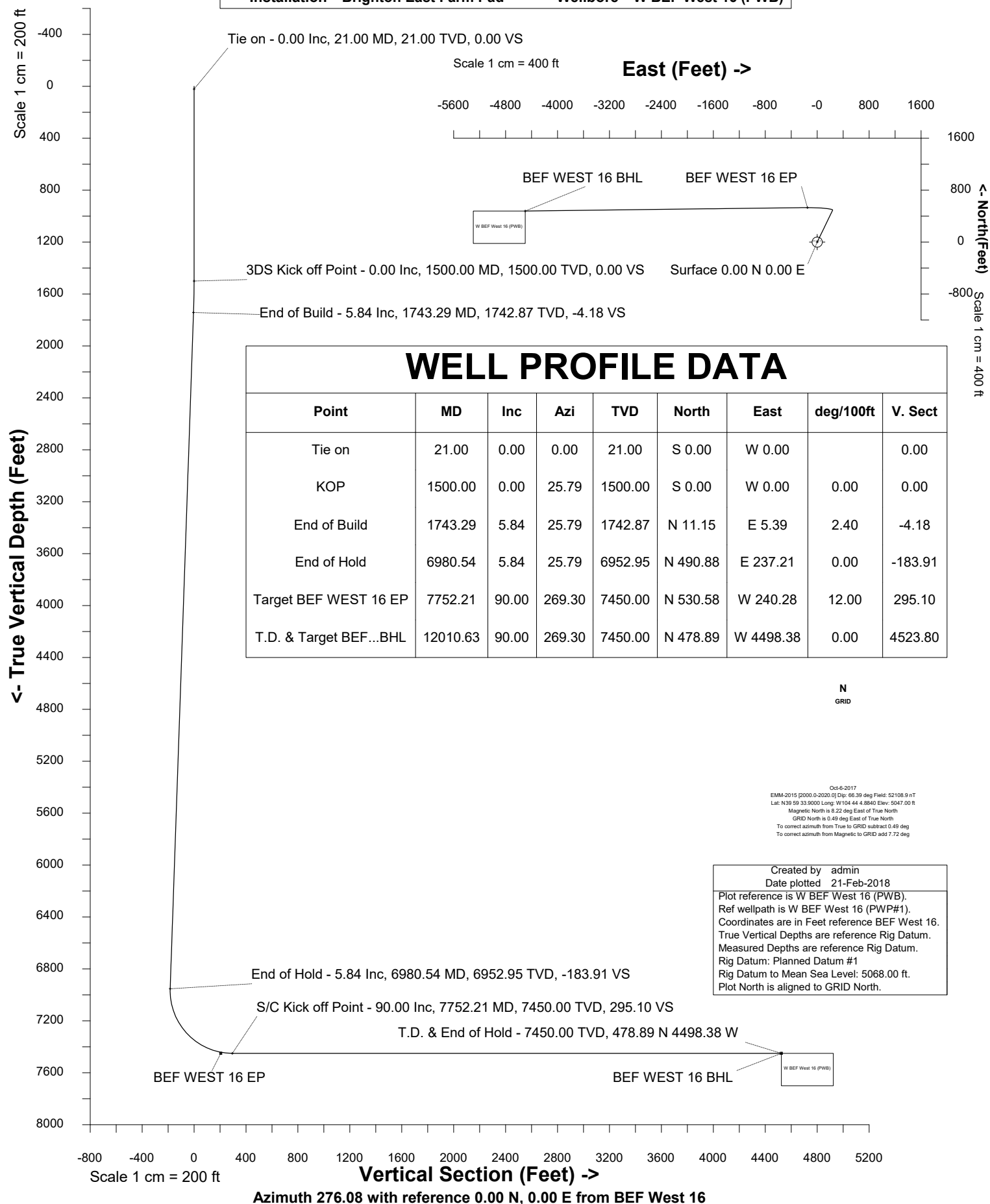


# Petro Operating Company

Location Weld County, CO Slot BEF West 16  
Field Wattenberg Well W BEF West 16  
Installation Brighton East Farm Pad Wellbore W BEF West 16 (PWB)





SYS DRILL  
Well Design Combined Report  
Wellbore: W BEF West 16 (PWB)



Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 16	39.99467000	-104.73470000	1241830.5033	3214415.6379	699.38N	8.84W	0.00

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	-5047.00	0.00N	0.00E		0.00
1500.00	0.00	25.790	1500.00	-3568.00	0.00N	0.00E	==>	0.00
1743.29	5.84	25.790	1742.87	-3325.13	11.15N	5.39E	2.40	-4.18
6980.54	5.84	25.790	6952.95	1884.95	490.88N	237.21E	==>	-183.91
7752.21	90.00	269.300	7450.00	2382.00	530.58N	240.28W	12.00	295.10
12010.63	90.00	269.300	7450.00	2382.00	478.89N	4498.38W	==>	4523.80

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	39.99467000	-104.73470000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1500.00	0.00	25.790	1500.00	0.00N	0.00E	==>	0.00	39.99467000	-104.73470000
1600.00	2.40	25.790	1599.97	1.89N	0.91E	2.40	-0.71	39.99467515	-104.73469669
1700.00	4.80	25.790	1699.77	7.54N	3.64E	2.40	-2.82	39.99469061	-104.73468677
1800.00	5.84	25.790	1799.28	16.35N	7.90E	==>	-6.12	39.99471468	-104.73467130
1900.00	5.84	25.790	1898.77	25.51N	12.33E	==>	-9.56	39.99473972	-104.73465522
2000.00	5.84	25.790	1998.25	34.67N	16.75E	==>	-12.99	39.99476476	-104.73463914
2100.00	5.84	25.790	2097.73	43.83N	21.18E	==>	-16.42	39.99478980	-104.73462306
2200.00	5.84	25.790	2197.21	52.99N	25.61E	==>	-19.85	39.99481484	-104.73460698
2300.00	5.84	25.790	2296.69	62.15N	30.03E	==>	-23.28	39.99483988	-104.73459091
2400.00	5.84	25.790	2396.17	71.31N	34.46E	==>	-26.72	39.99486492	-104.73457483
2500.00	5.84	25.790	2495.65	80.47N	38.88E	==>	-30.15	39.99488996	-104.73455875
2600.00	5.84	25.790	2595.13	89.63N	43.31E	==>	-33.58	39.99491500	-104.73454267
2700.00	5.84	25.790	2694.62	98.79N	47.74E	==>	-37.01	39.99494004	-104.73452659
2800.00	5.84	25.790	2794.10	107.95N	52.16E	==>	-40.44	39.99496507	-104.73451051
2900.00	5.84	25.790	2893.58	117.11N	56.59E	==>	-43.88	39.99499011	-104.73449443
3000.00	5.84	25.790	2993.06	126.27N	61.02E	==>	-47.31	39.99501515	-104.73447835
3100.00	5.84	25.790	3092.54	135.43N	65.44E	==>	-50.74	39.99504019	-104.73446227
3200.00	5.84	25.790	3192.02	144.59N	69.87E	==>	-54.17	39.99506523	-104.73444619

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5068.0ft above Mean Sea Level )  
Vertical Section is from 0.00N 0.00E on azimuth 276.080 degrees  
Bottom hole distance is 4523.80 Feet on azimuth 276.08 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 21-Feb-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)
3300.00	5.84	25.790	3291.50	153.75N	74.30E	==>	-57.60	39.99509027	-104.73443011
3400.00	5.84	25.790	3390.98	162.91N	78.72E	==>	-61.03	39.99511531	-104.73441403
3500.00	5.84	25.790	3490.46	172.07N	83.15E	==>	-64.47	39.99514035	-104.73439795
3600.00	5.84	25.790	3589.95	181.23N	87.58E	==>	-67.90	39.99516539	-104.73438187
3700.00	5.84	25.790	3689.43	190.39N	92.00E	==>	-71.33	39.99519042	-104.73436579
3800.00	5.84	25.790	3788.91	199.54N	96.43E	==>	-74.76	39.99521546	-104.73434971
3900.00	5.84	25.790	3888.39	208.70N	100.85E	==>	-78.19	39.99524050	-104.73433363
4000.00	5.84	25.790	3987.87	217.86N	105.28E	==>	-81.63	39.99526554	-104.73431755
4100.00	5.84	25.790	4087.35	227.02N	109.71E	==>	-85.06	39.99529058	-104.73430147
4200.00	5.84	25.790	4186.83	236.18N	114.13E	==>	-88.49	39.99531562	-104.73428539
4300.00	5.84	25.790	4286.31	245.34N	118.56E	==>	-91.92	39.99534066	-104.73426931
4400.00	5.84	25.790	4385.80	254.50N	122.99E	==>	-95.35	39.99536570	-104.73425323
4500.00	5.84	25.790	4485.28	263.66N	127.41E	==>	-98.79	39.99539074	-104.73423715
4600.00	5.84	25.790	4584.76	272.82N	131.84E	==>	-102.22	39.99541578	-104.73422107
4700.00	5.84	25.790	4684.24	281.98N	136.27E	==>	-105.65	39.99544081	-104.73420499
4800.00	5.84	25.790	4783.72	291.14N	140.69E	==>	-109.08	39.99546585	-104.73418891
4900.00	5.84	25.790	4883.20	300.30N	145.12E	==>	-112.51	39.99549089	-104.73417282
5000.00	5.84	25.790	4982.68	309.46N	149.55E	==>	-115.94	39.99551593	-104.73415674
5100.00	5.84	25.790	5082.16	318.62N	153.97E	==>	-119.38	39.99554097	-104.73414066
5200.00	5.84	25.790	5181.64	327.78N	158.40E	==>	-122.81	39.99556601	-104.73412458
5300.00	5.84	25.790	5281.13	336.94N	162.82E	==>	-126.24	39.99559105	-104.73410850
5400.00	5.84	25.790	5380.61	346.10N	167.25E	==>	-129.67	39.99561609	-104.73409242
5500.00	5.84	25.790	5480.09	355.26N	171.68E	==>	-133.10	39.99564113	-104.73407634
5600.00	5.84	25.790	5579.57	364.42N	176.10E	==>	-136.54	39.99566616	-104.73406026
5700.00	5.84	25.790	5679.05	373.58N	180.53E	==>	-139.97	39.99569120	-104.73404418
5800.00	5.84	25.790	5778.53	382.74N	184.96E	==>	-143.40	39.99571624	-104.73402810
5900.00	5.84	25.790	5878.01	391.90N	189.38E	==>	-146.83	39.99574128	-104.73401202
6000.00	5.84	25.790	5977.49	401.06N	193.81E	==>	-150.26	39.99576632	-104.73399594
6100.00	5.84	25.790	6076.98	410.22N	198.24E	==>	-153.70	39.99579136	-104.73397986
6200.00	5.84	25.790	6176.46	419.38N	202.66E	==>	-157.13	39.99581640	-104.73396378
6300.00	5.84	25.790	6275.94	428.54N	207.09E	==>	-160.56	39.99584144	-104.73394770
6400.00	5.84	25.790	6375.42	437.70N	211.52E	==>	-163.99	39.99586648	-104.73393162
6500.00	5.84	25.790	6474.90	446.86N	215.94E	==>	-167.42	39.99589151	-104.73391554
6600.00	5.84	25.790	6574.38	456.02N	220.37E	==>	-170.86	39.99591655	-104.73389946
6700.00	5.84	25.790	6673.86	465.18N	224.79E	==>	-174.29	39.99594159	-104.73388338
6800.00	5.84	25.790	6773.34	474.34N	229.22E	==>	-177.72	39.99596663	-104.73386730
6900.00	5.84	25.790	6872.82	483.50N	233.65E	==>	-181.15	39.99599167	-104.73385122
7000.00	5.24	2.220	6972.32	492.66N	237.68E	12.00	-184.19	39.99601671	-104.73383515
7100.00	12.83	293.000	7071.22	501.59N	227.59E	12.00	-173.22	39.99604146	-104.73381907
7200.00	24.27	281.020	7165.90	509.89N	197.09E	12.00	-142.00	39.99606496	-104.73379299
7300.00	36.06	276.520	7252.21	517.18N	147.49E	12.00	-91.91	39.99608817	-104.73415769
7400.00	47.95	274.040	7326.39	523.17N	80.96E	12.00	-25.13	39.99610417	-104.73439492
7500.00	59.87	272.350	7385.19	527.57N	0.42E	12.00	55.43	39.99611817	-104.73468224
7600.00	71.81	271.030	7426.04	530.21N	90.61W	12.00	146.23	39.99612755	-104.73500707
7700.00	83.76	269.880	7447.16	530.95N	188.17W	12.00	243.32	39.99613192	-104.73535522
7800.00	90.00	269.300	7450.00	530.00N	288.06W	==>	342.55	39.99613167	-104.73571177
7900.00	90.00	269.300	7450.00	528.79N	388.05W	==>	441.85	39.99613070	-104.73606868
8000.00	90.00	269.300	7450.00	527.57N	488.05W	==>	541.15	39.99612973	-104.73642559
8100.00	90.00	269.300	7450.00	526.36N	588.04W	==>	640.45	39.99612876	-104.73678250
8200.00	90.00	269.300	7450.00	525.15N	688.03W	==>	739.76	39.99612779	-104.73713941
8300.00	90.00	269.300	7450.00	523.93N	788.02W	==>	839.06	39.99612682	-104.73749633
8400.00	90.00	269.300	7450.00	522.72N	888.02W	==>	938.36	39.99612585	-104.73785324
8500.00	90.00	269.300	7450.00	521.50N	988.01W	==>	1037.66	39.99612488	-104.73821015
8600.00	90.00	269.300	7450.00	520.29N	1088.00W	==>	1136.97	39.99612390	-104.73856706
8700.00	90.00	269.300	7450.00	519.08N	1187.99W	==>	1236.27	39.99612293	-104.73892397
8800.00	90.00	269.300	7450.00	517.86N	1287.99W	==>	1335.57	39.99612195	-104.73928089
8900.00	90.00	269.300	7450.00	516.65N	1387.98W	==>	1434.87	39.99612097	-104.73963780
9000.00	90.00	269.300	7450.00	515.43N	1487.97W	==>	1534.18	39.99611999	-104.73999471

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Vertical Section is from 0.00N 0.00E on azimuth 276.080 degrees  
Bottom hole distance is 4523.80 Feet on azimuth 276.08 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 21-Feb-2018



SYSDRILL  
Well Design Combined Report  
Wellbore: W BEF West 16 (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)
9100.00	90.00	269.300	7450.00	514.22N	1587.96W	==>	1633.48	39.99611901	-104.74035162
9200.00	90.00	269.300	7450.00	513.01N	1687.96W	==>	1732.78	39.99611803	-104.74070853
9300.00	90.00	269.300	7450.00	511.79N	1787.95W	==>	1832.08	39.99611705	-104.74106544
9400.00	90.00	269.300	7450.00	510.58N	1887.94W	==>	1931.38	39.99611607	-104.74142236
9500.00	90.00	269.300	7450.00	509.37N	1987.94W	==>	2030.69	39.99611508	-104.74177927
9600.00	90.00	269.300	7450.00	508.15N	2087.93W	==>	2129.99	39.99611410	-104.74213618
9700.00	90.00	269.300	7450.00	506.94N	2187.92W	==>	2229.29	39.99611311	-104.74249309
9800.00	90.00	269.300	7450.00	505.72N	2287.91W	==>	2328.59	39.99611212	-104.74285000
9900.00	90.00	269.300	7450.00	504.51N	2387.91W	==>	2427.90	39.99611113	-104.74320692
10000.00	90.00	269.300	7450.00	503.30N	2487.90W	==>	2527.20	39.99611014	-104.74356383
10100.00	90.00	269.300	7450.00	502.08N	2587.89W	==>	2626.50	39.99610915	-104.74392074
10200.00	90.00	269.300	7450.00	500.87N	2687.88W	==>	2725.80	39.99610816	-104.74427765
10300.00	90.00	269.300	7450.00	499.65N	2787.88W	==>	2825.10	39.99610716	-104.74463456
10400.00	90.00	269.300	7450.00	498.44N	2887.87W	==>	2924.41	39.99610617	-104.74499147
10500.00	90.00	269.300	7450.00	497.23N	2987.86W	==>	3023.71	39.99610517	-104.74534839
10600.00	90.00	269.300	7450.00	496.01N	3087.85W	==>	3123.01	39.99610418	-104.74570530
10700.00	90.00	269.300	7450.00	494.80N	3187.85W	==>	3222.31	39.99610318	-104.74606221
10800.00	90.00	269.300	7450.00	493.58N	3287.84W	==>	3321.62	39.99610218	-104.74641912
10900.00	90.00	269.300	7450.00	492.37N	3387.83W	==>	3420.92	39.99610118	-104.74677603
11000.00	90.00	269.300	7450.00	491.16N	3487.82W	==>	3520.22	39.99610018	-104.74713294
11100.00	90.00	269.300	7450.00	489.94N	3587.82W	==>	3619.52	39.99609918	-104.74748986
11200.00	90.00	269.300	7450.00	488.73N	3687.81W	==>	3718.83	39.99609817	-104.74784677
11300.00	90.00	269.300	7450.00	487.52N	3787.80W	==>	3818.13	39.99609717	-104.74820368
11400.00	90.00	269.300	7450.00	486.30N	3887.80W	==>	3917.43	39.99609616	-104.74856059
11500.00	90.00	269.300	7450.00	485.09N	3987.79W	==>	4016.73	39.99609516	-104.74891750
11600.00	90.00	269.300	7450.00	483.87N	4087.78W	==>	4116.03	39.99609415	-104.74927442
11700.00	90.00	269.300	7450.00	482.66N	4187.77W	==>	4215.34	39.99609314	-104.74963133
11800.00	90.00	269.300	7450.00	481.45N	4287.77W	==>	4314.64	39.99609213	-104.74998824
11900.00	90.00	269.300	7450.00	480.23N	4387.76W	==>	4413.94	39.99609112	-104.75034515
12000.00	90.00	269.300	7450.00	479.02N	4487.75W	==>	4513.24	39.99609011	-104.75070206
12010.63	90.00	269.300	7450.00	478.89N	4498.38W	==>	4523.80	39.99609000	-104.75074000

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Vertical Section is from 0.00N 0.00E on azimuth 276.080 degrees  
Bottom hole distance is 4523.80 Feet on azimuth 276.08 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 21-Feb-2018



SYSDRILL  
Well Design Combined Report  
Wellbore: W BEF West 16 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 16 BHL	478.89N	4498.38W	7450.00	39.99609000	-104.75074000	1242309.38	3209917.42
BEF WEST 16 EP	530.58N	150.28W	7450.00	39.99613000	-104.73522000	1242361.07	3214265.37

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577661	Planned	2000.00	1998.25	WdW Rate Gyro	Standard	
577660	Planned	12010.63	7450.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes