	Land Plug	2/20/2021	11:28				1991	Land plug @ 428 psi took to 1991 psi
57	Check Floats	2/20/2021	11:33					Check floats, floats held 3/4 bbl back
58	Clean Pumps and Lines	2/20/2021	11:40					Wash pumps & lines to cellar
59	Safety Meeting	2/20/2021	12:04					Pre-Rig Down Safety meeting
60	Rig Down Iron	2/20/2021	12:18					Rig Down all equipment
61	Safety Meeting	2/20/2021	13:40					Pre-Convoy Safety meeting
62	Depart Location	2/20/2021	14:06					Depart from location for Rifle yard. Thank you for using American Cementing, Andrew Linn, and crew

### 3 Water Analysis

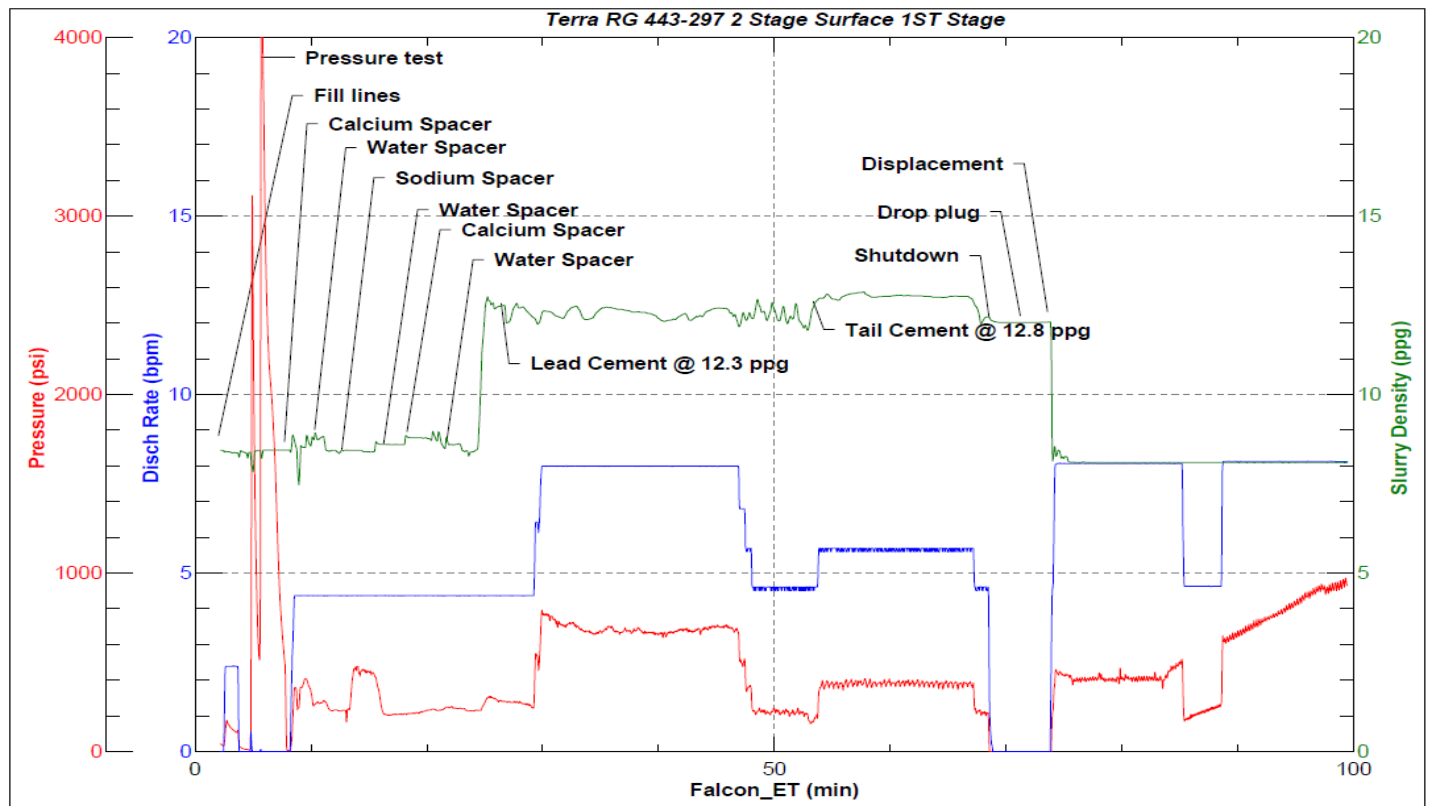
Metrics	Value	Recommended
Water Source	Upright Rig Tank	
Temperature	68.8 °F	50-80 °F
pH Level	7.5	5.5-8.5
Chlorides	280 mg/L	0-3000 mg/L
Total Alkalinity	0	0-1000
Total Hardness	>120 mg/L	0-500 mg/L
Carbonates	0 mg/L	0-100 mg/L
Sulfates	65 mg/L	0-1500 mg/L
Potassium	110 mg/L	0-3000 mg/L
Iron	0 mg/L	0-300 mg/L

# 4 Pump Diagrams

Stage-1



JobMaster Program Version 5.01C1  
Job Number:  
Customer:  
Well Name:



BJ Services

Job Start: Saturday, February 20, 2021

Circulation Between Stages and Stage-2



JobMaster Program Version 5.01C1  
 Job Number:  
 Customer:  
 Well Name:

