



Caerus

Well Name: Fed 11C-24-496

API #: 05-045-24177

Job Type: Surface

Date Job Completed: 12/12/2019

Quote #: QUO-39807

Execution #: EXC-23141



Caerus

Attention: Mr. Cole Walton | (720) 880-6325 | cwalton@caerusoilandgas.com

Caerus | 1001 17th Street, Suite 1600 | Denver, CO 80202

Dear Mr. Walton,

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
Technical Engineer, Cement | (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

Stage-1 Cementing Treatment Report

SERVICE SUPERVISOR	Douglas Diaz	FORMATION	
CLIENT FIELD REPRESENTATIVE	Beaude Oaks	RIG	H&P 329
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	19.50	20.00	52.73	130.00			
Open Hole	14.75			2,500.00	25.00		
Open Hole	14.75			3,175.00			
Casing	8.92	9.63	36.00	3,155.00		J-55	LTC

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Top Plug Used?	Yes	Tool Depth (ft)	3,110.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	3520.00
Top Plug Size	9.630	Max Casing Pressure - Operated (psi)	2816.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	10.00	Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	8 RND
Landing Collar Depth (ft)	3,110	Top Connection Size	9.63

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	Flare Prior to / during the Cement Job	No
Circulation Time (min)	30.00	Gas Present	No
Circulation Rate (bpm)	12.00		
Circulation Volume (bbls)	360.00		
Lost Circulation Prior to Cement Job	No		

TEMPERATURE

Ambient Temperature (°F)	19.00	Slurry Cement Temperature (°F)	80.00
Mix Water Temperature (°F)	77.00	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	IntegraGuard STAR Spacer	8.6000			1,071.00				40.0000
Lead Slurry	Beaded Lead	10.0000	3.8188	17.43	1,400.00	1,100.00	246	937.0000	166.7000
Tail Slurry	BJCem S100.3.01D	12.5000	2.2255	12.59	2,500.00	500.00	161	358.0000	63.7000
Displacement	Displacement	8.3300			0.00			0.0000	228.8000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer	IntegraGuard STAR Spacer	IntegraGuard STAR LT concentrate	10.0000	PPB
Spacer	IntegraGuard STAR Spacer	Fresh Water	100.0000	PCT
Spacer	IntegraGuard STAR Spacer	IntegraGuard STAR PLUS 3K	20.0000	PPB
Lead Slurry	Beaded Lead (14645-8)	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	Beaded Lead (14645-8)	BONDING AGENT, BA-90	5.0000	LBS/SK
Lead Slurry	Beaded Lead (14645-8)	IntegraSeal POLI	0.1300	LBS/SK
Lead Slurry	Beaded Lead (14645-8)	EXTENDER, LW-5E	37.0000	BWOB
Lead Slurry	Beaded Lead (14645-8)	Cement Additive, Sodium Metasilicate A-2	1.0000	LBS/SK
Lead Slurry	Beaded Lead (14645-8)	IntegraCare A-12	0.4000	BWOB
Lead Slurry	Beaded Lead (14645-8)	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	Beaded Lead (14645-8)	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Tail Slurry	BJCem S100.3.01D	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem S100.3.01D	IntegraSeal POLI	0.1300	LBS/SK
Tail Slurry	BJCem S100.3.01D	Cement Additive, Sodium Metasilicate A-2	2.0000	LBS/SK
Tail Slurry	BJCem S100.3.01D	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	LBS/SK
Tail Slurry	BJCem S100.3.01D	CEMENT, ASTM TYPE III	100.0000	PCT
Tail Slurry	BJCem S100.3.01D	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB

Client: Caerus Operating LLC

Well: FED #11C-24-496

Well API: 05-045-24177

Start Date: 12/12/2019

End Date: 12/12/2019

Field Ticket #: FT-23141-K5F0N10202-76019



TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
12/12/2019 12:21:00 AM	IntegraGuard STAR Spacer	4.50	40.00	107.00		
12/12/2019 12:34:00 AM	Beaded Lead (14645-8)	6.50	171.00	270.00		
12/12/2019 1:15:00 AM	BJCem S100.3.01D	7.00	64.00	313.00		
12/12/2019 1:29:00 AM	Displacement	6.50	238.00	705.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	107.00	705.00	348.75
Rate (bpm)	4.50	7.00	6.13

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	62.00
Calculated Displacement Vol (bbls)	238.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	238.00	Amt of Spacer to Surface	40.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	1.00
Bump Plug Pressure (psi)	1195.00	Total Volume Pumped (bbls)	523.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	Partial	Lost Circulation During Cement Job	No

