

Petro Operating Company

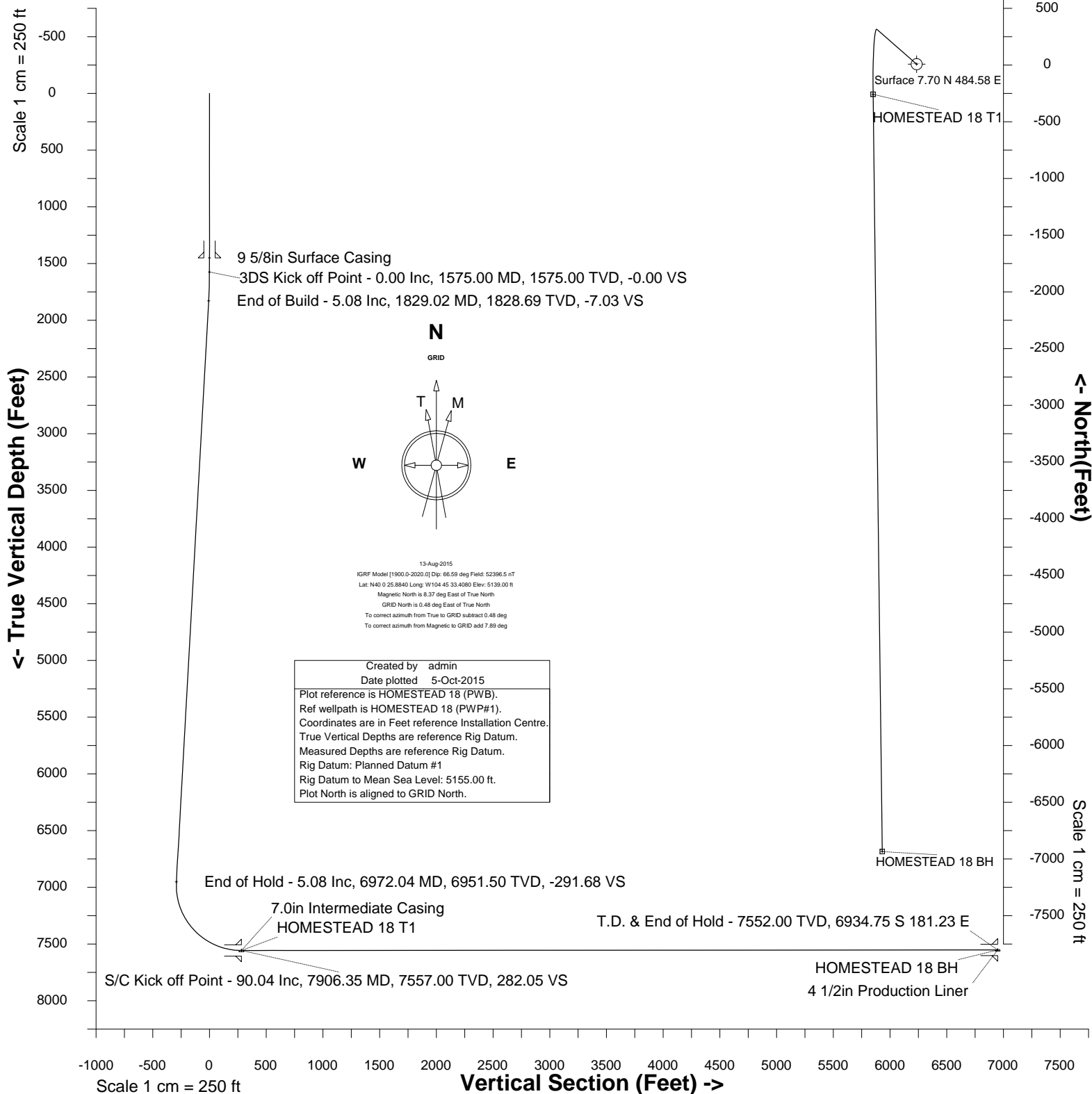
Location Weld County, CO
Field Wattenberg
Installation Homestead

Slot HOMESTEAD 18
Well HOMESTEAD 18
Wellbore HOMESTEAD 18 (PWB)



Scale 1 cm = 250 ft East (Feet) ->

-500 0 500 1000





SYSDRILL
Well Design Combined Report
Wellbore: HOMESTEAD 18 (PWB)

| Wellhead Details | | | | | | | |
|------------------|-------------|---------------|--------------|--------------|-------|---------|-----------------------------|
| Name | Latitude | Longitude | Northing | Easting | North | East | Slot Elevation Above Ground |
| HOMESTEAD 18 | 40.00720000 | -104.75755000 | 1246340.2689 | 3207975.6438 | 7.70N | 484.58E | 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 | 1246340.27 | 3207975.64 |
| 1575.00 | 0.00 | 311.190 | 1575.00 | 0.00N | 0.00E | ==> | 0.00 | 1246340.27 | 3207975.64 |
| 1829.02 | 5.08 | 311.190 | 1828.69 | 7.41N | 8.47W | 2.00 | -7.03 | 1246347.68 | 3207967.17 |
| 6972.04 | 5.08 | 311.190 | 6951.50 | 307.32N | 351.22W | ==> | -291.69 | 1246647.57 | 3207624.44 |
| 7906.35 | 90.04 | 179.300 | 7557.00 | 265.51S | 384.38W | 10.00 | 282.04 | 1246074.77 | 3207591.28 |
| 14583.78 | 90.04 | 179.300 | 7552.00 | 6942.45S | 303.36W | ==> | 6949.07 | 1239398.07 | 3207672.30 |

| 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 3DS Kick off Point |
| 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 | |
| 1575.00 | 0.00 | 311.190 | 1575.00 | 0.00N | 0.00E | ==> | 0.00 | |
| 1600.00 | 0.50 | 311.190 | 1600.00 | 0.07N | 0.08W | 2.00 | -0.07 | |
| 1700.00 | 2.50 | 311.190 | 1699.96 | 1.80N | 2.05W | 2.00 | -1.70 | End of Build |
| 1800.00 | 4.50 | 311.190 | 1799.77 | 5.82N | 6.65W | 2.00 | -5.52 | |
| 1829.02 | 5.08 | 311.190 | 1828.69 | 7.41N | 8.47W | 2.00 | -7.03 | |
| 1900.00 | 5.08 | 311.190 | 1899.39 | 11.55N | 13.20W | ==> | -10.96 | |
| 2000.00 | 5.08 | 311.190 | 1999.00 | 17.38N | 19.86W | ==> | -16.50 | |
| 2100.00 | 5.08 | 311.190 | 2098.60 | 23.21N | 26.53W | ==> | -22.03 | |
| 2200.00 | 5.08 | 311.190 | 2198.21 | 29.04N | 33.19W | ==> | -27.57 | |
| 2300.00 | 5.08 | 311.190 | 2297.82 | 34.88N | 39.86W | ==> | -33.10 | |
| 2400.00 | 5.08 | 311.190 | 2397.42 | 40.71N | 46.52W | ==> | -38.64 | |
| 2500.00 | 5.08 | 311.190 | 2497.03 | 46.54N | 53.19W | ==> | -44.17 | |
| 2600.00 | 5.08 | 311.190 | 2596.64 | 52.37N | 59.85W | ==> | -49.71 | |
| 2700.00 | 5.08 | 311.190 | 2696.25 | 58.20N | 66.52W | ==> | -55.24 | |
| 2800.00 | 5.08 | 311.190 | 2795.85 | 64.03N | 73.18W | ==> | -60.78 | |
| 2900.00 | 5.08 | 311.190 | 2895.46 | 69.86N | 79.84W | ==> | -66.31 | |
| 3000.00 | 5.08 | 311.190 | 2995.07 | 75.69N | 86.51W | ==> | -71.85 | |
| 3100.00 | 5.08 | 311.190 | 3094.67 | 81.53N | 93.17W | ==> | -77.38 | |

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 182.500 degrees
Bottom hole distance is 6949.07 Feet on azimuth 182.50 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 5-Oct-2015



SYSDRILL
Well Design Combined Report
Wellbore: HOMESTEAD 18 (PWB)

| Interpolated Wellpath | | | | | | | | |
|-----------------------|----------|----------|---------|-----------|----------|-----------------------|-------------------------|---|
| MD[ft] | Inc[deg] | Azi[deg] | TVD[ft] | North[ft] | East[ft] | Dogleg [deg/100ft] | Vertical Section[ft] | All Station Comments |
| 3200.00 | 5.08 | 311.190 | 3194.28 | 87.36N | 99.84W | ==> | -82.92 | |
| 3300.00 | 5.08 | 311.190 | 3293.89 | 93.19N | 106.50W | ==> | -88.45 | |
| 3400.00 | 5.08 | 311.190 | 3393.50 | 99.02N | 113.17W | ==> | -93.99 | |
| 3500.00 | 5.08 | 311.190 | 3493.10 | 104.85N | 119.83W | ==> | -99.52 | |
| 3600.00 | 5.08 | 311.190 | 3592.71 | 110.68N | 126.49W | ==> | -105.06 | |
| 3700.00 | 5.08 | 311.190 | 3692.32 | 116.51N | 133.16W | ==> | -110.59 | |
| 3800.00 | 5.08 | 311.190 | 3791.92 | 122.35N | 139.82W | ==> | -116.12 | |
| 3900.00 | 5.08 | 311.190 | 3891.53 | 128.18N | 146.49W | ==> | -121.66 | |
| 4000.00 | 5.08 | 311.190 | 3991.14 | 134.01N | 153.15W | ==> | -127.19 | |
| 4100.00 | 5.08 | 311.190 | 4090.75 | 139.84N | 159.82W | ==> | -132.73 | |
| 4200.00 | 5.08 | 311.190 | 4190.35 | 145.67N | 166.48W | ==> | -138.26 | |
| 4300.00 | 5.08 | 311.190 | 4289.96 | 151.50N | 173.14W | ==> | -143.80 | |
| 4400.00 | 5.08 | 311.190 | 4389.57 | 157.33N | 179.81W | ==> | -149.33 | |
| 4500.00 | 5.08 | 311.190 | 4489.17 | 163.16N | 186.47W | ==> | -154.87 | |
| 4600.00 | 5.08 | 311.190 | 4588.78 | 169.00N | 193.14W | ==> | -160.40 | |
| 4700.00 | 5.08 | 311.190 | 4688.39 | 174.83N | 199.80W | ==> | -165.94 | |
| 4800.00 | 5.08 | 311.190 | 4788.00 | 180.66N | 206.47W | ==> | -171.47 | |
| 4900.00 | 5.08 | 311.190 | 4887.60 | 186.49N | 213.13W | ==> | -177.01 | |
| 5000.00 | 5.08 | 311.190 | 4987.21 | 192.32N | 219.80W | ==> | -182.54 | |
| 5100.00 | 5.08 | 311.190 | 5086.82 | 198.15N | 226.46W | ==> | -188.08 | |
| 5200.00 | 5.08 | 311.190 | 5186.42 | 203.98N | 233.12W | ==> | -193.61 | |
| 5300.00 | 5.08 | 311.190 | 5286.03 | 209.82N | 239.79W | ==> | -199.15 | |
| 5400.00 | 5.08 | 311.190 | 5385.64 | 215.65N | 246.45W | ==> | -204.68 | |
| 5500.00 | 5.08 | 311.190 | 5485.25 | 221.48N | 253.12W | ==> | -210.22 | |
| 5600.00 | 5.08 | 311.190 | 5584.85 | 227.31N | 259.78W | ==> | -215.75 | |
| 5700.00 | 5.08 | 311.190 | 5684.46 | 233.14N | 266.45W | ==> | -221.29 | |
| 5800.00 | 5.08 | 311.190 | 5784.07 | 238.97N | 273.11W | ==> | -226.82 | |
| 5900.00 | 5.08 | 311.190 | 5883.67 | 244.80N | 279.77W | ==> | -232.36 | |
| 6000.00 | 5.08 | 311.190 | 5983.28 | 250.63N | 286.44W | ==> | -237.89 | |
| 6100.00 | 5.08 | 311.190 | 6082.89 | 256.47N | 293.10W | ==> | -243.43 | |
| 6200.00 | 5.08 | 311.190 | 6182.50 | 262.30N | 299.77W | ==> | -248.96 | |
| 6300.00 | 5.08 | 311.190 | 6282.10 | 268.13N | 306.43W | ==> | -254.50 | |
| 6400.00 | 5.08 | 311.190 | 6381.71 | 273.96N | 313.10W | ==> | -260.03 | |
| 6500.00 | 5.08 | 311.190 | 6481.32 | 279.79N | 319.76W | ==> | -265.57 | |
| 6600.00 | 5.08 | 311.190 | 6580.92 | 285.62N | 326.42W | ==> | -271.10 | |
| 6700.00 | 5.08 | 311.190 | 6680.53 | 291.45N | 333.09W | ==> | -276.63 | |
| 6800.00 | 5.08 | 311.190 | 6780.14 | 297.28N | 339.75W | ==> | -282.17 | |
| 6900.00 | 5.08 | 311.190 | 6879.75 | 303.12N | 346.42W | ==> | -287.70 | |
| 6972.04 | 5.08 | 311.190 | 6951.50 | 307.32N | 351.22W | ==> | -291.69 | End of Hold |
| 7000.00 | 3.83 | 278.210 | 6979.38 | 308.27N | 353.08W | 10.00 | -292.56 | |
| 7100.00 | 10.13 | 201.040 | 7078.74 | 300.51N | 359.56W | 10.00 | -284.53 | |
| 7200.00 | 19.76 | 189.930 | 7175.26 | 275.59N | 365.65W | 10.00 | -259.36 | |
| 7300.00 | 29.63 | 185.990 | 7266.01 | 234.25N | 371.16W | 10.00 | -217.82 | |
| 7400.00 | 39.56 | 183.900 | 7348.23 | 177.75N | 375.92W | 10.00 | -161.17 | |
| 7500.00 | 49.51 | 182.550 | 7419.42 | 107.81N | 379.78W | 10.00 | -91.13 | |
| 7600.00 | 59.48 | 181.540 | 7477.42 | 26.56N | 382.64W | 10.00 | -9.83 | |
| 7700.00 | 69.45 | 180.730 | 7520.47 | 63.55S | 384.40W | 10.00 | 80.27 | |
| 7800.00 | 79.43 | 180.020 | 7547.26 | 159.76S | 385.01W | 10.00 | 176.41 | |
| 7900.00 | 89.41 | 179.350 | 7556.97 | 259.16S | 384.45W | 10.00 | 275.69 | |
| 7906.00 | 90.01 | 179.310 | 7557.00 | 265.16S | 384.38W | 10.00 | 281.68 | 7.0in Intermediate Casing S/C Kick off Point/Target, HOMESTEAD 18 T1 |
| 7906.35 | 90.04 | 179.300 | 7557.00 | 265.51S | 384.38W | 10.00 | 282.04 | |
| 8000.00 | 90.04 | 179.300 | 7556.93 | 359.15S | 383.24W | ==> | 375.54 | |
| 8100.00 | 90.04 | 179.300 | 7556.86 | 459.14S | 382.03W | ==> | 475.38 | |
| 8200.00 | 90.04 | 179.300 | 7556.78 | 559.13S | 380.82W | ==> | 575.23 | |
| 8300.00 | 90.04 | 179.300 | 7556.71 | 659.13S | 379.60W | ==> | 675.07 | |
| 8400.00 | 90.04 | 179.300 | 7556.63 | 759.12S | 378.39W | ==> | 774.91 | |
| 8500.00 | 90.04 | 179.300 | 7556.56 | 859.11S | 377.18W | ==> | 874.76 | |
| 8600.00 | 90.04 | 179.300 | 7556.48 | 959.11S | 375.96W | ==> | 974.60 | |
| 8700.00 | 90.04 | 179.300 | 7556.41 | 1059.10S | 374.75W | ==> | 1074.45 | |
| 8800.00 | 90.04 | 179.300 | 7556.33 | 1159.09S | 373.54W | ==> | 1174.29 | |
| 8900.00 | 90.04 | 179.300 | 7556.26 | 1259.08S | 372.32W | ==> | 1274.14 | |
| 9000.00 | 90.04 | 179.300 | 7556.18 | 1359.08S | 371.11W | ==> | 1373.98 | |

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 182.500 degrees
Bottom hole distance is 6949.07 Feet on azimuth 182.50 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 5-Oct-2015



SYSDRILL
Well Design Combined Report
Wellbore: HOMESTEAD 18 (PWB)

| Interpolated Wellpath | | | | | | | | |
|-----------------------|----------|----------|---------|-----------|----------|-----------------------|-------------------------|--|
| MD[ft] | Inc[deg] | Azi[deg] | TVD[ft] | North[ft] | East[ft] | Dogleg [deg/100ft] | Vertical Section[ft] | All Station Comments |
| 9100.00 | 90.04 | 179.300 | 7556.11 | 1459.07S | 369.90W | ==> | 1473.83 | |
| 9200.00 | 90.04 | 179.300 | 7556.03 | 1559.06S | 368.68W | ==> | 1573.67 | |
| 9300.00 | 90.04 | 179.300 | 7555.96 | 1659.05S | 367.47W | ==> | 1673.51 | |
| 9400.00 | 90.04 | 179.300 | 7555.88 | 1759.05S | 366.26W | ==> | 1773.36 | |
| 9500.00 | 90.04 | 179.300 | 7555.81 | 1859.04S | 365.04W | ==> | 1873.20 | |
| 9600.00 | 90.04 | 179.300 | 7555.73 | 1959.03S | 363.83W | ==> | 1973.05 | |
| 9700.00 | 90.04 | 179.300 | 7555.66 | 2059.02S | 362.62W | ==> | 2072.89 | |
| 9800.00 | 90.04 | 179.300 | 7555.58 | 2159.02S | 361.40W | ==> | 2172.74 | |
| 9900.00 | 90.04 | 179.300 | 7555.51 | 2259.01S | 360.19W | ==> | 2272.58 | |
| 10000.00 | 90.04 | 179.300 | 7555.43 | 2359.00S | 358.98W | ==> | 2372.42 | |
| 10100.00 | 90.04 | 179.300 | 7555.36 | 2458.99S | 357.76W | ==> | 2472.27 | |
| 10200.00 | 90.04 | 179.300 | 7555.28 | 2558.99S | 356.55W | ==> | 2572.11 | |
| 10300.00 | 90.04 | 179.300 | 7555.21 | 2658.98S | 355.34W | ==> | 2671.96 | |
| 10400.00 | 90.04 | 179.300 | 7555.13 | 2758.97S | 354.12W | ==> | 2771.80 | |
| 10500.00 | 90.04 | 179.300 | 7555.06 | 2858.96S | 352.91W | ==> | 2871.65 | |
| 10600.00 | 90.04 | 179.300 | 7554.98 | 2958.96S | 351.70W | ==> | 2971.49 | |
| 10700.00 | 90.04 | 179.300 | 7554.91 | 3058.95S | 350.48W | ==> | 3071.33 | |
| 10800.00 | 90.04 | 179.300 | 7554.83 | 3158.94S | 349.27W | ==> | 3171.18 | |
| 10900.00 | 90.04 | 179.300 | 7554.76 | 3258.94S | 348.06W | ==> | 3271.02 | |
| 11000.00 | 90.04 | 179.300 | 7554.68 | 3358.93S | 346.84W | ==> | 3370.87 | |
| 11100.00 | 90.04 | 179.300 | 7554.61 | 3458.92S | 345.63W | ==> | 3470.71 | |
| 11200.00 | 90.04 | 179.300 | 7554.53 | 3558.91S | 344.42W | ==> | 3570.56 | |
| 11300.00 | 90.04 | 179.300 | 7554.46 | 3658.91S | 343.20W | ==> | 3670.40 | |
| 11400.00 | 90.04 | 179.300 | 7554.38 | 3758.90S | 341.99W | ==> | 3770.24 | |
| 11500.00 | 90.04 | 179.300 | 7554.31 | 3858.89S | 340.78W | ==> | 3870.09 | |
| 11600.00 | 90.04 | 179.300 | 7554.23 | 3958.88S | 339.56W | ==> | 3969.93 | |
| 11700.00 | 90.04 | 179.300 | 7554.16 | 4058.88S | 338.35W | ==> | 4069.78 | |
| 11800.00 | 90.04 | 179.300 | 7554.08 | 4158.87S | 337.14W | ==> | 4169.62 | |
| 11900.00 | 90.04 | 179.300 | 7554.01 | 4258.86S | 335.92W | ==> | 4269.47 | |
| 12000.00 | 90.04 | 179.300 | 7553.93 | 4358.85S | 334.71W | ==> | 4369.31 | |
| 12100.00 | 90.04 | 179.300 | 7553.86 | 4458.85S | 333.50W | ==> | 4469.15 | |
| 12200.00 | 90.04 | 179.300 | 7553.78 | 4558.84S | 332.28W | ==> | 4569.00 | |
| 12300.00 | 90.04 | 179.300 | 7553.71 | 4658.83S | 331.07W | ==> | 4668.84 | |
| 12400.00 | 90.04 | 179.300 | 7553.64 | 4758.82S | 329.86W | ==> | 4768.69 | |
| 12500.00 | 90.04 | 179.300 | 7553.56 | 4858.82S | 328.64W | ==> | 4868.53 | |
| 12600.00 | 90.04 | 179.300 | 7553.49 | 4958.81S | 327.43W | ==> | 4968.38 | |
| 12700.00 | 90.04 | 179.300 | 7553.41 | 5058.80S | 326.22W | ==> | 5068.22 | |
| 12800.00 | 90.04 | 179.300 | 7553.34 | 5158.79S | 325.00W | ==> | 5168.06 | |
| 12900.00 | 90.04 | 179.300 | 7553.26 | 5258.79S | 323.79W | ==> | 5267.91 | |
| 13000.00 | 90.04 | 179.300 | 7553.19 | 5358.78S | 322.58W | ==> | 5367.75 | |
| 13100.00 | 90.04 | 179.300 | 7553.11 | 5458.77S | 321.36W | ==> | 5467.60 | |
| 13200.00 | 90.04 | 179.300 | 7553.04 | 5558.77S | 320.15W | ==> | 5567.44 | |
| 13300.00 | 90.04 | 179.300 | 7552.96 | 5658.76S | 318.94W | ==> | 5667.29 | |
| 13400.00 | 90.04 | 179.300 | 7552.89 | 5758.75S | 317.72W | ==> | 5767.13 | |
| 13500.00 | 90.04 | 179.300 | 7552.81 | 5858.74S | 316.51W | ==> | 5866.98 | |
| 13600.00 | 90.04 | 179.300 | 7552.74 | 5958.74S | 315.29W | ==> | 5966.82 | |
| 13700.00 | 90.04 | 179.300 | 7552.66 | 6058.73S | 314.08W | ==> | 6066.66 | |
| 13800.00 | 90.04 | 179.300 | 7552.59 | 6158.72S | 312.87W | ==> | 6166.51 | |
| 13900.00 | 90.04 | 179.300 | 7552.51 | 6258.71S | 311.65W | ==> | 6266.35 | |
| 14000.00 | 90.04 | 179.300 | 7552.44 | 6358.71S | 310.44W | ==> | 6366.20 | |
| 14100.00 | 90.04 | 179.300 | 7552.36 | 6458.70S | 309.23W | ==> | 6466.04 | |
| 14200.00 | 90.04 | 179.300 | 7552.29 | 6558.69S | 308.01W | ==> | 6565.89 | |
| 14300.00 | 90.04 | 179.300 | 7552.21 | 6658.68S | 306.80W | ==> | 6665.73 | End of Hold/Target, 4 1/2in Production Liner, HOMESTEAD 18 BH |
| 14400.00 | 90.04 | 179.300 | 7552.14 | 6758.68S | 305.59W | ==> | 6765.57 | |
| 14500.00 | 90.04 | 179.300 | 7552.06 | 6858.67S | 304.37W | ==> | 6865.42 | |
| 14583.78 | 90.04 | 179.300 | 7552.00 | 6942.45S | 303.36W | ==> | 6949.07 | |

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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 182.500 degrees
Bottom hole distance is 6949.07 Feet on azimuth 182.50 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 5-Oct-2015



SYS DRILL
Well Design Combined Report
Wellbore: HOMESTEAD 18 (PWB)

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 | 7906.00 | 7557.00 | 265.16S | 384.38W |
| 6 1/8 | 7906.00 | 7557.00 | 265.16S | 384.38W | 14583.78 | 7552.00 | 6942.45S | 303.36W |

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 | 7906.00 | 7557.00 | 265.16S | 384.38W |
| 4 1/2in Production Liner | 7008.00 | 6987.36 | 308.29N | 353.60W | 14583.78 | 7552.00 | 6942.45S | 303.36W |

Targets

| Name | North[ft] | East[ft] | TVD[ft] | Latitude | Longitude | Northing | Easting |
|-----------------|-----------|----------|---------|-------------|---------------|------------|------------|
| HOMESTEAD 18 BH | 6942.45S | 303.36W | 7552.00 | 39.98815000 | -104.75884000 | 1239398.07 | 3207672.30 |
| HOMESTEAD 18 T1 | 265.51S | 384.38W | 7557.00 | 40.00648000 | -104.75893000 | 1246074.77 | 3207591.28 |

Survey Tool Program

| Reference | Survey Name | MD[ft] | TVD[ft] | Survey Tool | Error Model |
|-----------|-------------|----------|---------|-------------|------------------------------|
| 400793 | Planned | 14583.78 | 7552.00 | ISCWSA MWD | Rev 3 + Fixed Rig + Rotating |

Notes

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Vertical Section is from 0.00N 0.00E on azimuth 182.500 degrees
Bottom hole distance is 6949.07 Feet on azimuth 182.50 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by Integrated Petroleum Technologies, Inc.
Date Printed: 5-Oct-2015



SYSDRILL
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| |
|--|
| 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 18 (PWB) | 18-Aug-2015 | 24-Sep-2015 |

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

| Slot | | | | | | |
|--------------|-------------|---------------|---------------|--------------|-------|---------|
| Name | Latitude | Longitude | Grid Northing | Grid Easting | North | East |
| HOMESTEAD 18 | 40.00720000 | -104.75755000 | 1246340.2689 | 3207975.6438 | 7.70N | 484.58E |

| 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 NORTH AMERICAN DATUM 1983 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 19 | 16.81 | 1575.00 | 14583.78 | -155.58 | 14583.78 | 0.52 | 14583.78 | |
| HOMESTEAD 17 | 16.81 | 1550.00 | 1824.19 | -39.69 | 14583.78 | 0.85 | 14583.78 | |
| HOMESTEAD 16 | 30.81 | 1525.00 | 1525.00 | -19.17 | 14583.78 | 0.94 | 14583.78 | |
| HOMESTEAD 20 | 33.58 | 1581.40 | 14583.78 | 23.66 | 1614.21 | 1.11 | 14583.78 | |
| HOMESTEAD 21 | 47.62 | 1525.00 | 14581.94 | 37.88 | 1581.40 | 1.36 | 14583.78 | |
| HOMESTEAD 15 | 47.62 | 1499.38 | 1499.38 | 38.23 | 1523.00 | 1.36 | 14583.78 | |
| HOMESTEAD 22 | 64.43 | 1499.38 | 7899.71 | 54.99 | 1532.19 | 1.83 | 14583.78 | |
| HOMESTEAD 14 | 64.43 | 1474.00 | 1474.00 | 55.16 | 1433.76 | 1.92 | 14583.78 | |
| HOMESTEAD 13 | 78.44 | 1449.00 | 1449.00 | 69.08 | 1449.00 | 2.28 | 14583.78 | |
| HOMESTEAD 23 | 81.24 | 1476.00 | 14583.78 | 71.95 | 1499.38 | 2.34 | 14583.78 | |
| HOMESTEAD 24 | 95.25 | 1451.00 | 14583.78 | 85.98 | 1433.76 | 2.71 | 14583.78 | |
| HOMESTEAD 12 | 295.08 | 2005.14 | 14583.78 | 282.77 | 2040.72 | 2.79 | 14583.78 | |
| HOMESTEAD 11 | 314.84 | 1972.13 | 14583.78 | 302.77 | 1972.13 | 3.37 | 14583.78 | |
| HOMESTEAD 10 | 333.57 | 1939.97 | 14583.78 | 321.70 | 1939.97 | 3.82 | 14583.78 | |
| HOMESTEAD 9 | 351.98 | 1907.85 | 14583.78 | 340.29 | 1942.29 | 4.33 | 14583.78 | |
| HOMESTEAD 8 | 369.08 | 1876.67 | 14583.78 | 357.59 | 1876.67 | 4.89 | 14583.78 | |
| HOMESTEAD 7 | 387.64 | 1843.87 | 14583.78 | 376.35 | 1843.87 | 5.36 | 14583.78 | |
| HOMESTEAD 6 | 405.82 | 1735.12 | 14583.78 | 394.92 | 1811.06 | 5.87 | 14583.78 | |
| HOMESTEAD 5 | 420.20 | 1544.00 | 14583.78 | 410.58 | 1548.59 | 6.43 | 14583.78 | |
| HOMESTEAD 4 | 437.01 | 1519.00 | 14583.78 | 427.52 | 1548.59 | 6.89 | 14583.78 | |
| HOMESTEAD 3 | 453.82 | 1482.97 | 14583.78 | 444.45 | 1515.78 | 7.41 | 14583.78 | |
| HOMESTEAD 2 | 470.64 | 1468.00 | 14583.78 | 461.35 | 1433.76 | 7.95 | 14583.78 | |
| HOMESTEAD 1 | 484.65 | 1443.00 | 14583.78 | 475.30 | 1443.00 | 8.42 | 14583.78 | |

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Date Printed: 5-Oct-2015

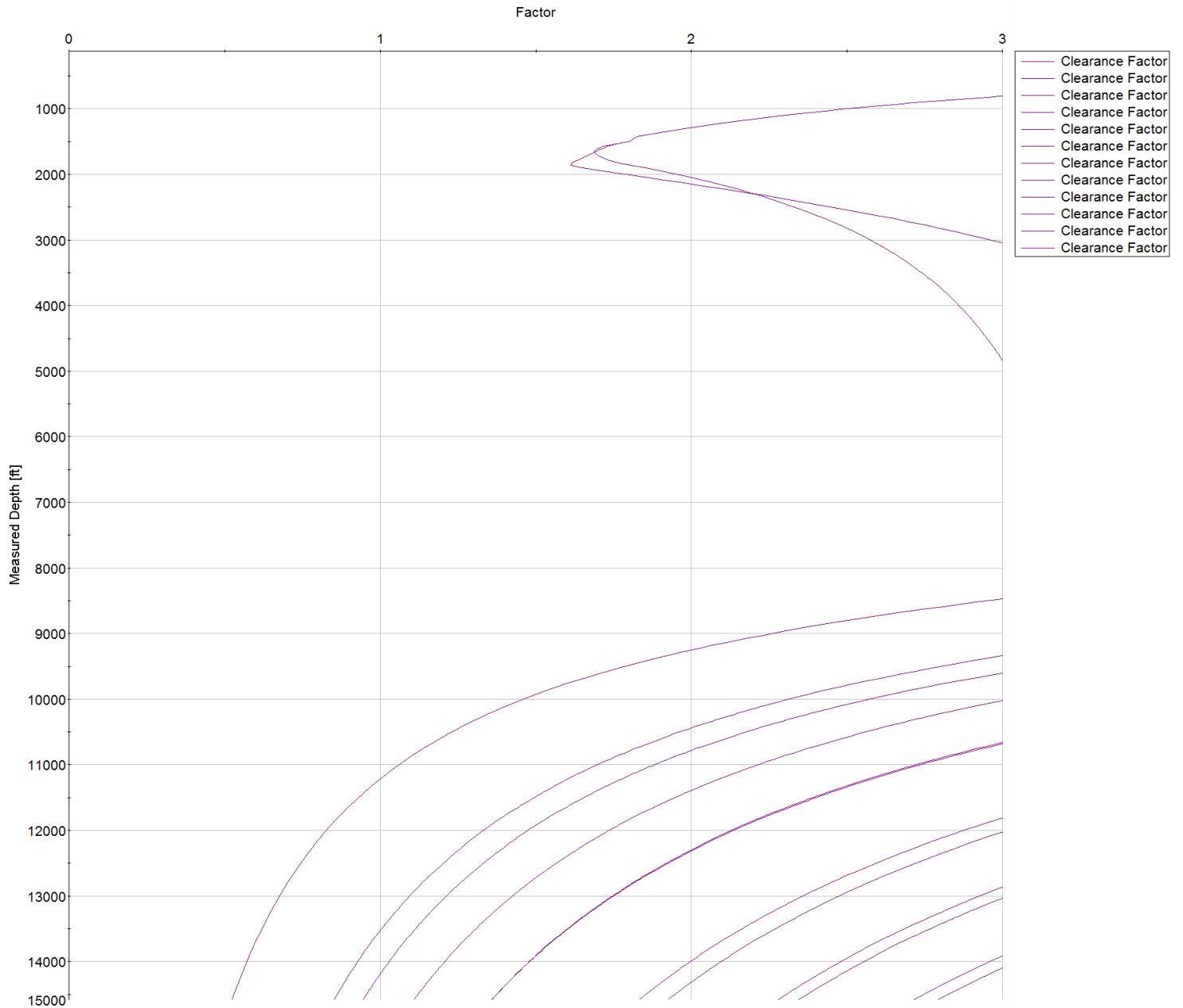


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| Clearance Summary | | | | | | | |
|------------------------------|--------------------|----------|-----------------------|----------------------------|-------------------|---------------------|---------------------|
| Offset WellName | Separation [ft] | MD[ft] | Diverging From[ft] | Ellipse Separation [ft] | Ellipse MD[ft] | Clearance Factor | Clearance MD[ft] |
| WILLARD, JOHN W. GAS UNIT #1 | 923.51 | 7023.00 | 7023.00 | 877.18 | 7023.00 | 19.88 | 7076.81 |
| BERGMAN #1 | 1115.45 | 10777.50 | 10777.50 | 1008.43 | 10800.56 | 10.35 | 10882.58 |
| BEN STEVENSON GAS UNIT #1 | 2129.78 | 14583.78 | 14583.78 | 2070.19 | 14583.78 | 35.74 | 14583.78 |
| BERGMAN #2 | 2193.47 | 13704.10 | 13704.10 | 2014.08 | 13753.31 | 11.89 | 14114.21 |
| UPRR 50 PAN AM M #1 | 2405.72 | 9079.96 | 9079.96 | 2337.37 | 9127.33 | 31.38 | 9996.75 |
| BRIGHTON COMPANY #1 | 3460.14 | 13413.03 | 13413.03 | 3288.12 | 13490.85 | 19.22 | 14212.63 |
| VISTA USX #WW33-08D | 4623.17 | 7290.06 | 7290.06 | 4565.21 | 7290.06 | 61.58 | 11194.26 |
| SHAW A #1 | 5335.85 | 14583.78 | 14583.78 | 5212.24 | 14583.78 | 43.17 | 14583.78 |

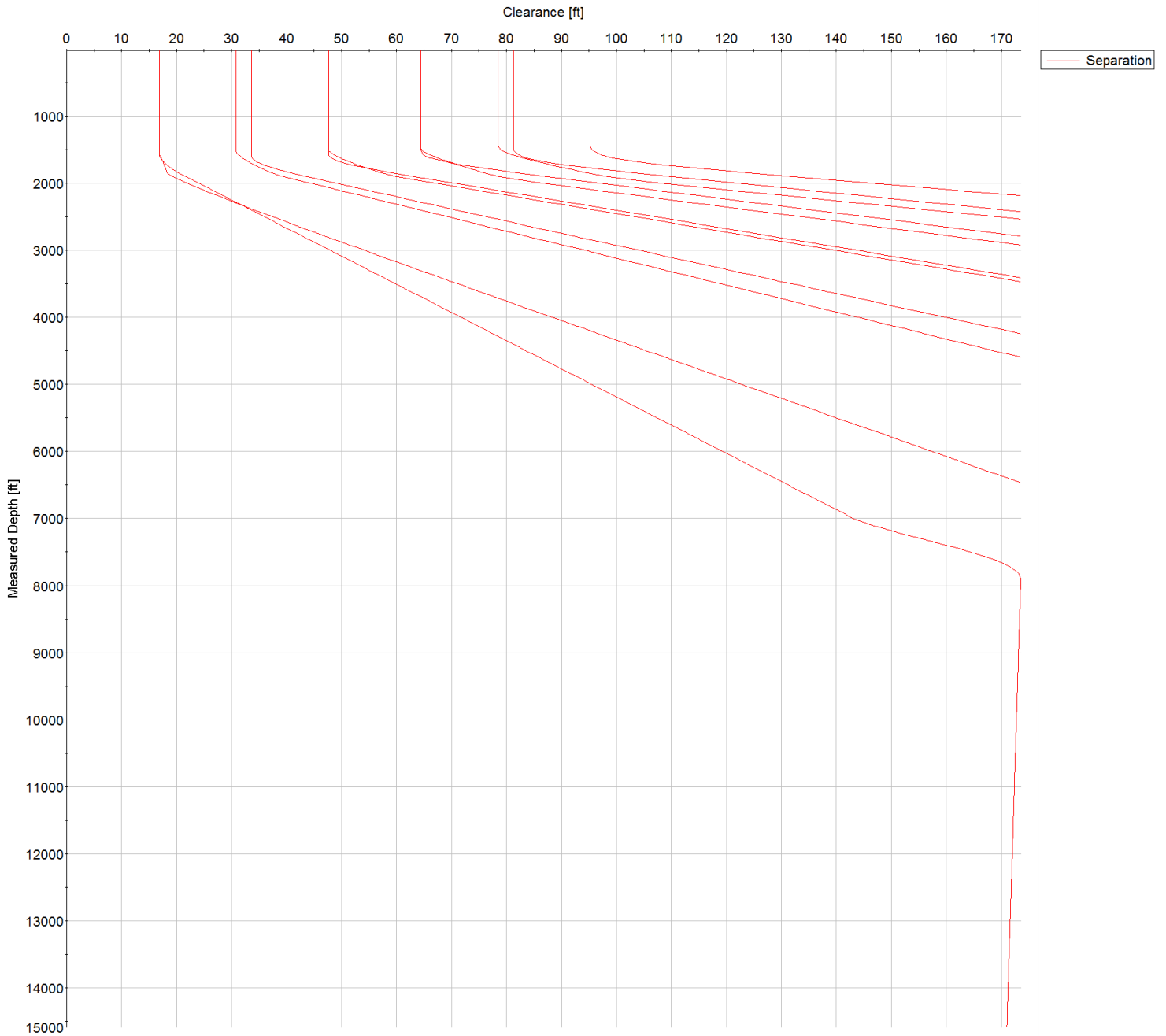


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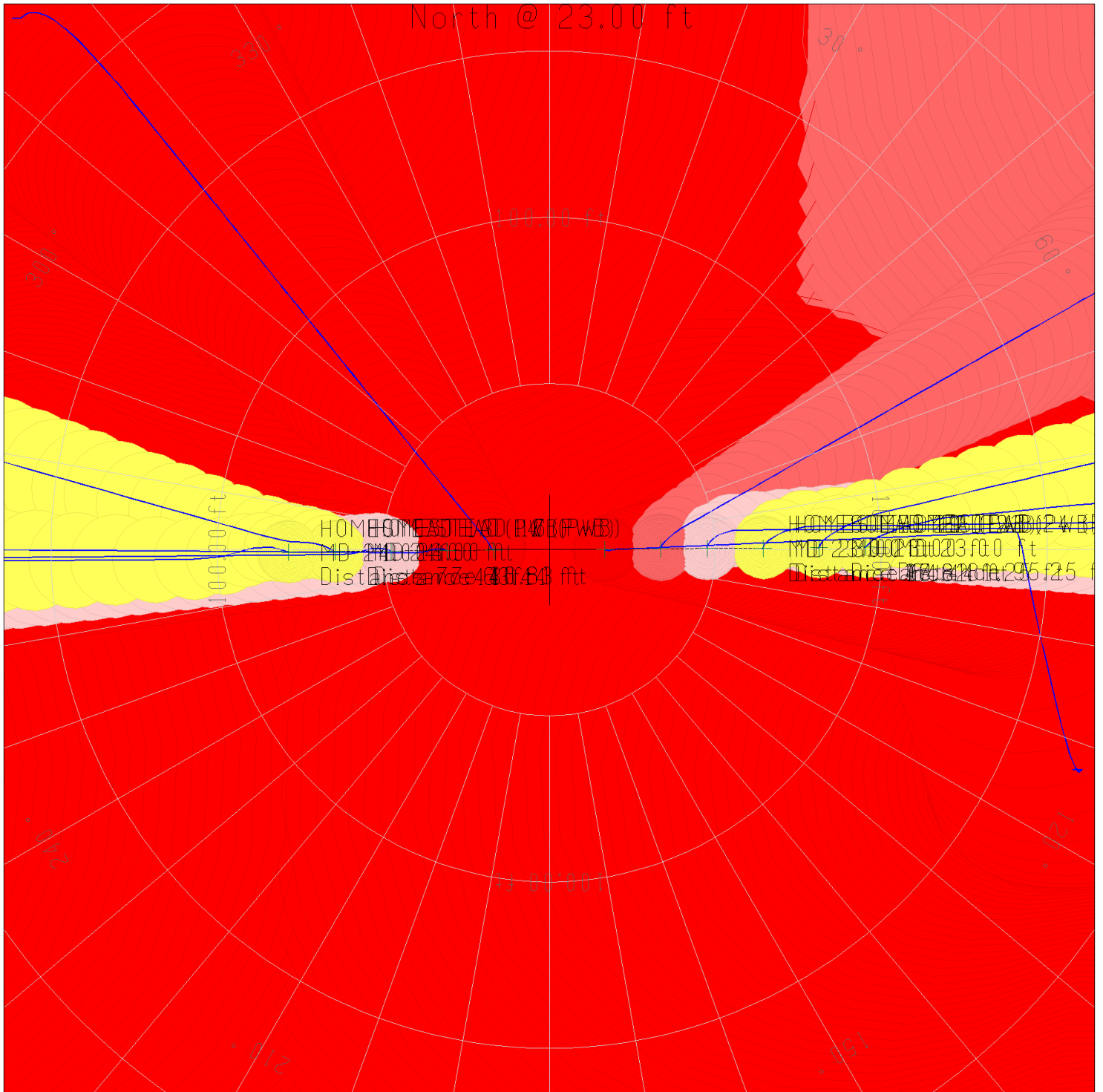


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