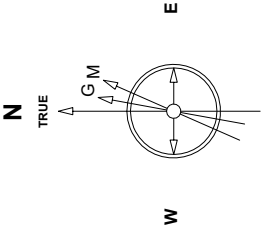


Great Western Operating Company, LLC

Location	Colorado	Slot	C12 - Schaefer LD 13-032HN
Field	Wattenburg	Well	Schaefer LD 13-032HN
Installation	Schaefer	Wellbore	Schaefer LD 13-032HN (AWB)

Created by	admin
Date plotted	9-May-2019
Plot reference is Schaefer LD 13-032HN (AWB).	
Ref wellpath is Schaefer LD 13-032HN (AWPH1).	
Coordinates are in Feet reference C12 - Schaefer LD 13-032HN.	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Actual Datum #1	
Rig Datum to Mean Sea Level: 5041.40 ft.	
Plot North is aligned to TRUE North.	



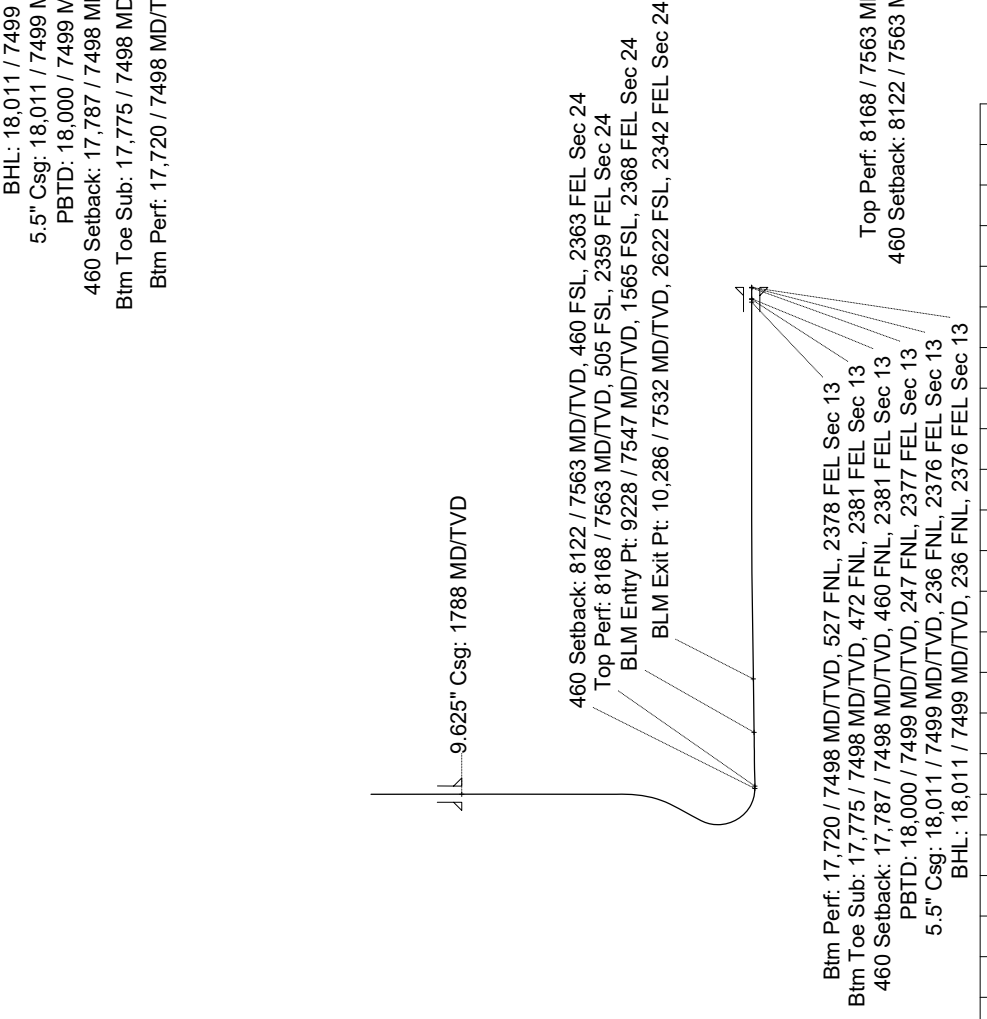
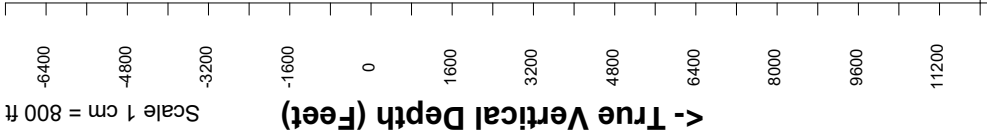
Aug-2-2018  
ENM-2015 (2000.0-2020.0) Dep: 88.28 deg Field: 51980.7 nT  
Lat: N89 56.40, 1460 Long: W104 50 5.2004 Elev: 9021.40 ft  
Magnetic North is 8.18 deg East of TRUE North  
To correct azimuth from Magnetic to TRUE add 8.18 deg

