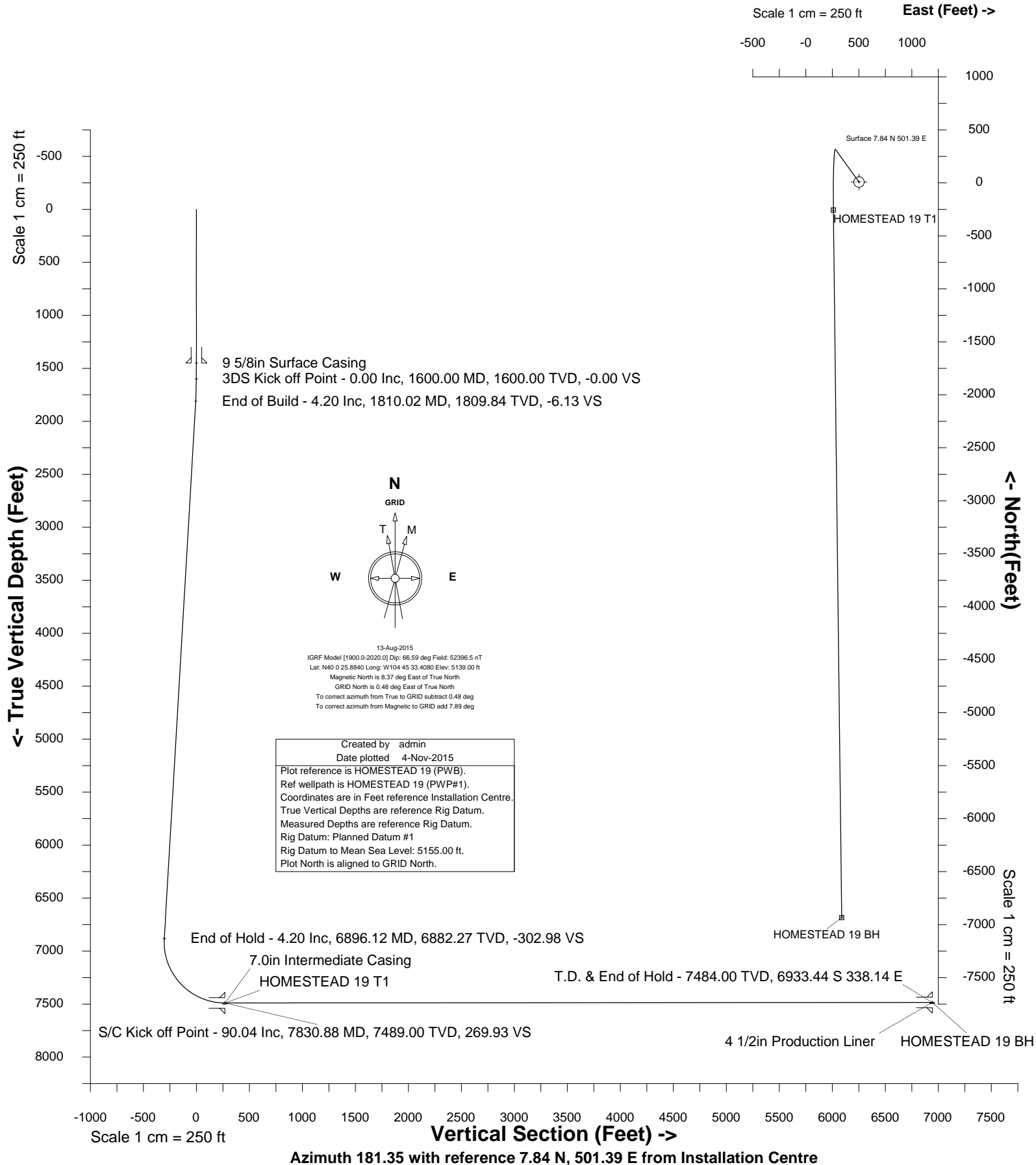




Petro Operating Company

Location	Weld County, CO	Slot	HOMESTEAD 19
Field	Wattenberg	Well	HOMESTEAD 19
Installation	Homestead	Wellbore	HOMESTEAD 19 (PWB)





SYSDRILL
Well Design Combined Report
Wellbore: HOMESTEAD 19 (PWB)

Wellhead Details							
Name	Latitude	Longitude	Northing	Easting	North	East	Slot Elevation Above Ground
HOMESTEAD 19	40.00720000	-104.75749000	1246340.4096	3207992.4507	7.84N	501.39E	0.00

Declination		
Date	Source	Time
13-Aug-2015	IGRF Model [1900.0-2020.0]	08:38

Installation Details						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Northing	Easting	Coord System Name	North Alignment
Homestead	40.00719000	-104.75928000	1246332.5735	3207491.0767	CO83-NF on NORTH AMERICAN DATUM 1983 datum	Grid

Summary Wellpath									
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	Northing	Easting
23.00	0.00	0.000	23.00	0.00N	0.00E		0.00	1246340.41	3207992.45
1600.00	0.00	324.180	1600.00	0.00N	0.00E	==>	0.00	1246340.41	3207992.45
14508.30	90.04	179.330	7484.00	6941.28S	163.25W	==>	6943.20	1239399.38	3207829.20

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
0.00	0.00	0.000	0.00	0.00N	0.00E		0.00	Rig Datum Slot Datum
23.00	0.00	0.000	23.00	0.00N	0.00E	==>	0.00	
100.00	0.00	0.000	100.00	0.00N	0.00E	==>	0.00	
200.00	0.00	0.000	200.00	0.00N	0.00E	==>	0.00	
300.00	0.00	0.000	300.00	0.00N	0.00E	==>	0.00	
400.00	0.00	0.000	400.00	0.00N	0.00E	==>	0.00	
500.00	0.00	0.000	500.00	0.00N	0.00E	==>	0.00	
600.00	0.00	0.000	600.00	0.00N	0.00E	==>	0.00	
700.00	0.00	0.000	700.00	0.00N	0.00E	==>	0.00	
800.00	0.00	0.000	800.00	0.00N	0.00E	==>	0.00	
900.00	0.00	0.000	900.00	0.00N	0.00E	==>	0.00	
1000.00	0.00	0.000	1000.00	0.00N	0.00E	==>	0.00	
1100.00	0.00	0.000	1100.00	0.00N	0.00E	==>	0.00	
1200.00	0.00	0.000	1200.00	0.00N	0.00E	==>	0.00	
1300.00	0.00	0.000	1300.00	0.00N	0.00E	==>	0.00	
1400.00	0.00	0.000	1400.00	0.00N	0.00E	==>	0.00	9 5/8in Surface Casing
1450.00	0.00	0.000	1450.00	0.00N	0.00E	==>	0.00	
1500.00	0.00	0.000	1500.00	0.00N	0.00E	==>	0.00	
1600.00	0.00	324.180	1600.00	0.00N	0.00E	==>	0.00	
1700.00	2.00	324.180	1699.98	1.42N	1.02W	2.00	-1.39	
1800.00	4.00	324.180	1799.84	5.66N	4.08W	2.00	-5.56	
1900.00	4.20	324.180	1899.57	11.58N	8.36W	==>	-11.38	
2000.00	4.20	324.180	1999.30	17.52N	12.65W	==>	-17.22	
2100.00	4.20	324.180	2099.03	23.46N	16.94W	==>	-23.06	
2200.00	4.20	324.180	2198.76	29.40N	21.22W	==>	-28.89	
2300.00	4.20	324.180	2298.50	35.34N	25.51W	==>	-34.73	
2400.00	4.20	324.180	2398.23	41.28N	29.80W	==>	-40.57	
2500.00	4.20	324.180	2497.96	47.22N	34.08W	==>	-46.40	
2600.00	4.20	324.180	2597.69	53.16N	38.37W	==>	-52.24	
2700.00	4.20	324.180	2697.42	59.10N	42.66W	==>	-58.08	
2800.00	4.20	324.180	2797.15	65.03N	46.95W	==>	-63.91	
2900.00	4.20	324.180	2896.88	70.97N	51.23W	==>	-69.75	
3000.00	4.20	324.180	2996.62	76.91N	55.52W	==>	-75.59	
3100.00	4.20	324.180	3096.35	82.85N	59.81W	==>	-81.42	
3200.00	4.20	324.180	3196.08	88.79N	64.09W	==>	-87.26	
3300.00	4.20	324.180	3295.81	94.73N	68.38W	==>	-93.10	
3400.00	4.20	324.180	3395.54	100.67N	72.67W	==>	-98.93	
3500.00	4.20	324.180	3495.27	106.61N	76.95W	==>	-104.77	
3600.00	4.20	324.180	3595.00	112.55N	81.24W	==>	-110.60	

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 5155.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 181.350 degrees
Bottom hole distance is 6943.20 Feet on azimuth 181.35 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 4-Nov-2015



SYSDRILL
Well Design Combined Report
Wellbore: HOMESTEAD 19 (PWB)

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
3700.00	4.20	324.180	3694.74	118.48N	85.53W	==>	-116.44	
3800.00	4.20	324.180	3794.47	124.42N	89.82W	==>	-122.28	
3900.00	4.20	324.180	3894.20	130.36N	94.10W	==>	-128.11	
4000.00	4.20	324.180	3993.93	136.30N	98.39W	==>	-133.95	
4100.00	4.20	324.180	4093.66	142.24N	102.68W	==>	-139.79	
4200.00	4.20	324.180	4193.39	148.18N	106.96W	==>	-145.62	
4300.00	4.20	324.180	4293.12	154.12N	111.25W	==>	-151.46	
4400.00	4.20	324.180	4392.85	160.06N	115.54W	==>	-157.30	
4500.00	4.20	324.180	4492.59	166.00N	119.83W	==>	-163.13	
4600.00	4.20	324.180	4592.32	171.94N	124.11W	==>	-168.97	
4700.00	4.20	324.180	4692.05	177.87N	128.40W	==>	-174.81	
4800.00	4.20	324.180	4791.78	183.81N	132.69W	==>	-180.64	
4900.00	4.20	324.180	4891.51	189.75N	136.97W	==>	-186.48	
5000.00	4.20	324.180	4991.24	195.69N	141.26W	==>	-192.32	
5100.00	4.20	324.180	5090.97	201.63N	145.55W	==>	-198.15	
5200.00	4.20	324.180	5190.71	207.57N	149.84W	==>	-203.99	
5300.00	4.20	324.180	5290.44	213.51N	154.12W	==>	-209.83	
5400.00	4.20	324.180	5390.17	219.45N	158.41W	==>	-215.66	
5500.00	4.20	324.180	5489.90	225.39N	162.70W	==>	-221.50	
5600.00	4.20	324.180	5589.63	231.33N	166.98W	==>	-227.34	
5700.00	4.20	324.180	5689.36	237.26N	171.27W	==>	-233.17	
5800.00	4.20	324.180	5789.09	243.20N	175.56W	==>	-239.01	
5900.00	4.20	324.180	5888.83	249.14N	179.84W	==>	-244.85	
6000.00	4.20	324.180	5988.56	255.08N	184.13W	==>	-250.68	
6100.00	4.20	324.180	6088.29	261.02N	188.42W	==>	-256.52	
6200.00	4.20	324.180	6188.02	266.96N	192.71W	==>	-262.35	
6300.00	4.20	324.180	6287.75	272.90N	196.99W	==>	-268.19	
6400.00	4.20	324.180	6387.48	278.84N	201.28W	==>	-274.03	
6500.00	4.20	324.180	6487.21	284.78N	205.57W	==>	-279.86	
6600.00	4.20	324.180	6586.95	290.72N	209.85W	==>	-285.70	
6700.00	4.20	324.180	6686.68	296.65N	214.14W	==>	-291.54	
6800.00	4.20	324.180	6786.41	302.59N	218.43W	==>	-297.37	
6900.00	3.89	320.880	6886.14	308.52N	222.72W	10.00	-303.20	
7000.00	7.36	198.430	6985.87	305.06N	226.89W	10.00	-299.65	
7100.00	17.12	187.220	7083.49	284.33N	230.78W	10.00	-278.83	
7200.00	27.05	184.080	7176.03	246.95N	234.26W	10.00	-241.37	
7300.00	37.02	182.540	7260.70	194.05N	237.22W	10.00	-188.42	
7400.00	47.00	181.590	7334.90	127.25N	239.58W	10.00	-121.58	
7500.00	56.99	180.900	7396.40	48.57N	241.26W	10.00	-42.89	
7600.00	66.98	180.360	7443.32	39.59S	242.21W	10.00	45.27	
7700.00	76.97	179.890	7474.23	134.56S	242.41W	10.00	140.22	
7800.00	86.96	179.460	7488.19	233.45S	241.84W	10.00	239.07	7.0in Intermediate Casing
7830.00	89.95	179.330	7489.00	263.43S	241.52W	10.00	269.04	
7900.00	90.04	179.330	7488.95	333.43S	240.70W	==>	339.00	
8000.00	90.04	179.330	7488.87	433.42S	239.53W	==>	438.93	
8100.00	90.04	179.330	7488.80	533.41S	238.36W	==>	538.87	
8200.00	90.04	179.330	7488.72	633.41S	237.19W	==>	638.81	
8300.00	90.04	179.330	7488.65	733.40S	236.02W	==>	738.75	
8400.00	90.04	179.330	7488.57	833.39S	234.84W	==>	838.68	
8500.00	90.04	179.330	7488.50	933.39S	233.67W	==>	938.62	
8600.00	90.04	179.330	7488.42	1033.38S	232.50W	==>	1038.56	
8700.00	90.04	179.330	7488.35	1133.37S	231.33W	==>	1138.50	
8800.00	90.04	179.330	7488.27	1233.37S	230.16W	==>	1238.44	
8900.00	90.04	179.330	7488.20	1333.36S	228.98W	==>	1338.37	
9000.00	90.04	179.330	7488.12	1433.35S	227.81W	==>	1438.31	
9100.00	90.04	179.330	7488.05	1533.35S	226.64W	==>	1538.25	
9200.00	90.04	179.330	7487.97	1633.34S	225.47W	==>	1638.19	
9300.00	90.04	179.330	7487.90	1733.33S	224.30W	==>	1738.13	
9400.00	90.04	179.330	7487.83	1833.32S	223.12W	==>	1838.06	
9500.00	90.04	179.330	7487.75	1933.32S	221.95W	==>	1938.00	
9600.00	90.04	179.330	7487.68	2033.31S	220.78W	==>	2037.94	

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5155.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 181.350 degrees
Bottom hole distance is 6943.20 Feet on azimuth 181.35 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 4-Nov-2015



SYSDRILL
Well Design Combined Report
Wellbore: HOMESTEAD 19 (PWB)

Interpolated Wellpath								
MD[ft]	Inc[deg]	Azi[deg]	TVD[ft]	North[ft]	East[ft]	Dogleg [deg/100ft]	Vertical Section[ft]	All Station Comments
9700.00	90.04	179.330	7487.60	2133.30S	219.61W	==>	2137.88	
9800.00	90.04	179.330	7487.53	2233.30S	218.44W	==>	2237.82	
9900.00	90.04	179.330	7487.45	2333.29S	217.26W	==>	2337.75	
10000.00	90.04	179.330	7487.38	2433.28S	216.09W	==>	2437.69	
10100.00	90.04	179.330	7487.30	2533.28S	214.92W	==>	2537.63	
10200.00	90.04	179.330	7487.23	2633.27S	213.75W	==>	2637.57	
10300.00	90.04	179.330	7487.15	2733.26S	212.58W	==>	2737.50	
10400.00	90.04	179.330	7487.08	2833.26S	211.40W	==>	2837.44	
10500.00	90.04	179.330	7487.00	2933.25S	210.23W	==>	2937.38	
10600.00	90.04	179.330	7486.93	3033.24S	209.06W	==>	3037.32	
10700.00	90.04	179.330	7486.85	3133.23S	207.89W	==>	3137.26	
10800.00	90.04	179.330	7486.78	3233.23S	206.72W	==>	3237.19	
10900.00	90.04	179.330	7486.70	3333.22S	205.54W	==>	3337.13	
11000.00	90.04	179.330	7486.63	3433.21S	204.37W	==>	3437.07	
11100.00	90.04	179.330	7486.55	3533.21S	203.20W	==>	3537.01	
11200.00	90.04	179.330	7486.48	3633.20S	202.03W	==>	3636.95	
11300.00	90.04	179.330	7486.40	3733.19S	200.85W	==>	3736.88	
11400.00	90.04	179.330	7486.33	3833.19S	199.68W	==>	3836.82	
11500.00	90.04	179.330	7486.25	3933.18S	198.51W	==>	3936.76	
11600.00	90.04	179.330	7486.18	4033.17S	197.34W	==>	4036.70	
11700.00	90.04	179.330	7486.10	4133.17S	196.17W	==>	4136.64	
11800.00	90.04	179.330	7486.03	4233.16S	194.99W	==>	4236.57	
11900.00	90.04	179.330	7485.95	4333.15S	193.82W	==>	4336.51	
12000.00	90.04	179.330	7485.88	4433.15S	192.65W	==>	4436.45	
12100.00	90.04	179.330	7485.80	4533.14S	191.48W	==>	4536.39	
12200.00	90.04	179.330	7485.73	4633.13S	190.31W	==>	4636.32	
12300.00	90.04	179.330	7485.65	4733.12S	189.13W	==>	4736.26	
12400.00	90.04	179.330	7485.58	4833.12S	187.96W	==>	4836.20	
12500.00	90.04	179.330	7485.50	4933.11S	186.79W	==>	4936.14	
12600.00	90.04	179.330	7485.43	5033.10S	185.62W	==>	5036.08	
12700.00	90.04	179.330	7485.35	5133.10S	184.45W	==>	5136.01	
12800.00	90.04	179.330	7485.28	5233.09S	183.27W	==>	5235.95	
12900.00	90.04	179.330	7485.20	5333.08S	182.10W	==>	5335.89	
13000.00	90.04	179.330	7485.13	5433.08S	180.93W	==>	5435.83	
13100.00	90.04	179.330	7485.05	5533.07S	179.76W	==>	5535.77	
13200.00	90.04	179.330	7484.98	5633.06S	178.59W	==>	5635.70	
13300.00	90.04	179.330	7484.90	5733.06S	177.41W	==>	5735.64	
13400.00	90.04	179.330	7484.83	5833.05S	176.24W	==>	5835.58	
13500.00	90.04	179.330	7484.76	5933.04S	175.07W	==>	5935.52	
13600.00	90.04	179.330	7484.68	6033.03S	173.90W	==>	6035.46	
13700.00	90.04	179.330	7484.61	6133.03S	172.73W	==>	6135.39	
13800.00	90.04	179.330	7484.53	6233.02S	171.55W	==>	6235.33	
13900.00	90.04	179.330	7484.46	6333.01S	170.38W	==>	6335.27	
14000.00	90.04	179.330	7484.38	6433.01S	169.21W	==>	6435.21	
14100.00	90.04	179.330	7484.31	6533.00S	168.04W	==>	6535.15	
14200.00	90.04	179.330	7484.23	6632.99S	166.87W	==>	6635.08	
14300.00	90.04	179.330	7484.16	6732.99S	165.69W	==>	6735.02	
14400.00	90.04	179.330	7484.08	6832.98S	164.52W	==>	6834.96	
14500.00	90.04	179.330	7484.01	6932.97S	163.35W	==>	6934.90	
14508.30	90.04	179.330	7484.00	6941.28S	163.25W	==>	6943.20	4 1/2in Production Liner

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 5155.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 181.350 degrees
Bottom hole distance is 6943.20 Feet on azimuth 181.35 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 4-Nov-2015

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 1/2	23.00	23.00	0.00N	0.00E	1450.00	1450.00	0.00N	0.00E
8 3/4	1450.00	1450.00	0.00N	0.00E	7830.00	7489.00	263.43S	241.52W
6 1/4	7830.00	7489.00	263.43S	241.52W	14508.30	7484.00	6941.28S	163.25W

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 Surface Casing	23.00	23.00	0.00N	0.00E	1450.00	1450.00	0.00N	0.00E
7.0in Intermediate Casing	23.00	23.00	0.00N	0.00E	7830.00	7489.00	263.43S	241.52W
4 1/2in Production Liner	6931.00	6917.10	309.31N	224.03W	14508.30	7484.00	6941.28S	163.25W

Targets

Name	North[ft]	East[ft]	TVD[ft]	Latitude	Longitude	Northing	Easting
HOMESTEAD 19 BH	6941.28S	163.25W	7484.00	39.98815000	-104.75828000	1239399.38	3207829.20
HOMESTEAD 19 T1	264.32S	241.51W	7489.00	40.00648000	-104.75836000	1246076.10	3207750.94

Survey Tool Program

Reference	Survey Name	MD[ft]	TVD[ft]	Survey Tool	Error Model
400829	Planned	14508.30	7484.00	ISCWSA MWD	Rev 3 + Fixed Rig + Rotating

Notes



SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: HOMESTEAD 19 (PWB)

Ellipse separations are reported ONLY if BOTH wells have uncertainty data
Only Depth and Magnetic Reference Field error terms are correlated across tie points
Scan limit is calculated on CENTRE to CENTRE distance
Summary data uses Closest Approach clearance calculation for all minima
Hole size/Casings ARE included
Hole size/Casings are NOT subtracted from Centre-Centre distance
Confidence limit of 95.00% / 2.80 SD.

Wellbore		
Name	Created	Last Revised
HOMESTEAD 19 (PWB)	18-Aug-2015	24-Sep-2015

Well		
Name	Government ID	Last Revised
HOMESTEAD 19		18-Aug-2015

Slot						
Name	Latitude	Longitude	Grid Northing	Grid Easting	North	East
HOMESTEAD 19	40.00720000	-104.75749000	1246340.4096	3207992.4507	7.84N	501.39E

Installation						
Name	Installation Position (Latitude)	Installation Position (Longitude)	Easting	Northing	Coord System Name	North Alignment
Homestead	40.00719000	-104.75928000	3207491.0767	1246332.5735	CO83-NF on NAD83 datum	Grid

Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
HOMESTEAD 20	16.70	1614.21	7830.88	6.54	1663.42	1.18	14508.30
HOMESTEAD 18	16.81	1575.00	14508.30	-155.64	14508.30	0.52	14508.30
HOMESTEAD 21	30.81	1525.00	1525.00	-18.05	14508.30	0.95	14507.91
HOMESTEAD 17	33.62	1550.00	1550.00	23.93	1581.40	1.32	14508.30
HOMESTEAD 22	47.62	1499.38	1499.38	38.18	1532.19	1.37	14508.30
HOMESTEAD 16	47.62	1525.00	1525.00	38.11	1548.59	1.36	14508.30
HOMESTEAD 23	64.43	1476.00	1476.00	55.14	1499.38	2.03	14508.30
HOMESTEAD 15	64.43	1499.38	14508.30	55.04	1523.00	1.82	14508.30
HOMESTEAD 24	78.44	1451.00	1451.00	69.17	1433.76	2.28	14508.30
HOMESTEAD 14	81.24	1474.00	1474.00	71.97	1433.76	2.44	14508.30
HOMESTEAD 13	95.25	1449.00	1449.00	85.88	1449.00	2.71	14508.30
HOMESTEAD 12	318.35	1932.22	14508.30	306.49	1958.70	3.25	14508.30
HOMESTEAD 11	337.13	1898.73	14508.30	325.47	1898.73	3.86	14508.30
HOMESTEAD 10	355.07	1866.16	14508.30	343.61	1866.16	4.26	14508.30
HOMESTEAD 9	372.89	1833.61	14508.30	361.63	1843.87	4.79	14508.30
HOMESTEAD 8	388.76	1729.04	14508.30	377.89	1794.65	5.37	14508.30
HOMESTEAD 7	406.07	1657.19	14508.30	395.65	1729.04	5.80	14508.30
HOMESTEAD 6	423.00	1595.00	14508.30	413.00	1623.00	6.33	14508.30
HOMESTEAD 5	437.01	1544.00	14508.30	427.39	1548.59	6.90	14508.30
HOMESTEAD 4	453.82	1519.00	14508.30	444.33	1548.59	7.34	14508.30
HOMESTEAD 3	470.63	1482.97	14508.30	461.26	1515.78	7.87	14508.30
HOMESTEAD 2	487.45	1468.00	14508.30	478.16	1433.76	8.43	14508.30
HOMESTEAD 1	501.45	1443.00	14508.30	492.11	1443.00	8.87	14508.30

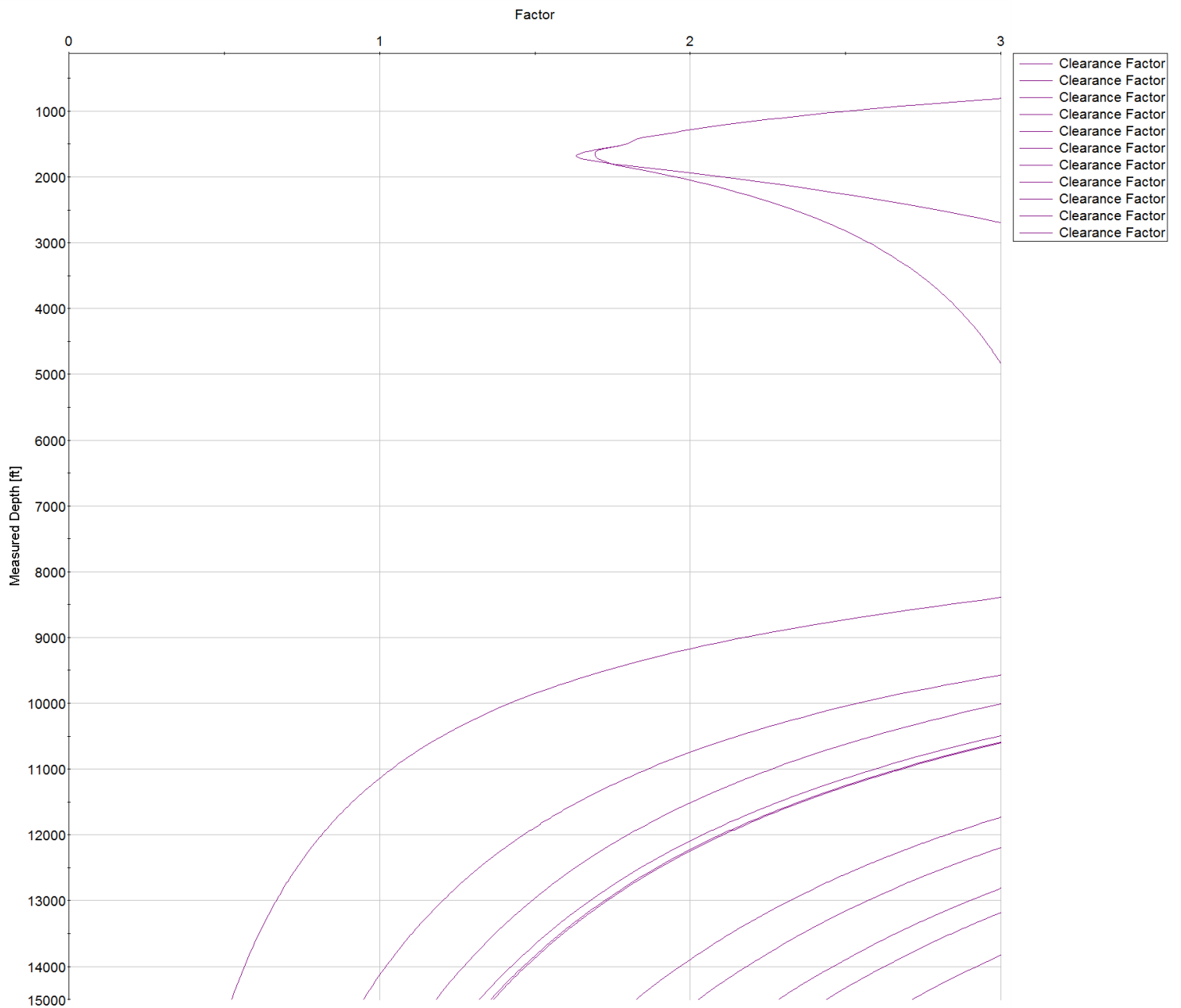


SYSDRILL
Closest Approach + Clearance Factor Summary Report
Wellbore: HOMESTEAD 19 (PWB)

Clearance Summary							
Offset WellName	Separation [ft]	MD[ft]	Diverging From[ft]	Ellipse Separation [ft]	Ellipse MD[ft]	Clearance Factor	Clearance MD[ft]
BERGMAN #1	956.96	10702.13	10702.13	850.15	10718.54	8.90	10784.15
WILLARD, JOHN W. GAS UNIT #1	978.14	6945.57	6945.57	932.96	6945.57	21.59	7011.19
BEN STEVENSON GAS UNIT #1	2124.16	14508.30	14508.30	2071.71	14508.30	40.50	14508.30
UPRR 50 PAN AM M #1	2246.52	9002.96	9002.96	2178.48	9045.31	29.49	9865.52
BERGMAN #2	2350.75	13626.01	13626.01	2171.54	13687.70	12.75	14064.99
BRIGHTON COMPANY #1	3302.74	13335.60	13335.60	3130.91	13408.83	18.38	14097.80
VISTA USX #WW33-08D	4774.56	7158.83	7158.83	4716.89	7158.83	63.72	11292.69
SHAW A #1	5255.79	14508.30	14508.30	5138.72	14508.30	44.90	14508.30



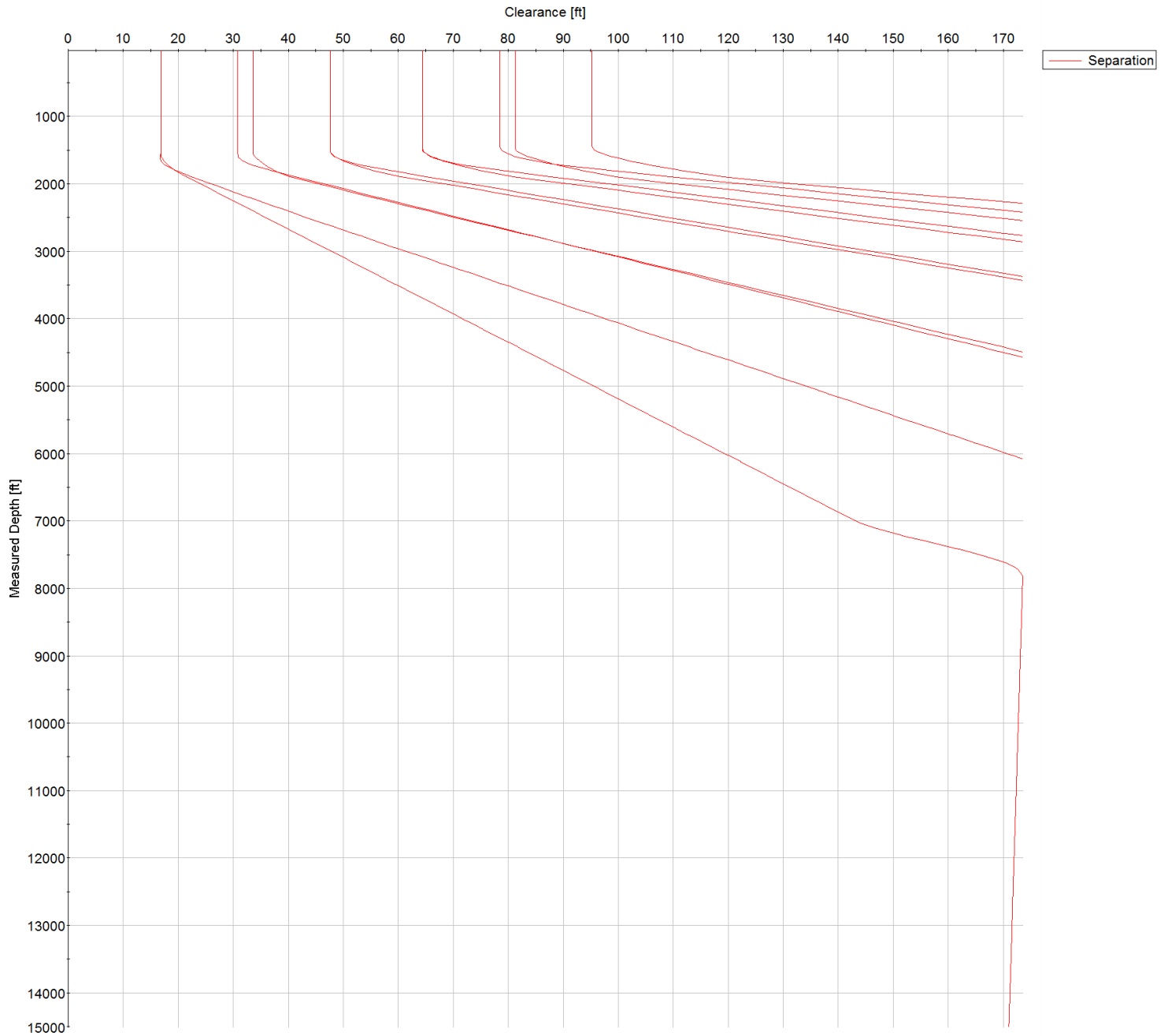
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All data is in Feet unless otherwise stated
Coordinates are from Slot MD's are from Rig and TVD's are from Rig (Planned Datum #1 5155.0ft above Mean Sea Level)
Vertical Section is from 0.00N 0.00E on azimuth 181.350 degrees
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 4-Nov-2015

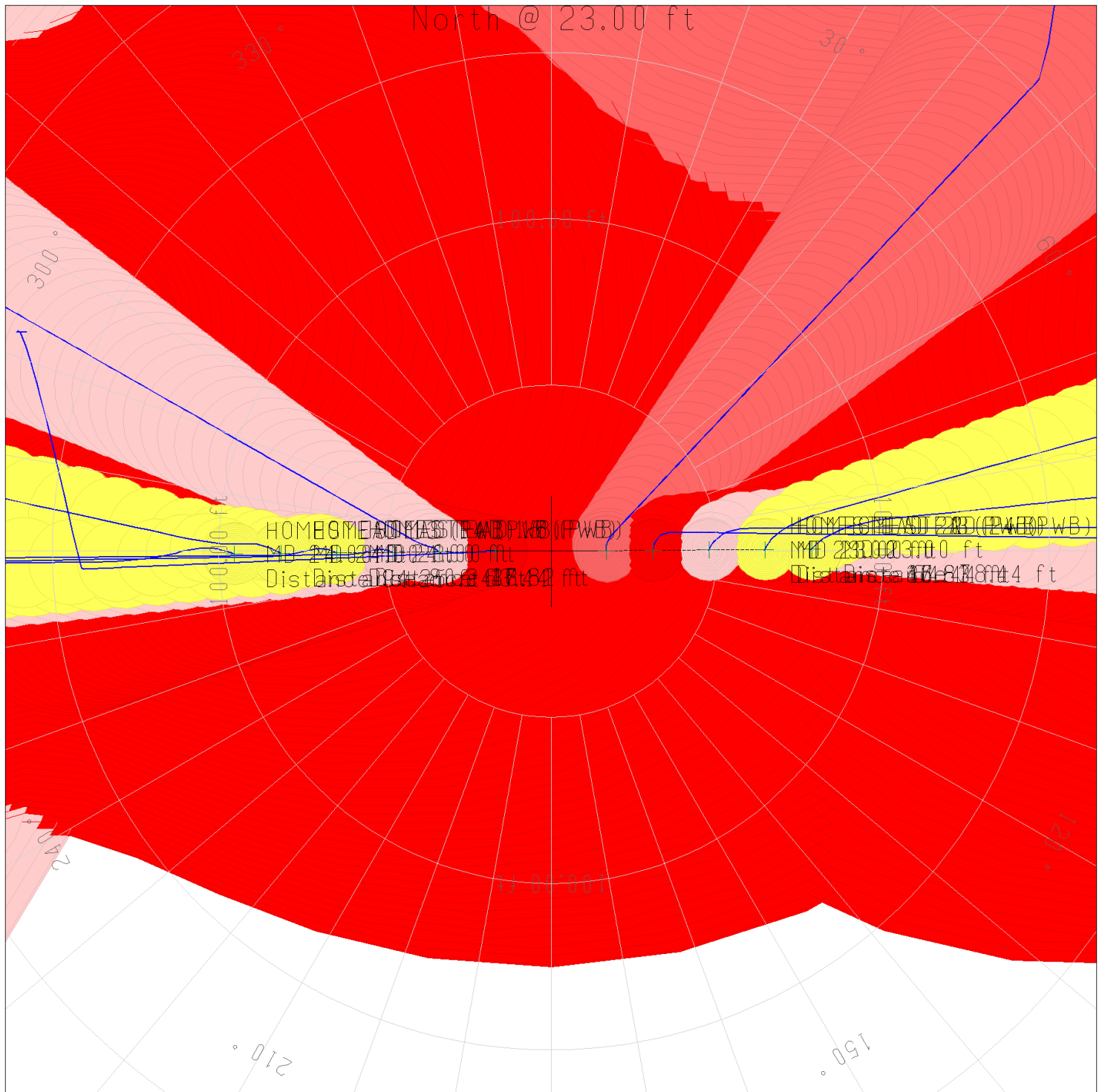


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