



Great Western Operating Company, LLC

SCHAEFER LD 13-033HN

API # 05-001-10253

Production

02/09/2019

Quote #: 26763

Execution #: 15425



Great Western Operating Company, LLC

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

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,
Ashraf Hamid
Field Engineer I | (307) 365-9484 | Ashraf.Hamid@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

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Chad Johnson	RIG	PD 460
DISTRICT	Cheyenne, WY	COUNTY	ADAMS
SERVICE	Cementing	STATE / PROVINCE	CO

WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)
Previous Casing	9.63	8.92	36.00	1,781.00	1,781.00	
Open Hole		8.50		4,100.00	4,100.00	0.00
Open Hole	0.00	8.50	0.00	18,044.00	7,576.00	5.00
Casing	5.50	4.89	17.00	18,044.00	7,576.00	

HARDWARE

Bottom Plug Used?	No	Landing Collar Depth (ft)	18,033
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	10640.00
Top Plug Size	5.500	Max Casing Pressure - Operated (psi)	2500.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	113.00	Job Pumped Through	Manifold
Top Connection Size	5.5	Top Connection Thread	BTC
Centralizers Type	Rigid		

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	7
Circulation Prior to Job	Yes	Solids Present at End of Circulation	No
Circulation Time (min)	180.00	10 sec SGS	7
Circulation Rate (bpm)	10.00	10 min SGS	9
Circulation Volume (bbls)	1800.00	30 min SGS	10
Lost Circulation Prior to Cement Job	No	Flare Prior to / during the Cement Job	No
Mud Density In (ppg)	11.30	Gas Present	No
PV Mud In	28		

TEMPERATURE

Ambient Temperature (°F)	15.00	Mix Water Temperature (°F)	80.00
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FLUID DETAILS

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Client
Name: Great Western Operating
Company LLC

Well: SCHAEFER LD #13-033HN

Well
API: 05-001-10253

Start
Date: 2/9/2019

End
Date: 2/10/2019

Field Ticket
#:



FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					50.0000
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					90.0000
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	12.5000					50.0000
Tail Slurry	BJCem P50.6.02C	14.5000	1.4462	6.45	2350	3397.0000	605.0000
Displacement 1	Retarded Water	8.3337				0.0000	20.0000
Displacement Final	3% KCl	8.3300				0.0000	402.2000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-267	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	IntegraGuard GW-86	0.6000	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SAND, S-8, Silica Flour, 200 Mesh	282.2600	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SAND, S-8, Silica Flour, 200 Mesh	282.2600	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	IntegraGuard GW-86	0.6000	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SAND, S-8, Silica Flour, 200 Mesh	282.2600	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	IntegraGuard GW-86	0.6000	PPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-267	0.7000	GPB
Spacer / Pre Flush / Flush	IntegraGuard EZ Spacer	SPACER SURFACTANT, SS-247	0.7000	GPB
Tail Slurry	BJCem P50.6.02C	FOAM PREVENTER, FP-25	0.3000	BWOB
Tail Slurry	BJCem P50.6.02C	SAND, S-8, Silica Flour, 200 Mesh	20.0000	BWOB
Tail Slurry	BJCem P50.6.02C	IntegraGuard GW-86	0.0500	BWOB
Tail Slurry	BJCem P50.6.02C	Flyash (Rockies)	50.0000	PCT
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	RETARDER, SR-20	0.8000	BWOB

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	418.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	418.00	Amt of Spacer to Surface	48.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	3500.00
Bump Plug	Yes	Amt Bled Back After Job	0.00
Bump Plug Pressure (psi)	2500.00	Total Volume Pumped (bbls)	1215.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	No
Cement Returns During Job	No	Lost Circulation During Cement Job	No

Client Name: Great Western Operating Company LLC

Well: SCHAEFER LD #13-033HN

Well API: 05-001-10253

Start Date: 2/9/2019

End Date: 2/10/2019

Field Ticket #:



BJ Cementing Event Log

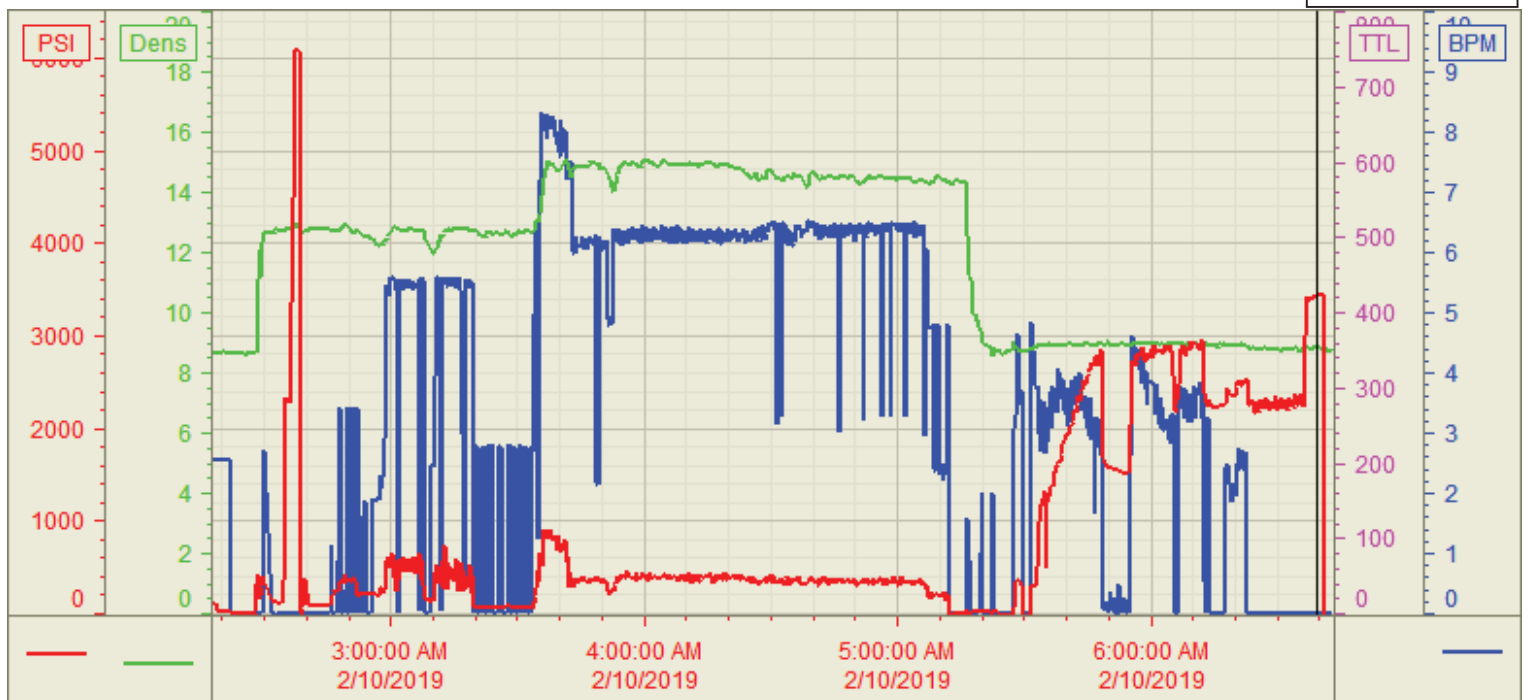
Long String - Cheyenne, WY - Chad Johnson

SEQ	START DATE / TIME	EVENT	DENSITY (ppg)	PUMP RATE (bpm)	PUMP VOL (bbls)	PIPE PRESSURE (psi)	COMMENTS
1	02/09/2019 13:00	Callout					Crew called out requested on location at 1900
2	02/09/2019 17:00	Arrive on Location					Arrived on location
3	02/09/2019 17:05	STEACS Briefing					Safety meeting
4	02/09/2019 17:20	Spot Units					Spotted all units
5	02/09/2019 17:40	Rig Up					Rigged up all equipment
6	02/09/2019 19:00	Client					Waiting on rig to finish running casing and circulate the well
7	02/10/2019 01:40	STEACS Briefing					Safety meeting
8	02/10/2019 02:20	Prime Up	12.5000	3.00	5.00		Fill line with 5 bbls spacer
9	02/10/2019 02:35	Pressure Test					Test line to 5000 psi
10	02/10/2019 02:45	Pump Spacer	12.5000	6.00	185.00	450.00	Pump 50 bbls spacer w/ chems at 12.5 ppg, 90 bbls spacer at 12.5 ppg, 50 bbls spacer at 12.5 ppg w/chems
11	02/10/2019 03:40	Pump Tail Cement	14.0000	8.00	607.00	800.00	Pump 605 bbls cement at 14 ppg (2350 sks, 1.445 Y, 6.45 gal/sk)
12	02/10/2019 05:13	Other (See comment)					Shutdown
13	02/10/2019 05:18	Wash Pumps and Lines					Wash pumps and lines to pit
14	02/10/2019 05:27	Drop Top Plug					Drop top plug
15	02/10/2019 05:28	Pump Displacement	8.5000	8.00	380.00	3000.00	Pump 418 bbls displacement
16	02/10/2019 06:15	Spacer Back-to-Surface					Spacer to surface. Total of 48 bbls spacer to surface
17	02/10/2019 06:25	Other (See comment)	8.5000	3.00	38.00	2500.00	Slow rate to 3 bpm at 400 bbls away
18	02/10/2019 06:30	Land Plug					Land plug at 2500 psi, took to 3500 psi
19	02/10/2019 06:32	Other (See comment)					Shut in cement head
20	02/10/2019 06:40	STEACS Briefing					Safety meeting
21	02/10/2019 07:00	Rig Down					Rigged down all equipment
22	02/10/2019 09:00	Leave Location					Crew departed location

Customer: GW
Well Number: 13-033HN
Lease Info: Schaefer LD



Print Date/Time
2/10/2019 6:57:10 AM



	Name	Y value	X value/time stamp	Tag name Y
1	PS - Press (PSI)	3429.3 i.	2/10/2019 6:39:19 AM i.	Cementer\PS_DISCHARGE_PRESS_DIAL
2	Den2 - Discharge Density (F	8.85 i.	2/10/2019 6:39:19 AM i.	Cementer\DENSITY2_ACTUAL_RATE
3	Flow Rate (BBLs)	0.00 i.	2/10/2019 6:39:19 AM i.	Cementer\Flow_Combined
4				
5				
				Source: Control1 6:57:05 AM