East (Feet) ->

Scale 1 cm = 500 ft



<- True Vertical Depth (Feet)  
Scale 1 cm = 800 ft



BHL: 18,011 / 7499 MD/TV, 236 FNL, 2376 FEL Sec 13  
5.5" Csg: 18,011 / 7499 MD/TV, 236 FNL, 2376 FEL Sec 13  
PBD: 18,000 / 7499 MD/TV, 247 FNL, 2377 FEL Sec 13  
460 Setback: 17,787 / 7498 MD/TV, 460 FNL, 2381 FEL Sec 13  
Btm Toe Sub: 17,775 / 7498 MD/TV, 472 FNL, 2381 FEL Sec 13  
Btm Perf: 17,720 / 7498 MD/TV, 527 FNL, 2378 FEL Sec 13

9.625" Csg: 1788 MD/TV

460 Setback: 8122 / 7563 MD/TV, 460 FSL, 2363 FEL Sec 24  
Top Perf: 8168 / 7563 MD/TV, 505 FSL, 2359 FEL Sec 24  
BLM Entry Pt: 9228 / 7547 MD/TV, 1565 FSL, 2368 FEL Sec 24  
BLM Exit Pt: 10,286 / 7532 MD/TV, 2622 FSL, 2342 FEL Sec 24

Btm Perf: 17,720 / 7498 MD/TV, 527 FNL, 2378 FEL Sec 13  
Btm Toe Sub: 17,775 / 7498 MD/TV, 472 FNL, 2381 FEL Sec 13  
460 Setback: 17,787 / 7498 MD/TV, 460 FNL, 2381 FEL Sec 13  
PBD: 18,000 / 7499 MD/TV, 247 FNL, 2377 FEL Sec 13  
5.5" Csg: 18,011 / 7499 MD/TV, 236 FNL, 2376 FEL Sec 13  
BHL: 18,011 / 7499 MD/TV, 236 FNL, 2376 FEL Sec 13

BLM Exit Pt: 10,286 / 7532 MD/TV  
2622 FSL, 2342 FEL Sec 24

BLM Entry Pt: 9228 / 7547 MD/TV  
1565 FSL, 2368 FEL Sec 24

Top Perf: 8168 / 7563 MD/TV, 505 FSL, 2359 FEL Sec 24  
460 Setback: 8122 / 7563 MD/TV, 460 FSL, 2363 FEL Sec 24

Sec 25, T1S, R67W

Sec 24, T1S, R67W

Sec 13, T1S, R67W

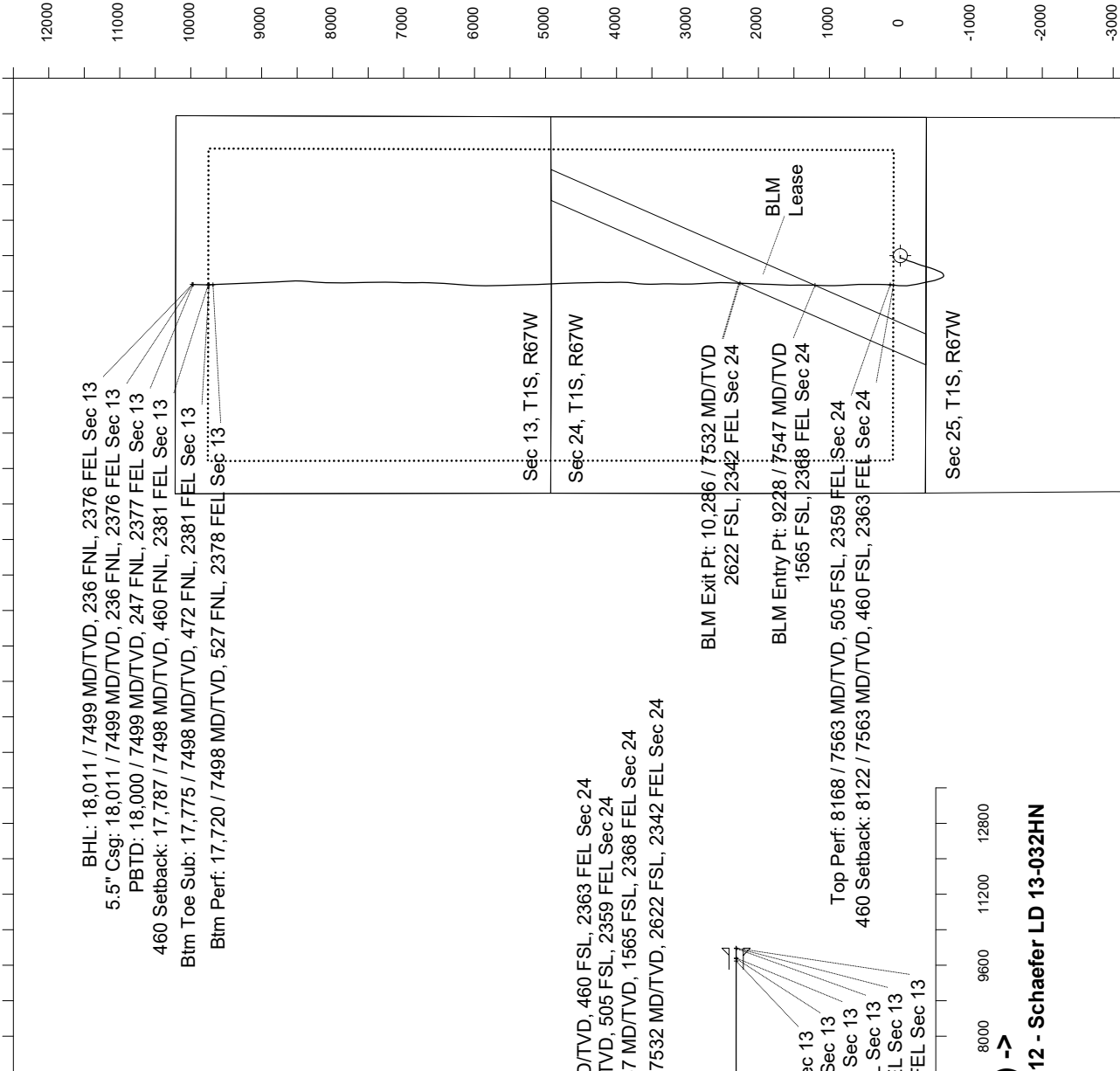
Vertical Section (Feet) ->

Scale 1 cm = 800 ft

Azimuth 357.67 with reference 0.00 N, 0.00 E from C12 - Schaefer LD 13-032HN

<- North(Feet)

Scale 1 cm = 500 ft



Great Western Operating Co, LLC  
Directional Survey Report  
Wellpath: Schaefer LD 13-032HN  
MDs and TVDs are from Rig Floor 5041.4ft above Mean Sea Level

**Wellbore Information**

Date Created	Date Revised	API #	RKB above GL	Well Name
Feb-14-2019	May-9-2019	05-001-10255	20.00	Schaefer LD 13-032HN