Stage-2 Cementing Treatment Report

SERVICE SUPERVISOR	Douglas Diaz	FORMATION	
CLIENT FIELD REPRESENTATIVE	Beaude Oaks	RIG	H&P 329
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	19.50	20.00	52.73	130.00			
Open Hole	14.75			1,422.00	25.00		
Casing	8.92	9.63	36.00	1,422.00		J-55	LTC

HARDWARE

Bottom Plug Used?	No	Tool Type	DV Tool
Top Plug Used?	Yes	Tool Depth (ft)	1,422.00
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	3520.00
Top Plug Size	9.630	Max Casing Pressure - Operated (psi)	2816.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	10.00	Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	8 RND
Landing Collar Depth (ft)	1,422	Top Connection Size	9.63

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	Flare Prior to / during the Cement Job	No
Circulation Time (min)	60.00	Gas Present	No
Circulation Rate (bpm)	4.50		
Circulation Volume (bbls)	279.00		
Lost Circulation Prior to Cement Job	No		

TEMPERATURE

Ambient Temperature (°F)	15.00	Slurry Cement Temperature (°F)	83.00
Mix Water Temperature (°F)	77.00	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	8.3300			1,071.00				40.0000
Lead Slurry	Beaded Lead	10.0000	3.8188	17.43	0.00	1,400.00	336	1284.0000	228.5000
Displacement	Displacement	8.3300			0.00			0.0000	108.2000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Lead Slurry	Beaded Lead (14645-8)	CEMENT, ASTM TYPE III	100.0000	PCT
Lead Slurry	Beaded Lead (14645-8)	Cement Additive, Sodium Metasilicate A-2	1.0000	LBS/SK
Lead Slurry	Beaded Lead (14645-8)	BONDING AGENT, BA-90	5.0000	LBS/SK
Lead Slurry	Beaded Lead (14645-8)	EXTENDER, LW-5E	37.0000	BWOB
Lead Slurry	Beaded Lead (14645-8)	CEMENT EXTENDER, GYPSUM, A-10	5.0000	BWOB
Lead Slurry	Beaded Lead (14645-8)	IntegraCare A-12	0.4000	BWOB
Lead Slurry	Beaded Lead (14645-8)	FOAM PREVENTER, FP-25	0.3000	BWOB
Lead Slurry	Beaded Lead (14645-8)	IntegraSeal POLI	0.1300	LBS/SK

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbls)	PIPE PRESS (psi)	ANNULUS PRESS (psi)	COMMENTS
12/12/2019 3:28:00 AM	Beaded Lead (14645-8)	6.50	223.00	341.00		
12/12/2019 4:11:00 AM	Displacement	7.00	109.00	390.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	341.00	390.00	365.50
Rate (bpm)	6.50	7.00	6.75

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	130.00
Calculated Displacement Vol (bbls)	109.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	109.00	Amt of Spacer to Surface	5.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	0.75
Bump Plug Pressure (psi)	2121.00	Total Volume Pumped (bbls)	332.00
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 - Douglas Diaz

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	12/11/2019 15:00	Callout					Yard call 1500 on location 2000
2	12/11/2019 17:07	Depart for Location					Leave Rifle shop for location
3	12/11/2019 19:00	Arrive on Location					Arrive on location, rig running casing
4	12/11/2019 19:00	Spot Units					Spot all equipment
5	12/11/2019 19:20	Rig Up					Pre rig up safety meeting, rig in all equipment and lines to the cellar
6	12/11/2019 20:30	Rig					Waiting on rig to run casing and circulate
7	12/11/2019 23:00	STEACS Briefing					Pre job safety meeting with company man and rig crew
8	12/11/2019 23:15	Rig Up					Rig up cement head and lines
9	12/12/2019 00:13	Prime Up	8.3400	2.50	5.00	102.00	Prime up pump and lines
10	12/12/2019 00:15	Pressure Test				3000.00	Pressure test, pressure held
11	12/12/2019 00:21	Pump Spacer	8.7000	3.50	0.00	75.00	Pumping LCM Spacer
12	12/12/2019 00:21	Pump Spacer	8.7000	4.50	40.00	107.00	Pumping LCM Spacer
13	12/12/2019 00:34	Pump Lead Cement	9.7000	4.50	0.00	107.00	Pumping lead cement
14	12/12/2019 00:34	Pump Lead Cement	9.7000	5.00	50.00	144.00	Pumping lead cement
15	12/12/2019 00:44	Pump Lead Cement	9.7000	5.00	100.00	135.00	Pumping lead cement
16	12/12/2019 00:55	Pump Lead Cement	9.7000	6.50	150.00	235.00	Pumping lead cement
17	12/12/2019 01:05	Pump Lead Cement	9.7000	6.00	171.00	270.00	Pumping lead cement
18	12/12/2019 01:15	Pump Tail Cement	12.5000	6.00	0.00	270.00	Pumping tail cement
19	12/12/2019 01:15	Pump Tail Cement	12.5000	7.00	50.00	313.00	Pumping tail cement

Client: Caerus Operating LLC

Well Name / API: FED #11C-24-496 / 05-045-24177

Well MD: 3175

Quote #: QUO-39807-V3N8C5

Plan #: ORD-23141-K5F0N1

Execution #: EXC-23141-K5F0N102



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
20	12/12/2019 01:22	Pump Tail Cement	12.5000	5.50	64.00	230.00	Pumping tail cement
21	12/12/2019 01:25	Drop Top Plug					Dropped plug verified by tool hand
22	12/12/2019 01:29	Pump Displacement	8.3400	6.00	0.00	147.00	Pumping displacement
23	12/12/2019 01:29	Pump Displacement	8.3400	6.00	50.00	243.00	Pumping displacement
24	12/12/2019 01:38	Pump Displacement	8.3400	6.00	100.00	277.00	Pumping displacement, gained returns @ 80 BBLs
25	12/12/2019 01:45	Pump Displacement	8.3400	6.50	150.00	389.00	Pumping displacement
26	12/12/2019 01:54	Pump Displacement	8.3400	6.50	200.00	588.00	Pumping displacement
27	12/12/2019 02:02	Pump Displacement	8.3400	3.00	238.00	532.00	Pumping displacement
28	12/12/2019 02:08	Land Plug				1195.00	Land plug, FCP 532 PSI Bumped to 1195 PSI
29	12/12/2019 02:08	Check Floats					Bled pressure, floats held, 1 BBL Bled back
30	12/12/2019 02:15	Other (See comment)					Pumped sugar water down parasite, pressure broke at 804 PSI
31	12/12/2019 02:21	Drop Opening Plug					Tool Hand dropped opening plug
32	12/12/2019 02:31	Other (See comment)					Opened DV Tool, opened at 790 PSI
33	12/12/2019 02:31	Pump Spacer	8.3400	2.00	20.00	209.00	Pumped fresh water through tool
34	12/12/2019 02:37	Rig					Waiting on rig to circulate, circulated 1 hour 279 BBL 4.5 BBL per min, 62 BBLs cement returned
35	12/12/2019 03:24	Pump Spacer	8.3400	5.00	5.00	110.00	Load pump and lines
36	12/12/2019 03:28	Pump Lead Cement	9.8000	4.50	0.00	126.00	Pumping lead cement
37	12/12/2019 03:28	Pump Lead Cement	9.8000	5.00	50.00	205.00	Pumping lead cement
38	12/12/2019 03:38	Pump Lead Cement	9.8000	6.50	100.00	229.00	Pumping lead cement
39	12/12/2019 03:49	Pump Lead Cement	9.8000	6.50	150.00	282.00	Pumping lead cement
40	12/12/2019 03:53	Pump Lead Cement	9.8000	6.50	200.00	341.00	Pumping lead cement, cement to surface at 200 BBLs pumped 130 BBLs to surface
41	12/12/2019 04:01	Pump Lead Cement	9.8000	5.50	223.00	244.00	Pumping lead cement
42	12/12/2019 04:07	Drop Closing Plug					Dropped closing plug, verified by tool hand
43	12/12/2019 04:11	Pump Displacement	8.3400	6.00	0.00	249.00	Pumping displacement
44	12/12/2019 04:11	Pump Displacement	8.3400	6.00	50.00	321.00	Pumping displacement
45	12/12/2019 04:20	Pump Displacement	8.3400	5.50	100.00	390.00	Pumping displacement



SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
46	12/12/2019 04:27	Pump Displacement	8.3400	4.00	109.00	310.00	Pumping displacement
47	12/12/2019 04:29	Land Plug				2121.00	Land plug FCP 310 PSI bumped to 2121 PSI
48	12/12/2019 04:29	Check Floats					Bled pressure, floats held, .75 BBL Bled back
49	12/12/2019 04:34	Rig Down					Rig down cement head and lines in cellar
50	12/12/2019 04:51	Wash Pumps and Lines					Wash pump and lines to cellar, winterized pump
51	12/12/2019 05:25	Rig Down					Pre rig down safety meeting, rig down all lines and equipment
52	12/12/2019 06:35	Leave Location					Leave location for Rifle shop



