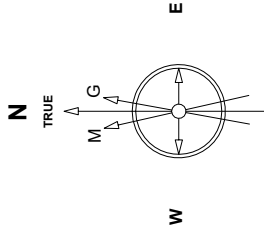


Great Western Operating Company, LLC

Created by	admin
Date plotted	15-Jul-2019
Plot reference is Raindance FD 20-282HC (AWB).	
Ref wellpath is Raindance FD 20-282HC (AWP#1).	
Coordinates are in Feet reference Slot W-09 - Raindance FD 20-282HC.	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Actual Datum #1	
Rig Datum to Mean Sea Level: 4806.40 ft.	
Plot North is aligned to TRUE North.	

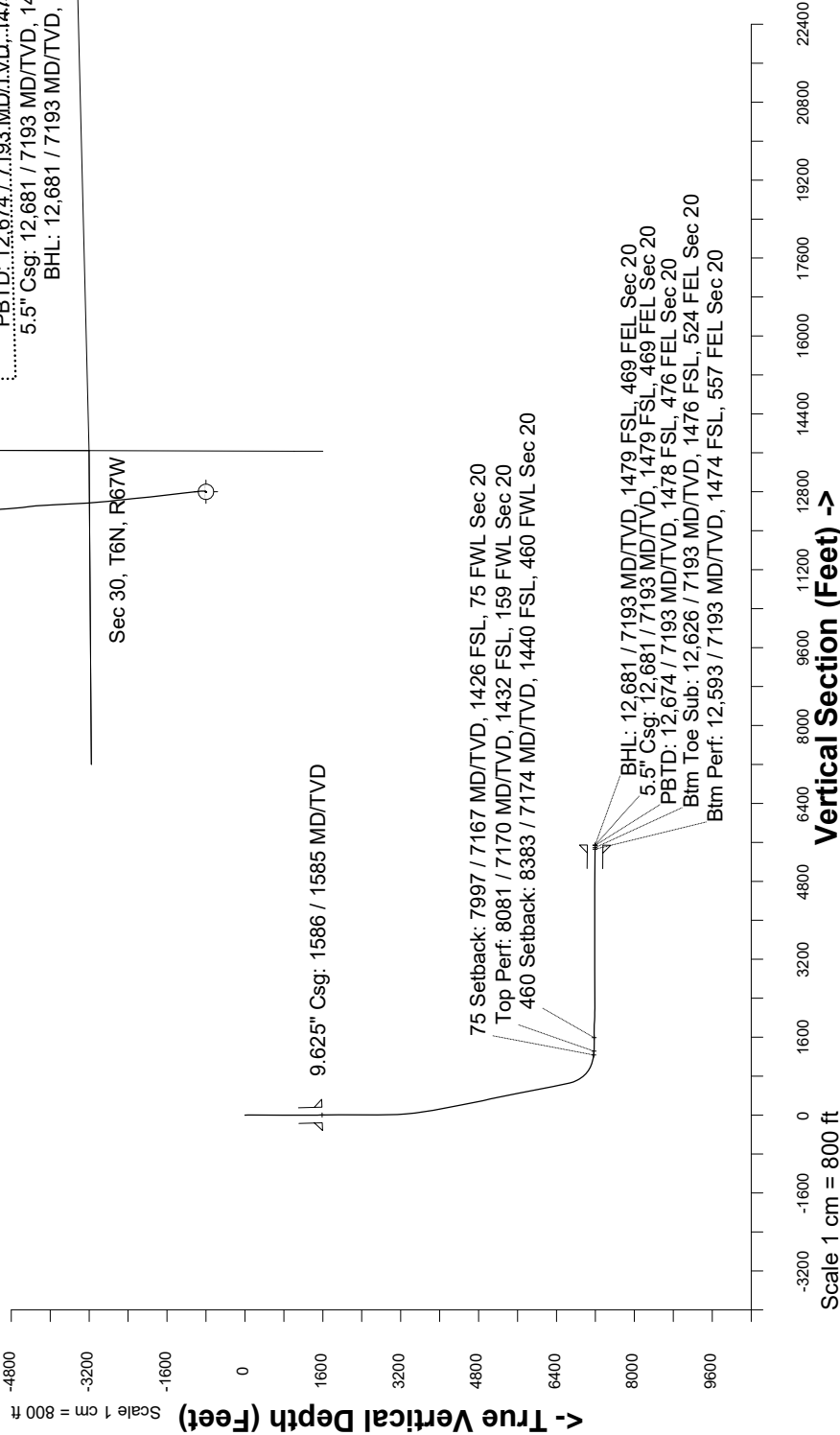
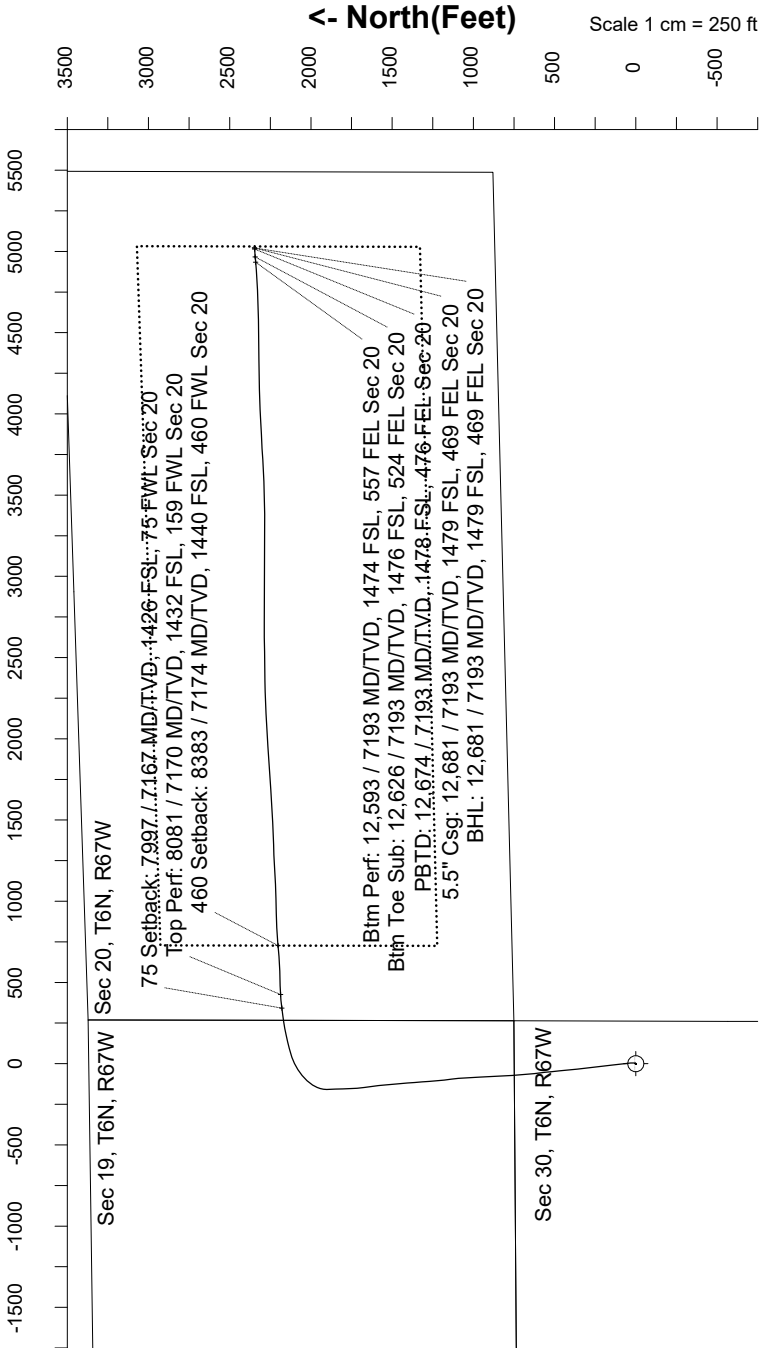
Location	Colorado	Slot	Slot W-09 - Raindance FD 20-282HC
Field	Wattenburg	Well	Raindance FD 20-282HC
Installation	Raindance	Wellbore	Raindance FD 20-282HC (AWB)



Nov-14-2016
Dip: -29.88 deg Field: 32206.0 nT
Lat: 50.0 0.0000 Long: E3.0 0.0000 Elev: 4768.40 ft
Magnetic North is 4.17 deg West of TRUE North
To correct azimuth from Magnetic to TRUE subtract 4.17 deg

East (Feet) ->

Scale 1 cm = 250 ft



Azimuth 64.95 with reference 0.00 N, 0.00 E from Slot W-09 - Raindance FD 20-282HC

Great Western Operating Co, LLC Directional Survey Report Wellpath: Raindance FD 20-282HC MDs and TVDs are from Rig Floor 4808.4ft above Mean Sea Level
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Wellbore Information

Date Created	Date Revised	API #	RKB above GL	Well Name
Jul-25-2017	Jul-10-2019	05-001-44991	20.00	Raindance FD 20-282HC

Slot Coordinates

Latitude	Longitude
40.46293600	-104.92740400

Pad Information

Pad Name	Ground Elev.
Raindance	4788.40

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	40.46293600	-104.92740400
61.50	0.97	30.540	61.50	0.45	0.26	1.58	0.43	40.46293723	-104.92740305
91.50	0.97	46.010	91.49	0.84	0.58	0.87	0.88	40.46293832	-104.92740193
120.50	0.88	49.090	120.49	1.16	0.92	0.35	1.33	40.46293918	-104.92740069
152.50	0.79	54.270	152.49	1.45	1.29	0.37	1.78	40.46293998	-104.92739938
184.50	0.48	38.360	184.48	1.68	1.55	1.11	2.12	40.46294062	-104.92739844
216.50	0.44	7.070	216.48	1.91	1.65	0.78	2.30	40.46294124	-104.92739808
247.50	0.35	331.830	247.48	2.11	1.62	0.82	2.36	40.46294180	-104.92739819
279.50	0.44	254.480	279.48	2.17	1.45	1.56	2.23	40.46294194	-104.92739878
311.50	0.75	220.560	311.48	1.97	1.20	1.43	1.92	40.46294142	-104.92739970
343.50	0.92	213.260	343.48	1.60	0.92	0.63	1.51	40.46294039	-104.92740069
373.50	1.41	210.800	373.47	1.08	0.60	1.64	1.00	40.46293897	-104.92740185
405.50	1.19	221.080	405.46	0.49	0.18	1.00	0.37	40.46293735	-104.92740336
436.50	1.05	226.970	436.46	0.06	-0.24	0.58	-0.19	40.46293615	-104.92740486
467.50	0.66	233.040	467.45	-0.25	-0.59	1.29	-0.64	40.46293533	-104.92740612
499.50	0.44	194.450	499.45	-0.48	-0.77	1.31	-0.90	40.46293470	-104.92740676
531.50	0.22	98.300	531.45	-0.60	-0.74	1.60	-0.92	40.46293434	-104.92740665
563.50	0.31	54.180	563.45	-0.56	-0.61	0.67	-0.79	40.46293446	-104.92740618
594.50	0.44	33.960	594.45	-0.41	-0.47	0.59	-0.60	40.46293487	-104.92740570
626.50	0.79	33.090	626.45	-0.13	-0.28	1.09	-0.31	40.46293565	-104.92740502
658.50	1.23	26.230	658.44	0.37	-0.01	1.42	0.14	40.46293701	-104.92740404
690.50	1.19	17.440	690.44	0.99	0.24	0.59	0.64	40.46293872	-104.92740314
722.50	1.27	4.080	722.43	1.66	0.37	0.93	1.03	40.46294056	-104.92740269
754.50	1.10	336.310	754.42	2.30	0.27	1.85	1.21	40.46294231	-104.92740304
786.50	1.01	296.320	786.42	2.70	-0.11	2.27	1.05	40.46294342	-104.92740439
818.50	1.41	265.600	818.41	2.80	-0.75	2.34	0.50	40.46294368	-104.92740671
850.50	1.54	248.940	850.40	2.61	-1.55	1.39	-0.30	40.46294317	-104.92740957
882.50	1.80	214.840	882.39	2.05	-2.24	3.16	-1.16	40.46294162	-104.92741204
914.50	1.93	215.190	914.37	1.19	-2.83	0.41	-2.06	40.46293928	-104.92741419
946.50	1.97	213.260	946.35	0.29	-3.45	0.24	-3.00	40.46293681	-104.92741639
978.50	1.27	216.770	978.34	-0.45	-3.96	2.21	-3.78	40.46293476	-104.92741823
1009.50	0.70	195.850	1009.33	-0.91	-4.22	2.14	-4.21	40.46293351	-104.92741916
1041.50	0.35	64.370	1041.33	-1.05	-4.18	3.03	-4.24	40.46293311	-104.92741903
1073.50	1.36	50.390	1073.33	-0.77	-3.80	3.20	-3.77	40.46293389	-104.92741767
1106.50	2.15	37.830	1106.31	-0.03	-3.12	2.65	-2.84	40.46293592	-104.92741522
1138.50	2.10	51.010	1138.29	0.81	-2.30	1.53	-1.74	40.46293823	-104.92741226
1170.50	1.45	48.990	1170.28	1.45	-1.54	2.04	-0.78	40.46293997	-104.92740952
1202.50	0.74	49.160	1202.27	1.85	-1.07	2.22	-0.19	40.46294107	-104.92740786
1233.50	0.39	278.300	1233.27	1.99	-1.03	3.35	-0.09	40.46294147	-104.92740769
1265.50	0.65	231.010	1265.27	1.90	-1.28	1.50	-0.35	40.46294120	-104.92740859
1297.50	1.23	215.980	1297.26	1.50	-1.62	1.95	-0.83	40.46294013	-104.92740982
1329.50	1.49	196.650	1329.25	0.83	-1.94	1.64	-1.41	40.46293827	-104.92741097
1360.50	1.31	164.570	1360.25	0.10	-1.96	2.56	-1.73	40.46293627	-104.92741105
1392.50	1.49	145.400	1392.24	-0.60	-1.63	1.56	-1.73	40.46293436	-104.92740985
1424.50	1.05	130.200	1424.23	-1.13	-1.17	1.72	-1.54	40.46293290	-104.92740820
1455.50	1.18	94.160	1455.22	-1.33	-0.63	2.26	-1.14	40.46293234	-104.92740627
1491.50	1.40	57.510	1491.21	-1.13	0.11	2.33	-0.38	40.46293291	-104.92740361
1535.50	1.58	42.000	1535.20	-0.39	0.97	1.00	0.71	40.46293494	-104.92740052
1585.50	1.62	42.560	1585.18	0.65	1.91	0.08	2.00	40.46293778	-104.92739715
1612.00	1.64	42.840	1611.67	1.20	2.42	0.08	2.70	40.46293930	-104.92739531
1701.00	0.31	146.410	1700.66	1.93	3.42	1.95	3.91	40.46294131	-104.92739172
1791.00	0.07	23.270	1790.66	1.78	3.57	0.39	3.99	40.46294089	-104.92739116
1881.00	0.03	67.130	1880.66	1.84	3.62	0.06	4.06	40.46294106	-104.92739100
1970.00	0.04	204.580	1969.66	1.82	3.63	0.07	4.06	40.46294100	-104.92739097
2059.00	0.04	299.530	2058.66	1.81	3.59	0.07	4.01	40.46294097	-104.92739111
2149.00	0.04	7.850	2148.66	1.86	3.56	0.05	4.01	40.46294109	-104.92739120
2238.00	0.03	87.040	2237.66	1.89	3.59	0.05	4.05	40.46294118	-104.92739110
2327.00	0.03	14.800	2326.66	1.91	3.62	0.04	4.09	40.46294125	-104.92739099
2417.00	0.16	122.320	2416.66	1.87	3.73	0.19	4.17	40.46294113	-104.92739059
2506.00	0.07	197.030	2505.66	1.75	3.82	0.18	4.20	40.46294080	-104.92739027
2596.00	0.07	151.450	2595.66	1.65	3.83	0.06	4.17	40.46294052	-104.92739023
2685.00	0.00	98.460	2684.66	1.60	3.86	0.08	4.17	40.46294039	-104.92739014
2774.00	0.03	16.640	2773.66	1.62	3.86	0.03	4.19	40.46294045	-104.92739012
2863.00	0.29	4.900	2862.66	1.87	3.89	0.29	4.31	40.46294113	-104.92739002
2953.00	2.76	4.280	2952.62	4.26	4.07	2.74	5.49	40.46294769	-104.92738937
3042.00	4.84	0.990	3041.42	10.15	4.30	2.35	8.19	40.46296386	-104.92738856
3132.00	6.77	2.230	3130.95	19.25	4.57	2.15	12.29	40.46298883	-104.92738759
3221.00	9.45	356.290	3219.05	31.78	4.30	3.15	17.35	40.46302324	-104.92738855
3310.00	12.56	354.350	3306.41	48.71	2.87	3.52	23.23	40.46306970	-104.92739368
3400.00	16.83	353.910	3393.44	71.41	0.53	4.75	30.72	40.46313202	-104.92740211
3490.00	22.70	354.710	3478.10	101.69	-2.46	6.53	40.83	40.46321511	-104.92741284
3579.00	23.94	353.010	3559.83	136.71	-6.24	1.59	52.24	40.46331125	-104.92742643
3669.00	24.02	349.900	3642.07	172.87	-11.68	1.41	62.62	40.46341050	-104.92744596
3758.00	25.94	351.390	3722.74	209.95	-17.77	2.27	72.81	40.46351229	-104.92746785
3847.00	26.88	354.080	3802.45	249.21	-22.76	1.71	84.91	40.46362006	-104.92748578
3937.00	30.02	356.060	3881.58	291.92	-26.40	3.64	99.69	40.46373729	-104.92749889
4026.00	30.17	355.340	3958.58	336.42	-29.75	0.44	115.51	40.46385944	-104.92751091
4115.00	30.15	354.000	4035.53	380.94	-33.90	0.76	130.59	40.46398164	-104.92752584
4205.00	29.86	353.340	4113.47	425.68	-38.86	0.49	145.04	40.46410442	-104.92754367
4294.00	30.06	353.790	4190.58	469.84	-43.84	0.34	159.23	40.46422565	-104.92756157
4384.00	29.85	353.720	4268.55	514.51	-48.73	0.24	173.72	40.46434827	-104.92757914
4473.00	29.90	354.370	4345.73	558.61	-53.33	0.37	188.22	40.46446930	-104.92759567
4562.00	30.13	354.200	4422.79	602.90	-57.77	0.28	202.96	40.46459089	-104.92761160
4652.00	29.								

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
6080.00	29.97	355.400	5736.55	1360.84	-115.71	0.66	471.42	40.46667133	-104.92781985
6169.00	30.09	355.360	5813.60	1405.24	-119.30	0.14	486.96	40.46679319	-104.92783274
6259.00	29.92	355.360	5891.54	1450.10	-122.94	0.19	502.66	40.46691632	-104.92784583
6348.00	30.23	355.530	5968.56	1494.56	-126.48	0.36	518.28	40.46703836	-104.92785856
6438.00	29.86	354.910	6046.47	1539.46	-130.23	0.54	533.89	40.46716161	-104.92787205
6527.00	29.61	353.120	6123.75	1583.36	-134.83	1.04	548.31	40.46728211	-104.92788858
6616.00	29.88	352.310	6201.02	1627.16	-140.43	0.54	561.79	40.46740233	-104.92790871
6706.00	30.02	352.290	6279.01	1671.68	-146.45	0.16	575.19	40.46752455	-104.92793035
6795.00	29.46	355.630	6356.29	1715.57	-151.11	1.96	589.55	40.46764502	-104.92794708
6884.00	30.06	358.000	6433.55	1759.67	-153.55	1.48	606.01	40.46776607	-104.92795587
6974.00	29.63	357.850	6511.62	1804.43	-155.17	0.48	623.50	40.46788893	-104.92796170
7063.00	29.28	358.640	6589.11	1848.18	-156.52	0.59	640.80	40.46800900	-104.92796652
7153.00	29.98	355.860	6667.35	1892.61	-158.66	1.71	657.68	40.46813096	-104.92797423
7242.00	29.61	13.530	6744.73	1936.25	-155.12	9.84	679.37	40.46825075	-104.92796149
7332.00	33.92	31.060	6821.40	1979.49	-136.91	11.27	714.17	40.46836944	-104.92789606
7421.00	37.37	40.990	6893.77	2021.20	-106.35	7.56	759.52	40.46848392	-104.92778622
7510.00	41.89	51.560	6962.38	2060.12	-65.29	9.11	813.20	40.46859076	-104.92763865
7600.00	51.70	62.970	7024.03	2095.00	-10.07	14.26	877.99	40.46868649	-104.92744018
7689.00	59.22	72.030	7074.52	2122.74	57.60	11.89	951.04	40.46876265	-104.92719698
7778.00	66.78	77.100	7114.92	2143.71	133.98	9.89	1029.11	40.46882020	-104.92692247
7868.00	74.26	79.840	7144.92	2160.61	217.06	8.79	1111.53	40.46886658	-104.92662389
7957.00	82.78	82.110	7162.62	2174.25	303.12	9.89	1195.27	40.46890403	-104.92631459
7996.60	85.27	83.350	7166.74	2179.23	342.18	7.01	1232.77	40.46891770	-104.92617419
8046.00	88.37	84.890	7169.48	2184.28	391.24	7.01	1279.35	40.46893156	-104.92599788
8081.00	89.03	86.420	7170.27	2186.94	426.13	4.75	1312.08	40.46893884	-104.92587248
8135.00	90.06	88.770	7170.70	2189.20	480.07	4.75	1361.91	40.46894506	-104.92567860
8225.00	89.11	88.580	7171.35	2191.28	570.04	1.08	1444.30	40.46895076	-104.92535523
8314.00	89.05	84.760	7172.78	2196.45	658.87	4.29	1526.95	40.46896494	-104.92503600
8382.64	89.14	84.980	7173.87	2202.59	727.22	0.34	1591.48	40.46898179	-104.92479033
8403.00	89.17	85.040	7174.17	2204.36	747.50	0.34	1610.60	40.46898665	-104.92471744
8493.00	88.95	87.890	7175.64	2209.91	837.31	3.18	1694.31	40.46900187	-104.92439466
8582.00	88.52	88.370	7177.61	2212.81	926.24	0.72	1776.10	40.46900983	-104.92407504
8672.00	88.31	88.640	7180.10	2215.16	1016.18	0.38	1858.57	40.46901627	-104.92375181
8761.00	88.28	87.440	7182.74	2218.20	1105.08	1.35	1940.40	40.46902461	-104.92343228
8850.00	88.37	86.000	7185.35	2223.29	1193.90	1.62	2023.02	40.46903857	-104.92311307
8940.00	88.83	87.520	7187.55	2228.38	1283.72	1.76	2106.54	40.46905251	-104.92279023
9029.00	90.25	88.020	7188.26	2231.84	1372.65	1.69	2188.57	40.46906200	-104.92247062
9119.00	90.18	87.670	7187.92	2235.23	1462.59	0.40	2271.48	40.46907128	-104.92214739
9208.00	90.28	87.070	7187.56	2239.31	1551.49	0.68	2353.75	40.46908247	-104.92182786
9298.00	90.28	86.510	7187.12	2244.35	1641.35	0.62	2437.29	40.46909629	-104.92150490
9387.00	90.15	86.770	7186.79	2249.56	1730.19	0.33	2519.98	40.46911059	-104.92118558
9477.00	90.28	86.740	7186.45	2254.66	1820.05	0.15	2603.54	40.46912456	-104.92086264
9566.00	90.22	85.570	7186.06	2260.63	1908.85	1.32	2686.51	40.46914092	-104.92054349
9656.00	89.97	85.480	7185.92	2267.65	1998.57	0.30	2770.77	40.46916017	-104.92022101
9745.00	90.12	86.160	7185.85	2274.14	2087.33	0.78	2853.93	40.46917796	-104.91990199
9835.00	90.15	88.070	7185.63	2278.67	2177.22	2.12	2937.27	40.46919037	-104.91957895
9924.00	90.06	89.000	7185.47	2280.94	2266.19	1.05	3018.84	40.46919660	-104.91925919
10014.00	90.09	88.580	7185.35	2282.84	2356.17	0.47	3101.16	40.46920179	-104.91893579
10103.00	90.06	89.250	7185.24	2284.53	2445.15	0.75	3182.48	40.46920639	-104.91861598
10192.00	90.12	89.430	7185.10	2285.55	2534.14	0.21	3263.54	40.46920918	-104.91829613
10282.00	90.12	89.200	7184.91	2286.63	2624.14	0.26	3345.52	40.46921211	-104.91797269
10372.00	90.09	89.980	7184.74	2287.27	2714.13	0.87	3427.32	40.46921385	-104.91764923
10461.00	90.00	90.080	7184.67	2287.23	2803.13	0.15	3507.93	40.46921369	-104.91732936
10550.00	89.97	89.690	7184.70	2287.40	2892.13	0.44	3588.63	40.46921416	-104.91700949
10640.00	89.97	90.110	7184.74	2287.56	2982.13	0.47	3670.23	40.46921456	-104.91668603
10729.00	89.85	91.240	7184.88	2286.51	3071.12	1.28	3750.41	40.46921165	-104.91636619
10819.00	90.06	91.550	7184.95	2284.32	3161.10	0.42	3830.99	40.46920561	-104.91604282
10908.00	90.09	90.110	7184.84	2283.03	3250.09	1.62	3911.06	40.46920204	-104.91572299
10998.00	90.03	89.550	7184.74	2283.30	3340.09	0.63	3992.71	40.46920273	-104.91539953
11087.00	89.97	88.310	7184.74	2284.96	3429.07	1.39	4074.02	40.46920726	-104.91507972
11177.00	89.85	87.370	7184.88	2288.35	3519.00	1.05	4156.93	40.46921654	-104.91475648
11266.00	90.06	87.620	7184.95	2292.24	3607.92	0.37	4239.13	40.46922718	-104.91443691
11355.00	89.91	87.380	7184.98	2296.13	3696.83	0.32	4321.32	40.46923780	-104.91411735
11445.00	90.00	87.120	7185.05	2300.44	3786.73	0.31	4404.59	40.46924962	-104.91379425
11534.00	90.00	87.050	7185.05	2304.97	3875.61	0.08	4487.03	40.46926200	-104.91347479
11624.00	89.91	87.320	7185.12	2309.39	3965.51	0.32	4570.34	40.46927409	-104.91315171
11713.00	90.03	87.210	7185.17	2313.64	4054.40	0.18	4652.67	40.46928571	-104.91283220
11803.00	90.25	88.550	7184.95	2316.97	4144.34	1.51	4735.55	40.46929481	-104.91250896
11892.00	89.17	89.220	7185.40	2318.70	4233.32	1.43	4816.90	40.46929952	-104.91218916
11981.00	89.32	88.710	7186.57	2320.31	4322.30	0.60	4898.18	40.46930389	-104.91186937
12071.00	89.29	89.850	7187.66	2321.44	4412.28	1.27	4980.18	40.46930695	-104.91154596
12160.00	89.51	90.310	7188.59	2321.31	4501.28	0.57	5060.75	40.46930657	-104.91122611
12250.00	89.51	88.670	7189.36	2322.11	4591.27	1.82	5142.62	40.46930872	-104.91090267
12339.00	89.51	87.430	7190.12	2325.14	4680.21	1.39	5224.47	40.46931699	-104.91058300
12429.00	89.45	86.640	7190.94	2329.80	4770.09	0.88	5307.87	40.46932972	-104.91025998
12518.00	89.35	86.160	7191.87	2335.38	4858.91	0.55	5390.69	40.46934501	-104.90994076
12593.00	89.48	85.860	7192.64	2340.60	4933.72	0.44	5460.68	40.46935929	-104.90967187
12608.00	89.51	85.800	7192.77	2341.69	4948.68	0.44	5474.69	40.46936228	-104.90961810
12626.00	89.53	85.770	7192.92	2343.02	4966.63	0.22	5491.52	40.46936590	-104.90955358
12657.00	89.57	85.710	7193.16	2345.32	4997.54	0.22	5520.50	40.46937220	-104.90944248
12674.00	89.57	85.710	7193.29	2346.59	5014.49	==>	5536.39	40.46937569	-104.90938155
12681.00	89.57	85.710	7193.34	2347.12	5021.48	==>	5542.94	40.46937712	-104.90935646

Comments							
MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment	
1585.50	1585.18	0.65	1.91	40.46293778	-104.92739715	9.625" Csg: 1586 / 1585 MD/TVD	
7996.60	7166.74	2179.23	342.18	40.46891770	-104.92617419	75 Setback: 7997 / 7167 MD/TVD, 1426 FSL, 75 FWL Sec 20	
8081.00	7170.27	2186.94	426.13	40.46893884	-104.92587248	Top Perf: 8081 / 7170 MD/TVD, 1432 FSL, 159 FWL Sec 20	
8382.64	7173.87	2202.59	727.22	40.46898179	-104.92479033	460 Setback: 8383 / 7174 MD/TVD, 1440 FSL, 460 FWL Sec 20	
12593.00	7192.64	2340.60	4933.72	40.46935929	-104.90967187	Btm Perf: 12,593 / 7193 MD/TVD, 1474 FSL, 557 FEL Sec 20	
12626.00	7192.92	2343.02	4966.63	40.46936590	-104.90955358	Btm Toe Sub: 12,626 / 7193 MD/TVD, 1476 FSL, 524 FEL Sec 20	
12674.00	7193.29	2346.59	5014.49	40.46937569	-104.90938155	PBTD: 12,674 / 7193 MD/TVD, 1478 FSL, 476 FEL Sec 20	
12681.00	7193.34	2347.12	5021.48	40.46937712	-104.90935646	5.5" Csg: 12,681 / 7193 MD/TVD, 1479 FSL, 469 FEL Sec 20	
12681.00	7193.34	2347.12	5021.48	40.46937712	-104.90935646	BHL: 12,681 / 7193 MD/TVD, 1479 FSL, 469 FEL Sec 20	

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	1585.50	1585.18	0.65	1.91
8.500	1585.50	1585.18	0.65	1.91	12681.00	7193.34	2347.12	5021.48