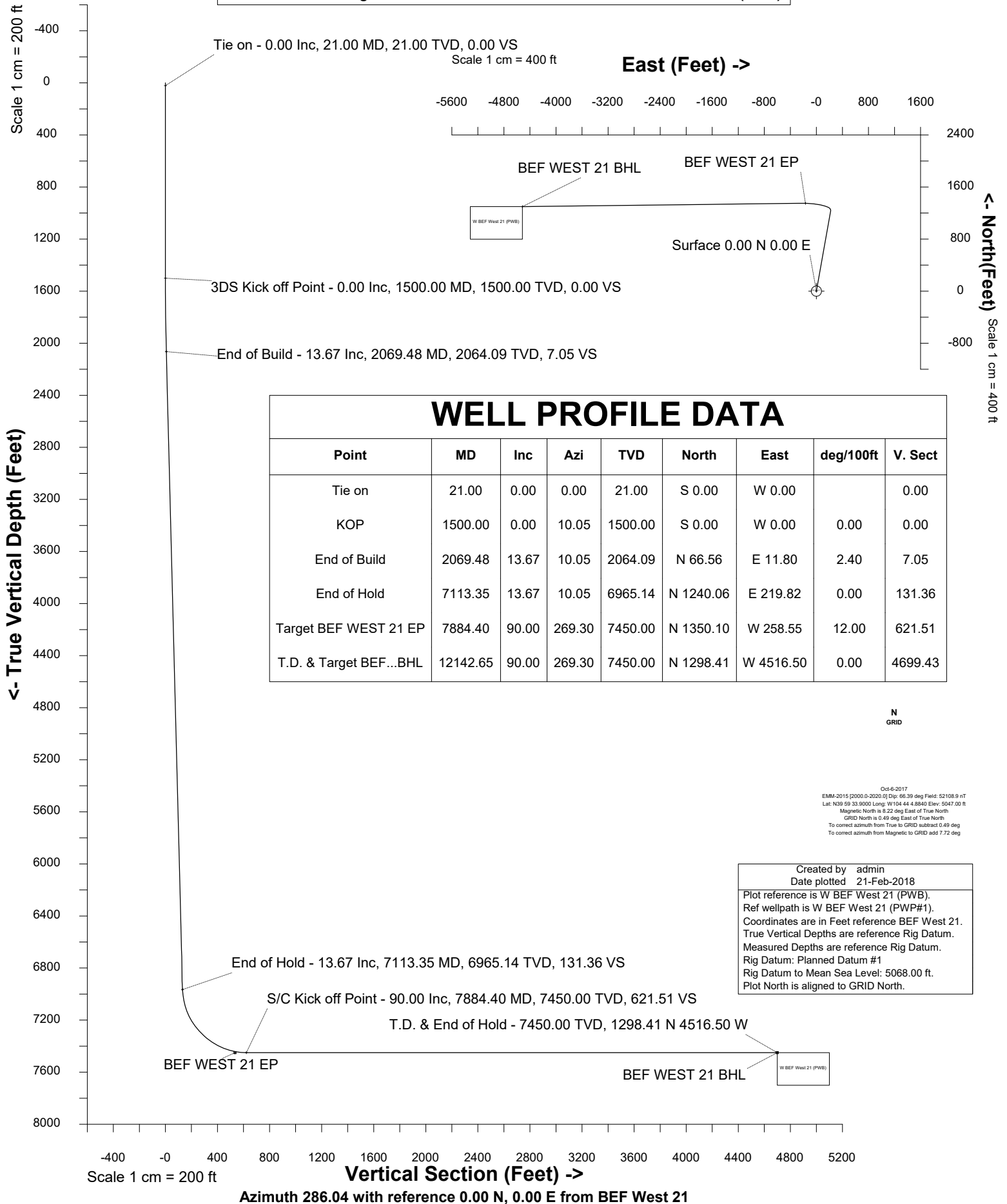


# Petro Operating Company

Location Weld County, CO Slot BEF West 21  
Field Wattenberg Well W BEF West 21  
Installation Brighton East Farm Pad Wellbore W BEF West 21 (PWB)





SYSDRILL  
Well Design Combined Report  
Wellbore: W BEF West 21 (PWB)



### Wellhead Details

Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
BEF West 21	39.99489000	-104.73470000	1241910.6405	3214414.9463	779.52N	9.53W	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	10.050	1500.00	-3568.00	0.00N	0.00E	==>	0.00
2069.48	13.67	10.050	2064.09	-3003.91	66.56N	11.80E	2.40	7.05
7113.35	13.67	10.050	6965.14	1897.14	1240.06N	219.82E	==>	131.36
7884.40	90.00	269.300	7450.00	2382.00	1350.10N	258.55W	12.00	621.51
12142.65	90.00	269.300	7450.00	2382.00	1298.41N	4516.50W	==>	4699.43

### 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	39.99489000	-104.73470000
21.00	0.00	0.000	21.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1500.00	0.00	10.050	1500.00	0.00N	0.00E	==>	0.00	39.99489000	-104.73470000
1600.00	2.40	10.050	1599.97	2.06N	0.37E	2.40	0.22	39.99489565	-104.73469863
1700.00	4.80	10.050	1699.77	8.24N	1.46E	2.40	0.87	39.99491260	-104.73469453
1800.00	7.20	10.050	1799.21	18.54N	3.29E	2.40	1.96	39.99494080	-104.73468770
1900.00	9.60	10.050	1898.13	32.92N	5.84E	2.40	3.49	39.99498022	-104.73467816
2000.00	12.00	10.050	1996.35	51.37N	9.11E	2.40	5.44	39.99503079	-104.73466592
2100.00	13.67	10.050	2093.75	73.66N	13.06E	==>	7.80	39.99509190	-104.73465113
2200.00	13.67	10.050	2190.92	96.93N	17.18E	==>	10.27	39.99515567	-104.73463569
2300.00	13.67	10.050	2288.09	120.20N	21.31E	==>	12.73	39.99521943	-104.73462026
2400.00	13.67	10.050	2385.26	143.46N	25.43E	==>	15.20	39.99528320	-104.73460482
2500.00	13.67	10.050	2482.42	166.73N	29.55E	==>	17.66	39.99534697	-104.73458938
2600.00	13.67	10.050	2579.59	189.99N	33.68E	==>	20.13	39.99541073	-104.73457395
2700.00	13.67	10.050	2676.76	213.26N	37.80E	==>	22.59	39.99547450	-104.73455851
2800.00	13.67	10.050	2773.93	236.53N	41.93E	==>	25.05	39.99553827	-104.73454308
2900.00	13.67	10.050	2871.10	259.79N	46.05E	==>	27.52	39.99560203	-104.73452764
3000.00	13.67	10.050	2968.27	283.06N	50.18E	==>	29.98	39.99566580	-104.73451220
3100.00	13.67	10.050	3065.43	306.32N	54.30E	==>	32.45	39.99572957	-104.73449677
3200.00	13.67	10.050	3162.60	329.59N	58.42E	==>	34.91	39.99579333	-104.73448133

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Vertical Section is from 0.00N 0.00E on azimuth 286.040 degrees  
Bottom hole distance is 4699.43 Feet on azimuth 286.04 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	13.67	10.050	3259.77	352.85N	62.55E	==>	37.38	39.99585710	-104.73446590
3400.00	13.67	10.050	3356.94	376.12N	66.67E	==>	39.84	39.99592087	-104.73445046
3500.00	13.67	10.050	3454.11	399.39N	70.80E	==>	42.31	39.99598463	-104.73443502
3600.00	13.67	10.050	3551.28	422.65N	74.92E	==>	44.77	39.99604840	-104.73441959
3700.00	13.67	10.050	3648.44	445.92N	79.05E	==>	47.23	39.99611217	-104.73440415
3800.00	13.67	10.050	3745.61	469.18N	83.17E	==>	49.70	39.99617593	-104.73438871
3900.00	13.67	10.050	3842.78	492.45N	87.29E	==>	52.16	39.99623970	-104.73437328
4000.00	13.67	10.050	3939.95	515.72N	91.42E	==>	54.63	39.99630347	-104.73435784
4100.00	13.67	10.050	4037.12	538.98N	95.54E	==>	57.09	39.99636723	-104.73434241
4200.00	13.67	10.050	4134.29	562.25N	99.67E	==>	59.56	39.99643100	-104.73432697
4300.00	13.67	10.050	4231.45	585.51N	103.79E	==>	62.02	39.99649477	-104.73431153
4400.00	13.67	10.050	4328.62	608.78N	107.91E	==>	64.49	39.99655853	-104.73429610
4500.00	13.67	10.050	4425.79	632.04N	112.04E	==>	66.95	39.99662230	-104.73428066
4600.00	13.67	10.050	4522.96	655.31N	116.16E	==>	69.41	39.99668607	-104.73426522
4700.00	13.67	10.050	4620.13	678.58N	120.29E	==>	71.88	39.99674983	-104.73424979
4800.00	13.67	10.050	4717.30	701.84N	124.41E	==>	74.34	39.99681360	-104.73423435
4900.00	13.67	10.050	4814.46	725.11N	128.54E	==>	76.81	39.99687737	-104.73421891
5000.00	13.67	10.050	4911.63	748.37N	132.66E	==>	79.27	39.99694113	-104.73420348
5100.00	13.67	10.050	5008.80	771.64N	136.78E	==>	81.74	39.99700490	-104.73418804
5200.00	13.67	10.050	5105.97	794.91N	140.91E	==>	84.20	39.99706867	-104.73417260
5300.00	13.67	10.050	5203.14	818.17N	145.03E	==>	86.67	39.99713243	-104.73415717
5400.00	13.67	10.050	5300.31	841.44N	149.16E	==>	89.13	39.99719620	-104.73414173
5500.00	13.67	10.050	5397.47	864.70N	153.28E	==>	91.60	39.99725997	-104.73412629
5600.00	13.67	10.050	5494.64	887.97N	157.41E	==>	94.06	39.99732373	-104.73411086
5700.00	13.67	10.050	5591.81	911.23N	161.53E	==>	96.52	39.99738750	-104.73409542
5800.00	13.67	10.050	5688.98	934.50N	165.65E	==>	98.99	39.99745127	-104.73407998
5900.00	13.67	10.050	5786.15	957.77N	169.78E	==>	101.45	39.99751503	-104.73406455
6000.00	13.67	10.050	5883.32	981.03N	173.90E	==>	103.92	39.99757880	-104.73404911
6100.00	13.67	10.050	5980.48	1004.30N	178.03E	==>	106.38	39.99764257	-104.73403367
6200.00	13.67	10.050	6077.65	1027.56N	182.15E	==>	108.85	39.99770633	-104.73401823
6300.00	13.67	10.050	6174.82	1050.83N	186.27E	==>	111.31	39.99777010	-104.73400280
6400.00	13.67	10.050	6271.99	1074.10N	190.40E	==>	113.78	39.99783387	-104.73398736
6500.00	13.67	10.050	6369.16	1097.36N	194.52E	==>	116.24	39.99789763	-104.73397192
6600.00	13.67	10.050	6466.33	1120.63N	198.65E	==>	118.70	39.99796140	-104.73395649
6700.00	13.67	10.050	6563.50	1143.89N	202.77E	==>	121.17	39.99802517	-104.73394105
6800.00	13.67	10.050	6660.66	1167.16N	206.90E	==>	123.63	39.99808893	-104.73392561
6900.00	13.67	10.050	6757.83	1190.42N	211.02E	==>	126.10	39.99815270	-104.73391017
7000.00	13.67	10.050	6855.00	1213.69N	215.14E	==>	128.56	39.99821647	-104.73389474
7100.00	13.67	10.050	6952.17	1236.96N	219.27E	==>	131.03	39.99828023	-104.73387930
7200.00	15.54	328.550	7049.21	1260.10N	215.54E	12.00	141.00	39.99834384	-104.73389190
7300.00	23.84	302.040	7143.47	1282.32N	191.34E	12.00	170.41	39.99840543	-104.73397760
7400.00	34.31	289.800	7230.82	1302.66N	147.53E	12.00	218.13	39.99846230	-104.73413332
7500.00	45.48	282.890	7307.46	1320.23N	86.03E	12.00	282.08	39.99851197	-104.73435227
7600.00	56.93	278.250	7370.03	1334.25N	9.53E	12.00	359.48	39.99855227	-104.73462487
7700.00	68.51	274.700	7415.80	1344.11N	78.62W	12.00	446.93	39.99858143	-104.73493920
7800.00	80.15	271.680	7442.76	1349.39N	174.58W	12.00	540.61	39.99859820	-104.73528154
7900.00	90.00	269.300	7450.00	1349.91N	274.16W	==>	636.45	39.99860198	-104.73563692
8000.00	90.00	269.300	7450.00	1348.70N	374.15W	==>	732.22	39.99860101	-104.73599384
8100.00	90.00	269.300	7450.00	1347.48N	474.14W	==>	827.98	39.99860005	-104.73635077
8200.00	90.00	269.300	7450.00	1346.27N	574.13W	==>	923.75	39.99859908	-104.73670769
8300.00	90.00	269.300	7450.00	1345.05N	674.13W	==>	1019.51	39.99859811	-104.73706462
8400.00	90.00	269.300	7450.00	1343.84N	774.12W	==>	1115.28	39.99859714	-104.73742154
8500.00	90.00	269.300	7450.00	1342.63N	874.11W	==>	1211.04	39.99859616	-104.73777847
8600.00	90.00	269.300	7450.00	1341.41N	974.10W	==>	1306.81	39.99859519	-104.73813539
8700.00	90.00	269.300	7450.00	1340.20N	1074.10W	==>	1402.57	39.99859422	-104.73849232
8800.00	90.00	269.300	7450.00	1338.99N	1174.09W	==>	1498.34	39.99859324	-104.73884924
8900.00	90.00	269.300	7450.00	1337.77N	1274.08W	==>	1594.10	39.99859226	-104.73920616
9000.00	90.00	269.300	7450.00	1336.56N	1374.07W	==>	1689.87	39.99859129	-104.73956309

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Vertical Section is from 0.00N 0.00E on azimuth 286.040 degrees  
Bottom hole distance is 4699.43 Feet on azimuth 286.04 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 21 (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	1335.34N	1474.07W	==>	1785.63	39.99859031	-104.73992001
9200.00	90.00	269.300	7450.00	1334.13N	1574.06W	==>	1881.40	39.99858933	-104.74027694
9300.00	90.00	269.300	7450.00	1332.92N	1674.05W	==>	1977.16	39.99858835	-104.74063386
9400.00	90.00	269.300	7450.00	1331.70N	1774.04W	==>	2072.93	39.99858736	-104.74099079
9500.00	90.00	269.300	7450.00	1330.49N	1874.04W	==>	2168.69	39.99858638	-104.74134771
9600.00	90.00	269.300	7450.00	1329.27N	1974.03W	==>	2264.46	39.99858540	-104.74170464
9700.00	90.00	269.300	7450.00	1328.06N	2074.02W	==>	2360.22	39.99858441	-104.74206156
9800.00	90.00	269.300	7450.00	1326.85N	2174.02W	==>	2455.99	39.99858343	-104.74241849
9900.00	90.00	269.300	7450.00	1325.63N	2274.01W	==>	2551.75	39.99858244	-104.74277541
10000.00	90.00	269.300	7450.00	1324.42N	2374.00W	==>	2647.52	39.99858145	-104.74313234
10100.00	90.00	269.300	7450.00	1323.20N	2473.99W	==>	2743.28	39.99858046	-104.74348926
10200.00	90.00	269.300	7450.00	1321.99N	2573.99W	==>	2839.05	39.99857947	-104.74384619
10300.00	90.00	269.300	7450.00	1320.78N	2673.98W	==>	2934.81	39.99857848	-104.74420311
10400.00	90.00	269.300	7450.00	1319.56N	2773.97W	==>	3030.58	39.99857748	-104.74456004
10500.00	90.00	269.300	7450.00	1318.35N	2873.96W	==>	3126.34	39.99857649	-104.74491696
10600.00	90.00	269.300	7450.00	1317.14N	2973.96W	==>	3222.10	39.99857549	-104.74527389
10700.00	90.00	269.300	7450.00	1315.92N	3073.95W	==>	3317.87	39.99857450	-104.74563081
10800.00	90.00	269.300	7450.00	1314.71N	3173.94W	==>	3413.63	39.99857350	-104.74598774
10900.00	90.00	269.300	7450.00	1313.49N	3273.93W	==>	3509.40	39.99857250	-104.74634466
11000.00	90.00	269.300	7450.00	1312.28N	3373.93W	==>	3605.16	39.99857150	-104.74670158
11100.00	90.00	269.300	7450.00	1311.07N	3473.92W	==>	3700.93	39.99857050	-104.74705851
11200.00	90.00	269.300	7450.00	1309.85N	3573.91W	==>	3796.69	39.99856950	-104.74741543
11300.00	90.00	269.300	7450.00	1308.64N	3673.90W	==>	3892.46	39.99856850	-104.74777236
11400.00	90.00	269.300	7450.00	1307.42N	3773.90W	==>	3988.22	39.99856749	-104.74812928
11500.00	90.00	269.300	7450.00	1306.21N	3873.89W	==>	4083.99	39.99856649	-104.74848621
11600.00	90.00	269.300	7450.00	1305.00N	3973.88W	==>	4179.75	39.99856548	-104.74884313
11700.00	90.00	269.300	7450.00	1303.78N	4073.88W	==>	4275.52	39.99856447	-104.74920006
11800.00	90.00	269.300	7450.00	1302.57N	4173.87W	==>	4371.28	39.99856346	-104.74955698
11900.00	90.00	269.300	7450.00	1301.36N	4273.86W	==>	4467.05	39.99856245	-104.74991391
12000.00	90.00	269.300	7450.00	1300.14N	4373.85W	==>	4562.81	39.99856144	-104.75027083
12100.00	90.00	269.300	7450.00	1298.93N	4473.85W	==>	4658.58	39.99856043	-104.75062775
12142.65	90.00	269.300	7450.00	1298.41N	4516.50W	==>	4699.43	39.99856000	-104.75078000

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Vertical Section is from 0.00N 0.00E on azimuth 286.040 degrees  
Bottom hole distance is 4699.43 Feet on azimuth 286.04 degrees from Wellhead  
Calculation method uses Minimum Curvature method  
Prepared by IPT  
Date Printed: 21-Feb-2018



Targets							
Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
BEF WEST 21 BHL	1298.41N	4516.50W	7450.00	39.99856000	-104.75078000	1243209.00	3209898.61
BEF WEST 21 EP	1350.10N	168.55W	7450.00	39.99860000	-104.73526000	1243260.69	3214246.40

Survey Tool Program						
Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model	
577696	Planned	2000.00	1996.35	WdW Rate Gyro	Standard	
577695	Planned	12142.65	7450.00	ISCWSA MWD	Rev 4 + SAG + FLT	

Notes