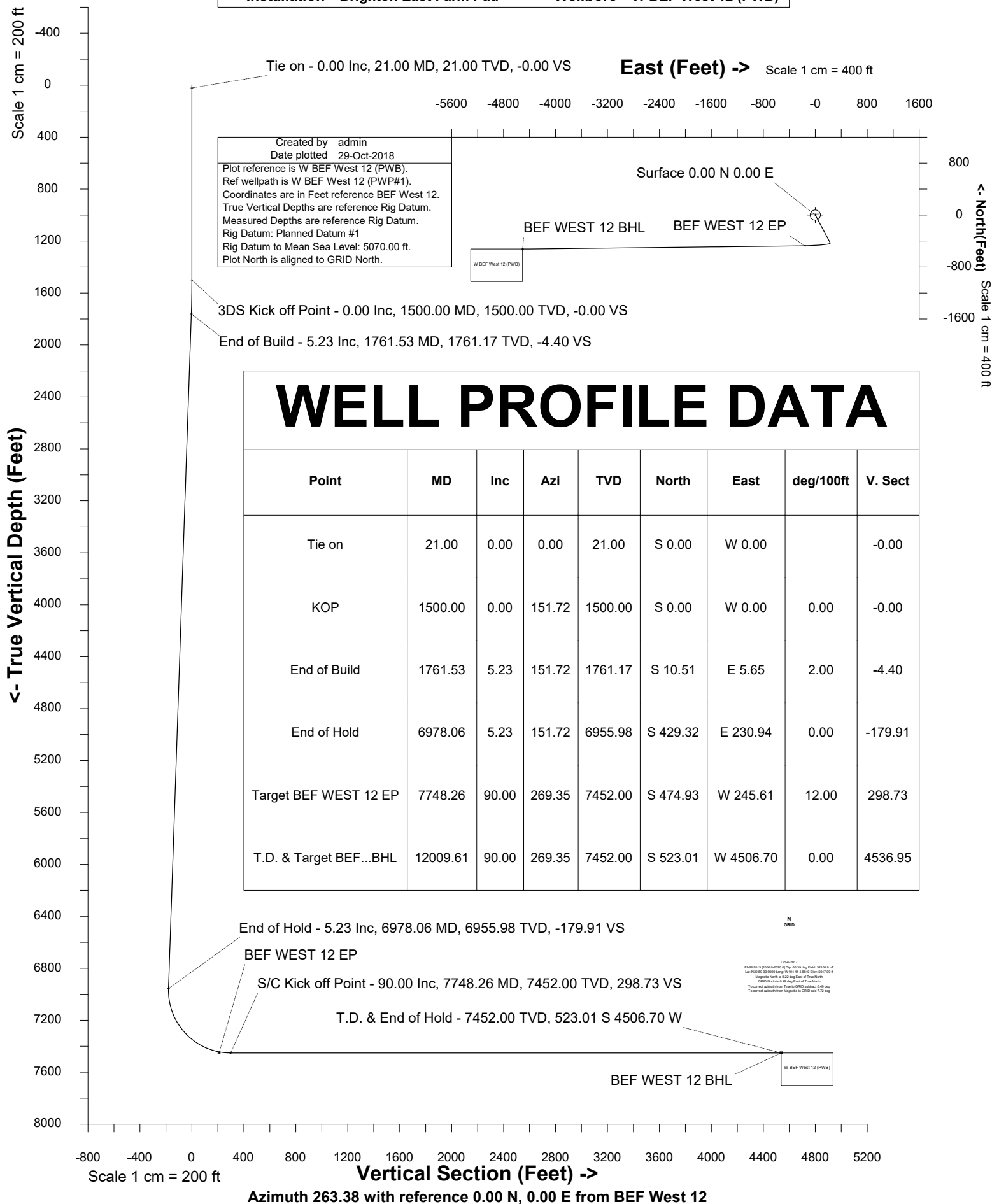


Petro Operating Company

Location Weld County, CO Slot BEF West 12
Field Wattenberg Well W BEF West 12
Installation Brighton East Farm Pad Wellbore W BEF West 12 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: W BEF West 12 (PWB)



Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 12	39.99503000	-104.73461000	1241961.8546	3214439.7209	830.74N	15.25E	2.00

Declination

Date	Source	Time
Oct-6-2017	EMM-2015 [2000.0-2020.0]	14:35

Installation Details

Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Brighton East Farm Pad	39.99275000	-104.73469000	1241131.1481	3214424.4758	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	Vertical Depth SS	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]
21.00	0.00	0.000	21.00	-5049.00	0.00N	0.00E		0.00
1500.00	0.00	151.720	1500.00	-3570.00	0.00N	0.00E	==>	0.00
1761.53	5.23	151.720	1761.17	-3308.83	10.51S	5.65E	2.00	-4.40
6978.06	5.23	151.720	6955.98	1885.98	429.32S	230.94E	==>	-179.91
7748.26	90.00	269.350	7452.00	2382.00	474.93S	245.61W	12.00	298.73
12009.61	90.00	269.350	7452.00	2382.00	523.01S	4506.70W	==>	4536.95

Interpolated Wellpath

MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	39.99503000	-104.73461000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1500.00	0.00	151.720	1500.00	0.00N	0.00E	==>	0.00	39.99503000	-104.73461000
1600.00	2.00	151.720	1599.98	1.54S	0.83E	2.00	-0.64	39.99502576	-104.73460710
1700.00	4.00	151.720	1699.84	6.15S	3.31E	2.00	-2.58	39.99501305	-104.73459839
1761.53	5.23	151.720	1761.17	10.51S	5.65E	2.00	-4.40	39.99500103	-104.73459015
1800.00	5.23	151.720	1799.48	13.59S	7.31E	==>	-5.70	39.99499251	-104.73458432
1900.00	5.23	151.720	1899.06	21.62S	11.63E	==>	-9.06	39.99497037	-104.73456915
2000.00	5.23	151.720	1998.64	29.65S	15.95E	==>	-12.43	39.99494823	-104.73455399
2100.00	5.23	151.720	2098.23	37.68S	20.27E	==>	-15.79	39.99492609	-104.73453882
2200.00	5.23	151.720	2197.81	45.71S	24.59E	==>	-19.15	39.99490395	-104.73452366
2300.00	5.23	151.720	2297.39	53.74S	28.91E	==>	-22.52	39.99488181	-104.73450849
2400.00	5.23	151.720	2396.98	61.77S	33.23E	==>	-25.88	39.99485966	-104.73449332
2500.00	5.23	151.720	2496.56	69.80S	37.54E	==>	-29.25	39.99483752	-104.73447816
2600.00	5.23	151.720	2596.15	77.82S	41.86E	==>	-32.61	39.99481538	-104.73446299
2700.00	5.23	151.720	2695.73	85.85S	46.18E	==>	-35.98	39.99479324	-104.73444783
2800.00	5.23	151.720	2795.31	93.88S	50.50E	==>	-39.34	39.99477110	-104.73443266
2900.00	5.23	151.720	2894.90	101.91S	54.82E	==>	-42.71	39.99474896	-104.73441749

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Vertical Section is from 0.00N 0.00E on azimuth 263.380 degrees
Bottom hole distance is 4536.95 Feet on azimuth 263.38 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 29-Oct-2018

Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
3000.00	5.23	151.720	2994.48	109.94S	59.14E	==>	-46.07	39.99472682	-104.73440233
3100.00	5.23	151.720	3094.06	117.97S	63.46E	==>	-49.43	39.99470468	-104.73438716
3200.00	5.23	151.720	3193.65	126.00S	67.77E	==>	-52.80	39.99468254	-104.73437200
3300.00	5.23	151.720	3293.23	134.02S	72.09E	==>	-56.16	39.99466040	-104.73435683
3400.00	5.23	151.720	3392.81	142.05S	76.41E	==>	-59.53	39.99463826	-104.73434167
3500.00	5.23	151.720	3492.40	150.08S	80.73E	==>	-62.89	39.99461611	-104.73432650
3600.00	5.23	151.720	3591.98	158.11S	85.05E	==>	-66.26	39.99459397	-104.73431133
3700.00	5.23	151.720	3691.56	166.14S	89.37E	==>	-69.62	39.99457183	-104.73429617
3800.00	5.23	151.720	3791.15	174.17S	93.69E	==>	-72.99	39.99454969	-104.73428100
3900.00	5.23	151.720	3890.73	182.20S	98.01E	==>	-76.35	39.99452755	-104.73426584
4000.00	5.23	151.720	3990.32	190.22S	102.32E	==>	-79.71	39.99450541	-104.73425067
4100.00	5.23	151.720	4089.90	198.25S	106.64E	==>	-83.08	39.99448327	-104.73423550
4200.00	5.23	151.720	4189.48	206.28S	110.96E	==>	-86.44	39.99446113	-104.73422034
4300.00	5.23	151.720	4289.07	214.31S	115.28E	==>	-89.81	39.99443899	-104.73420517
4400.00	5.23	151.720	4388.65	222.34S	119.60E	==>	-93.17	39.99441685	-104.73419001
4500.00	5.23	151.720	4488.23	230.37S	123.92E	==>	-96.54	39.99439471	-104.73417484
4600.00	5.23	151.720	4587.82	238.40S	128.24E	==>	-99.90	39.99437256	-104.73415968
4700.00	5.23	151.720	4687.40	246.43S	132.56E	==>	-103.26	39.99435042	-104.73414451
4800.00	5.23	151.720	4786.98	254.45S	136.87E	==>	-106.63	39.99432828	-104.73412934
4900.00	5.23	151.720	4886.57	262.48S	141.19E	==>	-109.99	39.99430614	-104.73411418
5000.00	5.23	151.720	4986.15	270.51S	145.51E	==>	-113.36	39.99428400	-104.73409901
5100.00	5.23	151.720	5085.73	278.54S	149.83E	==>	-116.72	39.99426186	-104.73408385
5200.00	5.23	151.720	5185.32	286.57S	154.15E	==>	-120.09	39.99423972	-104.73406868
5300.00	5.23	151.720	5284.90	294.60S	158.47E	==>	-123.45	39.99421758	-104.73405352
5400.00	5.23	151.720	5384.49	302.63S	162.79E	==>	-126.82	39.99419544	-104.73403835
5500.00	5.23	151.720	5484.07	310.65S	167.11E	==>	-130.18	39.99417330	-104.73402318
5600.00	5.23	151.720	5583.65	318.68S	171.42E	==>	-133.54	39.99415116	-104.73400802
5700.00	5.23	151.720	5683.24	326.71S	175.74E	==>	-136.91	39.99412901	-104.73399285
5800.00	5.23	151.720	5782.82	334.74S	180.06E	==>	-140.27	39.99410687	-104.73397769
5900.00	5.23	151.720	5882.40	342.77S	184.38E	==>	-143.64	39.99408473	-104.73396252
6000.00	5.23	151.720	5981.99	350.80S	188.70E	==>	-147.00	39.99406259	-104.73394736
6100.00	5.23	151.720	6081.57	358.83S	193.02E	==>	-150.37	39.99404045	-104.73393219
6200.00	5.23	151.720	6181.15	366.85S	197.34E	==>	-153.73	39.99401831	-104.73391703
6300.00	5.23	151.720	6280.74	374.88S	201.66E	==>	-157.10	39.99399617	-104.73390186
6400.00	5.23	151.720	6380.32	382.91S	205.97E	==>	-160.46	39.99397403	-104.73388669
6500.00	5.23	151.720	6479.90	390.94S	210.29E	==>	-163.82	39.99395189	-104.73387153
6600.00	5.23	151.720	6579.49	398.97S	214.61E	==>	-167.19	39.99392975	-104.73385636
6700.00	5.23	151.720	6679.07	407.00S	218.93E	==>	-170.55	39.99390760	-104.73384120
6800.00	5.23	151.720	6778.66	415.03S	223.25E	==>	-173.92	39.99388546	-104.73382603
6900.00	5.23	151.720	6878.24	423.06S	227.57E	==>	-177.28	39.99386332	-104.73381087
6978.06	5.23	151.720	6955.98	429.32S	230.94E	==>	-179.91	39.99384604	-104.73379903
7000.00	4.64	181.940	6977.84	431.09S	231.38E	12.00	-180.15	39.99384117	-104.73379750
7100.00	13.05	248.870	7076.74	439.23S	220.68E	12.00	-168.57	39.99381908	-104.73383596
7200.00	24.62	259.160	7171.25	447.25S	189.57E	12.00	-136.75	39.99379781	-104.73394721
7300.00	36.46	263.050	7257.23	454.79S	139.43E	12.00	-86.08	39.99377830	-104.73412639
7400.00	48.38	265.220	7330.92	461.52S	72.44E	12.00	-18.76	39.99376141	-104.73436568
7500.00	60.32	266.700	7389.11	467.16S	8.47W	12.00	62.26	39.99374786	-104.73465461
7600.00	72.27	267.870	7429.24	471.44S	99.76W	12.00	153.44	39.99373826	-104.73498055
7700.00	84.23	268.880	7449.57	474.19S	197.45W	12.00	250.79	39.99373302	-104.73532927
7748.26	90.00	269.350	7452.00	474.93S	245.61W	12.00	298.73	39.99373213	-104.73550120
7800.00	90.00	269.350	7452.00	475.52S	297.36W	==>	350.19	39.99373175	-104.73568587
7900.00	90.00	269.350	7452.00	476.64S	397.35W	==>	449.65	39.99373102	-104.73604277
8000.00	90.00	269.350	7452.00	477.77S	497.34W	==>	549.10	39.99373029	-104.73639968
8100.00	90.00	269.350	7452.00	478.90S	597.34W	==>	648.56	39.99372955	-104.73675658
8200.00	90.00	269.350	7452.00	480.03S	697.33W	==>	748.02	39.99372882	-104.73711348
8300.00	90.00	269.350	7452.00	481.16S	797.32W	==>	847.47	39.99372808	-104.73747038
8400.00	90.00	269.350	7452.00	482.29S	897.32W	==>	946.93	39.99372735	-104.73782728
8500.00	90.00	269.350	7452.00	483.41S	997.31W	==>	1046.39	39.99372661	-104.73818418

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5070.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 263.380 degrees
Bottom hole distance is 4536.95 Feet on azimuth 263.38 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 29-Oct-2018



SYSDRILL
Well Design Combined Report
Wellbore: W BEF West 12 (PWB)



Interpolated Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Station Position (Latitude)	Station Position (Longitude)
8600.00	90.00	269.350	7452.00	484.54S	1097.30W	==>	1145.85	39.99372587	-104.73854108
8700.00	90.00	269.350	7452.00	485.67S	1197.30W	==>	1245.30	39.99372513	-104.73889798
8800.00	90.00	269.350	7452.00	486.80S	1297.29W	==>	1344.76	39.99372439	-104.73925488
8900.00	90.00	269.350	7452.00	487.93S	1397.29W	==>	1444.22	39.99372364	-104.73961178
9000.00	90.00	269.350	7452.00	489.06S	1497.28W	==>	1543.67	39.99372290	-104.73996868
9100.00	90.00	269.350	7452.00	490.18S	1597.27W	==>	1643.13	39.99372216	-104.74032558
9200.00	90.00	269.350	7452.00	491.31S	1697.27W	==>	1742.59	39.99372141	-104.74068248
9300.00	90.00	269.350	7452.00	492.44S	1797.26W	==>	1842.05	39.99372066	-104.74103938
9400.00	90.00	269.350	7452.00	493.57S	1897.25W	==>	1941.50	39.99371991	-104.74139628
9500.00	90.00	269.350	7452.00	494.70S	1997.25W	==>	2040.96	39.99371917	-104.74175318
9600.00	90.00	269.350	7452.00	495.82S	2097.24W	==>	2140.42	39.99371841	-104.74211008
9700.00	90.00	269.350	7452.00	496.95S	2197.23W	==>	2239.87	39.99371766	-104.74246698
9800.00	90.00	269.350	7452.00	498.08S	2297.23W	==>	2339.33	39.99371691	-104.74282388
9900.00	90.00	269.350	7452.00	499.21S	2397.22W	==>	2438.79	39.99371616	-104.74318078
10000.00	90.00	269.350	7452.00	500.34S	2497.22W	==>	2538.24	39.99371540	-104.74353768
10100.00	90.00	269.350	7452.00	501.47S	2597.21W	==>	2637.70	39.99371465	-104.74389458
10200.00	90.00	269.350	7452.00	502.59S	2697.20W	==>	2737.16	39.99371389	-104.74425148
10300.00	90.00	269.350	7452.00	503.72S	2797.20W	==>	2836.62	39.99371313	-104.74460838
10400.00	90.00	269.350	7452.00	504.85S	2897.19W	==>	2936.07	39.99371237	-104.74496528
10500.00	90.00	269.350	7452.00	505.98S	2997.18W	==>	3035.53	39.99371161	-104.74532218
10600.00	90.00	269.350	7452.00	507.11S	3097.18W	==>	3134.99	39.99371085	-104.74567908
10700.00	90.00	269.350	7452.00	508.23S	3197.17W	==>	3234.44	39.99371009	-104.74603598
10800.00	90.00	269.350	7452.00	509.36S	3297.16W	==>	3333.90	39.99370932	-104.74639288
10900.00	90.00	269.350	7452.00	510.49S	3397.16W	==>	3433.36	39.99370856	-104.74674978
11000.00	90.00	269.350	7452.00	511.62S	3497.15W	==>	3532.82	39.99370779	-104.74710668
11100.00	90.00	269.350	7452.00	512.75S	3597.15W	==>	3632.27	39.99370703	-104.74746358
11200.00	90.00	269.350	7452.00	513.88S	3697.14W	==>	3731.73	39.99370626	-104.74782048
11300.00	90.00	269.350	7452.00	515.00S	3797.13W	==>	3831.19	39.99370549	-104.74817738
11400.00	90.00	269.350	7452.00	516.13S	3897.13W	==>	3930.64	39.99370472	-104.74853428
11500.00	90.00	269.350	7452.00	517.26S	3997.12W	==>	4030.10	39.99370395	-104.74889118
11600.00	90.00	269.350	7452.00	518.39S	4097.11W	==>	4129.56	39.99370318	-104.74924808
11700.00	90.00	269.350	7452.00	519.52S	4197.11W	==>	4229.01	39.99370240	-104.74960498
11800.00	90.00	269.350	7452.00	520.64S	4297.10W	==>	4328.47	39.99370163	-104.74996188
11900.00	90.00	269.350	7452.00	521.77S	4397.09W	==>	4427.93	39.99370085	-104.75031878
12000.00	90.00	269.350	7452.00	522.90S	4497.09W	==>	4527.39	39.99370007	-104.75067568
12009.61	90.00	269.350	7452.00	523.01S	4506.70W	==>	4536.95	39.99370000	-104.75071000

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Vertical Section is from 0.00N 0.00E on azimuth 263.380 degrees
Bottom hole distance is 4536.95 Feet on azimuth 263.38 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by IPT
Date Printed: 29-Oct-2018



SYS DRILL
Well Design Combined Report
Wellbore: W BEF West 12 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 12 BHL	523.01S	4506.70W	7452.00	39.99370000	-104.75071000	1241438.86	3209933.18
BEF WEST 12 EP	474.93S	155.61W	7452.00	39.99373000	-104.73518000	1241486.94	3214284.11

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577633	Planned	2000.00	1998.64	WdW Rate Gyro	Standard	
577632	Planned	12009.61	7452.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes