

Cement Post Job Report

Client: PDC Energy

Well Name: Broe 28NA

API #: 05-123-51955-00

Job Date: April 15, 2023

Job Type: New Well - 5.5" Production String

Cement Company & Contact: EXERO Well Integrity -
Cheve Meyer 720-239-3819



ROCK SOLID
WELL INTEGRITY
SOLUTIONS

TREATMENT REPORT

CLIENT	WELL	RIG	JOB TYPE	THREAD TYPE	WELLHEAD CONNECTION
PDC Energy	Broe 28NA	Ensign 769	Production	Buttress	CRT Connection

WELL MD (FT)	WELL TVD (FT)	DEVIATION (DEG)	NUMBER OF STAGES	BHST (DEG)	BHCT (DEG)
14531	6777	90	1	230	230

PACKER/RETAINER/CIBP/DV TOOL DEPTHS	TOOL TYPE	TOP OF PERFS (FT)	BOTTOM OF PERFS (FT)	NUMBER OF HOLES
3348	PACKER			

CASING/TUBING/DP DETAILS								
STRING TYPE	GRADE	OD"	WT/FT	ID"	OH SIZE"	% EXCESS LEAD	% EXCESS TAIL	TOTAL DEPTH (FT)
Surface		9.625	36					1753
Production		5.5	20		8.5	0	0	14525
MAXIMUM CASING/TUBING/DP PSI				MAXIMUM ANNULAR PSI				

Mud Type	OBM	Rotate Y,N	No	Circulation Data				Water Requirements (bbls)		
Mud ppg	10.9	Rate (rpm)		Circulate Time (hrs)		2		Spacers	140	
Flow Temp		Torque Val.		Circulation Rate (bpm)		10		Stage 1 Lead	121	
Vis. Sec/qt		Time (hr)		Full Circulation ? (Y,N,P)		Yes		Stage 1 Tail	155	
PV (cP)		Pipe Reciprocation		Gas Present (Y,N)		Yes	Units	4400	Stage 2 Lead	
Yield Pt		Recip Y,N	No	Centralizers/Plugs				Stage 2 Tail		
10 sec gel		Stroke (ft)		Quantity & Type		customer provided		Displacement	322	
10 min gel		Recip time		Top Plug/Type		customer provided		Wash up	20	
30 min gel		Stuck ?		Bottom Plug/Type		customer provided		Total + 10% Safety	833	

Preflush & Spacers		Stage 1 Lead: Class G		Stage 1 Tail: Class G		Stage 2 Lead		Stage 2 Tail		Displacement	
Spacer 1	Spacer	Density	12.9	Density	13.7	Density		Density		Fluid Type	Water
Density	12	Sacks	1381	Sacks	979	Sacks		Sacks		Dens. ppg	8.33
Volume	140	Vol/bbbls	255.8	Vol/bbbls	238.9	Vol/bbbls	0.0	Vol/bbbls	0.0	Vol. bbl	322
Rate	12	Rate	12	Rate	12	Rate		Rate		Rate bpm	10
Spacer 2		Yield	1.04	Yield	1.37	Yield		Yield		Clay Stay?	No
Density		Gal/Sk	3.68	Gal/Sk	6.63	Gal/Sk		Gal/Sk		Biocide ?	Yes
Volume		% Excess	0	% Excess	0	% Excess		% Excess		Slow @ bbl	300
Rate		TOL (ft)	2391	TOT (ft)	8665	TOL (ft)		TOT (ft)		Bump PSI	2500

Final Displacement (bbbls)	322
Bump Plug?	YES
Final Bump Pressure (psi)	3000
Full Returns throughout job?	Full
Vol away/Time when returns lost	NA
Vol away when returns were regained	NA
Spacer to Surface?	YES
Spacer volume returned (bbbls)	25
Cement to surface?	NO
Cement volume to surface stage 1	NA
Cement volume to surface stage 2	NA

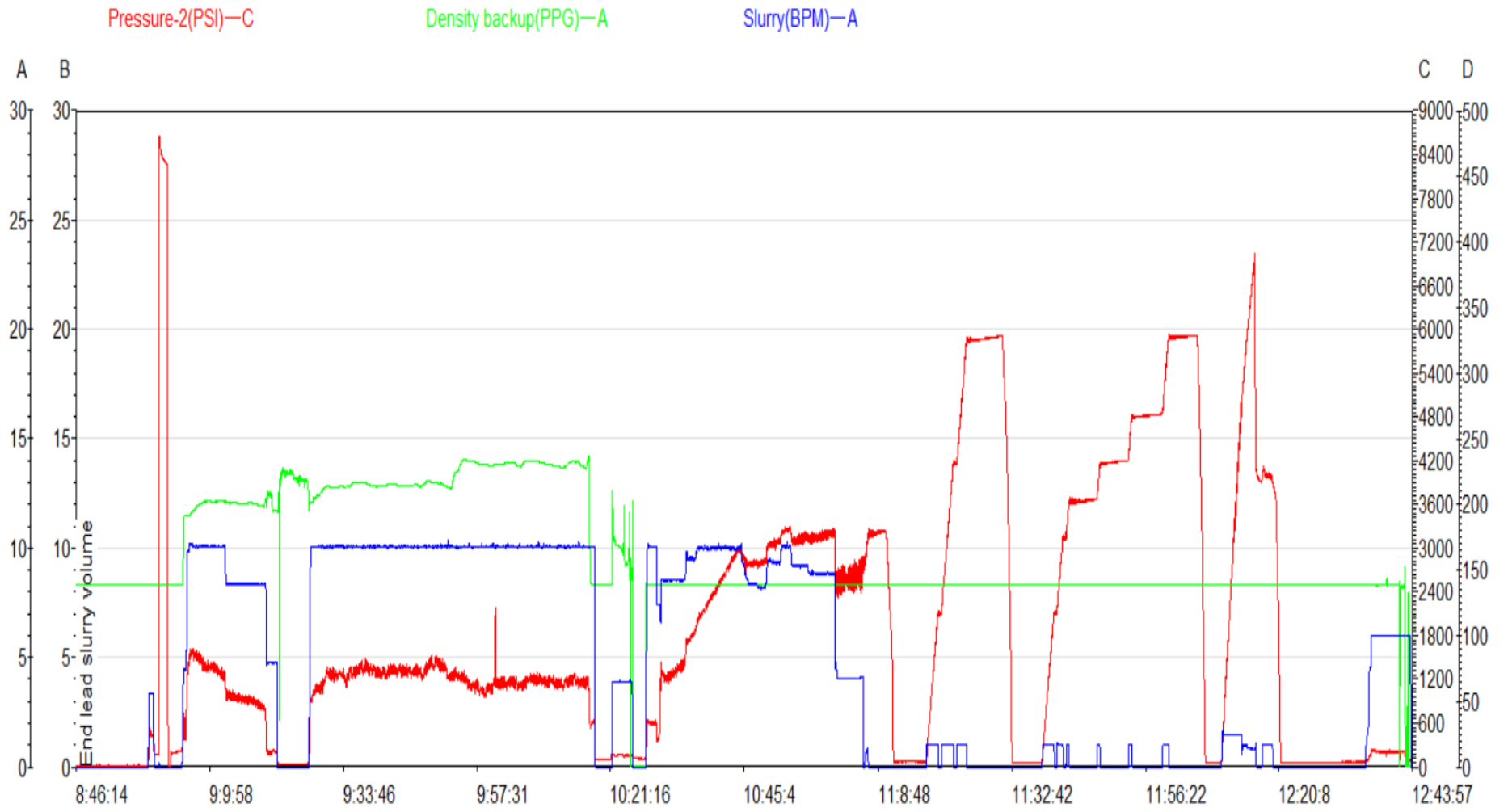
Surface Top Out Details-Pumped		Job Summary Additional Chems Used	
Cement Type		MFC 47 (gal)	70
Dens. ppg	NA	MFC 67 (gal)	168
Sacks qty	NA	Defoamer (gal)	35
Gal/sk	NA	Biocide (gal)	15
Yield	NA	Corr. Inhib (gal)	NA
Calcium Chlor. Used?	NA	Fiber (lbs)	290
Top out pipe used ?	NA	Chloride (lbs)	NA
Annulus holding?	NA	Retarder (lbs)	NA
		Clay Stabilizer (gal)	NA
		Other	

JOB LOG

CLIENT	WELL	RIG	JOB TYPE	START DATE	Ambient Conditions
PDC Energy	Broe 28NA	Ensign 769	Production	4/15/2023	Temp / Hum / Air Press 34 Deg F / 93% / 25.04 in

Date	Time	Density	Rate	Volume	Volume	Pressure	TREATMENT COMMENTS
4/14/2023	10:00:00 PM						CREW CALLED OUT FOR AN ON LOCATION TIME OF 06:00 AM 4/15/23
	10:30:00 PM						CREW ARRIVES ON LOCATION/CHECK IN WITH CO REP/CALCULATE JOB/WAIT ON CASING TO LAND
4/15/2023	6:54:00 AM						CASING LANDED/FILL PIPE/CIRCULATE WELL 1.5 BOTTOMS UP
	7:15:00 AM						SPOT IN AND RIG UP EQUIPMENT
	8:30:00 AM						SAFETY MEETING
	8:45:00 AM						RIG UP FLOOR
	8:51:00 AM	8.33	3.4	3	3	500	FILL LINES
	8:55:00 AM	8.33	1.0	1	1	8500	PRESSURE TEST
	9:00:00 AM	12	10.0	140	140	1400	PUMP 140 BBLS OF SPACER AT 12#
	9:16:00 AM						SHUT IN
	9:18:00 AM						DROP BOTTOM PLUG
	9:23:00 AM	12.9	10.0	256	256	1300	PUMP 256 BBLS OF LEAD CEMENT AT 12.9# (1381 SKS, 1.04 YLD, 3.68 GAL/SK, 121 MIXWATER)
	9:48:00 AM	13.7	10.0	239	239	1200	PUMP 239 BBLS OF TAIL CEMENT AT 13.7# (979 SKS, 1.37 YLD, 6.63 GAL/SK, 155 MIXWATER)
	10:11:00 AM	8.33	10.0	10	10	500	PUMP 10 BBLS OF SUGAR WATER
	10:13:00 AM						SHUT IN/WASH UP THE PUMPS AND LINES
	10:15:00 AM						DROP TOP PLUG
	10:21:00 AM	8.33	10.0	20	20	700	START DISPLACEMENT WITH FRESHWATER AND BIOCIDES IN ALL
	10:23:00 AM	8.33	10.0	20	20	1200	PLUG CAUGHT UP TO CEMENT
	10:26:00 AM	8.33	10.0	30	50	1300	FRESHWATER DISPLACEMENT WITH BIOCIDES IN ALL
	10:33:00 AM	8.33	10.0	50	100	2400	FRESHWATER DISPLACEMENT WITH BIOCIDES IN ALL
	10:38:00 AM	8.33	10.0	50	150	3000	FRESHWATER DISPLACEMENT WITH BIOCIDES IN ALL
	10:44:00 AM	8.33	10.0	50	200	3000	FRESHWATER DISPLACEMENT WITH BIOCIDES IN ALL
	10:50:00 AM	8.33	10.0	50	250	3200	FRESHWATER DISPLACEMENT WITH BIOCIDES IN ALL/NEO FLOW AND SPACER INTERFACE VISIBLE AT SHAKERS
	10:00:00 AM	8.33	9.0	47	297	3200	GOOD SPACER VISIBLE AT SHAKERS
	10:57:00 AM	8.33	4.0	3	300	2500	FRESHWATER DISPLACEMENT/SLOWED RATE TO LAND PLUG
	11:01:00 AM	8.33	4.0	22	322	3000	BUMPED PLUG AT CALCULATED DISPLACEMENT/BROUGHT PRESSURE 3000PSI/25BBLS OF SPACER TO SURFACE
	11:06:00 AM						CHECK FLOATS/FLOATS HELD/RECEIVED 4 BBLS BACK
	11:11:00 AM	8.33	1.0	16	16	5900	START SETTING PACKER PER TOOL HAND
	12:06:00 PM	8.33	1.0	1	1	1000	PRESSURE UP TO SHIFT SLEEVE
	12:10:00 PM	8.33	1.0	7	8	7000	SLEEVE SHIFTED AT 7000PSI/NO RETURNS PRESENT AT OPEN TOPS
	12:12:00 PM	8.33	1.0	2	2	4000	PUMP A 2 BBL WET SHOE/NO RETURNS PRESENT AT OPEN TOPS/PACKER HELD
	12:14:00 PM						CHECK FLOATS/FLOATS HELD/RECEIVED 4 BBLS BACK
	12:16:00 PM						RIG DOWN FLOOR/RIG UP TO FLUSH STACK
	12:20:00 PM	8.33	5.0	40	40	150	FLUSH STACK
	12:39:00 PM						RIG DOWN REST OF EQUIPMENT
	12:45:00 PM						FINISH PAPERWORK
	1:30:00 PM						DEPART LOCATION

Broe 28NA Production Pump Chart – Pressure / Rate / Density



Chart



Centralizer Depths

Well Name: Broe 28NA

Production, Set Depth: 14,525.0ftKB

API 0512351955000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwry	Connections	Top (ftKB)	Cum Len (ft)
7	1	Casing Joints	5 1/2	20.00	P-110	Yes	37.16	Yes		GBCD	14,453.6	71.43
9	3	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	14,365.1	159.87
11	5	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	14,276.7	248.30
13	7	Casing Joints	5 1/2	20.00	P-110	Yes	43.50	Yes		GBCD	14,189.0	336.05
15	9	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	14,100.4	424.57
17		Marker Joint	5 1/2	20.00	P-110	Yes	9.98	Yes		GBCD	14,048.0	477.00
19	12	Casing Joints	5 1/2	20.00	P-110	Yes	43.87	Yes		GBCD	13,959.9	565.15
21	14	Casing Joints	5 1/2	20.00	P-110	Yes	43.50	Yes		GBCD	13,872.8	652.23
23	16	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	13,784.3	740.74
25	18	Casing Joints	5 1/2	20.00	P-110	Yes	43.98	Yes		GBCD	13,696.4	828.63
27	20	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	13,607.8	917.18
29	22	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	13,519.3	1,005.68
31	24	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	13,431.6	1,093.44
33	26	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	13,344.6	1,180.43
35	28	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	13,256.1	1,268.95
37	30	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	13,167.5	1,357.46
39	32	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	13,079.1	1,445.95
41	34	Casing Joints	5 1/2	20.00	P-110	Yes	42.82	Yes		GBCD	12,992.8	1,532.21
43	36	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	12,904.3	1,620.71
45	38	Casing Joints	5 1/2	20.00	P-110	Yes	43.78	Yes		GBCD	12,816.2	1,708.78
47	40	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	12,727.6	1,797.36
49	42	Casing Joints	5 1/2	20.00	P-110	Yes	44.31	Yes		GBCD	12,639.1	1,885.94
51	44	Casing Joints	5 1/2	20.00	P-110	Yes	44.31	Yes		GBCD	12,550.5	1,974.55
53	46	Casing Joints	5 1/2	20.00	P-110	Yes	42.38	Yes		GBCD	12,463.8	2,061.23
55	48	Casing Joints	5 1/2	20.00	P-110	Yes	43.92	Yes		GBCD	12,376.4	2,148.60
57	50	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	12,288.6	2,236.36
59	52	Casing Joints	5 1/2	20.00	P-110	Yes	44.29	Yes		GBCD	12,200.0	2,324.99
61	54	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	12,111.5	2,413.51
63	56	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	12,025.1	2,499.94
65	58	Casing Joints	5 1/2	20.00	P-110	Yes	44.34	Yes		GBCD	11,937.2	2,587.80
67	60	Casing Joints	5 1/2	20.00	P-110	Yes	42.70	Yes		GBCD	11,851.7	2,673.28



Centralizer Depths

Well Name: **Broe 28NA**

Production, Set Depth: **14,525.0ftKB**

API 0512351955000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwry	Connections	Top (ftKB)	Cum Len (ft)
69	62	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	11,763.2	2,761.81
71	64	Casing Joints	5 1/2	20.00	P-110	Yes	44.34	Yes		GBCD	11,674.6	2,850.41
73	66	Casing Joints	5 1/2	20.00	P-110	Yes	44.29	Yes		GBCD	11,586.0	2,939.04
75	68	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	11,497.4	3,027.59
77	70	Casing Joints	5 1/2	20.00	P-110	Yes	43.90	Yes		GBCD	11,409.2	3,115.76
79	72	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	11,320.7	3,204.29
81	74	Casing Joints	5 1/2	20.00	P-110	Yes	44.29	Yes		GBCD	11,232.2	3,292.84
83	76	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	11,143.6	3,381.38
85	78	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	11,055.2	3,469.84
87		Marker Joint	5 1/2	20.00	P-110	Yes	9.86	Yes		GBCD	11,001.0	3,523.96
89	81	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	10,912.5	3,612.51
91	83	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	10,823.9	3,701.06
93	85	Casing Joints	5 1/2	20.00	P-110	Yes	43.51	Yes		GBCD	10,736.2	3,788.85
95	87	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	10,647.6	3,877.40
97	89	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	10,559.1	3,965.88
99	91	Casing Joints	5 1/2	20.00	P-110	Yes	43.94	Yes		GBCD	10,470.9	4,054.06
101	93	Casing Joints	5 1/2	20.00	P-110	Yes	42.67	Yes		GBCD	10,384.4	4,140.56
103	95	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	10,296.7	4,228.26
105	97	Casing Joints	5 1/2	20.00	P-110	Yes	38.86	Yes		GBCD	10,219.3	4,305.75
107	99	Casing Joints	5 1/2	20.00	P-110	Yes	40.02	Yes		GBCD	10,139.2	4,385.77
109	101	Casing Joints	5 1/2	20.00	P-110	Yes	40.48	Yes		GBCD	10,054.5	4,470.48
111	103	Casing Joints	5 1/2	20.00	P-110	Yes	42.36	Yes		GBCD	9,968.0	4,557.00
113	105	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	9,879.5	4,645.53
115	107	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	9,790.9	4,734.08
117	109	Casing Joints	5 1/2	20.00	P-110	Yes	44.34	Yes		GBCD	9,703.8	4,821.24
119	111	Casing Joints	5 1/2	20.00	P-110	Yes	43.23	Yes		GBCD	9,617.3	4,907.74
121	113	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	9,529.5	4,995.47
123	115	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	9,441.0	5,084.02
125	117	Casing Joints	5 1/2	20.00	P-110	Yes	43.82	Yes		GBCD	9,353.6	5,171.39
127	119	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	9,265.4	5,259.57
129	121	Casing Joints	5 1/2	20.00	P-110	Yes	44.00	Yes		GBCD	9,177.5	5,347.53



Centralizer Depths

Well Name: **Broe 28NA**

Production, Set Depth: **14,525.0ftKB**

API 05123519550000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwry	Connections	Top (ftKB)	Cum Len (ft)
131	123	Casing Joints	5 1/2	20.00	P-110	Yes	43.12	Yes		GBCD	9,090.1	5,434.95
133	125	Casing Joints	5 1/2	20.00	P-110	Yes	44.31	Yes		GBCD	9,001.5	5,523.54
135	127	Casing Joints	5 1/2	20.00	P-110	Yes	44.34	Yes		GBCD	8,913.2	5,611.83
137	129	Casing Joints	5 1/2	20.00	P-110	Yes	43.50	Yes		GBCD	8,825.7	5,699.29
139	131	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	8,737.1	5,787.91
141	133	Casing Joints	5 1/2	20.00	P-110	Yes	44.34	Yes		GBCD	8,648.9	5,876.06
143	135	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	8,560.5	5,964.54
145	137	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	8,472.4	6,052.65
147	139	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	8,383.9	6,141.15
149	141	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	8,295.3	6,229.67
151	143	Casing Joints	5 1/2	20.00	P-110	Yes	43.44	Yes		GBCD	8,208.1	6,316.92
153	145	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	8,119.6	6,405.41
155	147	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	8,031.5	6,493.53
157	149	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	7,943.0	6,582.00
159	151	Casing Joints	5 1/2	20.00	P-110	Yes	44.20	Yes		GBCD	7,855.7	6,669.26
161	153	Casing Joints	5 1/2	20.00	P-110	Yes	43.20	Yes		GBCD	7,768.3	6,756.67
163	155	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	7,679.8	6,845.16
165	157	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	7,591.8	6,933.20
167		Marker Joint	5 1/2	20.00	P-110	Yes	22.24	Yes		GBCD	7,526.1	6,998.95
168	159	Casing Joints	5 1/2	20.00	P-110	Yes	44.19	Yes		GBCD	7,481.9	7,043.14
169	160	Casing Joints	5 1/2	20.00	P-110	Yes	44.18	Yes		GBCD	7,437.7	7,087.32
170	161	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	7,393.5	7,131.53
171	162	Casing Joints	5 1/2	20.00	P-110	Yes	44.20	Yes		GBCD	7,349.3	7,175.73
172	163	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	7,305.0	7,219.96
173	164	Casing Joints	5 1/2	20.00	P-110	Yes	44.19	Yes		GBCD	7,260.9	7,264.15
174	165	Casing Joints	5 1/2	20.00	P-110	Yes	44.18	Yes		GBCD	7,216.7	7,308.33
175	166	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	7,172.4	7,352.61
176	167	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	7,128.1	7,396.88
177	168	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	7,083.8	7,441.16
178	169	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	7,039.6	7,485.38
179	170	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	6,995.4	7,529.62



Centralizer Depths

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Production, Set Depth: **14,525.0ftKB**

API 05123519550000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00		Original KB Elevation (ft) 4,769.00		KB-Ground Distance (ft) 28.00		Spud Date 4/12/2023 14:45		Rig Release Date 4/15/2023 14:30		On Production Date Abandon Date	

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwry	Connections	Top (ftKB)	Cum Len (ft)
180	171	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	6,951.1	7,573.88
181	172	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	6,906.9	7,618.11
182	173	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	6,862.7	7,662.35
183	174	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	6,818.4	7,706.65
184	175	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	6,774.1	7,750.88
185	176	Casing Joints	5 1/2	20.00	P-110	Yes	44.20	Yes		GBCD	6,729.9	7,795.08
186	177	Casing Joints	5 1/2	20.00	P-110	Yes	43.84	Yes		GBCD	6,686.1	7,838.92
187	178	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	6,641.8	7,883.16
188	179	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	6,597.6	7,927.39
189	180	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	6,553.4	7,971.63
190		Marker Joint	5 1/2	20.00	P-110	Yes	21.92	Yes		GBCD	6,531.5	7,993.55
191	181	Casing Joints	5 1/2	20.00	P-110	Yes	44.31	Yes		GBCD	6,487.1	8,037.86
192	182	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	6,442.9	8,082.13
193	183	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	6,398.6	8,126.39
194	184	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	6,354.3	8,170.66
195	185	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	6,310.1	8,214.87
196	186	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	6,265.9	8,259.10
197	187	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	6,221.7	8,303.34
198	188	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	6,177.4	8,347.57
199	189	Casing Joints	5 1/2	20.00	P-110	Yes	42.68	Yes		GBCD	6,134.8	8,390.25
200	190	Casing Joints	5 1/2	20.00	P-110	Yes	44.29	Yes		GBCD	6,090.5	8,434.54
201	191	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	6,046.2	8,478.81
202	192	Casing Joints	5 1/2	20.00	P-110	Yes	44.00	Yes		GBCD	6,002.2	8,522.81
203	193	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	5,958.0	8,567.04
204	194	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	5,913.7	8,611.28
205	195	Casing Joints	5 1/2	20.00	P-110	Yes	43.87	Yes		GBCD	5,869.9	8,655.15
206	196	Casing Joints	5 1/2	20.00	P-110	Yes	43.85	Yes		GBCD	5,826.0	8,699.00
207	197	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	5,781.7	8,743.27
208	198	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	5,737.5	8,787.50
209	199	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	5,693.2	8,831.76
210	200	Casing Joints	5 1/2	20.00	P-110	Yes	43.50	Yes		GBCD	5,649.7	8,875.26



Centralizer Depths

Well Name: Broe 28NA

Production, Set Depth: 14,525.0ftKB

API 0512351955000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwly	Connections	Top (ftKB)	Cum Len (ft)
211	201	Casing Joints	5 1/2	20.00	P-110	Yes	43.43	Yes		GBCD	5,606.3	8,918.69
212	202	Casing Joints	5 1/2	20.00	P-110	Yes	44.19	Yes		GBCD	5,562.1	8,962.88
213	203	Casing Joints	5 1/2	20.00	P-110	Yes	44.20	Yes		GBCD	5,517.9	9,007.08
214	204	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	5,473.7	9,051.31
215	205	Casing Joints	5 1/2	20.00	P-110	Yes	43.88	Yes		GBCD	5,429.8	9,095.19
216	206	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	5,385.6	9,139.42
217	207	Casing Joints	5 1/2	20.00	P-110	Yes	43.48	Yes		GBCD	5,342.1	9,182.90
218	208	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	5,297.9	9,227.11
219	209	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	5,253.7	9,271.35
220	210	Casing Joints	5 1/2	20.00	P-110	Yes	44.20	Yes		GBCD	5,209.5	9,315.55
221	211	Casing Joints	5 1/2	20.00	P-110	Yes	43.45	Yes		GBCD	5,166.0	9,359.00
222	212	Casing Joints	5 1/2	20.00	P-110	Yes	43.54	Yes		GBCD	5,122.5	9,402.54
223	213	Casing Joints	5 1/2	20.00	P-110	Yes	43.04	Yes		GBCD	5,079.4	9,445.58
224	214	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	5,035.2	9,489.84
225	215	Casing Joints	5 1/2	20.00	P-110	Yes	43.47	Yes		GBCD	4,991.7	9,533.31
226	216	Casing Joints	5 1/2	20.00	P-110	Yes	43.86	Yes		GBCD	4,947.8	9,577.17
227	217	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	4,903.6	9,621.40
228	218	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	4,859.3	9,665.67
229	219	Casing Joints	5 1/2	20.00	P-110	Yes	44.19	Yes		GBCD	4,815.1	9,709.86
230	220	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	4,770.9	9,754.08
231	221	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	4,726.7	9,798.31
232	222	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	4,682.5	9,842.53
233	223	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	4,638.2	9,886.76
234	224	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	4,594.0	9,931.01
235	225	Casing Joints	5 1/2	20.00	P-110	Yes	43.30	Yes		GBCD	4,550.7	9,974.31
236	226	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	4,506.4	10,018.56
237	227	Casing Joints	5 1/2	20.00	P-110	Yes	43.48	Yes		GBCD	4,463.0	10,062.04
238	228	Casing Joints	5 1/2	20.00	P-110	Yes	43.47	Yes		GBCD	4,419.5	10,105.51
239	229	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	4,375.3	10,149.75
240	230	Casing Joints	5 1/2	20.00	P-110	Yes	43.84	Yes		GBCD	4,331.4	10,193.59
241	231	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	4,287.1	10,237.86



Centralizer Depths

Well Name: **Broe 28NA**

Production, Set Depth: **14,525.0ftKB**

API 0512351955000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jw/ry	Connections	Top (ftKB)	Cum Len (ft)
242	232	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	4,242.9	10,282.12
243	233	Casing Joints	5 1/2	20.00	P-110	Yes	44.30	Yes		GBCD	4,198.6	10,326.42
244	234	Casing Joints	5 1/2	20.00	P-110	Yes	42.58	Yes		GBCD	4,156.0	10,369.00
245	235	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	4,111.8	10,413.24
246	236	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	4,067.5	10,457.49
247	237	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	4,023.2	10,501.76
248	238	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	3,979.0	10,546.04
249	239	Casing Joints	5 1/2	20.00	P-110	Yes	43.45	Yes		GBCD	3,935.5	10,589.49
250	240	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	3,891.3	10,633.73
251	241	Casing Joints	5 1/2	20.00	P-110	Yes	43.92	Yes		GBCD	3,847.4	10,677.65
252	242	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	3,803.1	10,721.89
253	243	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	3,758.9	10,766.12
254	244	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	3,714.6	10,810.40
255	245	Casing Joints	5 1/2	20.00	P-110	Yes	43.43	Yes		GBCD	3,671.2	10,853.83
256	246	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	3,626.9	10,898.07
257	247	Casing Joints	5 1/2	20.00	P-110	Yes	43.48	Yes		GBCD	3,583.5	10,941.55
258	248	Casing Joints	5 1/2	20.00	P-110	Yes	43.51	Yes		GBCD	3,539.9	10,985.06
259	249	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	3,495.7	11,029.30
260	250	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	3,451.5	11,073.53
261	251	Casing Joints	5 1/2	20.00	P-110	Yes	43.88	Yes		GBCD	3,407.6	11,117.41
262	252	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	3,363.3	11,161.67
264	253	Casing Joints	5 1/2	20.00	P-110	Yes	43.49	Yes		GBCD	3,304.8	11,220.16
265	254	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	3,260.6	11,264.44
266	255	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	3,216.3	11,308.66
267	256	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	3,172.1	11,352.88
268	257	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	3,127.9	11,397.13
269	258	Casing Joints	5 1/2	20.00	P-110	Yes	43.85	Yes		GBCD	3,084.0	11,440.98
270	259	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	3,039.8	11,485.24
271	260	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	2,995.5	11,529.52
272	261	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	2,951.2	11,573.80
273	262	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	2,907.0	11,618.04



Centralizer Depths

Well Name: **Broe 28NA**

Production, Set Depth: **14,525.0ftKB**

API 0512351955000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally

Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jw/ry	Connections	Top (ftKB)	Cum Len (ft)
274	263	Casing Joints	5 1/2	20.00	P-110	Yes	44.09	Yes		GBCD	2,862.9	11,662.13
275	264	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	2,818.6	11,706.41
276	265	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	2,774.4	11,750.65
277	266	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	2,730.1	11,794.88
278	267	Casing Joints	5 1/2	20.00	P-110	Yes	43.84	Yes		GBCD	2,686.3	11,838.72
279	268	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	2,642.0	11,882.97
280	269	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	2,597.8	11,927.23
281	270	Casing Joints	5 1/2	20.00	P-110	Yes	43.10	Yes		GBCD	2,554.7	11,970.33
282	271	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	2,510.4	12,014.58
283	272	Casing Joints	5 1/2	20.00	P-110	Yes	43.50	Yes		GBCD	2,466.9	12,058.08
284	273	Casing Joints	5 1/2	20.00	P-110	Yes	43.95	Yes		GBCD	2,423.0	12,102.03
285	274	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	2,378.7	12,146.31
286	275	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	2,334.5	12,190.53
287	276	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	2,290.2	12,234.76
288	277	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	2,246.0	12,279.00
289	278	Casing Joints	5 1/2	20.00	P-110	Yes	44.22	Yes		GBCD	2,201.8	12,323.22
290	279	Casing Joints	5 1/2	20.00	P-110	Yes	43.84	Yes		GBCD	2,157.9	12,367.06
291	280	Casing Joints	5 1/2	20.00	P-110	Yes	43.90	Yes		GBCD	2,114.0	12,410.96
292	281	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	2,069.8	12,455.23
293	282	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	2,025.5	12,499.48
294	283	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	1,981.3	12,543.72
295	284	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	1,937.1	12,587.95
296	285	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	1,892.8	12,632.23
297	286	Casing Joints	5 1/2	20.00	P-110	Yes	43.50	Yes		GBCD	1,849.3	12,675.73
298	287	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	1,805.1	12,719.94
299	288	Casing Joints	5 1/2	20.00	P-110	Yes	43.90	Yes		GBCD	1,761.2	12,763.84
300	289	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	1,716.9	12,808.07
301	290	Casing Joints	5 1/2	20.00	P-110	Yes	44.21	Yes		GBCD	1,672.7	12,852.28
302	291	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	1,628.5	12,896.51
303	292	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	1,584.2	12,940.76
304	293	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	1,540.0	12,984.99



Centralizer Depths

Well Name: Broe 28NA

Production, Set Depth: 14,525.0ftKB

API 05123519550000		Surface Legal Location NENW 35 6N 67W		Field Name Wattenberg		State CO		Well Configuration Type Horizontal			
Ground Elevation (ft) 4,741.00	Original KB Elevation (ft) 4,769.00	KB-Ground Distance (ft) 28.00	Spud Date 4/12/2023 14:45	Rig Release Date 4/15/2023 14:30	On Production Date	Abandon Date					

Casing Run Tally												
Run #	Ref #	Item Des	OD (in)	Wt (lb/ft)	Grade	Run?	Len (ft)	Centralized?	Ext Jwry	Connections	Top (ftKB)	Cum Len (ft)
305	294	Casing Joints	5 1/2	20.00	P-110	Yes	43.45	Yes		GBCD	1,496.6	13,028.44
306	295	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	1,452.3	13,072.72
307	296	Casing Joints	5 1/2	20.00	P-110	Yes	43.41	Yes		GBCD	1,408.9	13,116.13
308	297	Casing Joints	5 1/2	20.00	P-110	Yes	44.28	Yes		GBCD	1,364.6	13,160.41
309	298	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	1,320.3	13,204.66
310	299	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	1,276.1	13,248.90
311	300	Casing Joints	5 1/2	20.00	P-110	Yes	43.48	Yes		GBCD	1,232.6	13,292.38
312	301	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	1,188.4	13,336.62
313	302	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	1,144.1	13,380.87
314	303	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	1,099.9	13,425.11
315	304	Casing Joints	5 1/2	20.00	P-110	Yes	44.04	Yes		GBCD	1,055.9	13,469.15
316	305	Casing Joints	5 1/2	20.00	P-110	Yes	44.23	Yes		GBCD	1,011.6	13,513.38
317	306	Casing Joints	5 1/2	20.00	P-110	Yes	44.25	Yes		GBCD	967.4	13,557.63
318	307	Casing Joints	5 1/2	20.00	P-110	Yes	43.47	Yes		GBCD	923.9	13,601.10
319	308	Casing Joints	5 1/2	20.00	P-110	Yes	43.84	Yes		GBCD	880.1	13,644.94
320	309	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	835.8	13,689.21
321	310	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	791.5	13,733.47
322	311	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	747.3	13,777.71
323	312	Casing Joints	5 1/2	20.00	P-110	Yes	44.27	Yes		GBCD	703.0	13,821.98
324	313	Casing Joints	5 1/2	20.00	P-110	Yes	44.26	Yes		GBCD	658.8	13,866.24
325	314	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	614.5	13,910.48
326	315	Casing Joints	5 1/2	20.00	P-110	Yes	43.88	Yes		GBCD	570.6	13,954.36
327	316	Casing Joints	5 1/2	20.00	P-110	Yes	44.24	Yes		GBCD	526.4	13,998.60
328	317	Casing Joints	5 1/2	20.00	P-110	Yes	43.86	Yes		GBCD	482.5	14,042.46