**Slot Coordinates**

Latitude	Longitude
39.94432000	-104.83478600

**Pad Information**

Pad Name	Ground Elev.
Schaefer	5021.40

**Field**

Name
Wattenburg

**Wellpath Report**

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
0.00	0.00	0.000	0.00	0.00	0.00		0.00	39.94432000	-104.83478600
20.00	0.00	222.690	20.00	0.00	0.00	==>	0.00	39.94432000	-104.83478600
160.00	0.48	222.690	160.00	-0.43	-0.40	0.34	-0.41	39.94431882	-104.83478742
245.00	0.31	271.640	245.00	-0.69	-0.87	0.43	-0.65	39.94431812	-104.83478910
305.00	0.79	295.990	304.99	-0.50	-1.40	0.87	-0.44	39.94431863	-104.83479100
395.00	1.67	290.540	394.97	0.23	-3.19	0.99	0.36	39.94432064	-104.83479737
485.00	1.41	271.730	484.94	0.73	-5.52	0.63	0.95	39.94432199	-104.83480570
575.00	1.89	282.720	574.90	1.09	-8.08	0.64	1.41	39.94432298	-104.83481481
665.00	1.49	274.020	664.86	1.49	-10.69	0.53	1.93	39.94432410	-104.83482414
755.00	1.36	262.940	754.84	1.45	-12.92	0.34	1.97	39.94432397	-104.83483208
845.00	1.19	268.040	844.81	1.28	-14.91	0.23	1.89	39.94432352	-104.83483919
935.00	1.32	271.560	934.79	1.28	-16.88	0.17	1.96	39.94432351	-104.83484622
1025.00	1.67	264.960	1024.76	1.19	-19.23	0.43	1.97	39.94432327	-104.83485457
1115.00	1.36	264.520	1114.73	0.97	-21.60	0.34	1.85	39.94432267	-104.83486302
1205.00	1.41	255.820	1204.70	0.60	-23.73	0.24	1.56	39.94432165	-104.83487064
1295.00	0.97	273.050	1294.68	0.37	-25.57	0.62	1.41	39.94432102	-104.83487719
1385.00	1.23	255.120	1384.67	0.16	-27.26	0.48	1.27	39.94432045	-104.83488323
1475.00	0.97	261.980	1474.65	-0.19	-28.95	0.32	0.98	39.94431947	-104.83488925
1565.00	0.88	274.810	1564.64	-0.24	-30.39	0.25	0.99	39.94431934	-104.83489439
1655.00	0.40	297.040	1654.63	-0.04	-31.36	0.59	1.23	39.94431989	-104.83489785
1737.00	0.53	102.190	1736.63	0.01	-31.25	1.12	1.28	39.94432003	-104.83489744
1788.00	0.66	97.700	1787.63	-0.08	-30.72	0.28	1.17	39.94431978	-104.83489557
1794.00	0.68	97.290	1793.63	-0.09	-30.65	0.28	1.16	39.94431976	-104.83489532
1883.00	0.03	160.750	1882.63	-0.18	-30.12	0.75	1.05	39.94431951	-104.83489342
1973.00	0.03	74.410	1972.63	-0.19	-30.09	0.05	1.03	39.94431947	-104.83489332
2062.00	0.21	35.120	2061.63	-0.05	-29.97	0.21	1.16	39.94431985	-104.83489290
2152.00	0.69	264.950	2151.63	0.03	-30.42	0.93	1.27	39.94432009	-104.83489449
2241.00	0.13	294.560	2240.62	0.03	-31.04	0.65	1.29	39.94432008	-104.83489672
2331.00	0.09	243.120	2330.62	0.04	-31.20	0.11	1.31	39.94432011	-104.83489728
2421.00	0.31	287.280	2420.62	0.08	-31.50	0.28	1.36	39.94432022	-104.83489833
2510.00	0.07	345.670	2509.62	0.20	-31.74	0.31	1.49	39.94432056	-104.83489920
2600.00	0.18	70.170	2599.62	0.31	-31.62	0.21	1.59	39.94432084	-104.83489877
2689.00	0.19	236.630	2688.62	0.27	-31.61	0.41	1.55	39.94432074	-104.83489874
2779.00	0.04	351.790	2778.62	0.22	-31.74	0.23	1.51	39.94432060	-104.83489920
2868.00	0.20	198.690	2867.62	0.10	-31.80	0.27	1.39	39.94432029	-104.83489940
2958.00	0.16	181.100	2957.62	-0.17	-31.85	0.08	1.12	39.94431953	-104.83489958
3047.00	0.44	238.770	3046.62	-0.47	-32.14	0.43	0.83	39.94431870	-104.83490063
3137.00	0.04	356.700	3136.62	-0.62	-32.44	0.51	0.70	39.94431830	-104.83490170
3227.00	0.03	29.840	3226.62	-0.57	-32.43	0.02	0.75	39.94431844	-104.83490166
3316.00	0.06	253.090	3315.62	-0.56	-32.46	0.09	0.76	39.94431846	-104.83490178
3405.00	0.06	73.680	3404.62	-0.56	-32.46	0.13	0.76	39.94431846	-104.83490178
3495.00	0.14	149.740	3494.62	-0.64	-32.36	0.15	0.67	39.94431823	-104.83490142
3584.00	0.25	198.860	3583.62	-0.92	-32.37	0.21	0.39	39.94431747	-104.83490145
3673.00	0.03	270.660	3672.62	-1.10	-32.46	0.27	0.21	39.94431697	-104.83490175
3763.00	0.09	308.060	3762.62	-1.06	-32.54	0.08	0.26	39.94431709	-104.83490204
3852.00	0.04	5.840	3851.62	-0.99	-32.59	0.09	0.34	39.94431729	-104.83490222
3942.00	0.07	154.260	3941.62	-1.01	-32.56	0.12	0.32	39.94431724	-104.83490212
4031.00	0.07	323.370	4030.62	-1.01	-32.57	0.16	0.31	39.94431723	-104.83490216
4121.00	0.20	183.240	4120.62	-1.12	-32.61	0.29	0.20	39.94431692	-104.83490230
4210.00	0.59	261.110	4209.62	-1.35	-33.07	0.65	-0.01	39.94431630	-104.83490395
4300.00	0.10	283.760	4299.61	-1.40	-33.61	0.55	-0.04	39.94431615	-104.83490586
4389.00	0.18	330.620	4388.61	-1.26	-33.75	0.15	0.11	39.94431654	-104.83490637
4478.00	0.41	12.990	4477.61	-0.83	-33.75	0.34	0.54	39.94431772	-104.83490636
4568.00	0.33	8.460	4567.61	-0.26	-33.64	0.09	1.11	39.94431929	-104.83490596
4657.00	0.22	140.130	4656.61	-0.14	-33.49	0.57	1.22	39.94431962	-104.83490544
4748.00	0.00	8.230	4747.61	-0.27	-33.38	0.24	1.08	39.94431926	-104.83490504
4838.00	0.29	214.070	4837.61	-0.46	-33.51	0.32	0.90	39.94431874	-104.83490549
4927.00	0.06	194.790	4926.61	-0.69	-33.64	0.26	0.67	39.94431810	-104.83490599
5016.00	0.13	170.160	5015.61	-0.84	-33.64	0.09	0.53	39.94431771	-104.83490597
5106.00	2.79	181.060	5105.57	-3.13	-33.66	2.96	-1.76	39.94431142	-104.83490605
5195.00	5.55	185.610	5194.33	-9.58	-34.12	3.12	-8.18	39.94429371	-104.83490769
5285.00	7.96	189.860	5283.70	-20.05	-35.61	2.73	-18.59	39.94426496	-104.83491302
5374.00	10.47	197.960	5371.54	-33.82	-39.16	3.17	-32.20	39.94422717	-104.83492568
5464.00	12.67	205.890	5459.72	-50.48	-46.00	3.01	-48.57	39.94418143	-104.83495004
5553.00	15.72	207.360	5545.99	-69.97	-55.80	3.45	-67.65	39.94412792	-104.83498501
5643.00	18.75	202.210	5631.94	-94.20	-66.88	3.77	-91.41	39.94406141	-104.83502451
5732.00	21.14	194.670	5715.61	-122.98	-76.35	3.94	-119.78	39.94398242	-104.83505830
5822.00	23.64	197.940	5798.82	-155.85	-86.02	3.10	-152.23	39.94389217	-104.83509279
5911.00	26.93	199.450	5879.29	-191.84	-98.23	3.77	-187.70	39.94379338	-104.83513633
6001.00	30.04	199.770	5958.38	-232.27	-112.64	3.46	-227.50	39.94368240	-104.83518772
6090.00	30.04	199.020	6035.43	-274.29	-127.44	0.42	-268.89	39.94356704	-104.83524049

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
6180.00	29.77	199.340	6113.44	-316.67	-142.18	0.35	-310.64	39.94345070	-104.83529306
6270.00	29.94	195.510	6191.51	-359.40	-155.58	2.13	-352.79	39.94333341	-104.83534087
6359.00	29.69	194.570	6268.73	-402.13	-167.07	0.60	-395.02	39.94321610	-104.83538183
6448.00	30.09	199.800	6345.90	-444.46	-180.17	2.96	-436.79	39.94309989	-104.83542856
6538.00	29.86	201.370	6423.86	-486.56	-195.98	0.91	-478.20	39.94298434	-104.83548493
6628.00	29.85	203.340	6501.92	-527.99	-213.02	1.09	-518.91	39.94287061	-104.83554570
6717.00	23.92	204.290	6581.27	-564.80	-229.23	6.68	-555.03	39.94276955	-104.83560351
6807.00	17.90	223.040	6665.40	-591.60	-246.21	9.93	-581.12	39.94269600	-104.83566407
6896.00	13.43	240.100	6751.11	-606.76	-264.52	7.16	-595.53	39.94265437	-104.83572938
6986.00	10.81	273.320	6839.20	-611.49	-282.03	8.14	-599.54	39.94264139	-104.83579183
7075.00	10.78	309.270	6926.73	-605.73	-296.82	7.45	-593.18	39.94265720	-104.83584458
7164.00	15.78	336.900	7013.40	-589.30	-308.03	8.93	-576.32	39.94270229	-104.83588456
7254.00	22.06	336.880	7098.50	-562.48	-319.48	6.98	-549.05	39.94277593	-104.83592539
7343.00	28.57	335.370	7178.91	-527.72	-334.93	7.35	-513.70	39.94287133	-104.83598049
7433.00	35.62	345.490	7255.16	-482.70	-350.50	9.83	-468.08	39.94299493	-104.83603601
7522.00	42.30	350.470	7324.34	-428.00	-361.97	8.28	-412.96	39.94314509	-104.83607691
7611.00	48.60	349.830	7386.75	-365.54	-372.83	7.10	-350.11	39.94331653	-104.83611565
7701.00	56.26	346.230	7441.60	-295.86	-387.72	9.08	-279.88	39.94350784	-104.83616877
7790.00	63.89	346.570	7485.96	-220.94	-405.84	8.58	-204.28	39.94371349	-104.83623338
7879.00	70.75	352.560	7520.29	-140.25	-420.59	9.89	-123.07	39.94393498	-104.83628599
7969.00	77.34	0.760	7545.05	-53.99	-425.52	11.41	-36.68	39.94417177	-104.83630359
8058.00	84.45	5.980	7559.13	33.64	-420.32	9.86	50.67	39.94441234	-104.83628504
8122.36	89.03	5.240	7562.79	97.57	-414.04	7.22	114.30	39.94458784	-104.83626266
8148.00	90.86	4.940	7562.82	123.11	-411.77	7.22	139.72	39.94465794	-104.83625456
8168.00	90.88	4.340	7562.51	143.04	-410.15	2.98	159.57	39.94471266	-104.83624878
8237.00	90.95	2.290	7561.41	211.91	-406.16	2.98	228.22	39.94490172	-104.83623455
8326.00	90.95	0.370	7559.93	300.87	-404.09	2.16	317.03	39.94514593	-104.83622719
8416.00	91.17	359.100	7558.27	390.86	-404.51	1.43	406.95	39.94539294	-104.83622868
8505.00	90.95	0.480	7556.62	479.84	-404.83	1.57	495.87	39.94563720	-104.83622985
8595.00	91.05	359.050	7555.05	569.82	-405.20	1.59	585.80	39.94588422	-104.83623117
8684.00	90.89	355.860	7553.54	658.71	-409.15	3.59	674.77	39.94612822	-104.83624527
8773.00	90.74	356.560	7552.28	747.51	-415.04	0.80	763.73	39.94637198	-104.83626625
8863.00	90.65	357.660	7551.19	837.38	-419.57	1.23	853.72	39.94661870	-104.83628244
8952.00	90.71	359.040	7550.13	926.34	-422.14	1.55	942.71	39.94686289	-104.83629158
9041.00	90.55	0.610	7549.15	1015.33	-422.41	1.77	1031.63	39.94710719	-104.83629256
9131.00	90.77	2.050	7548.11	1105.30	-420.32	1.62	1121.44	39.94735416	-104.83628511
9220.00	90.77	1.880	7546.92	1194.24	-417.27	0.19	1210.19	39.94759831	-104.83627424
9228.23	90.77	1.820	7546.81	1202.46	-417.00	0.79	1218.39	39.94762088	-104.83627329
9310.00	90.80	1.170	7545.69	1284.19	-414.87	0.79	1299.97	39.94784525	-104.83626570
9399.00	90.68	359.750	7544.54	1373.18	-414.16	1.60	1388.86	39.94808953	-104.83626316
9489.00	90.86	358.400	7543.33	1463.16	-415.61	1.51	1478.82	39.94833653	-104.83626834
9578.00	90.89	1.110	7541.97	1552.14	-415.99	3.04	1567.74	39.94858080	-104.83626971
9668.00	90.80	3.050	7540.64	1642.07	-412.73	2.16	1657.46	39.94882766	-104.83625806
9757.00	90.74	2.220	7539.44	1730.96	-408.63	0.93	1746.12	39.94907169	-104.83624347
9847.00	90.71	2.090	7538.30	1820.89	-405.25	0.15	1835.84	39.94931855	-104.83623141
9937.00	90.83	1.860	7537.10	1910.83	-402.15	0.29	1925.58	39.94956545	-104.83622035
10026.00	90.86	2.810	7535.78	1999.75	-398.52	1.07	2014.27	39.94980953	-104.83620743
10116.00	90.71	2.200	7534.55	2089.65	-394.59	0.70	2103.94	39.95005633	-104.83619340
10205.00	91.02	1.620	7533.21	2178.59	-391.62	0.74	2192.69	39.95030048	-104.83618283
10286.12	90.74	1.380	7531.96	2259.67	-389.50	0.45	2273.62	39.95052306	-104.83617525
10294.00	90.71	1.360	7531.86	2267.55	-389.31	0.45	2281.48	39.95054468	-104.83617458
10384.00	90.80	3.150	7530.68	2357.47	-385.77	1.99	2371.18	39.95079152	-104.83616196
10474.00	90.62	3.790	7529.56	2447.30	-380.32	0.74	2460.72	39.95103811	-104.83614253
10563.00	90.49	358.020	7528.70	2536.25	-378.92	6.48	2549.53	39.95128228	-104.83613753
10653.00	90.46	355.260	7527.95	2626.08	-384.19	3.07	2639.51	39.95152888	-104.83615634
10742.00	90.89	357.240	7526.90	2714.88	-390.01	2.28	2728.47	39.95177264	-104.83617711
10832.00	90.62	358.050	7525.72	2804.79	-393.71	0.95	2818.46	39.95201947	-104.83619030
10921.00	90.74	356.890	7524.66	2893.70	-397.64	1.31	2907.45	39.95226353	-104.83620432
11011.00	90.92	358.570	7523.36	2983.62	-401.20	1.88	2997.44	39.95251036	-104.83621704
11100.00	90.65	1.340	7522.14	3072.60	-401.27	3.13	3086.35	39.95275463	-104.83621729
11190.00	90.83	1.910	7520.98	3162.55	-398.72	0.66	3176.13	39.95300157	-104.83620820
11279.00	90.77	0.950	7519.73	3251.52	-396.50	1.08	3264.93	39.95324578	-104.83620028
11369.00	90.68	358.050	7518.59	3341.50	-397.28	3.22	3354.87	39.95349278	-104.83620309
11459.00	90.92	358.100	7517.34	3431.44	-400.31	0.27	3444.86	39.95373968	-104.83621387
11548.00	90.49	359.060	7516.24	3520.40	-402.51	1.18	3533.84	39.95398390	-104.83622174
11637.00	90.68	2.280	7515.33	3609.38	-401.47	3.62	3622.70	39.95422815	-104.83621804
11727.00	90.83	6.940	7514.15	3699.06	-394.24	5.18	3712.01	39.95447432	-104.83619225
11816.00	90.98	8.000	7512.74	3787.29	-382.67	1.20	3799.70	39.95471653	-104.83615099
11906.00	90.95	1.640	7511.22	3876.91	-375.12	7.07	3888.94	39.95496256	-104.83612404
11995.00	90.83	358.150	7509.84	3965.89	-375.28	3.92	3977.85	39.95520680	-104.83612462
12084.00	90.92	358.680	7508.48	4054.84	-377.74	0.60	4066.83	39.95545100	-104.83613341
12174.00	90.86	0.680	7507.08	4144.82	-378.24	2.22	4156.76	39.95569801	-104.83613521
12263.00	90.86	359.640	7505.75	4233.81	-377.99	1.17	4245.66	39.95594229	-104.83613432
12352.00	91.02	358.540	7504.29	4322.79	-379.41	1.25	4334.62	39.95618654	-104.83613937
12442.00	91.02	359.140	7502.69	4412.75	-381.23	0.67	4424.59	39.95643351	-104.83614587
12531.00	90.92	358.770	7501.18	4501.73	-382.85	0.43	4513.56	39.95667775	-104.83615167
12621.00	90.83	358.350	7499.80	4591.69	-385.11	0.48	4603.53	39.95692470	-104.83615974
12710.00	89.94	358.080	7499.21	4680.64	-387.89	1.05	4692.53	39.95716889	-104.83616963
12800.00	90.03	357.910	7499.23	4770.59	-391.03	0.21	4782.53	39.95741580	-104.83618087
12889.00	89.94	357.670	7499.25	4859.52	-394.47	0.29	4871.53	39.95765993	-104.83619312
12979.00	90.12	357.270	7499.21	4949.43	-398.44	0.49	4961.52	39.95790675	-104.83620729
13068.00	90.00	357.540	7499.11	5038.34	-402.47	0.33	5050.52	39.95815081	-104.83622167
13158.00	90.00	358.010	7499.11	5128.27	-405.96	0.52	5140.52	39.95839769	-104.83623414
13247.00	89.97	358.900	7499.14	5217.24	-408.36	1.00	5229.51	39.95864191	-104.83624271
13337.00	90.00	358.510	7499.16	5307.22	-410.40	0.43	5319.50	39.95888891	-104.83624997
13426.00	89.97	357.820	7499.18	5396.17	-413.25	0.78	5408.50	39.95913309	-104.83626014
13515.00	90.18	358.430	7499.07	5485.12	-416.16	0.72	5497.49	39.95937728	-104.83627053
13605.00	90.03	358.510	7498.90	5575.09	-418.56	0.19	5587.48	39.95962425	-104.83627911
13695.00	89.91	358.140	7498.95	5665.05	-421.19	0.43	5677.48	39.95987120	-104.83628850
13784.00	90.06	359.150	7498.97	5754.03	-423.30	1.15	5766.46	39.96011545	-104.83629601
13873.00	89.91	359.900	7499.00	5843.02	-424.03	0.86	5855.42	39.96035975	-104.83629865
13963.00	89.97	1.160	7499.09	5933.02	-423.20	1.40	5945.30	39.96060680	-104.83629569
14052.00	89.94	2.340	7499.16	6021.97	-420.48	1.33	6034.08	39.96085099	-104.83628600
14142.00	89.88	4.010	7499.30	6111.83	-415.50	1.86	6123.66	39.96109766	-104.83626822

