

# Petro Operating Company

Location Weld County, CO Slot BEF West 10  
Field Wattenberg Well W BEF West 10  
Installation Brighton East Farm Pad Wellbore W BEF West 10 (PWB)

Tie on - 0.00 Inc, 21.00 MD, 21.00 TVD, -0.00 VS

Scale 1 cm = 400 ft

East (Feet) ->

-5600 -4800 -4000 -3200 -2400 -1600 -800 -0 800 1600

3DS Kick off Point - 0.00 Inc, 1500.00 MD, 1500.00 TVD, -0.00 VS

Surface 0.00 N 0.00 E

BEF WEST 10 BHL

BEF WEST 10 EP

W BEF West 10 (PWB)

End of Build - 3.39 Inc, 1630.49 MD, 1630.42 TVD, -2.97 VS

## WELL PROFILE DATA

Point	MD	Inc	Azi	TVD	North	East	deg/100ft	V. Sect
Tie on	21.00	0.00	0.00	21.00	S 0.00	W 0.00		-0.00
KOP	1500.00	0.00	126.43	1500.00	S 0.00	W 0.00	0.00	-0.00
End of Build	1630.49	3.39	126.43	1630.42	S 2.29	E 3.11	2.60	-2.97
End of Hold	6959.71	3.39	126.43	6950.30	S 189.60	E 256.86	0.00	-245.59
Target BEF WEST 10 EP	7732.28	90.00	269.40	7450.00	S 212.41	W 219.86	12.00	231.65
T.D. & Target BEF...BHL	11996.49	90.00	269.40	7450.00	S 256.87	W 4483.84	0.00	4491.19

N

GRID

Oct-6-2017

EMMA-2015 [2000.0-2020.0] Dip: 66.39 deg Field: 52108.9 nT  
Lat: N39 59 33.9000 Long: W104 44 4.8840 Elev: 5047.00 ft  
Magnetic North is 8.22 deg East of True North  
GRID North is 0.49 deg East of True North  
To correct azimuth from True to GRID subtract 0.49 deg  
To correct azimuth from Magnetic to GRID add 7.72 deg

Created by admin  
Date plotted 21-Feb-2018

Plot reference is W BEF West 10 (PWB).  
Ref wellpath is W BEF West 10 (PWP#1).  
Coordinates are in Feet reference BEF West 10.  
True Vertical Depths are reference Rig Datum.  
Measured Depths are reference Rig Datum.  
Rig Datum: Planned Datum #1  
Rig Datum to Mean Sea Level: 5068.00 ft.  
Plot North is aligned to GRID North.

End of Hold - 3.39 Inc, 6959.71 MD, 6950.30 TVD, -245.59 VS

S/C Kick off Point - 90.00 Inc, 7732.28 MD, 7450.00 TVD, 231.65 VS

T.D. & End of Hold - 7450.00 TVD, 256.87 S 4483.84 W

BEF WEST 10 EP

BEF WEST 10 BHL

W BEF West 10 (PWB)

<- True Vertical Depth (Feet)

<- North(Feet)

Scale 1 cm = 400 ft

Vertical Section (Feet) ->

Azimuth 266.72 with reference 0.00 N, 0.00 E from BEF West 10

Scale 1 cm = 200 ft



SYSDRILL  
Well Design Combined Report  
Wellbore: W BEF West 10 (PWB)



### Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 10	39.99340000	-104.73469000	1241367.9171	3214422.4323	236.78N	2.04W	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	126.430	1500.00	-3568.00	0.00N	0.00E	==>	0.00
1630.49	3.39	126.430	1630.42	-3437.58	2.29S	3.11E	2.60	-2.97
6959.71	3.39	126.430	6950.30	1882.30	189.60S	256.86E	==>	-245.59
7732.28	90.00	269.400	7450.00	2382.00	212.41S	219.86W	12.00	231.65
11996.49	90.00	269.400	7450.00	2382.00	256.87S	4483.84W	==>	4491.19

### 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	39.99340000	-104.73469000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1500.00	0.00	126.430	1500.00	0.00N	0.00E	==>	0.00	39.99340000	-104.73469000
1600.00	2.60	126.430	1599.97	1.35S	1.83E	2.60	-1.75	39.99339626	-104.73468353
1700.00	3.39	126.430	1699.80	4.74S	6.42E	==>	-6.14	39.99338685	-104.73466724
1800.00	3.39	126.430	1799.63	8.25S	11.18E	==>	-10.69	39.99337708	-104.73465036
1900.00	3.39	126.430	1899.45	11.77S	15.94E	==>	-15.24	39.99336732	-104.73463347
2000.00	3.39	126.430	1999.28	15.28S	20.70E	==>	-19.79	39.99335756	-104.73461659
2100.00	3.39	126.430	2099.10	18.80S	25.46E	==>	-24.35	39.99334780	-104.73459970
2200.00	3.39	126.430	2198.93	22.31S	30.22E	==>	-28.90	39.99333804	-104.73458282
2300.00	3.39	126.430	2298.75	25.83S	34.99E	==>	-33.45	39.99332828	-104.73456594
2400.00	3.39	126.430	2398.57	29.34S	39.75E	==>	-38.00	39.99331852	-104.73454905
2500.00	3.39	126.430	2498.40	32.85S	44.51E	==>	-42.56	39.99330876	-104.73453217
2600.00	3.39	126.430	2598.22	36.37S	49.27E	==>	-47.11	39.99329900	-104.73451528
2700.00	3.39	126.430	2698.05	39.88S	54.03E	==>	-51.66	39.99328924	-104.73449840
2800.00	3.39	126.430	2797.87	43.40S	58.79E	==>	-56.22	39.99327948	-104.73448151
2900.00	3.39	126.430	2897.70	46.91S	63.55E	==>	-60.77	39.99326972	-104.73446463
3000.00	3.39	126.430	2997.52	50.43S	68.32E	==>	-65.32	39.99325996	-104.73444774
3100.00	3.39	126.430	3097.35	53.94S	73.08E	==>	-69.87	39.99325020	-104.73443086
3200.00	3.39	126.430	3197.17	57.46S	77.84E	==>	-74.43	39.99324043	-104.73441397

All data is in Feet unless otherwise stated  
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 266.720 degrees  
Bottom hole distance is 4491.19 Feet on azimuth 266.72 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	3.39	126.430	3297.00	60.97S	82.60E	==>	-78.98	39.99323067	-104.73439709
3400.00	3.39	126.430	3396.82	64.49S	87.36E	==>	-83.53	39.99322091	-104.73438020
3500.00	3.39	126.430	3496.65	68.00S	92.12E	==>	-88.08	39.99321115	-104.73436332
3600.00	3.39	126.430	3596.47	71.52S	96.89E	==>	-92.64	39.99320139	-104.73434643
3700.00	3.39	126.430	3696.30	75.03S	101.65E	==>	-97.19	39.99319163	-104.73432955
3800.00	3.39	126.430	3796.12	78.55S	106.41E	==>	-101.74	39.99318187	-104.73431266
3900.00	3.39	126.430	3895.95	82.06S	111.17E	==>	-106.29	39.99317211	-104.73429578
4000.00	3.39	126.430	3995.77	85.58S	115.93E	==>	-110.85	39.99316235	-104.73427889
4100.00	3.39	126.430	4095.60	89.09S	120.69E	==>	-115.40	39.99315259	-104.73426201
4200.00	3.39	126.430	4195.42	92.60S	125.45E	==>	-119.95	39.99314283	-104.73424512
4300.00	3.39	126.430	4295.24	96.12S	130.22E	==>	-124.50	39.99313307	-104.73422824
4400.00	3.39	126.430	4395.07	99.63S	134.98E	==>	-129.06	39.99312331	-104.73421136
4500.00	3.39	126.430	4494.89	103.15S	139.74E	==>	-133.61	39.99311355	-104.73419447
4600.00	3.39	126.430	4594.72	106.66S	144.50E	==>	-138.16	39.99310378	-104.73417759
4700.00	3.39	126.430	4694.54	110.18S	149.26E	==>	-142.72	39.99309402	-104.73416070
4800.00	3.39	126.430	4794.37	113.69S	154.02E	==>	-147.27	39.99308426	-104.73414382
4900.00	3.39	126.430	4894.19	117.21S	158.78E	==>	-151.82	39.99307450	-104.73412693
5000.00	3.39	126.430	4994.02	120.72S	163.55E	==>	-156.37	39.99306474	-104.73411005
5100.00	3.39	126.430	5093.84	124.24S	168.31E	==>	-160.93	39.99305498	-104.73409316
5200.00	3.39	126.430	5193.67	127.75S	173.07E	==>	-165.48	39.99304522	-104.73407628
5300.00	3.39	126.430	5293.49	131.27S	177.83E	==>	-170.03	39.99303546	-104.73405939
5400.00	3.39	126.430	5393.32	134.78S	182.59E	==>	-174.58	39.99302570	-104.73404251
5500.00	3.39	126.430	5493.14	138.30S	187.35E	==>	-179.14	39.99301594	-104.73402562
5600.00	3.39	126.430	5592.97	141.81S	192.12E	==>	-183.69	39.99300618	-104.73400874
5700.00	3.39	126.430	5692.79	145.33S	196.88E	==>	-188.24	39.99299642	-104.73399185
5800.00	3.39	126.430	5792.62	148.84S	201.64E	==>	-192.79	39.99298665	-104.73397497
5900.00	3.39	126.430	5892.44	152.36S	206.40E	==>	-197.35	39.99297689	-104.73395809
6000.00	3.39	126.430	5992.26	155.87S	211.16E	==>	-201.90	39.99296713	-104.73394120
6100.00	3.39	126.430	6092.09	159.38S	215.92E	==>	-206.45	39.99295737	-104.73392432
6200.00	3.39	126.430	6191.91	162.90S	220.68E	==>	-211.01	39.99294761	-104.73390743
6300.00	3.39	126.430	6291.74	166.41S	225.45E	==>	-215.56	39.99293785	-104.73389055
6400.00	3.39	126.430	6391.56	169.93S	230.21E	==>	-220.11	39.99292809	-104.73387366
6500.00	3.39	126.430	6491.39	173.44S	234.97E	==>	-224.66	39.99291833	-104.73385678
6600.00	3.39	126.430	6591.21	176.96S	239.73E	==>	-229.22	39.99290857	-104.73383989
6700.00	3.39	126.430	6691.04	180.47S	244.49E	==>	-233.77	39.99289881	-104.73382301
6800.00	3.39	126.430	6790.86	183.99S	249.25E	==>	-238.32	39.99288905	-104.73380612
6900.00	3.39	126.430	6890.69	187.50S	254.01E	==>	-242.87	39.99287929	-104.73378924
7000.00	2.95	225.540	6990.54	191.04S	257.08E	12.00	-245.73	39.99286951	-104.73377242
7100.00	14.27	261.330	7089.30	194.71S	243.00E	12.00	-231.47	39.99285977	-104.73382875
7200.00	26.20	265.240	7182.96	198.41S	208.69E	12.00	-197.00	39.99285042	-104.73395131
7300.00	38.17	266.800	7267.44	201.98S	155.65E	12.00	-143.84	39.99284188	-104.73414074
7400.00	50.16	267.700	7339.04	205.26S	86.18E	12.00	-74.30	39.99283452	-104.73438876
7500.00	62.15	268.320	7394.64	208.11S	3.33E	12.00	8.58	39.99282866	-104.73468453
7600.00	74.14	268.820	7431.80	210.40S	89.28W	12.00	101.17	39.99282456	-104.73501512
7700.00	86.13	269.260	7448.91	212.04S	187.61W	12.00	199.43	39.99282240	-104.73536608
7800.00	90.00	269.400	7450.00	213.12S	287.58W	==>	299.30	39.99282179	-104.73572289
7900.00	90.00	269.400	7450.00	214.16S	387.57W	==>	399.19	39.99282130	-104.73607978
8000.00	90.00	269.400	7450.00	215.21S	487.57W	==>	499.08	39.99282080	-104.73643668
8100.00	90.00	269.400	7450.00	216.25S	587.56W	==>	598.97	39.99282030	-104.73679358
8200.00	90.00	269.400	7450.00	217.29S	687.56W	==>	698.86	39.99281980	-104.73715047
8300.00	90.00	269.400	7450.00	218.33S	787.55W	==>	798.75	39.99281930	-104.73750737
8400.00	90.00	269.400	7450.00	219.38S	887.55W	==>	898.64	39.99281880	-104.73786427
8500.00	90.00	269.400	7450.00	220.42S	987.54W	==>	998.53	39.99281829	-104.73822116
8600.00	90.00	269.400	7450.00	221.46S	1087.54W	==>	1098.42	39.99281779	-104.73857806
8700.00	90.00	269.400	7450.00	222.50S	1187.53W	==>	1198.31	39.99281728	-104.73893496
8800.00	90.00	269.400	7450.00	223.55S	1287.52W	==>	1298.20	39.99281678	-104.73929185
8900.00	90.00	269.400	7450.00	224.59S	1387.52W	==>	1398.09	39.99281627	-104.73964875
9000.00	90.00	269.400	7450.00	225.63S	1487.51W	==>	1497.98	39.99281576	-104.74000564

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Vertical Section is from 0.00N 0.00E on azimuth 266.720 degrees  
Bottom hole distance is 4491.19 Feet on azimuth 266.72 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 10 (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	269.400	7450.00	226.67S	1587.51W	==>	1597.87	39.99281525	-104.74036254
9200.00	90.00	269.400	7450.00	227.72S	1687.50W	==>	1697.77	39.99281474	-104.74071944
9300.00	90.00	269.400	7450.00	228.76S	1787.50W	==>	1797.66	39.99281423	-104.74107633
9400.00	90.00	269.400	7450.00	229.80S	1887.49W	==>	1897.55	39.99281371	-104.74143323
9500.00	90.00	269.400	7450.00	230.85S	1987.49W	==>	1997.44	39.99281320	-104.74179013
9600.00	90.00	269.400	7450.00	231.89S	2087.48W	==>	2097.33	39.99281268	-104.74214702
9700.00	90.00	269.400	7450.00	232.93S	2187.48W	==>	2197.22	39.99281217	-104.74250392
9800.00	90.00	269.400	7450.00	233.97S	2287.47W	==>	2297.11	39.99281165	-104.74286081
9900.00	90.00	269.400	7450.00	235.02S	2387.47W	==>	2397.00	39.99281113	-104.74321771
10000.00	90.00	269.400	7450.00	236.06S	2487.46W	==>	2496.89	39.99281061	-104.74357461
10100.00	90.00	269.400	7450.00	237.10S	2587.45W	==>	2596.78	39.99281009	-104.74393150
10200.00	90.00	269.400	7450.00	238.14S	2687.45W	==>	2696.67	39.99280957	-104.74428840
10300.00	90.00	269.400	7450.00	239.19S	2787.44W	==>	2796.56	39.99280905	-104.74464530
10400.00	90.00	269.400	7450.00	240.23S	2887.44W	==>	2896.45	39.99280852	-104.74500219
10500.00	90.00	269.400	7450.00	241.27S	2987.43W	==>	2996.34	39.99280800	-104.74535909
10600.00	90.00	269.400	7450.00	242.31S	3087.43W	==>	3096.23	39.99280747	-104.74571598
10700.00	90.00	269.400	7450.00	243.36S	3187.42W	==>	3196.12	39.99280694	-104.74607288
10800.00	90.00	269.400	7450.00	244.40S	3287.42W	==>	3296.01	39.99280641	-104.74642978
10900.00	90.00	269.400	7450.00	245.44S	3387.41W	==>	3395.90	39.99280588	-104.74678667
11000.00	90.00	269.400	7450.00	246.48S	3487.41W	==>	3495.79	39.99280535	-104.74714357
11100.00	90.00	269.400	7450.00	247.53S	3587.40W	==>	3595.68	39.99280482	-104.74750047
11200.00	90.00	269.400	7450.00	248.57S	3687.39W	==>	3695.58	39.99280429	-104.74785736
11300.00	90.00	269.400	7450.00	249.61S	3787.39W	==>	3795.47	39.99280375	-104.74821426
11400.00	90.00	269.400	7450.00	250.65S	3887.38W	==>	3895.36	39.99280322	-104.74857115
11500.00	90.00	269.400	7450.00	251.70S	3987.38W	==>	3995.25	39.99280268	-104.74892805
11600.00	90.00	269.400	7450.00	252.74S	4087.37W	==>	4095.14	39.99280214	-104.74928495
11700.00	90.00	269.400	7450.00	253.78S	4187.37W	==>	4195.03	39.99280160	-104.74964184
11800.00	90.00	269.400	7450.00	254.83S	4287.36W	==>	4294.92	39.99280106	-104.74999874
11900.00	90.00	269.400	7450.00	255.87S	4387.36W	==>	4394.81	39.99280052	-104.75035563
11996.49	90.00	269.400	7450.00	256.87S	4483.84W	==>	4491.19	39.99280000	-104.75070000

All data is in Feet unless otherwise stated  
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 266.720 degrees  
Bottom hole distance is 4491.19 Feet on azimuth 266.72 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 10 (PWB)



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 10 BHL	256.87S	4483.84W	7450.00	39.99280000	-104.75070000	1241111.05	3209938.75
BEF WEST 10 EP	212.41S	129.86W	7450.00	39.99282000	-104.73516000	1241155.51	3214292.57

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577619	Planned	2000.00	1999.28	WdW Rate Gyro	Standard	
577618	Planned	11996.49	7450.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes