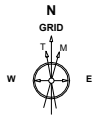
# Cub Creek Energy, LLC

| | | | |
|---|---|---|---|
| **Location** | **Weld County, CO** | **Slot** | **OLANDER 4** |
| **Field** | **WATTENBERG** | **Well** | **OLANDER 4** |
| **Installation** | **Olander Pad Rework 04-09-2019** | **Wellbore** | **OLANDER 4 (PWB)** |



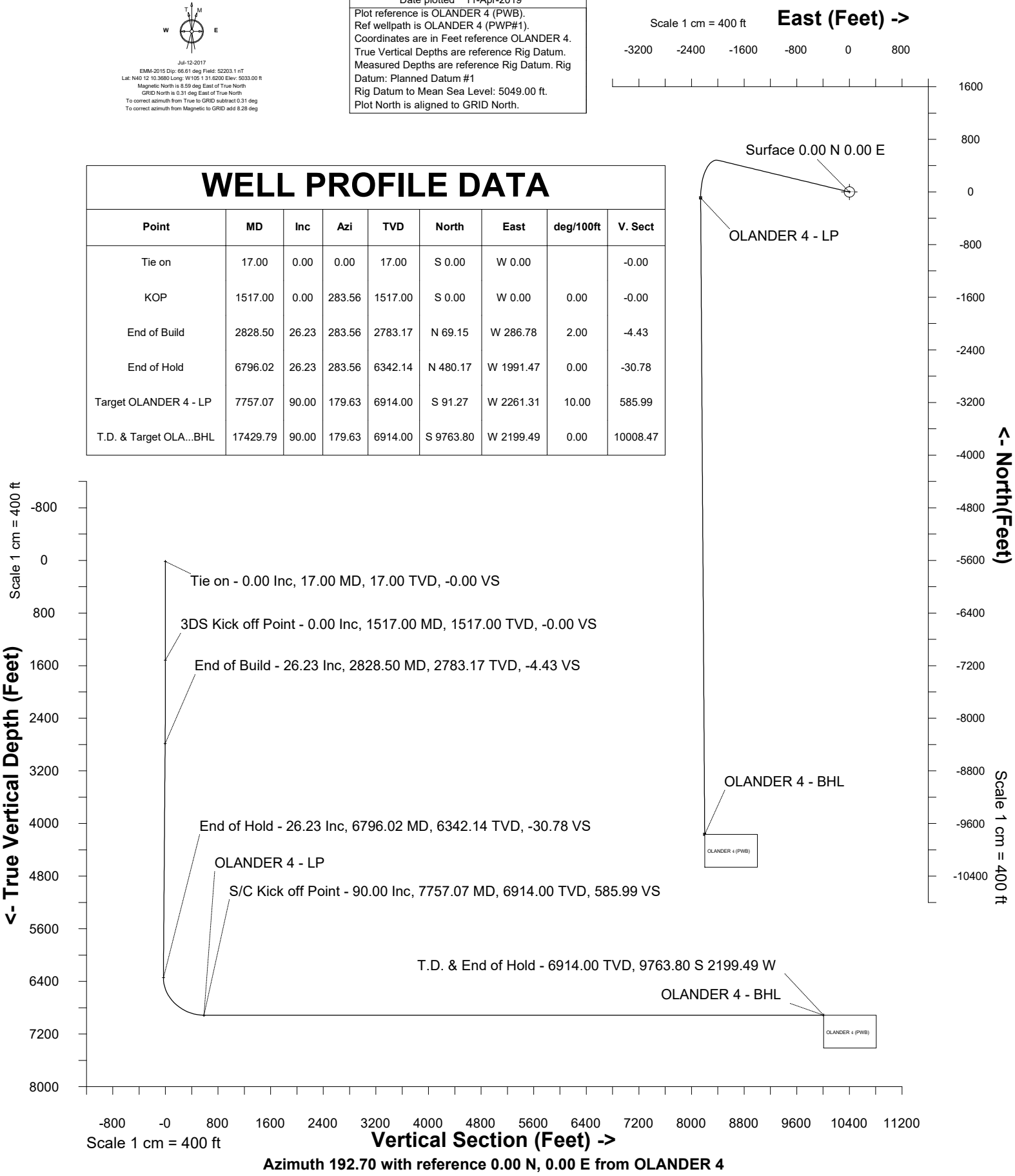

Jul-12-2017
EMM-2015 Dip: 66.61 deg Field: 52203.1 nT
Lat: N40 12 10.3680 Long: W105 1 31.6200 Elev: 5033.00 ft
Magnetic North is 8.59 deg East of True North
GRID North is 0.31 deg East of True North
To correct azimuth from True to GRID subtract 0.31 deg
To correct azimuth from Magnetic to GRID add 8.28 deg

Created by sean.dolfinger
Date plotted 11-Apr-2019

Plot reference is OLANDER 4 (PWB).
Ref wellpath is OLANDER 4 (PWP#1).
Coordinates are in Feet reference OLANDER 4.
True Vertical Depths are reference Rig Datum.
Measured Depths are reference Rig Datum. Rig Datum: Planned Datum #1
Rig Datum to Mean Sea Level: 5049.00 ft.
Plot North is aligned to GRID North.

## WELL PROFILE DATA

| Point | MD | Inc | Azi | TVD | North | East | deg/100ft | V. Sect |
|---|---|---|---|---|---|---|---|---|
| Tie on | 17.00 | 0.00 | 0.00 | 17.00 | S 0.00 | W 0.00 | | -0.00 |
| KOP | 1517.00 | 0.00 | 283.56 | 1517.00 | S 0.00 | W 0.00 | 0.00 | -0.00 |
| End of Build | 2828.50 | 26.23 | 283.56 | 2783.17 | N 69.15 | W 286.78 | 2.00 | -4.43 |
| End of Hold | 6796.02 | 26.23 | 283.56 | 6342.14 | N 480.17 | W 1991.47 | 0.00 | -30.78 |
| Target OLANDER 4 - LP | 7757.07 | 90.00 | 179.63 | 6914.00 | S 91.27 | W 2261.31 | 10.00 | 585.99 |
| T.D. & Target OLA...BHL | 17429.79 | 90.00 | 179.63 | 6914.00 | S 9763.80 | W 2199.49 | 0.00 | 10008.47 |



SYSDRILL
Well Design Combined Report
Wellbore: OLANDER 4 (PWB)

## Wellhead Details

| Name | Latitude | Longitude | Northing | Easting | North | East | Slot Elevation Above Ground |
|---|---|---|---|---|---|---|---|
| OLANDER 4 | 40.20281000 | -105.02535000 | 1317080.9236 | 3132578.8152 | 25.35S | 28.07E | 0.00 |

## Declination

| Date | Source | Time |
|---|---|---|
| Jul-12-2017 | EMM-2015 | 14:01 |

## Installation Details

| Name | Installation Position (Latitude) | Installation Position (Longitude) | Northing | Easting | Coord System Name | North Alignment |
|---|---|---|---|---|---|---|
| Olander Pad Rework 04-09-2019 | 40.20288000 | -105.02545000 | 1317106.2735 | 3132550.7471 | NAD83 Based Colorado State Planes, Northern Zone, US Feet | Grid |

## Summary Wellpath

| MD[ft] | Inc[deg] | Azi[deg] | TVD[ft] | Vertical Depth SS | North[ft] | East[ft] | Dogleg [deg/100ft] | Vertical Section[ft] |
|---|---|---|---|---|---|---|---|---|
| 17.00 | 0.00 | 0.00 | 17.00 | -5032.00 | 0.00N | 0.00E | | 0.00 |
| 1517.00 | 0.00 | 283.56 | 1517.00 | -3532.00 | 0.00N | 0.00E | ==> | 0.00 |
| 2828.50 | 26.23 | 283.56 | 2783.17 | -2265.83 | 69.15N | 286.78W | 2.00 | -4.43 |
| 6796.02 | 26.23 | 283.56 | 6342.14 | 1293.14 | 480.17N | 1991.47W | ==> | -30.78 |
| 7757.07 | 90.00 | 179.63 | 6914.00 | 1865.00 | 91.27S | 2261.31W | 10.00 | 585.99 |
| 17429.79 | 90.00 | 179.63 | 6914.00 | 1865.00 | 9763.80S | 2199.49W | ==> | 10008.47 |

## 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 | 0.00 | 0.00 | 0.00N | 0.00E | | 0.00 | 40.20281000 | -105.02535000 |
| 17.00 | 0.00 | 0.00 | 17.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 100.00 | 0.00 | 0.00 | 100.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| | | | | | | | | | |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| | | | | | | | | | |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1000.00 | 0.00 | 0.00 | 1000.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1100.00 | 0.00 | 0.00 | 1100.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1200.00 | 0.00 | 0.00 | 1200.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1300.00 | 0.00 | 0.00 | 1300.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| | | | | | | | | | |
| 1400.00 | 0.00 | 0.00 | 1400.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1500.00 | 0.00 | 0.00 | 1500.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1517.00 | 0.00 | 283.56 | 1517.00 | 0.00N | 0.00E | ==> | 0.00 | 40.20281000 | -105.02535000 |
| 1600.00 | 1.66 | 283.56 | 1599.99 | 0.28N | 1.17W | 2.00 | -0.02 | 40.20281079 | -105.02535418 |
| 1700.00 | 3.66 | 283.56 | 1699.88 | 1.37N | 5.68W | 2.00 | -0.09 | 40.20281384 | -105.02537031 |
| | | | | | | | | | |
| 1800.00 | 5.66 | 283.56 | 1799.54 | 3.27N | 13.58W | 2.00 | -0.21 | 40.20281919 | -105.02539854 |
| 1900.00 | 7.66 | 283.56 | 1898.86 | 5.99N | 24.85W | 2.00 | -0.38 | 40.20282681 | -105.02543885 |
| 2000.00 | 9.66 | 283.56 | 1997.71 | 9.52N | 39.49W | 2.00 | -0.61 | 40.20283672 | -105.02549118 |
| 2100.00 | 11.66 | 283.56 | 2095.98 | 13.86N | 57.47W | 2.00 | -0.89 | 40.20284888 | -105.02555547 |
| 2200.00 | 13.66 | 283.56 | 2193.55 | 18.99N | 78.78W | 2.00 | -1.22 | 40.20286329 | -105.02563164 |
| | | | | | | | | | |
| 2300.00 | 15.66 | 283.56 | 2290.29 | 24.93N | 103.38W | 2.00 | -1.60 | 40.20287994 | -105.02571960 |
| 2400.00 | 17.66 | 283.56 | 2386.09 | 31.65N | 131.25W | 2.00 | -2.03 | 40.20289879 | -105.02581924 |
| 2500.00 | 19.66 | 283.56 | 2480.82 | 39.14N | 162.35W | 2.00 | -2.51 | 40.20291983 | -105.02593044 |
| 2600.00 | 21.66 | 283.56 | 2574.39 | 47.41N | 196.65W | 2.00 | -3.04 | 40.20294304 | -105.02605307 |
| 2700.00 | 23.66 | 283.56 | 2666.66 | 56.44N | 234.10W | 2.00 | -3.62 | 40.20296837 | -105.02618697 |
| | | | | | | | | | |
| 2800.00 | 25.66 | 283.56 | 2757.54 | 66.22N | 274.66W | 2.00 | -4.25 | 40.20299581 | -105.02633198 |
| 2828.50 | 26.23 | 283.56 | 2783.17 | 69.15N | 286.78W | 2.00 | -4.43 | 40.20300401 | -105.02637531 |

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 5049.0ft above Mean Sea Level )
Vertical Section is from 0.00N 0.00E on azimuth 192.70 degrees
Bottom hole distance is 10008.47 Feet on azimuth 192.70 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by
Date Printed: 11-Apr-2019

SYSDRILL
Well Design Combined Report
Wellbore: OLANDER 4 (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) |
|---|---|---|---|---|---|---|---|---|---|
| 2900.00 | 26.23 | 283.56 | 2847.30 | 76.55N | 317.50W | ==> | -4.91 | 40.20302479 | -105.02648515 |
| 3000.00 | 26.23 | 283.56 | 2937.01 | 86.91N | 360.46W | ==> | -5.57 | 40.20305386 | -105.02663877 |
| 3100.00 | 26.23 | 283.56 | 3026.71 | 97.27N | 403.43W | ==> | -6.24 | 40.20308293 | -105.02679239 |
| | | | | | | | | | |
| 3200.00 | 26.23 | 283.56 | 3116.41 | 107.63N | 446.40W | ==> | -6.90 | 40.20311199 | -105.02694600 |
| 3300.00 | 26.23 | 283.56 | 3206.12 | 117.99N | 489.36W | ==> | -7.56 | 40.20314106 | -105.02709962 |
| 3400.00 | 26.23 | 283.56 | 3295.82 | 128.35N | 532.33W | ==> | -8.23 | 40.20317013 | -105.02725324 |
| 3500.00 | 26.23 | 283.56 | 3385.52 | 138.71N | 575.30W | ==> | -8.89 | 40.20319919 | -105.02740686 |
| 3600.00 | 26.23 | 283.56 | 3475.22 | 149.07N | 618.26W | ==> | -9.56 | 40.20322826 | -105.02756048 |
| | | | | | | | | | |
| 3700.00 | 26.23 | 283.56 | 3564.93 | 159.43N | 661.23W | ==> | -10.22 | 40.20325732 | -105.02771410 |
| 3800.00 | 26.23 | 283.56 | 3654.63 | 169.79N | 704.19W | ==> | -10.88 | 40.20328639 | -105.02786771 |
| 3900.00 | 26.23 | 283.56 | 3744.33 | 180.15N | 747.16W | ==> | -11.55 | 40.20331545 | -105.02802133 |
| 4000.00 | 26.23 | 283.56 | 3834.03 | 190.51N | 790.13W | ==> | -12.21 | 40.20334452 | -105.02817495 |
| 4100.00 | 26.23 | 283.56 | 3923.74 | 200.87N | 833.09W | ==> | -12.88 | 40.20337358 | -105.02832857 |
| | | | | | | | | | |
| 4200.00 | 26.23 | 283.56 | 4013.44 | 211.23N | 876.06W | ==> | -13.54 | 40.20340265 | -105.02848219 |
| 4300.00 | 26.23 | 283.56 | 4103.14 | 221.59N | 919.03W | ==> | -14.20 | 40.20343171 | -105.02863581 |
| 4400.00 | 26.23 | 283.56 | 4192.84 | 231.95N | 961.99W | ==> | -14.87 | 40.20346077 | -105.02878943 |
| 4500.00 | 26.23 | 283.56 | 4282.55 | 242.31N | 1004.96W | ==> | -15.53 | 40.20348984 | -105.02894305 |
| 4600.00 | 26.23 | 283.56 | 4372.25 | 252.67N | 1047.92W | ==> | -16.20 | 40.20351890 | -105.02909667 |
| | | | | | | | | | |
| 4700.00 | 26.23 | 283.56 | 4461.95 | 263.03N | 1090.89W | ==> | -16.86 | 40.20354796 | -105.02925029 |
| 4800.00 | 26.23 | 283.56 | 4551.66 | 273.39N | 1133.86W | ==> | -17.53 | 40.20357703 | -105.02940391 |
| 4900.00 | 26.23 | 283.56 | 4641.36 | 283.75N | 1176.82W | ==> | -18.19 | 40.20360609 | -105.02955753 |
| 5000.00 | 26.23 | 283.56 | 4731.06 | 294.11N | 1219.79W | ==> | -18.85 | 40.20363515 | -105.02971115 |
| 5100.00 | 26.23 | 283.56 | 4820.76 | 304.47N | 1262.76W | ==> | -19.52 | 40.20366422 | -105.02986477 |
| | | | | | | | | | |
| 5200.00 | 26.23 | 283.56 | 4910.47 | 314.83N | 1305.72W | ==> | -20.18 | 40.20369328 | -105.03001839 |
| 5300.00 | 26.23 | 283.56 | 5000.17 | 325.19N | 1348.69W | ==> | -20.85 | 40.20372234 | -105.03017201 |
| 5400.00 | 26.23 | 283.56 | 5089.87 | 335.55N | 1391.65W | ==> | -21.51 | 40.20375140 | -105.03032563 |
| 5500.00 | 26.23 | 283.56 | 5179.57 | 345.91N | 1434.62W | ==> | -22.17 | 40.20378046 | -105.03047925 |
| 5600.00 | 26.23 | 283.56 | 5269.28 | 356.27N | 1477.59W | ==> | -22.84 | 40.20380952 | -105.03063287 |
| | | | | | | | | | |
| 5700.00 | 26.23 | 283.56 | 5358.98 | 366.63N | 1520.55W | ==> | -23.50 | 40.20383859 | -105.03078649 |
| 5800.00 | 26.23 | 283.56 | 5448.68 | 376.99N | 1563.52W | ==> | -24.17 | 40.20386765 | -105.03094012 |
| 5900.00 | 26.23 | 283.56 | 5538.39 | 387.35N | 1606.49W | ==> | -24.83 | 40.20389671 | -105.03109374 |
| 6000.00 | 26.23 | 283.56 | 5628.09 | 397.71N | 1649.45W | ==> | -25.49 | 40.20392577 | -105.03124736 |
| 6100.00 | 26.23 | 283.56 | 5717.79 | 408.07N | 1692.42W | ==> | -26.16 | 40.20395483 | -105.03140098 |
| | | | | | | | | | |
| 6200.00 | 26.23 | 283.56 | 5807.49 | 418.42N | 1735.38W | ==> | -26.82 | 40.20398389 | -105.03155460 |
| 6300.00 | 26.23 | 283.56 | 5897.20 | 428.78N | 1778.35W | ==> | -27.49 | 40.20401295 | -105.03170822 |
| 6400.00 | 26.23 | 283.56 | 5986.90 | 439.14N | 1821.32W | ==> | -28.15 | 40.20404201 | -105.03186185 |
| 6500.00 | 26.23 | 283.56 | 6076.60 | 449.50N | 1864.28W | ==> | -28.81 | 40.20407107 | -105.03201547 |
| 6600.00 | 26.23 | 283.56 | 6166.30 | 459.86N | 1907.25W | ==> | -29.48 | 40.20410013 | -105.03216909 |
| | | | | | | | | | |
| 6700.00 | 26.23 | 283.56 | 6256.01 | 470.22N | 1950.22W | ==> | -30.14 | 40.20412919 | -105.03232271 |
| 6796.02 | 26.23 | 283.56 | 6342.14 | 480.17N | 1991.47W | ==> | -30.78 | 40.20415709 | -105.03247023 |
| 6800.00 | 26.15 | 282.68 | 6345.71 | 480.57N | 1993.18W | 10.00 | -30.79 | 40.20415821 | -105.03247634 |
| 6900.00 | 25.89 | 259.76 | 6435.80 | 481.53N | 2036.28W | 10.00 | -22.26 | 40.20416146 | -105.03263059 |
| 7000.00 | 29.05 | 239.07 | 6524.72 | 465.13N | 2078.69W | 10.00 | 3.06 | 40.20411705 | -105.03278276 |
| | | | | | | | | | |
| 7100.00 | 34.69 | 223.34 | 6609.76 | 431.87N | 2119.15W | 10.00 | 44.40 | 40.20402635 | -105.03292823 |
| 7200.00 | 41.81 | 211.95 | 6688.34 | 382.76N | 2156.42W | 10.00 | 100.49 | 40.20389210 | -105.03306256 |
| 7300.00 | 49.78 | 203.49 | 6758.07 | 319.30N | 2189.36W | 10.00 | 169.64 | 40.20371838 | -105.03318169 |
| 7400.00 | 58.23 | 196.86 | 6816.83 | 243.42N | 2216.98W | 10.00 | 249.74 | 40.20351047 | -105.03328199 |
| 7500.00 | 66.96 | 191.37 | 6862.84 | 157.41N | 2238.43W | 10.00 | 338.37 | 40.20327469 | -105.03336042 |
| | | | | | | | | | |
| 7600.00 | 75.86 | 186.55 | 6894.70 | 63.89N | 2253.07W | 10.00 | 432.81 | 40.20301820 | -105.03341458 |
| 7700.00 | 84.85 | 182.10 | 6911.44 | 34.29S | 2260.45W | 10.00 | 530.22 | 40.20274880 | -105.03344284 |
| 7757.07 | 90.00 | 179.63 | 6914.00 | 91.27S | 2261.31W | 10.00 | 585.99 | 40.20259240 | -105.03344700 |
| 7800.00 | 90.00 | 179.63 | 6914.00 | 134.20S | 2261.04W | ==> | 627.82 | 40.20247455 | -105.03344683 |
| 7900.00 | 90.00 | 179.63 | 6914.00 | 234.20S | 2260.40W | ==> | 725.23 | 40.20220005 | -105.03344642 |
| | | | | | | | | | |
| 8000.00 | 90.00 | 179.63 | 6914.00 | 334.20S | 2259.76W | ==> | 822.64 | 40.20192556 | -105.03344602 |
| 8100.00 | 90.00 | 179.63 | 6914.00 | 434.20S | 2259.12W | ==> | 920.05 | 40.20165106 | -105.03344561 |
| 8200.00 | 90.00 | 179.63 | 6914.00 | 534.20S | 2258.48W | ==> | 1017.47 | 40.20137656 | -105.03344521 |
| 8300.00 | 90.00 | 179.63 | 6914.00 | 634.19S | 2257.84W | ==> | 1114.88 | 40.20110206 | -105.03344480 |
| 8400.00 | 90.00 | 179.63 | 6914.00 | 734.19S | 2257.20W | ==> | 1212.29 | 40.20082756 | -105.03344440 |
| | | | | | | | | | |

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 5049.0ft above Mean Sea Level )
Vertical Section is from 0.00N 0.00E on azimuth 192.70 degrees
Bottom hole distance is 10008.47 Feet on azimuth 192.70 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by
Date Printed: 11-Apr-2019

SYSDRILL
Well Design Combined Report
Wellbore: OLANDER 4 (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) |
|---|---|---|---|---|---|---|---|---|---|
| 8500.00 | 90.00 | 179.63 | 6914.00 | 834.19S | 2256.56W | ==> | 1309.71 | 40.20055306 | -105.03344400 |
| 8600.00 | 90.00 | 179.63 | 6914.00 | 934.19S | 2255.92W | ==> | 1407.12 | 40.20027856 | -105.03344359 |
| 8700.00 | 90.00 | 179.63 | 6914.00 | 1034.19S | 2255.28W | ==> | 1504.53 | 40.20000406 | -105.03344319 |
| 8800.00 | 90.00 | 179.63 | 6914.00 | 1134.18S | 2254.64W | ==> | 1601.94 | 40.19972956 | -105.03344278 |
| 8900.00 | 90.00 | 179.63 | 6914.00 | 1234.18S | 2254.01W | ==> | 1699.36 | 40.19945506 | -105.03344238 |
| | | | | | | | | | |
| 9000.00 | 90.00 | 179.63 | 6914.00 | 1334.18S | 2253.37W | ==> | 1796.77 | 40.19918056 | -105.03344197 |
| 9100.00 | 90.00 | 179.63 | 6914.00 | 1434.18S | 2252.73W | ==> | 1894.18 | 40.19890606 | -105.03344157 |
| 9200.00 | 90.00 | 179.63 | 6914.00 | 1534.18S | 2252.09W | ==> | 1991.60 | 40.19863156 | -105.03344117 |
| 9300.00 | 90.00 | 179.63 | 6914.00 | 1634.17S | 2251.45W | ==> | 2089.01 | 40.19835707 | -105.03344076 |
| 9400.00 | 90.00 | 179.63 | 6914.00 | 1734.17S | 2250.81W | ==> | 2186.42 | 40.19808257 | -105.03344036 |
| | | | | | | | | | |
| 9500.00 | 90.00 | 179.63 | 6914.00 | 1834.17S | 2250.17W | ==> | 2283.83 | 40.19780807 | -105.03343995 |
| 9600.00 | 90.00 | 179.63 | 6914.00 | 1934.17S | 2249.53W | ==> | 2381.25 | 40.19753357 | -105.03343955 |
| 9700.00 | 90.00 | 179.63 | 6914.00 | 2034.17S | 2248.89W | ==> | 2478.66 | 40.19725907 | -105.03343914 |
| 9800.00 | 90.00 | 179.63 | 6914.00 | 2134.16S | 2248.25W | ==> | 2576.07 | 40.19698457 | -105.03343874 |
| 9900.00 | 90.00 | 179.63 | 6914.00 | 2234.16S | 2247.61W | ==> | 2673.49 | 40.19671007 | -105.03343834 |
| | | | | | | | | | |
| 10000.00 | 90.00 | 179.63 | 6914.00 | 2334.16S | 2246.98W | ==> | 2770.90 | 40.19643557 | -105.03343793 |
| 10100.00 | 90.00 | 179.63 | 6914.00 | 2434.16S | 2246.34W | ==> | 2868.31 | 40.19616107 | -105.03343753 |
| 10200.00 | 90.00 | 179.63 | 6914.00 | 2534.16S | 2245.70W | ==> | 2965.72 | 40.19588657 | -105.03343712 |
| 10300.00 | 90.00 | 179.63 | 6914.00 | 2634.15S | 2245.06W | ==> | 3063.14 | 40.19561207 | -105.03343672 |
| 10400.00 | 90.00 | 179.63 | 6914.00 | 2734.15S | 2244.42W | ==> | 3160.55 | 40.19533757 | -105.03343631 |
| | | | | | | | | | |
| 10500.00 | 90.00 | 179.63 | 6914.00 | 2834.15S | 2243.78W | ==> | 3257.96 | 40.19506307 | -105.03343591 |
| 10600.00 | 90.00 | 179.63 | 6914.00 | 2934.15S | 2243.14W | ==> | 3355.38 | 40.19478857 | -105.03343550 |
| 10700.00 | 90.00 | 179.63 | 6914.00 | 3034.15S | 2242.50W | ==> | 3452.79 | 40.19451407 | -105.03343510 |
| 10800.00 | 90.00 | 179.63 | 6914.00 | 3134.14S | 2241.86W | ==> | 3550.20 | 40.19423957 | -105.03343470 |
| 10900.00 | 90.00 | 179.63 | 6914.00 | 3234.14S | 2241.22W | ==> | 3647.61 | 40.19396507 | -105.03343429 |
| | | | | | | | | | |
| 11000.00 | 90.00 | 179.63 | 6914.00 | 3334.14S | 2240.58W | ==> | 3745.03 | 40.19369057 | -105.03343389 |
| 11100.00 | 90.00 | 179.63 | 6914.00 | 3434.14S | 2239.95W | ==> | 3842.44 | 40.19341608 | -105.03343348 |
| 11200.00 | 90.00 | 179.63 | 6914.00 | 3534.13S | 2239.31W | ==> | 3939.85 | 40.19314158 | -105.03343308 |
| 11300.00 | 90.00 | 179.63 | 6914.00 | 3634.13S | 2238.67W | ==> | 4037.27 | 40.19286708 | -105.03343267 |
| 11400.00 | 90.00 | 179.63 | 6914.00 | 3734.13S | 2238.03W | ==> | 4134.68 | 40.19259258 | -105.03343227 |
| | | | | | | | | | |
| 11500.00 | 90.00 | 179.63 | 6914.00 | 3834.13S | 2237.39W | ==> | 4232.09 | 40.19231808 | -105.03343187 |
| 11600.00 | 90.00 | 179.63 | 6914.00 | 3934.13S | 2236.75W | ==> | 4329.51 | 40.19204358 | -105.03343146 |
| 11700.00 | 90.00 | 179.63 | 6914.00 | 4034.12S | 2236.11W | ==> | 4426.92 | 40.19176908 | -105.03343106 |
| 11800.00 | 90.00 | 179.63 | 6914.00 | 4134.12S | 2235.47W | ==> | 4524.33 | 40.19149458 | -105.03343065 |
| 11900.00 | 90.00 | 179.63 | 6914.00 | 4234.12S | 2234.83W | ==> | 4621.74 | 40.19122008 | -105.03343025 |
| | | | | | | | | | |
| 12000.00 | 90.00 | 179.63 | 6914.00 | 4334.12S | 2234.19W | ==> | 4719.16 | 40.19094558 | -105.03342985 |
| 12100.00 | 90.00 | 179.63 | 6914.00 | 4434.12S | 2233.55W | ==> | 4816.57 | 40.19067108 | -105.03342944 |
| 12200.00 | 90.00 | 179.63 | 6914.00 | 4534.11S | 2232.92W | ==> | 4913.98 | 40.19039658 | -105.03342904 |
| 12300.00 | 90.00 | 179.63 | 6914.00 | 4634.11S | 2232.28W | ==> | 5011.40 | 40.19012208 | -105.03342863 |
| 12400.00 | 90.00 | 179.63 | 6914.00 | 4734.11S | 2231.64W | ==> | 5108.81 | 40.18984758 | -105.03342823 |
| | | | | | | | | | |
| 12500.00 | 90.00 | 179.63 | 6914.00 | 4834.11S | 2231.00W | ==> | 5206.22 | 40.18957308 | -105.03342782 |
| 12600.00 | 90.00 | 179.63 | 6914.00 | 4934.11S | 2230.36W | ==> | 5303.63 | 40.18929858 | -105.03342742 |
| 12700.00 | 90.00 | 179.63 | 6914.00 | 5034.10S | 2229.72W | ==> | 5401.05 | 40.18902408 | -105.03342702 |
| 12800.00 | 90.00 | 179.63 | 6914.00 | 5134.10S | 2229.08W | ==> | 5498.46 | 40.18874958 | -105.03342661 |
| 12900.00 | 90.00 | 179.63 | 6914.00 | 5234.10S | 2228.44W | ==> | 5595.87 | 40.18847508 | -105.03342621 |
| | | | | | | | | | |
| 13000.00 | 90.00 | 179.63 | 6914.00 | 5334.10S | 2227.80W | ==> | 5693.29 | 40.18820058 | -105.03342580 |
| 13100.00 | 90.00 | 179.63 | 6914.00 | 5434.10S | 2227.16W | ==> | 5790.70 | 40.18792608 | -105.03342540 |
| 13200.00 | 90.00 | 179.63 | 6914.00 | 5534.09S | 2226.52W | ==> | 5888.11 | 40.18765158 | -105.03342499 |
| 13300.00 | 90.00 | 179.63 | 6914.00 | 5634.09S | 2225.89W | ==> | 5985.52 | 40.18737708 | -105.03342459 |
| 13400.00 | 90.00 | 179.63 | 6914.00 | 5734.09S | 2225.25W | ==> | 6082.94 | 40.18710258 | -105.03342419 |
| | | | | | | | | | |
| 13500.00 | 90.00 | 179.63 | 6914.00 | 5834.09S | 2224.61W | ==> | 6180.35 | 40.18682808 | -105.03342378 |
| 13600.00 | 90.00 | 179.63 | 6914.00 | 5934.09S | 2223.97W | ==> | 6277.76 | 40.18655358 | -105.03342338 |
| 13700.00 | 90.00 | 179.63 | 6914.00 | 6034.08S | 2223.33W | ==> | 6375.18 | 40.18627908 | -105.03342297 |
| 13800.00 | 90.00 | 179.63 | 6914.00 | 6134.08S | 2222.69W | ==> | 6472.59 | 40.18600458 | -105.03342257 |
| 13900.00 | 90.00 | 179.63 | 6914.00 | 6234.08S | 2222.05W | ==> | 6570.00 | 40.18573008 | -105.03342216 |
| | | | | | | | | | |
| 14000.00 | 90.00 | 179.63 | 6914.00 | 6334.08S | 2221.41W | ==> | 6667.41 | 40.18545558 | -105.03342176 |
| 14100.00 | 90.00 | 179.63 | 6914.00 | 6434.08S | 2220.77W | ==> | 6764.83 | 40.18518108 | -105.03342136 |
| 14200.00 | 90.00 | 179.63 | 6914.00 | 6534.07S | 2220.13W | ==> | 6862.24 | 40.18490658 | -105.03342095 |
| 14300.00 | 90.00 | 179.63 | 6914.00 | 6634.07S | 2219.49W | ==> | 6959.65 | 40.18463208 | -105.03342055 |

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Coordinates are from Slot MD's are from Rig and TVD's are from Rig ( Planned Datum #1 5049.0ft above Mean Sea Level )
Vertical Section is from 0.00N 0.00E on azimuth 192.70 degrees
Bottom hole distance is 10008.47 Feet on azimuth 192.70 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by
Date Printed: 11-Apr-2019

SYSDRILL
Well Design Combined Report
Wellbore: OLANDER 4 (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) |
|---|---|---|---|---|---|---|---|---|---|
| 14400.00 | 90.00 | 179.63 | 6914.00 | 6734.07S | 2218.86W | ==> | 7057.07 | 40.18435758 | -105.03342014 |
| | | | | | | | | | |
| 14500.00 | 90.00 | 179.63 | 6914.00 | 6834.07S | 2218.22W | ==> | 7154.48 | 40.18408308 | -105.03341974 |
| 14600.00 | 90.00 | 179.63 | 6914.00 | 6934.07S | 2217.58W | ==> | 7251.89 | 40.18380858 | -105.03341934 |
| 14700.00 | 90.00 | 179.63 | 6914.00 | 7034.06S | 2216.94W | ==> | 7349.30 | 40.18353408 | -105.03341893 |
| 14800.00 | 90.00 | 179.63 | 6914.00 | 7134.06S | 2216.30W | ==> | 7446.72 | 40.18325958 | -105.03341853 |
| 14900.00 | 90.00 | 179.63 | 6914.00 | 7234.06S | 2215.66W | ==> | 7544.13 | 40.18298508 | -105.03341812 |
| | | | | | | | | | |
| 15000.00 | 90.00 | 179.63 | 6914.00 | 7334.06S | 2215.02W | ==> | 7641.54 | 40.18271058 | -105.03341772 |
| 15100.00 | 90.00 | 179.63 | 6914.00 | 7434.06S | 2214.38W | ==> | 7738.96 | 40.18243608 | -105.03341731 |
| 15200.00 | 90.00 | 179.63 | 6914.00 | 7534.05S | 2213.74W | ==> | 7836.37 | 40.18216158 | -105.03341691 |
| 15300.00 | 90.00 | 179.63 | 6914.00 | 7634.05S | 2213.10W | ==> | 7933.78 | 40.18188708 | -105.03341651 |
| 15400.00 | 90.00 | 179.63 | 6914.00 | 7734.05S | 2212.46W | ==> | 8031.19 | 40.18161258 | -105.03341610 |
| | | | | | | | | | |
| 15500.00 | 90.00 | 179.63 | 6914.00 | 7834.05S | 2211.83W | ==> | 8128.61 | 40.18133808 | -105.03341570 |
| 15600.00 | 90.00 | 179.63 | 6914.00 | 7934.04S | 2211.19W | ==> | 8226.02 | 40.18106358 | -105.03341529 |
| 15700.00 | 90.00 | 179.63 | 6914.00 | 8034.04S | 2210.55W | ==> | 8323.43 | 40.18078908 | -105.03341489 |
| 15800.00 | 90.00 | 179.63 | 6914.00 | 8134.04S | 2209.91W | ==> | 8420.85 | 40.18051458 | -105.03341449 |
| 15900.00 | 90.00 | 179.63 | 6914.00 | 8234.04S | 2209.27W | ==> | 8518.26 | 40.18024008 | -105.03341408 |
| | | | | | | | | | |
| 16000.00 | 90.00 | 179.63 | 6914.00 | 8334.04S | 2208.63W | ==> | 8615.67 | 40.17996558 | -105.03341368 |
| 16100.00 | 90.00 | 179.63 | 6914.00 | 8434.03S | 2207.99W | ==> | 8713.09 | 40.17969108 | -105.03341327 |
| 16200.00 | 90.00 | 179.63 | 6914.00 | 8534.03S | 2207.35W | ==> | 8810.50 | 40.17941658 | -105.03341287 |
| 16300.00 | 90.00 | 179.63 | 6914.00 | 8634.03S | 2206.71W | ==> | 8907.91 | 40.17914208 | -105.03341247 |
| 16400.00 | 90.00 | 179.63 | 6914.00 | 8734.03S | 2206.07W | ==> | 9005.32 | 40.17886758 | -105.03341206 |
| | | | | | | | | | |
| 16500.00 | 90.00 | 179.63 | 6914.00 | 8834.03S | 2205.43W | ==> | 9102.74 | 40.17859308 | -105.03341166 |
| 16600.00 | 90.00 | 179.63 | 6914.00 | 8934.02S | 2204.80W | ==> | 9200.15 | 40.17831858 | -105.03341125 |
| 16700.00 | 90.00 | 179.63 | 6914.00 | 9034.02S | 2204.16W | ==> | 9297.56 | 40.17804408 | -105.03341085 |
| 16800.00 | 90.00 | 179.63 | 6914.00 | 9134.02S | 2203.52W | ==> | 9394.98 | 40.17776958 | -105.03341044 |
| 16900.00 | 90.00 | 179.63 | 6914.00 | 9234.02S | 2202.88W | ==> | 9492.39 | 40.17749508 | -105.03341004 |
| | | | | | | | | | |
| 17000.00 | 90.00 | 179.63 | 6914.00 | 9334.02S | 2202.24W | ==> | 9589.80 | 40.17722058 | -105.03340964 |
| 17100.00 | 90.00 | 179.63 | 6914.00 | 9434.01S | 2201.60W | ==> | 9687.21 | 40.17694608 | -105.03340923 |
| 17200.00 | 90.00 | 179.63 | 6914.00 | 9534.01S | 2200.96W | ==> | 9784.63 | 40.17667158 | -105.03340883 |
| 17300.00 | 90.00 | 179.63 | 6914.00 | 9634.01S | 2200.32W | ==> | 9882.04 | 40.17639708 | -105.03340842 |
| 17400.00 | 90.00 | 179.63 | 6914.00 | 9734.01S | 2199.68W | ==> | 9979.45 | 40.17612258 | -105.03340802 |
| | | | | | | | | | |
| 17429.79 | 90.00 | 179.63 | 6914.00 | 9763.80S | 2199.49W | ==> | 10008.47 | 40.17604080 | -105.03340790 |

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Bottom hole distance is 10008.47 Feet on azimuth 192.70 degrees from Wellhead
Calculation method uses Minimum Curvature method
Prepared by
Date Printed: 11-Apr-2019

SYSDRILL
Well Design Combined Report
Wellbore: OLANDER 4 (PWB)

## Targets

| Name | North[ft] | East[ft] | TVD[ft] | Latitude | Longitude | Northing | Easting |
|---|---|---|---|---|---|---|---|
| OLANDER 4 - LP | 91.27S | 2261.31W | 6914.00 | 40.20259240 | -105.03344700 | 1316989.65 | 3130317.61 |
| OLANDER 4 - BHL | 9763.80S | 2199.49W | 6914.00 | 40.17604080 | -105.03340790 | 1307317.56 | 3130379.42 |

## Survey Tool Program

| Reference | Survey Name | MD[ft] | TVD[ft] | Survey Tool | Error Model |
|---|---|---|---|---|---|
| 791152 | Planned | 1500.00 | 1500.00 | WdW Rate Gyro | Standard |
| 791151 | Planned | 17429.79 | 6914.00 | ISCWSA MWD | Rev 4 + SAG + FLT |

Notes

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