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
14231.00	89.97	4.990	7499.42	6200.56	-408.52	1.11	6212.03	39.96134122	-104.83624332
14321.00	89.97	4.550	7499.46	6290.24	-401.03	0.49	6301.34	39.96158743	-104.83621662
14410.00	89.91	3.830	7499.56	6379.01	-394.53	0.81	6389.76	39.96183109	-104.83619343
14499.00	89.97	2.660	7499.65	6467.86	-389.49	1.32	6478.34	39.96207501	-104.83617546
14589.00	90.65	3.370	7499.16	6557.73	-384.76	1.09	6567.95	39.96232172	-104.83615858
14678.00	89.91	2.010	7498.73	6646.63	-380.58	1.74	6656.60	39.96256575	-104.83614369
14768.00	89.97	359.240	7498.82	6736.62	-379.60	3.08	6746.47	39.96281278	-104.83614019
14857.00	89.88	358.720	7498.94	6825.60	-381.18	0.59	6835.45	39.96305705	-104.83614585
14946.00	90.06	0.310	7498.99	6914.60	-381.94	1.80	6924.40	39.96330135	-104.83614854
15036.00	90.09	1.550	7498.87	7004.58	-380.48	1.38	7014.25	39.96354837	-104.83614333
15125.00	90.00	1.040	7498.80	7093.56	-378.47	0.58	7103.08	39.96379262	-104.83613616
15215.00	90.22	1.360	7498.63	7183.54	-376.58	0.43	7192.91	39.96403963	-104.83612944
15304.00	90.03	1.660	7498.43	7272.51	-374.24	0.40	7281.71	39.96428386	-104.83612108
15394.00	90.00	0.380	7498.41	7362.49	-372.63	1.42	7371.55	39.96453087	-104.83611537
15483.00	89.94	359.180	7498.45	7451.49	-372.98	1.35	7460.49	39.96477518	-104.83611660
15573.00	90.09	357.400	7498.43	7541.45	-375.66	1.98	7550.48	39.96502212	-104.83612618
15662.00	90.34	357.170	7498.10	7630.35	-379.88	0.38	7639.48	39.96526616	-104.83614123
15752.00	90.03	359.060	7497.81	7720.29	-382.84	2.13	7729.47	39.96551307	-104.83615179
15841.00	90.03	359.910	7497.76	7809.29	-383.64	0.96	7818.42	39.96575738	-104.83615465
15931.00	90.06	359.100	7497.69	7899.28	-384.41	0.90	7908.38	39.96600442	-104.83615743
16020.00	90.43	0.600	7497.31	7988.28	-384.65	1.74	7997.31	39.96624873	-104.83615826
16109.00	90.25	2.620	7496.78	8077.24	-382.15	2.28	8086.09	39.96649293	-104.83614935
16199.00	90.28	5.430	7496.36	8167.01	-375.83	3.12	8175.53	39.96673935	-104.83612682
16288.00	89.97	3.350	7496.17	8255.74	-369.02	2.36	8263.92	39.96698294	-104.83610252
16378.00	90.28	2.970	7495.97	8345.60	-364.06	0.54	8353.50	39.96722962	-104.83608483
16467.00	90.06	4.080	7495.71	8434.43	-358.58	1.27	8442.04	39.96747347	-104.83606531
16557.00	89.69	359.170	7495.91	8524.37	-356.03	5.47	8531.80	39.96772035	-104.83605621
16646.00	89.85	355.670	7496.26	8613.26	-360.04	3.94	8620.78	39.96796438	-104.83607051
16736.00	89.82	355.980	7496.52	8703.03	-366.59	0.35	8710.73	39.96821078	-104.83609389
16825.00	89.63	358.530	7496.95	8791.91	-370.85	2.87	8799.72	39.96845479	-104.83610910
16915.00	89.82	358.880	7497.38	8881.89	-372.89	0.44	8889.71	39.96870179	-104.83611636
17004.00	89.69	355.900	7497.76	8970.79	-376.94	3.35	8978.69	39.96894582	-104.83613082
17094.00	89.72	357.480	7498.23	9060.63	-382.14	1.76	9068.68	39.96919245	-104.83614936
17183.00	90.03	358.800	7498.42	9149.58	-385.02	1.52	9157.67	39.96943663	-104.83615967
17273.00	89.97	356.930	7498.42	9239.52	-388.38	2.08	9247.67	39.96968351	-104.83617164
17362.00	90.18	357.620	7498.30	9328.42	-392.61	0.81	9336.66	39.96992755	-104.83618674
17451.00	89.97	357.280	7498.19	9417.33	-396.57	0.45	9425.66	39.97017162	-104.83620088
17541.00	89.97	358.510	7498.23	9507.27	-399.87	1.37	9515.66	39.97041851	-104.83621267
17630.00	90.12	357.520	7498.16	9596.21	-402.96	1.13	9604.66	39.97066267	-104.83622368
17720.00	89.75	355.890	7498.27	9686.06	-408.13	1.86	9694.64	39.97090932	-104.83624214
17774.97	89.85	358.740	7498.46	9740.96	-410.70	5.19	9749.61	39.97106003	-104.83625132
17786.83	89.87	359.360	7498.49	9752.82	-410.90	5.19	9761.46	39.97109258	-104.83625202
17809.00	89.91	0.510	7498.53	9774.99	-410.92	5.19	9783.61	39.97115344	-104.83625212
17899.00	89.88	1.280	7498.70	9864.98	-409.52	0.86	9873.47	39.97140047	-104.83624711
17988.00	89.97	2.800	7498.81	9953.92	-406.35	1.71	9962.21	39.97164462	-104.83623581
18000.24	89.97	2.800	7498.82	9966.14	-405.75	==>	9974.40	39.97167818	-104.83623367
18011.00	89.97	2.800	7498.82	9976.89	-405.23	==>	9985.12	39.97170769	-104.83623180

Comments

MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
1788.00	1787.63	-0.08	-30.72	39.94431978	-104.83489557	9.625" Csg: 1788 MD/TVD
8122.36	7562.79	97.57	-414.04	39.94458784	-104.83626266	460 Setback: 8122 / 7563 MD/TVD, 460 FSL, 2363 FEL Sec 24
8168.00	7562.51	143.04	-410.15	39.94471266	-104.83624878	Top Perf: 8168 / 7563 MD/TVD, 505 FSL, 2359 FEL Sec 24
9228.23	7546.81	1202.46	-417.00	39.94762088	-104.83627329	BLM Entry Pt: 9228 / 7547 MD/TVD, 1565 FSL, 2368 FEL Sec 24
10286.12	7531.96	2259.67	-389.50	39.95052306	-104.83617525	BLM Exit Pt: 10,286 / 7532 MD/TVD, 2622 FSL, 2342 FEL Sec 24
17720.00	7498.27	9686.06	-408.13	39.97090932	-104.83624214	Btm Perf: 17,720 / 7498 MD/TVD, 527 FNL, 2378 FEL Sec 13
17774.97	7498.46	9740.96	-410.70	39.97106003	-104.83625132	Btm Toe Sub: 17,775 / 7498 MD/TVD, 472 FNL, 2381 FEL Sec 13
17786.83	7498.49	9752.82	-410.90	39.97109258	-104.83625202	460 Setback: 17,787 / 7498 MD/TVD, 460 FNL, 2381 FEL Sec 13
18000.24	7498.82	9966.14	-405.75	39.97167818	-104.83623367	PBTD: 18,000 / 7499 MD/TVD, 247 FNL, 2377 FEL Sec 13
18011.00	7498.82	9976.89	-405.23	39.97170769	-104.83623180	5.5" Csg: 18,011 / 7499 MD/TVD, 236 FNL, 2376 FEL Sec 13
18011.00	7498.82	9976.89	-405.23	39.97170769	-104.83623180	BHL: 18,011 / 7499 MD/TVD, 236 FNL, 2376 FEL Sec 13

Hole Sections

Diameter [in]	Start MD[ft]	Start TVD[ft]	Start North[ft]	Start East[ft]	End MD[ft]	End TVD[ft]	End North[ft]	End East[ft]
13.500	0.00	0.00	0.00	0.00	1788.00	1787.63	-0.08	-30.72
8.500	1788.00	1787.63	-0.08	-30.72	18011.00	7498.82	9976.89	-405.23

Casings

Name	Top MD[ft]	Top TVD[ft]	Top North[ft]	Top East[ft]	Shoe MD[ft]	Shoe TVD[ft]	Shoe North[ft]	Shoe East[ft]
9 5/8in Casing	0.00	0.00	0.00	0.00	1788.00	1787.63	-0.08	-30.72
5 1/2in Casing	0.00	0.00	0.00	0.00	18011.00	7498.82	9976.89	-405.23

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
524890	As Drilled - 20190217	18011.00	7498.82	MWD

Coordinates are from Slot  
MD's and TVD's are from Rig Floor 5041.4ft above Mean Sea Level  
Vertical Section is from 0.00 0.00 on azimuth 357.670 degrees  
Bottom hole distance is 9985.12 Feet on azimuth 357.67 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Great Western Operating Co.  
Date Printed: