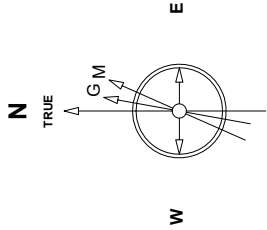


Great Western Operating Company, LLC

Created by	admin
Date plotted	17-Apr-2019
Plot reference is Stillroven Farm 4 (AWB).	
Ref wellpath is Stillroven Farm 4 (AWP#1).	
Coordinates are in Feet reference Stillroven Farm 4.	
True Vertical Depths are reference Rig Datum.	
Measured Depths are reference Rig Datum.	
Rig Datum: Actual Datum #1	
Rig Datum to Mean Sea Level: 5095.00 ft.	
Plot North is aligned to TRUE North.	

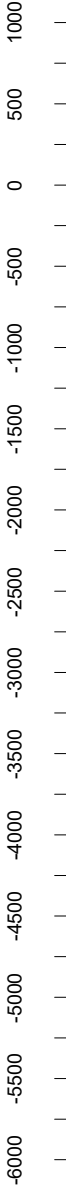
Location	Colorado	Slot	Stillroven Farm 4
Field	Wattenburg	Well	Stillroven Farm 4
Installation	Stillroven Farm	Wellbore	Stillroven Farm 4 (AWB)



Aug-10-2018  
EAM-2016 (2000.0-2020.0) Dip: 66.62 deg Field: 52108.7 nT  
Lat: N40 15 38; 7000 Long: W 105 17 760 Elev: 5075.00 ft  
Magnetic North is 8.48 deg East of TRUE North  
To correct azimuth from Magnetic to TRUE add 8.48 deg

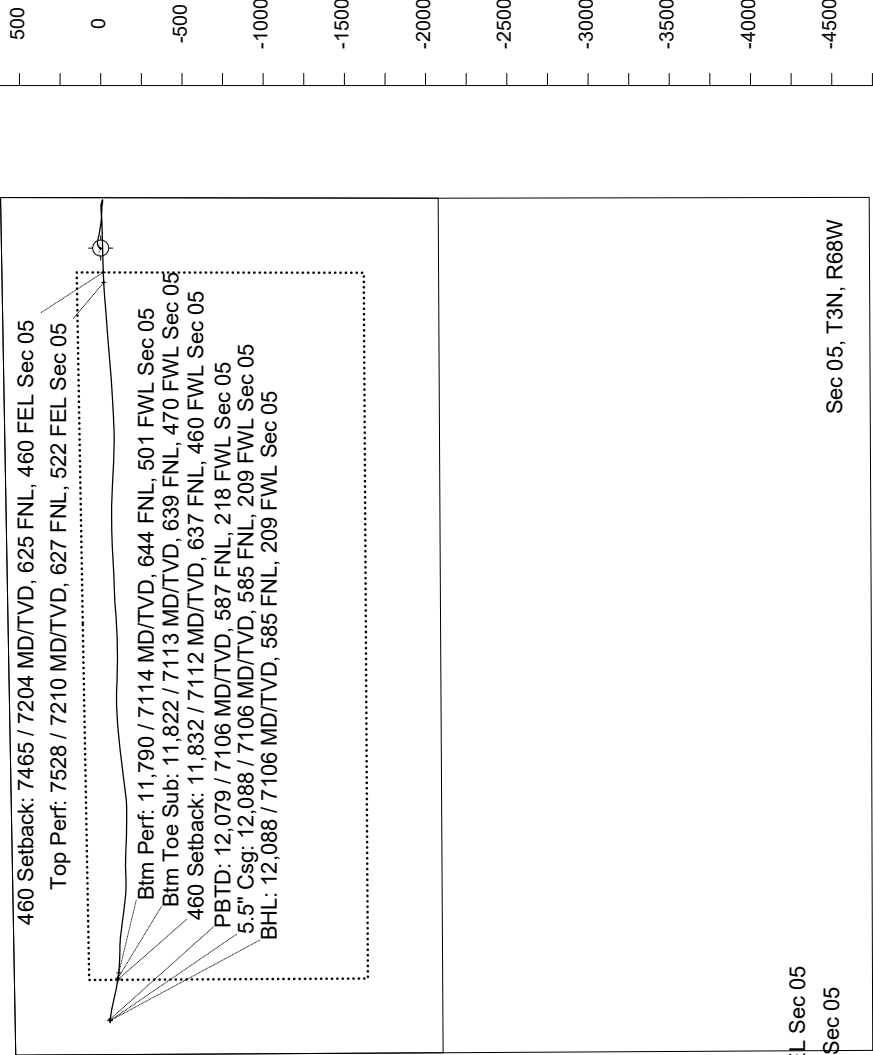
East (Feet) ->

Scale 1 cm = 250 ft



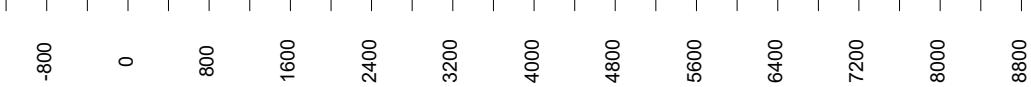
North(Feet)

Scale 1 cm = 250 ft



Scale 1 cm = 400 ft

<- True Vertical Depth (Feet)



460 Setback: 7465 / 7204 MD/TVD, 625 FNL, 460 FEL Sec 05  
Top Perf: 7528 / 7210 MD/TVD, 627 FNL, 522 FEL Sec 05

Btm Perf: 11,790 / 7114 MD/TVD, 644 FNL, 501 FWL Sec 05  
Btm Toe Sub: 11,822 / 7113 MD/TVD, 639 FNL, 470 FWL Sec 05  
460 Setback: 11,832 / 7112 MD/TVD, 637 FNL, 460 FWL Sec 05  
BHL: 12,088 / 7106 MD/TVD, 585 FNL, 209 FWL Sec 05  
5.5" Csg: 12,088 / 7106 MD/TVD, 585 FNL, 209 FWL Sec 05  
PBTD: 12,079 / 7106 MD/TVD, 587 FNL, 218 FWL Sec 05

Scale 1 cm = 400 ft

Vertical Section (Feet) ->



Azimuth 269.30 with reference 0.00 N, 0.00 E from Stillroven Farm 4

Great Western Operating Co, LLC Directional Survey Report Wellpath: Stillroven Farm 4 MDs and TVDs are from Rig Floor 5095.0ft above Mean Sea Level
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Wellbore Information

Date Created	Date Revised	API #	RKB above GL	Well Name
Oct-5-2018	Dec-5-2018	05-123-45404	20.00	Stillroven Farm 4

Slot Coordinates

Latitude	Longitude
40.26062300	-105.01880600

Pad Information

Pad Name	Ground Elev.
Stillroven Farm	5075.00

Field

Name
Wattensburg

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	40.26062300	-105.01880600
20.00	0.00	231.980	20.00	0.00	0.00	==>	0.00	40.26062300	-105.01880600
151.00	0.48	231.980	151.00	-0.34	-0.43	0.37	0.44	40.26062207	-105.01880755
238.00	0.70	226.090	237.99	-0.93	-1.10	0.26	1.11	40.26062044	-105.01880995
296.00	0.22	206.840	295.99	-1.28	-1.41	0.86	1.42	40.26061950	-105.01881104
387.00	0.04	339.120	386.99	-1.40	-1.50	0.27	1.51	40.26061915	-105.01881137
477.00	0.18	268.980	476.99	-1.38	-1.65	0.19	1.67	40.26061922	-105.01881191
567.00	0.22	264.320	566.99	-1.40	-1.96	0.05	1.98	40.26061917	-105.01881304
657.00	0.13	140.220	656.99	-1.49	-2.07	0.35	2.09	40.26061891	-105.01881342
747.00	0.44	90.830	746.99	-1.57	-1.66	0.41	1.68	40.26061868	-105.01881195
837.00	0.35	54.350	836.99	-1.42	-1.09	0.29	1.11	40.26061911	-105.01880991
927.00	0.57	76.940	926.98	-1.16	-0.43	0.31	0.45	40.26061982	-105.01880754
1017.00	1.10	18.840	1016.98	-0.24	0.28	1.04	-0.28	40.26062234	-105.01880498
1107.00	0.66	333.930	1106.97	1.04	0.34	0.87	-0.35	40.26062587	-105.01880480
1197.00	0.40	249.380	1196.96	1.40	-0.19	0.82	0.17	40.26062684	-105.01880667
1287.00	0.75	232.950	1286.96	0.93	-0.95	0.43	0.94	40.26062556	-105.01880941
1377.00	0.31	269.860	1376.95	0.58	-1.66	0.60	1.66	40.26062459	-105.01881196
1467.00	0.44	56.020	1466.95	0.77	-1.62	0.80	1.61	40.26062512	-105.01881181
1523.00	0.29	52.010	1522.95	0.98	-1.33	0.27	1.32	40.26062569	-105.01881077
1616.00	0.07	5.180	1615.95	1.18	-1.14	0.27	1.12	40.26062624	-105.01881008
1706.00	0.10	298.060	1705.95	1.27	-1.20	0.11	1.19	40.26062649	-105.01881031
1795.00	0.03	209.630	1794.95	1.29	-1.28	0.12	1.27	40.26062654	-105.01881060
1885.00	0.10	256.730	1884.95	1.25	-1.37	0.09	1.36	40.26062643	-105.01881091
1975.00	0.09	285.370	1974.95	1.25	-1.52	0.05	1.50	40.26062644	-105.01881143
2065.00	0.09	238.450	2064.95	1.23	-1.64	0.08	1.63	40.26062639	-105.01881189
2154.00	0.11	285.390	2153.95	1.22	-1.79	0.09	1.77	40.26062635	-105.01881240
2244.00	0.07	282.890	2243.95	1.25	-1.92	0.04	1.91	40.26062644	-105.01881289
2334.00	0.13	174.840	2333.95	1.17	-1.97	0.18	1.95	40.26062620	-105.01881305
2423.00	0.37	174.370	2422.95	0.78	-1.93	0.27	1.92	40.26062514	-105.01881292
2513.00	0.04	250.280	2512.95	0.48	-1.93	0.40	1.93	40.26062431	-105.01881292
2603.00	0.07	279.440	2602.95	0.48	-2.02	0.04	2.01	40.26062431	-105.01881322
2692.00	0.14	247.010	2691.95	0.44	-2.17	0.10	2.16	40.26062422	-105.01881377
2782.00	0.11	250.810	2781.95	0.37	-2.35	0.03	2.35	40.26062402	-105.01881443
2872.00	0.09	299.240	2871.95	0.38	-2.49	0.09	2.49	40.26062404	-105.01881494
2961.00	0.07	260.100	2960.95	0.40	-2.61	0.06	2.60	40.26062411	-105.01881535
3051.00	0.07	200.260	3050.95	0.34	-2.68	0.08	2.68	40.26062394	-105.01881561
3141.00	0.09	260.610	3140.95	0.28	-2.77	0.09	2.77	40.26062377	-105.01881593
3231.00	0.00	98.390	3230.95	0.27	-2.84	0.10	2.84	40.26062373	-105.01881618
3320.00	0.07	218.810	3319.95	0.23	-2.88	0.08	2.87	40.26062362	-105.01881630
3410.00	0.07	255.400	3409.95	0.17	-2.96	0.05	2.96	40.26062346	-105.01881662
3500.00	0.10	266.930	3499.95	0.15	-3.09	0.04	3.09	40.26062341	-105.01881709
3589.00	0.09	259.250	3588.95	0.13	-3.24	0.02	3.24	40.26062337	-105.01881761
3679.00	0.10	236.830	3678.95	0.08	-3.38	0.04	3.37	40.26062321	-105.01881810
3769.00	0.06	177.350	3768.95	-0.01	-3.44	0.10	3.44	40.26062296	-105.01881832
3858.00	0.10	283.820	3857.95	-0.04	-3.51	0.15	3.51	40.26062289	-105.01881859
3948.00	0.10	174.620	3947.95	-0.10	-3.58	0.18	3.58	40.26062272	-105.01881883
4038.00	0.15	272.350	4037.95	-0.17	-3.69	0.21	3.69	40.26062252	-105.01881923
4128.00	0.24	261.000	4127.95	-0.20	-4.00	0.11	4.00	40.26062246	-105.01882032
4217.00	0.16	276.700	4216.95	-0.21	-4.30	0.11	4.31	40.26062242	-105.01882142
4307.00	0.13	229.830	4306.95	-0.26	-4.51	0.13	4.51	40.26062227	-105.01882215
4397.00	0.06	236.710	4396.95	-0.36	-4.62	0.08	4.63	40.26062202	-105.01882257
4487.00	0.25	231.850	4486.95	-0.50	-4.82	0.21	4.82	40.26062162	-105.01882326
4576.00	0.31	222.170	4575.95	-0.80	-5.13	0.09	5.14	40.26062080	-105.01882439
4666.00	0.06	253.190	4665.95	-1.00	-5.34	0.29	5.35	40.26062027	-105.01882513
4756.00	0.15	262.170	4755.95	-1.03	-5.50	0.10	5.51	40.26062019	-105.01882571
4845.00	0.17	217.690	4844.94	-1.15	-5.70	0.14	5.71	40.26061986	-105.01882642
4935.00	0.34	239.830	4934.94	-1.39	-6.01	0.21	6.03	40.26061920	-105.01882754
5025.00	0.20	221.290	5024.94	-1.64	-6.35	0.18	6.36	40.26061850	-105.01882874
5115.00	0.17	270.140	5114.94	-1.76	-6.58	0.17	6.60	40.26061818	-105.01882959
5204.00	0.15	276.510	5203.94	-1.74	-6.83	0.03	6.85	40.26061822	-105.01883047
5294.00	0.14	250.010	5293.94	-1.77	-7.05	0.07	7.07	40.26061815	-105.01883126
5384.00	3.39	44.390	5383.89	0.10	-5.29	3.91	5.29	40.26062327	-105.01882496
5474.00	6.61	40.640	5473.54	5.93	-0.06	3.59	-0.02	40.26063928	-105.01880620
5563.00	8.87	55.890	5561.73	13.67	8.96	3.41	-9.13	40.26066052	-105.01877388
5653.00	11.57	75.130	5650.32	19.88	23.44	4.80	-23.68	40.26067757	-105.01872202
5743.00	13.80	102.340	5738.19	19.90	42.67	7.01	-42.91	40.26067763	-105.01865312
5833.00	18.84	104.760	5824.54	13.90	67.22	5.65	-67.39	40.26066116	-105.01856514
5922.00	19.68	100.680	5908.56	7.46	95.85	1.78	-95.93	40.26064348	-105.01846258
6012.00	19.43	98.570	5993.37	2.42	125.54	0.83	-125.56	40.26062965	-105.01835619
6102.00	19.35	97.240	6078.27	-1.69	155.13	0.50	-155.10	40.26061837	-105.01825015
6191.00	19.31	93.400	6162.26	-4.42	184.45	1.43	-184.38	40.26061087	-105.01814511
6281.00	19.16	91.230	6247.23	-5.62	214.07	0.81	-213.99	40.26060758	-105.01803898
6371.00	19.67	94.920	6332.12	-7.23	243.93	1.48	-243.83	40.26060314	-105.01793199
6461.00	18.92	97.370	6417.06	-10.40	273.49	1.23	-273.35	40.26059444	-105.01782607
6550.00	7.15	89.440	6503.62	-12.21	293.41	13.35	-293.24	40.26058949	-105.01775470
6640.00	2.28	291.110	6593.43	-11.51	297.35	10.34	-297.19	40.26059141	-105.01774058
6730.00	9.33	288.720	6682.92	-8.52	288.76	7.84	-288.64	40.26059962	-105.01777136
6820.00	13.34	288.360	6771.14	-2.90	271.99	4.46	-271.94	40.26061503	-105.01783145
6909.00	17.94	264.990	6856.91	-0.86	248.56	8.67	-248.53	40.26062063	-105.01791542
6999.00	26.85	264.860	6940.04	-3.90	214.44	9.90	-214.37	40.26061229	-105.01803767
7089.00	37.84	267.640	7015.96	-6.87	166.46	12.32	-166.37	40.26060415	-105.01820956
7179.00	47.79	268.550	7081.90	-8.85	105.41	11.08	-105.29	40.26059870	-105.01842833
7268.00	58.20	268.630	7135.39	-10.60	34.45	11.70	-34.32	40.26059392	-105.01868256

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Lat - NAD 83	Long - NAD 83
7358.00	68.15	268.320	7175.95	-12.74	-45.73	11.06	45.89	40.26058803	-105.01896986
7448.00	78.88	267.730	7201.46	-15.72	-131.86	11.94	132.04	40.26057984	-105.01927844
7465.32	80.95	267.760	7204.49	-16.39	-148.89	11.94	149.08	40.26057800	-105.01933949
7528.00	88.44	267.850	7210.28	-18.79	-211.21	11.94	211.43	40.26057143	-105.01956278
7537.00	89.51	267.860	7210.45	-19.12	-220.21	11.94	220.42	40.26057051	-105.01959500
7627.00	91.66	265.310	7209.53	-24.48	-310.03	3.71	310.30	40.26055579	-105.01991684
7717.00	92.16	264.750	7206.53	-32.27	-399.64	0.83	400.00	40.26053440	-105.02023791
7806.00	91.69	266.210	7203.54	-39.28	-488.31	1.72	488.75	40.26051515	-105.02055562
7896.00	91.69	265.310	7200.88	-45.94	-578.03	1.00	578.54	40.26049689	-105.02087706
7986.00	91.66	264.750	7198.25	-53.73	-667.65	0.62	668.25	40.26047549	-105.02119818
8075.00	91.94	265.830	7195.46	-61.03	-756.30	1.25	756.99	40.26045543	-105.02151583
8165.00	91.97	266.220	7192.39	-67.27	-846.03	0.43	846.79	40.26043831	-105.02183733
8255.00	92.22	266.620	7189.10	-72.88	-935.80	0.52	936.62	40.26042289	-105.02215895
8345.00	92.28	267.070	7185.56	-77.83	-1025.59	0.50	1026.46	40.26040929	-105.02248069
8434.00	92.19	268.320	7182.09	-81.41	-1114.45	1.41	1115.36	40.26039946	-105.02279906
8524.00	91.76	270.140	7178.99	-82.62	-1204.38	2.08	1205.30	40.26039613	-105.02312130
8614.00	91.63	272.480	7176.33	-80.56	-1294.32	2.60	1295.20	40.26040176	-105.02344352
8704.00	91.57	273.290	7173.81	-76.03	-1384.17	0.90	1384.99	40.26041418	-105.02376545
8793.00	91.88	272.480	7171.13	-71.56	-1473.01	0.97	1473.77	40.26042646	-105.02408379
8883.00	91.69	271.190	7168.33	-68.68	-1562.92	1.45	1563.64	40.26043435	-105.02440593
8973.00	91.69	270.390	7165.68	-67.44	-1652.87	0.89	1653.57	40.26043774	-105.02472823
9062.00	91.79	268.680	7162.97	-68.16	-1741.82	1.92	1742.52	40.26043574	-105.02504694
9152.00	91.85	267.200	7160.12	-71.39	-1831.72	1.64	1832.45	40.26042685	-105.02536903
9242.00	91.51	266.580	7157.48	-76.27	-1921.55	0.79	1922.33	40.26041343	-105.02569088
9332.00	90.71	267.860	7155.73	-80.64	-2011.42	1.68	2012.25	40.26040143	-105.02601290
9421.00	90.71	268.090	7154.63	-83.78	-2100.36	0.26	2101.22	40.26039278	-105.02633156
9511.00	90.40	266.680	7153.76	-87.89	-2190.26	1.60	2191.17	40.26038149	-105.02665367
9601.00	90.52	265.310	7153.04	-94.17	-2280.03	1.53	2281.01	40.26036421	-105.02697533
9691.00	90.80	267.020	7152.00	-100.19	-2369.82	1.93	2370.87	40.26034767	-105.02729705
9780.00	91.05	268.890	7150.56	-103.37	-2458.75	2.12	2459.83	40.26033893	-105.02761567
9870.00	90.68	271.300	7149.20	-103.22	-2548.73	2.71	2549.80	40.26033931	-105.02793808
9960.00	91.82	272.660	7147.24	-100.11	-2638.65	1.97	2639.68	40.26034782	-105.02826027
10050.00	89.48	271.050	7146.22	-97.20	-2728.59	3.16	2729.57	40.26035579	-105.02858251
10139.00	90.71	268.480	7146.07	-97.56	-2817.58	3.20	2818.56	40.26035476	-105.02890136
10229.00	90.98	265.670	7144.74	-102.15	-2907.45	3.14	2908.47	40.26034212	-105.02922334
10319.00	91.02	264.280	7143.17	-110.03	-2997.08	1.54	2998.20	40.26032046	-105.02954451
10408.00	90.95	263.890	7141.64	-119.21	-3085.60	0.45	3086.82	40.26029526	-105.02986165
10498.00	91.45	262.880	7139.76	-129.57	-3174.98	1.25	3176.32	40.26026677	-105.03018189
10588.00	91.29	262.230	7137.61	-141.23	-3264.19	0.74	3265.67	40.26023474	-105.03050154
10678.00	91.63	262.430	7135.31	-153.24	-3353.36	0.44	3354.98	40.26020175	-105.03082101
10767.00	91.48	269.030	7132.90	-159.86	-3442.03	7.41	3443.72	40.26018354	-105.03113872
10857.00	91.97	270.650	7130.19	-160.11	-3531.98	1.88	3533.67	40.26018282	-105.03146103
10947.00	91.14	271.180	7127.74	-158.67	-3621.94	1.09	3623.60	40.26018672	-105.03178333
11036.00	92.06	273.550	7125.26	-155.00	-3710.82	2.86	3712.43	40.26019676	-105.03210180
11126.00	91.08	268.800	7122.79	-153.16	-3800.74	5.39	3802.32	40.26020179	-105.03242398
11216.00	90.83	268.040	7121.29	-155.64	-3890.69	0.89	3892.30	40.26019494	-105.03274628
11306.00	90.68	274.810	7120.10	-153.40	-3980.61	7.52	3982.18	40.26020104	-105.03306843
11395.00	90.68	277.970	7119.05	-143.50	-4069.04	3.55	4070.48	40.26022818	-105.03338528
11485.00	90.99	276.620	7117.74	-132.07	-4158.30	1.54	4159.60	40.26025951	-105.03370510
11575.00	90.65	276.550	7116.45	-121.75	-4247.69	0.39	4248.86	40.26028779	-105.03402542
11664.00	89.48	269.130	7116.35	-117.35	-4336.52	8.44	4337.63	40.26029985	-105.03434369
11754.00	92.03	274.520	7115.16	-114.48	-4426.43	6.62	4427.49	40.26030766	-105.03466582
11790.00	92.01	276.680	7113.89	-110.97	-4462.23	6.00	4463.25	40.26031728	-105.03479411
11822.09	91.99	278.610	7112.77	-106.71	-4494.01	6.00	4494.98	40.26032897	-105.03490799
11831.89	91.98	279.190	7112.43	-105.19	-4503.69	6.00	4504.64	40.26033313	-105.03494266
11844.00	91.97	279.920	7112.02	-103.18	-4515.62	6.00	4516.55	40.26033864	-105.03498543
11934.00	91.85	282.560	7109.02	-85.65	-4603.84	2.93	4604.54	40.26038672	-105.03530152
12023.00	91.32	280.890	7106.56	-67.57	-4690.95	1.97	4691.42	40.26043629	-105.03561363
12064.00	90.71	277.480	7105.83	-61.03	-4731.41	8.45	4731.80	40.26045423	-105.03575861
12088.00	90.71	277.480	7105.53	-57.91	-4755.20	==>	4755.56	40.26046279	-105.03584386

Comments						
MD[ft]	TVD[ft]	North[ft]	East[ft]	Lat - NAD 83	Long - NAD 83	Comment
1523.00	1522.95	0.98	-1.33	40.26062569	-105.01881077	9.625" Csg: 1523 MD/TVD
7465.32	7204.49	-16.39	-148.89	40.26057800	-105.01933949	460 Setback: 7465 / 7204 MD/TVD, 625 FNL, 460 FWL Sec 05
7528.00	7210.28	-18.79	-211.21	40.26057143	-105.01956278	Top Perf: 7528 / 7210 MD/TVD, 627 FNL, 522 FWL Sec 05
11790.00	7113.89	-110.97	-4462.23	40.26031728	-105.03479411	Btm Perf: 11,790 / 7114 MD/TVD, 644 FNL, 501 FWL Sec 05
11822.09	7112.77	-106.71	-4494.01	40.26032897	-105.03490799	Btm Toe Sub: 11,822 / 7113 MD/TVD, 639 FNL, 470 FWL Sec 05
11831.89	7112.43	-105.19	-4503.69	40.26033313	-105.03494266	460 Setback: 11,832 / 7112 MD/TVD, 637 FNL, 460 FWL Sec 05
12079.11	7105.64	-59.06	-4746.39	40.26045962	-105.03581228	PBTD: 12,079 / 7106 MD/TVD, 587 FNL, 218 FWL Sec 05
12088.00	7105.53	-57.91	-4755.20	40.26046279	-105.03584386	5.5" Csg: 12,088 / 7106 MD/TVD, 585 FNL, 209 FWL Sec 05
12088.00	7105.53	-57.91	-4755.20	40.26046279	-105.03584386	BHL: 12,088 / 7106 MD/TVD, 585 FNL, 209 FWL Sec 05

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	1523.00	1522.95	0.98	-1.33
8.500	1523.00	1522.95	0.98	-1.33	12088.00	7105.53	-57.91	-4755.20

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	1523.00	1522.95	0.98	-1.33
5 1/2in Casing	0.00	0.00	0.00	0.00	12088.00	7105.53	-57.91	-4755.20

Survey Tool Program				
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool
464613	As Drilled - 20181005	12088.00	7105.53	MWD

Coordinates are from Slot  
MD's and TVD's are from Rig Floor 5095.0ft above Mean Sea Level  
Vertical Section is from 0.00 0.00 on azimuth 269.300 degrees  
Bottom hole distance is 4755.56 Feet on azimuth 269.30 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by Great Western Operating Co.  
Date Printed: