



# Great Western Operating Company, LLC

Seltzer LD 21-031HC

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API # 05-001-10199

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## Production

12/7/2018

Quote #: 23048

Execution #: 13317



# Great Western Operating Company, LLC

Great Western Operating Company, LLC | 1801 Broadway, Suite 500 | Denver, CO 80202

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Dear Great Western Operating Company, LLC,

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,  
Jason Creel  
Field Engineer I | (307) 256-0306 | [Jason.Creel@BJServices.com](mailto:Jason.Creel@BJServices.com)

Field Office  
1716 East Allison Rd., Cheyenne WY. 82007 | (307) 638-5585

Sales Office  
999 18th St. Suite 1200, Denver, CO. 80202 | (281) 408-2361

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# Cementing Treatment



<b>Start Date</b>	12/6/2018	<b>Well</b>	SELTZER LD 21-031HC
<b>End Date</b>	12/7/2018	<b>API#</b>	05-001-10199
<b>Client</b>	Great Western Operating Company LLC	<b>County</b>	ADAMS
<b>Service Sup.</b>	Zachary Hyde	<b>State/Province</b>	CO
<b>District</b>	Cheyenne, WY	<b>Rig</b>	PD 460
<b>Type of Job</b>	Long String	<b>Project ID</b>	PRJ1013056
<b>Execution ID</b>	EXC-13317-G8T8P802		

## WELL GEOMETRY

Type	ID (in)	OD (in)	Wt. (lb/ft)	MD (ft)	TVD (ft)	Excess(%)
Previous Casing	8.92	9.63	36.00	1,739.00	1,739.00	
Open Hole	8.50	0.00	0.00	23,960.00	7,979.00	5.00
Casing	4.89	5.50	17.00	23,960.00	7,979.00	

**Shoe Length (ft):** 42.00

## HARDWARE

<b>Top Plug Used?</b>	Yes	<b>Landing Collar Depth (ft)</b>	23,950
<b>Top Plug Provided By</b>	Non BJ	<b>Pipe Movement</b>	None
<b>Top Plug Size</b>	5.500	<b>Job Pumped Through</b>	No Manifold
<b>Centralizers Used</b>	Yes	<b>Top Connection Thread</b>	BTC
<b>Centralizers Quantity</b>	125.00	<b>Top Connection Size</b>	5.5
<b>Centralizers Type</b>	Rigid		

## CIRCULATION PRIOR TO JOB

<b>Well Circulated By</b>	Rig	<b>PV Mud Out</b>	8
<b>Circulation Prior to Job</b>	Yes	<b>YP Mud In</b>	8
<b>Circulation Time (min)</b>	240.00	<b>YP Mud Out</b>	8
<b>Circulation Rate (bpm)</b>	8.00	<b>Solids Present at End of Circulation</b>	No
<b>Circulation Volume (bbls)</b>	2,240.00	<b>10 sec SGS</b>	5.00
<b>Lost Circulation Prior to Cement Job</b>	No	<b>10 min SGS</b>	6.00
<b>Mud Density In (ppg)</b>	11.00	<b>30 min SGS</b>	8.00
<b>Mud Density Out (ppg)</b>	11.00	<b>Flare Prior to/during the Cement Job</b>	No
<b>PV Mud In</b>	8	<b>Gas Present</b>	No

## TEMPERATURE

<b>Ambient Temperature (°F)</b>	19.00	<b>Slurry Cement Temperature (°F)</b>	70.00
<b>Mix Water Temperature (°F)</b>	80.00		

# Cementing Treatment



## BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H2O Req. (gals/sk)	Planned Top of Fluid (Ft)	Length (Ft)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	Star II Spacer	11.0000			2,975.00				50.0000
Spacer / Pre Flush / Flush	Star II Spacer	11.0000			1,966.00				95.0000
Spacer / Pre Flush / Flush	Star II Spacer	11.0000			2,975.00				50.0000
Tail Slurry	BJCem P50.6.02C	14.0000	1.5866	7.46	4,200.00	19604	2976	4,721.0000	840.8000
Displacement 1	Retarded Water	8.3337			22,902.00			0.0000	20.0000
Displacement Final	3% KCl	8.3300			0.00	0		0.0000	576.0000

Fluid Type	Fluid Name	Component	Concentration	UOM
Spacer / Pre Flush / Flush	Star II Spacer	IntegraGuard STAR II concentrate	13.9900	PPB
Spacer / Pre Flush / Flush	Star II Spacer	SPACER SURFACTANT, SS-267	0.7000	GPB
Spacer / Pre Flush / Flush	Star II Spacer	SAND, S-8, Silica Flour, 200 Mesh	163.1500	PPB
Spacer / Pre Flush / Flush	Star II Spacer	IntegraGuard STAR PLUS	20.0000	PPB
Spacer / Pre Flush / Flush	Star II Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
Spacer / Pre Flush / Flush	Star II Spacer	IntegraGuard STAR II concentrate	13.9900	PPB
Spacer / Pre Flush / Flush	Star II Spacer	IntegraGuard STAR PLUS	20.0000	PPB
Spacer / Pre Flush / Flush	Star II Spacer	SAND, S-8, Silica Flour, 200 Mesh	163.1500	PPB
Spacer / Pre Flush / Flush	Star II Spacer	IntegraGuard STAR PLUS	20.0000	PPB
Spacer / Pre Flush / Flush	Star II Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
Spacer / Pre Flush / Flush	Star II Spacer	SAND, S-8, Silica Flour, 200 Mesh	163.1500	PPB
Spacer / Pre Flush / Flush	Star II Spacer	SPACER SURFACTANT, SS-267	0.7000	GPB
Spacer / Pre Flush / Flush	Star II Spacer	IntegraGuard STAR II concentrate	13.9900	PPB
Tail Slurry	BJCem P50.6.02C	EXTENDER, BENTONITE	1.0000	BWOB
Tail Slurry	BJCem P50.6.02C	CEMENT, CLASS G	50.0000	PCT
Tail Slurry	BJCem P50.6.02C	FLUID LOSS, FL-24	0.5000	BWOB
Tail Slurry	BJCem P50.6.02C	SAND, S-8, Silica Flour, 200 Mesh	20.0000	BWOB
Tail Slurry	BJCem P50.6.02C	RETARDER, SR-20	0.8000	BWOB
Tail Slurry	BJCem P50.6.02C	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P50.6.02C	IntegraGuard GW-86	0.0500	BWOB
Tail Slurry	BJCem P50.6.02C	Flyash (Rockies)	50.0000	PCT

# Cementing Treatment



## DISPLACEMENT AND END OF JOB SUMMARY

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<b>Displaced By</b>	BJ Services	<b>Amount of Cement Returned/Reversed</b>	0.00
<b>Calculated Displacement Volume (bbls)</b>	555.00	<b>Method Used to Verify Returns</b>	Visual
<b>Actual Displacement Volume (bbls)</b>	555.00	<b>Amount of Spacer to Surface</b>	0.00
<b>Did Float Hold?</b>	N/A	<b>Pressure Left on Casing (psi)</b>	3,800.00
<b>Bump Plug</b>	Yes	<b>Amount Bled Back After Job</b>	0.00
<b>Bump Plug Pressure (psi)</b>	3,100.00	<b>Total Volume Pumped (bbls)</b>	1,590.00
<b>Were Returns Planned at Surface</b>	No	<b>Top Out Cement Spotted</b>	No
<b>Cement returns During Job</b>	No	<b>Lost Circulation During Cement Job</b>	No

# EVENT LOG



**Customer Name:** Great Western Operating  
Company LLC

**Well Name:** SELTZER LD 21-031HC

**Job Type:** Long String

**Quote ID:** QUO-23048-Z8Z9K1

**Plan ID:** ORD-13317-G8T8P8

**Execution ID:** EXC-13317-G8T8P802

**District:** Cheyenne, WY

**BJ Supervisor:** Zachary Hyde

Seq.	Start Dt./Time	Event	Density (ppg)	Pump Rate (bpm)	Pump Vol (bbls)	Pipe Pressure (psi)	Comments
1	12/06/2018 11:09	Callout					Crew gets called out at 1030. Requested time 1700 12/6/18
2	12/06/2018 11:10	Depart for Location					Crew leaves yard
3	12/06/2018 11:30	Arrive on Location					Crew arrives on location at 1600
4	12/06/2018 16:00	Spot Units					Crew spots units
5	12/06/2018 16:20	Rig Up					Crew rigs up iron and hoses needed for the job
6	12/06/2018 18:00	Rig					Crew waits for rig to finish circulating
7	12/06/2018 21:40	STEACS Briefing					Crew has a steacs briefing with the rig crew and company going over the job
8	12/06/2018 22:04	Prime Up	11.0000	3.00	5.00	300.00	Filled lines with spacer
9	12/06/2018 22:08	Pressure Test					Pressure tested lines to 5500 psi
10	12/06/2018 22:13	Pump Spacer	11.0000	4.00	45.00	400.00	Pumped 50 bbls of Spacer at 11 ppg with surfactant
11	12/06/2018 22:25	Pump Spacer	11.0000	5.00	95.00	500.00	Pumped 95 bbls of Spacer at 11 ppg without surfactant
12	12/06/2018 22:40	Pump Spacer	11.0000	4.00	50.00	400.00	Pumped 50 bbls of Spacer at 11 ppg with surfactant
13	12/06/2018 22:58	Pump Tail Cement	14.0000	4.50	840.00	500.00	Pumped 840 bbls of Cement at 14ppg (2976 sks, 1.58 yld, 7.46 gal/sk) Had to pump at 4.5 bpm due to iron jacking
14	12/07/2018 02:25	End Pumping					Shutdown
15	12/07/2018 02:27	Wash Pumps and Lines					Washed pump and lines to pit
16	12/07/2018 02:30	Pump Displacement	8.3300	5.00	20.00	50.00	First 20 bbls of Displacement with fresh water and retarder
17	12/07/2018 02:36	Other (See comment)					Had to shut down too due to leaks on the top cap of the plug container
18	12/07/2018 02:40	Pump Displacement	8.4000	6.50	515.00	2,800.00	Pumped 515 bbls of Displacement at 6.5 bpm due to iron jacking
19	12/07/2018 04:40	Other (See comment)	8.3300	5.00	20.00	3,100.00	Slowed rate the last 20 bbls to 5 bpm
20	12/07/2018 04:49	Land Plug					Landed plug went 1000 psi over FCP. FCP was 3100 brought it up to 4200 psi
21	12/07/2018 04:51	Other (See comment)					Shut the head in on the well so they can monitor pressure for 6 hours. Pressure left on casing 3800 pdi

# EVENT LOG

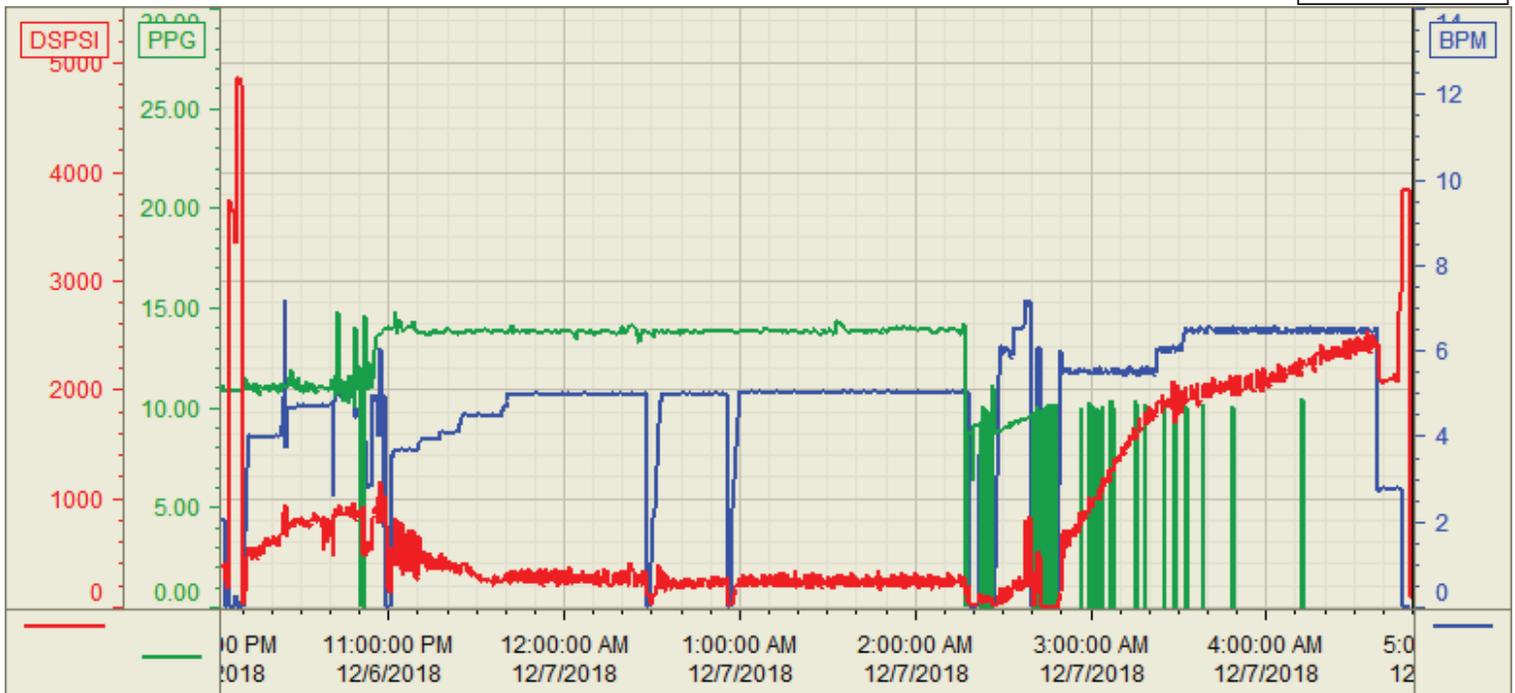


22	12/07/2018 04:51	Other (See comment)					Release pressure on our lines and rig down
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Customer: Great Western  
 Well Number: 21-031HC  
 Lease Info: Seltzer LD



Print Date/Time  
 12/7/2018 5:38:40 AM



	Name	Y value	X value/time stamp	Tag name Y
1	DS - Press(PSI)	90.1 i.	12/7/2018 4:50:00 AM i.	Cementer\DS_DISCHARGE_PRESS_DIAL
2	Recirc - Density (PPG)	-3.12	12/7/2018 4:50:03 AM	Cementer\DENSITY_ACTUAL_RATE
3	Combined rate (BPM)		12/7/2018 4:50:00 AM i.	Cementer\Flow_Combined
4				
5				

Source: Control1 5:38:36 AM