

PETROLEUM DEVELOPMENT CORP Weld County CO

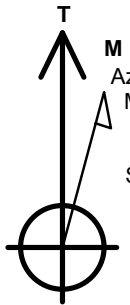
Well Name: **Alles 22D-312**

Surface Location: Alles 22S-HZ Pad Sec.22-T5N-R65W
 North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone
 Ground Elevation: 4645.0

| +N/-S | +E/-W | Northing | Easting | Latitude | Longitude | Slot |
|---------------------------------------|-------|------------|------------|-----------|-------------|------|
| 0.0 | 0.0 | 1383647.78 | 3239041.95 | 40.383340 | -104.641910 | |
| RKB - 15' WELL @ 4660.0ft (RKB - 15') | | | | | | |

WELLBORE TARGET DETAILS

| Name | TVD | +N/-S | +E/-W | Shape |
|--------------------------------|--------|---------|--------|---------|
| SHL 2125'FSL, 559'FEL, SEC.22 | 1.0 | 0.0 | 0.0 | Point |
| LEASE LINE | 6807.0 | -2063.2 | -759.5 | Polygon |
| SHL 1830'FSL, 500'FEL, SEC. 23 | 6843.0 | -312.7 | 5315.6 | Point |

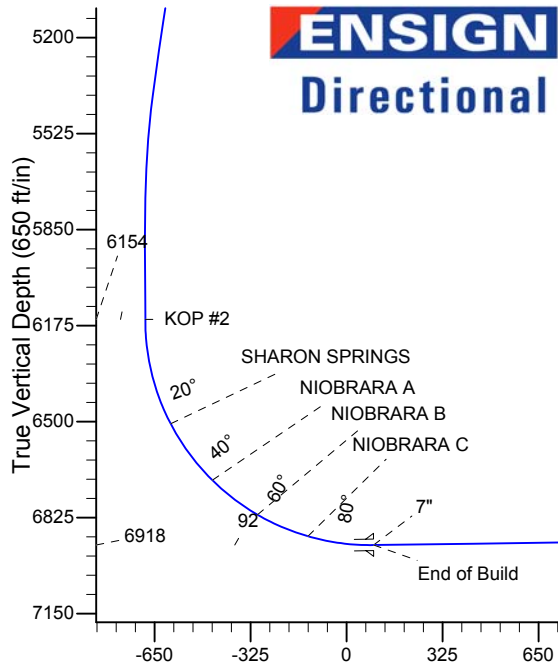
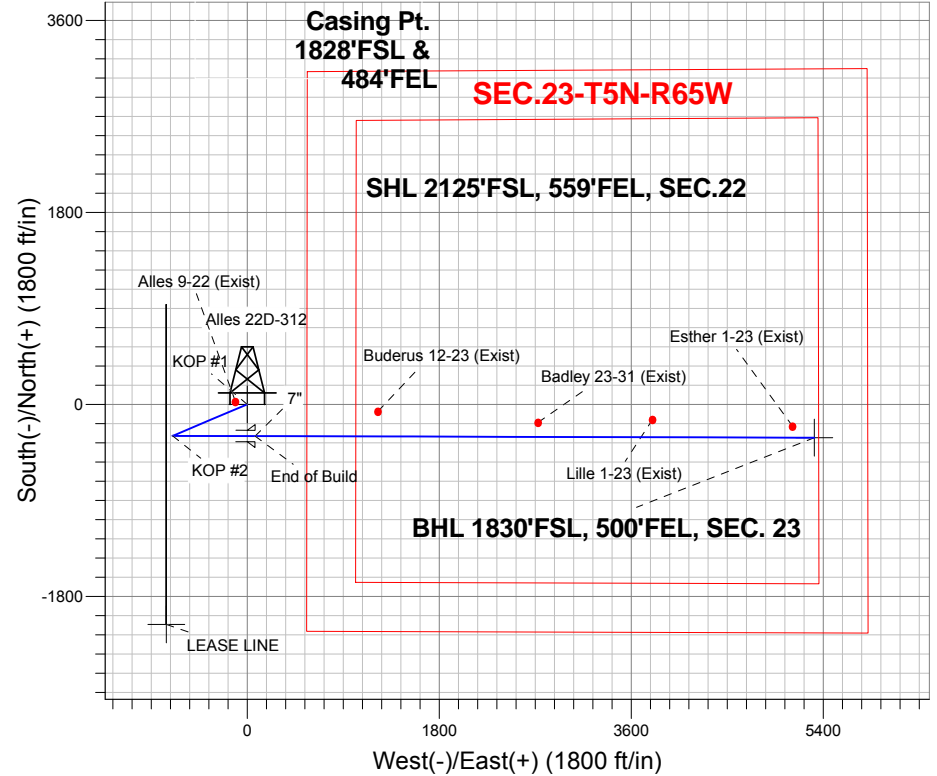


Azimuths to True North
 Magnetic North: 8.48°
 Magnetic Field
 Strength: 52889.0snT
 Dip Angle: 66.98°
 Date: 10/22/2013
 Model: IGRF2010

ANNOTATIONS

| TVD | MD | Annotation |
|--------|--------|--------------|
| 600.0 | 600.0 | KOP #1 |
| 6154.2 | 6212.7 | KOP #2 |
| 6918.0 | 7423.6 | End of Build |

Alles 22S-HZ Pad Sec.22-T5N-R65W
 Alles 22D-312
 Plan #2 (10-22-13)
 8:28, October 25 2013



SECTION DETAILS

| Sec | MD | Inc | Azi | TVD | +N/-S | +E/-W | DLeg | TFace | Target | VSec |
|-----|---------|-------|--------|--------|--------|--------|------|--------|--------|--------------------------------|
| 1 | 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 2 | 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.0 | |
| 3 | 1054.8 | 9.10 | 247.15 | 1052.9 | -14.0 | -33.2 | 2.00 | 247.15 | -32.3 | |
| 4 | 5403.7 | 9.10 | 247.15 | 5347.1 | -281.0 | -666.8 | 0.00 | 0.00 | -649.1 | |
| 5 | 5858.5 | 0.00 | 0.00 | 5800.0 | -295.0 | -700.0 | 2.00 | 180.00 | -681.5 | |
| 6 | 6212.7 | 0.00 | 0.00 | 6154.1 | -295.0 | -700.0 | 0.00 | 0.00 | -681.5 | |
| 7 | 7423.6 | 90.82 | 90.17 | 6918.0 | -297.3 | 74.9 | 7.50 | 90.17 | 92.2 | |
| 8 | 12664.9 | 90.82 | 90.17 | 6843.0 | -312.7 | 5315.6 | 0.00 | 0.00 | 5324.8 | BHL 1830'FSL, 500'FEL, SEC. 23 |

BHL 1830'FSL, 500'FEL, SEC. 23

Vertical Section at 93.37° (650 ft/in)



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.22-T5N-R65W

Alles 22S-HZ Pad Sec.22-T5N-R65W

Alles 22D-312

Wellbore #1

Plan: Plan #2 (10-22-13)

Standard Planning Report

25 October, 2013

| | | | |
|------------------|---|-------------------------------------|-----------------------------|
| Database: | Landmark | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Project: | SEC.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | North Reference: | True |
| Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #2 (10-22-13) | | |

| | | | |
|--------------------|--|----------------------|-----------------------------|
| Project | SEC.22-T5N-R65W, Weld County, Colorado | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | Using Well Reference Point |
| Map Zone: | Colorado Northern Zone | | Using geodetic scale factor |

| | | | |
|------------------------------|----------------------------------|--------------------------|-----------------|
| Site | Alles 22S-HZ Pad Sec.22-T5N-R65W | | |
| Site Position: | | Northing: | 1,383,618.80 ft |
| From: | Lat/Long | Easting: | 3,239,056.16 ft |
| Position Uncertainty: | 0.0 ft | Slot Radius: | " |
| | | Latitude: | 40.383260 |
| | | Longitude: | -104.641860 |
| | | Grid Convergence: | 0.55 ° |

| | | | |
|-----------------------------|---------------|----------|----------------------------|
| Well | Alles 22D-312 | | |
| Well Position | +N/-S | 29.1 ft | Northing: |
| | +E/-W | -13.9 ft | Easting: |
| Position Uncertainty | | 0.0 ft | Wellhead Elevation: |
| | | | ft |
| | | | Latitude: |
| | | | 40.383340 |
| | | | Longitude: |
| | | | -104.641910 |
| | | | Ground Level: |
| | | | 4,645.0 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | Wellbore #1 | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 10/22/2013 | 8.48 | 66.98 | 52,889 |

| | | | | |
|--------------------------|------------------------------|-------------------|----------------------|----------------------|
| Design | Plan #2 (10-22-13) | | | |
| Audit Notes: | | | | |
| Version: | Phase: | PROTOTYPE | Tie On Depth: | 0.0 |
| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) |
| | 0.0 | 0.0 | 0.0 | 93.37 |

| Plan Sections | | | | | | | | | | |
|----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|----------------------|---------------------|---------|-------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) | TFO (°) | Target |
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,054.8 | 9.10 | 247.15 | 1,052.9 | -14.0 | -33.2 | 2.00 | 2.00 | 0.00 | 247.15 | |
| 5,403.7 | 9.10 | 247.15 | 5,347.1 | -281.0 | -666.8 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 5,858.5 | 0.00 | 0.00 | 5,800.0 | -295.0 | -700.0 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 6,212.7 | 0.00 | 0.00 | 6,154.1 | -295.0 | -700.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 7,423.6 | 90.82 | 90.17 | 6,918.0 | -297.3 | 74.9 | 7.50 | 7.50 | 0.00 | 90.17 | |
| 12,664.9 | 90.82 | 90.17 | 6,843.0 | -312.7 | 5,315.6 | 0.00 | 0.00 | 0.00 | 0.00 | BHL 1830'FSL, 500 |

| | | | |
|------------------|---|-------------------------------------|-----------------------------|
| Database: | Landmark | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Project: | SEC.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | North Reference: | True |
| Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #2 (10-22-13) | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N-S (ft) | +E-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|--|-----------------|-------------|---------------------|-----------|-----------|-----------------------|-----------------------|----------------------|---------------------|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Alles 9-22 (Exist) 500' Target Circle | | | | | | | | | |
| 1.0 | 0.00 | 0.00 | 1.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| SHL 2125'FSL, 559'FEL, SEC.22 | | | | | | | | | |
| 2.0 | 0.00 | 0.00 | 2.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Badley 23-31 (Exist) 500' Target Circle - Lillie 1-23 (Exist) 500' Target Circle - Buderus 12-23 (Exist) 500' Target Circle | | | | | | | | | |
| 4.0 | 0.00 | 0.00 | 4.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| Esther 1-23 (Exist) 500' Target Circle | | | | | | | | | |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 |
| KOP #1 | | | | | | | | | |
| 700.0 | 2.00 | 247.15 | 700.0 | -0.7 | -1.6 | -1.6 | 2.00 | 2.00 | 0.00 |
| 800.0 | 4.00 | 247.15 | 799.8 | -2.7 | -6.4 | -6.3 | 2.00 | 2.00 | 0.00 |
| 900.0 | 6.00 | 247.15 | 899.5 | -6.1 | -14.5 | -14.1 | 2.00 | 2.00 | 0.00 |
| 1,000.0 | 8.00 | 247.15 | 998.7 | -10.8 | -25.7 | -25.0 | 2.00 | 2.00 | 0.00 |
| 1,054.8 | 9.10 | 247.15 | 1,052.9 | -14.0 | -32.2 | -32.3 | 2.00 | 2.00 | 0.00 |
| 1,100.0 | 9.10 | 247.15 | 1,097.5 | -16.8 | -39.8 | -38.7 | 0.00 | 0.00 | 0.00 |
| 1,200.0 | 9.10 | 247.15 | 1,196.3 | -22.9 | -54.4 | -52.9 | 0.00 | 0.00 | 0.00 |
| 1,300.0 | 9.10 | 247.15 | 1,295.0 | -29.0 | -68.9 | -67.1 | 0.00 | 0.00 | 0.00 |
| 1,400.0 | 9.10 | 247.15 | 1,393.8 | -35.2 | -83.5 | -81.3 | 0.00 | 0.00 | 0.00 |
| 1,500.0 | 9.10 | 247.15 | 1,492.5 | -41.3 | -98.1 | -95.5 | 0.00 | 0.00 | 0.00 |
| 1,600.0 | 9.10 | 247.15 | 1,591.2 | -47.5 | -112.6 | -109.6 | 0.00 | 0.00 | 0.00 |
| 1,700.0 | 9.10 | 247.15 | 1,690.0 | -53.6 | -127.2 | -123.8 | 0.00 | 0.00 | 0.00 |
| 1,800.0 | 9.10 | 247.15 | 1,788.7 | -59.7 | -141.8 | -138.0 | 0.00 | 0.00 | 0.00 |
| 1,900.0 | 9.10 | 247.15 | 1,887.5 | -65.9 | -156.3 | -152.2 | 0.00 | 0.00 | 0.00 |
| 2,000.0 | 9.10 | 247.15 | 1,986.2 | -72.0 | -170.9 | -166.4 | 0.00 | 0.00 | 0.00 |
| 2,100.0 | 9.10 | 247.15 | 2,084.9 | -78.2 | -185.5 | -180.6 | 0.00 | 0.00 | 0.00 |
| 2,200.0 | 9.10 | 247.15 | 2,183.7 | -84.3 | -200.0 | -194.7 | 0.00 | 0.00 | 0.00 |
| 2,300.0 | 9.10 | 247.15 | 2,282.4 | -90.4 | -214.6 | -208.9 | 0.00 | 0.00 | 0.00 |
| 2,400.0 | 9.10 | 247.15 | 2,381.2 | -96.6 | -229.2 | -223.1 | 0.00 | 0.00 | 0.00 |
| 2,500.0 | 9.10 | 247.15 | 2,479.9 | -102.7 | -243.8 | -237.3 | 0.00 | 0.00 | 0.00 |
| 2,600.0 | 9.10 | 247.15 | 2,578.7 | -108.9 | -258.3 | -251.5 | 0.00 | 0.00 | 0.00 |
| 2,700.0 | 9.10 | 247.15 | 2,677.4 | -115.0 | -272.9 | -265.7 | 0.00 | 0.00 | 0.00 |
| 2,800.0 | 9.10 | 247.15 | 2,776.1 | -121.1 | -287.5 | -279.8 | 0.00 | 0.00 | 0.00 |
| 2,900.0 | 9.10 | 247.15 | 2,874.9 | -127.3 | -302.0 | -294.0 | 0.00 | 0.00 | 0.00 |
| 3,000.0 | 9.10 | 247.15 | 2,973.6 | -133.4 | -316.6 | -308.2 | 0.00 | 0.00 | 0.00 |
| 3,100.0 | 9.10 | 247.15 | 3,072.4 | -139.6 | -331.2 | -322.4 | 0.00 | 0.00 | 0.00 |
| 3,200.0 | 9.10 | 247.15 | 3,171.1 | -145.7 | -345.7 | -336.6 | 0.00 | 0.00 | 0.00 |
| 3,300.0 | 9.10 | 247.15 | 3,269.9 | -151.8 | -360.3 | -350.8 | 0.00 | 0.00 | 0.00 |
| 3,400.0 | 9.10 | 247.15 | 3,368.6 | -158.0 | -374.9 | -365.0 | 0.00 | 0.00 | 0.00 |
| 3,500.0 | 9.10 | 247.15 | 3,467.3 | -164.1 | -389.4 | -379.1 | 0.00 | 0.00 | 0.00 |
| 3,600.0 | 9.10 | 247.15 | 3,566.1 | -170.3 | -404.0 | -393.3 | 0.00 | 0.00 | 0.00 |
| 3,609.0 | 9.10 | 247.15 | 3,575.0 | -170.8 | -405.3 | -394.6 | 0.00 | 0.00 | 0.00 |
| PARKMAN | | | | | | | | | |
| 3,700.0 | 9.10 | 247.15 | 3,664.8 | -176.4 | -418.6 | -407.5 | 0.00 | 0.00 | 0.00 |
| 3,800.0 | 9.10 | 247.15 | 3,763.6 | -182.5 | -433.2 | -421.7 | 0.00 | 0.00 | 0.00 |
| 3,900.0 | 9.10 | 247.15 | 3,862.3 | -188.7 | -447.7 | -435.9 | 0.00 | 0.00 | 0.00 |
| 4,000.0 | 9.10 | 247.15 | 3,961.0 | -194.8 | -462.3 | -450.1 | 0.00 | 0.00 | 0.00 |

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|------------------|---|-------------------------------------|-----------------------------|
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| Project: | SEC.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | North Reference: | True |
| Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #2 (10-22-13) | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|-----------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 4,100.0 | 9.10 | 247.15 | 4,059.8 | -201.0 | -476.9 | -464.2 | 0.00 | 0.00 | 0.00 |
| 4,200.0 | 9.10 | 247.15 | 4,158.5 | -207.1 | -491.4 | -478.4 | 0.00 | 0.00 | 0.00 |
| 4,300.0 | 9.10 | 247.15 | 4,257.3 | -213.2 | -506.0 | -492.6 | 0.00 | 0.00 | 0.00 |
| 4,300.7 | 9.10 | 247.15 | 4,258.0 | -213.3 | -506.1 | -492.7 | 0.00 | 0.00 | 0.00 |
| SUSSEX | | | | | | | | | |
| 4,400.0 | 9.10 | 247.15 | 4,356.0 | -219.4 | -520.6 | -506.8 | 0.00 | 0.00 | 0.00 |
| 4,500.0 | 9.10 | 247.15 | 4,454.8 | -225.5 | -535.1 | -521.0 | 0.00 | 0.00 | 0.00 |
| 4,600.0 | 9.10 | 247.15 | 4,553.5 | -231.7 | -549.7 | -535.2 | 0.00 | 0.00 | 0.00 |
| 4,700.0 | 9.10 | 247.15 | 4,652.2 | -237.8 | -564.3 | -549.3 | 0.00 | 0.00 | 0.00 |
| 4,800.0 | 9.10 | 247.15 | 4,751.0 | -243.9 | -578.8 | -563.5 | 0.00 | 0.00 | 0.00 |
| 4,892.2 | 9.10 | 247.15 | 4,842.0 | -249.6 | -592.3 | -576.6 | 0.00 | 0.00 | 0.00 |
| SHANNON | | | | | | | | | |
| 4,900.0 | 9.10 | 247.15 | 4,849.7 | -250.1 | -593.4 | -577.7 | 0.00 | 0.00 | 0.00 |
| 5,000.0 | 9.10 | 247.15 | 4,948.5 | -256.2 | -608.0 | -591.9 | 0.00 | 0.00 | 0.00 |
| 5,100.0 | 9.10 | 247.15 | 5,047.2 | -262.4 | -622.6 | -606.1 | 0.00 | 0.00 | 0.00 |
| 5,200.0 | 9.10 | 247.15 | 5,146.0 | -268.5 | -637.1 | -620.3 | 0.00 | 0.00 | 0.00 |
| 5,300.0 | 9.10 | 247.15 | 5,244.7 | -274.6 | -651.7 | -634.4 | 0.00 | 0.00 | 0.00 |
| 5,400.0 | 9.10 | 247.15 | 5,343.4 | -280.8 | -666.3 | -648.6 | 0.00 | 0.00 | 0.00 |
| 5,403.7 | 9.10 | 247.15 | 5,347.1 | -281.0 | -666.8 | -649.1 | 0.00 | 0.00 | 0.00 |
| 5,500.0 | 7.17 | 247.15 | 5,442.4 | -286.3 | -679.4 | -661.4 | 2.00 | -2.00 | 0.00 |
| 5,600.0 | 5.17 | 247.15 | 5,541.8 | -290.5 | -689.3 | -671.0 | 2.00 | -2.00 | 0.00 |
| 5,700.0 | 3.17 | 247.15 | 5,641.6 | -293.3 | -696.0 | -677.5 | 2.00 | -2.00 | 0.00 |
| 5,800.0 | 1.17 | 247.15 | 5,741.5 | -294.8 | -699.4 | -680.9 | 2.00 | -2.00 | 0.00 |
| 5,858.5 | 0.00 | 0.00 | 5,800.0 | -295.0 | -700.0 | -681.5 | 2.00 | -2.00 | 0.00 |
| 5,900.0 | 0.00 | 0.00 | 5,841.5 | -295.0 | -700.0 | -681.5 | 0.00 | 0.00 | 0.00 |
| 6,000.0 | 0.00 | 0.00 | 5,941.5 | -295.0 | -700.0 | -681.5 | 0.00 | 0.00 | 0.00 |
| 6,100.0 | 0.00 | 0.00 | 6,041.5 | -295.0 | -700.0 | -681.5 | 0.00 | 0.00 | 0.00 |
| 6,200.0 | 0.00 | 0.00 | 6,141.5 | -295.0 | -700.0 | -681.5 | 0.00 | 0.00 | 0.00 |
| 6,212.7 | 0.00 | 0.00 | 6,154.2 | -295.0 | -700.0 | -681.5 | 0.00 | 0.00 | 0.00 |
| KOP #2 | | | | | | | | | |
| 6,300.0 | 6.55 | 90.17 | 6,241.3 | -295.0 | -695.0 | -676.5 | 7.50 | 7.50 | 0.00 |
| 6,400.0 | 14.05 | 90.17 | 6,339.6 | -295.1 | -677.1 | -658.6 | 7.50 | 7.50 | 0.00 |
| 6,500.0 | 21.55 | 90.17 | 6,434.8 | -295.2 | -646.6 | -628.1 | 7.50 | 7.50 | 0.00 |
| 6,579.4 | 27.51 | 90.17 | 6,507.0 | -295.3 | -613.6 | -595.2 | 7.50 | 7.50 | 0.00 |
| SHARON SPRINGS | | | | | | | | | |
| 6,600.0 | 29.05 | 90.17 | 6,525.1 | -295.3 | -603.9 | -585.5 | 7.50 | 7.50 | 0.00 |
| 6,700.0 | 36.55 | 90.17 | 6,609.1 | -295.4 | -549.8 | -531.5 | 7.50 | 7.50 | 0.00 |
| 6,718.7 | 37.95 | 90.17 | 6,624.0 | -295.5 | -538.5 | -520.2 | 7.50 | 7.50 | 0.00 |
| LEASE LINE | | | | | | | | | |
| 6,800.0 | 44.05 | 90.17 | 6,685.3 | -295.6 | -485.1 | -466.9 | 7.50 | 7.50 | 0.00 |
| 6,817.9 | 45.39 | 90.17 | 6,698.0 | -295.7 | -472.6 | -454.4 | 7.50 | 7.50 | 0.00 |
| NIORARA A | | | | | | | | | |
| 6,900.0 | 51.55 | 90.17 | 6,752.4 | -295.9 | -411.1 | -393.0 | 7.50 | 7.50 | 0.00 |
| 7,000.0 | 59.05 | 90.17 | 6,809.3 | -296.1 | -328.9 | -311.0 | 7.50 | 7.50 | 0.00 |
| 7,011.2 | 59.89 | 90.17 | 6,815.0 | -296.1 | -319.3 | -301.4 | 7.50 | 7.50 | 0.00 |
| NIORARA B | | | | | | | | | |
| 7,100.0 | 66.55 | 90.17 | 6,855.0 | -296.4 | -240.1 | -222.2 | 7.50 | 7.50 | 0.00 |
| 7,197.5 | 73.87 | 90.17 | 6,888.0 | -296.6 | -148.3 | -130.7 | 7.50 | 7.50 | 0.00 |
| NIORARA C | | | | | | | | | |
| 7,200.0 | 74.05 | 90.17 | 6,888.7 | -296.6 | -146.0 | -128.3 | 7.50 | 7.50 | 0.00 |
| 7,300.0 | 81.55 | 90.17 | 6,909.8 | -296.9 | -48.3 | -30.8 | 7.50 | 7.50 | 0.00 |
| 7,400.0 | 89.05 | 90.17 | 6,918.0 | -297.2 | 51.3 | 68.7 | 7.50 | 7.50 | 0.00 |

| | | | |
|------------------|---|-------------------------------------|-----------------------------|
| Database: | Landmark | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Project: | SEC.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | North Reference: | True |
| Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #2 (10-22-13) | | |

| Planned Survey | | | | | | | | | |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
| 7,423.6 | 90.82 | 90.17 | 6,918.0 | -297.3 | 74.9 | 92.2 | 7.50 | 7.50 | 0.00 |
| End of Build - 7" | | | | | | | | | |
| 7,500.0 | 90.82 | 90.17 | 6,916.9 | -297.5 | 151.3 | 168.5 | 0.00 | 0.00 | 0.00 |
| 7,600.0 | 90.82 | 90.17 | 6,915.5 | -297.8 | 251.3 | 268.3 | 0.00 | 0.00 | 0.00 |
| 7,700.0 | 90.82 | 90.17 | 6,914.1 | -298.1 | 351.3 | 368.2 | 0.00 | 0.00 | 0.00 |
| 7,800.0 | 90.82 | 90.17 | 6,912.6 | -298.4 | 451.2 | 468.0 | 0.00 | 0.00 | 0.00 |
| 7,900.0 | 90.82 | 90.17 | 6,911.2 | -298.7 | 551.2 | 567.8 | 0.00 | 0.00 | 0.00 |
| 8,000.0 | 90.82 | 90.17 | 6,909.8 | -299.0 | 651.2 | 667.7 | 0.00 | 0.00 | 0.00 |
| 8,100.0 | 90.82 | 90.17 | 6,908.3 | -299.3 | 751.2 | 767.5 | 0.00 | 0.00 | 0.00 |
| 8,200.0 | 90.82 | 90.17 | 6,906.9 | -299.6 | 851.2 | 867.3 | 0.00 | 0.00 | 0.00 |
| 8,300.0 | 90.82 | 90.17 | 6,905.5 | -299.9 | 951.2 | 967.2 | 0.00 | 0.00 | 0.00 |
| 8,400.0 | 90.82 | 90.17 | 6,904.0 | -300.2 | 1,051.2 | 1,067.0 | 0.00 | 0.00 | 0.00 |
| 8,500.0 | 90.82 | 90.17 | 6,902.6 | -300.5 | 1,151.2 | 1,166.8 | 0.00 | 0.00 | 0.00 |
| 8,600.0 | 90.82 | 90.17 | 6,901.2 | -300.7 | 1,251.2 | 1,266.7 | 0.00 | 0.00 | 0.00 |
| 8,700.0 | 90.82 | 90.17 | 6,899.7 | -301.0 | 1,351.1 | 1,366.5 | 0.00 | 0.00 | 0.00 |
| 8,800.0 | 90.82 | 90.17 | 6,898.3 | -301.3 | 1,451.1 | 1,466.3 | 0.00 | 0.00 | 0.00 |
| 8,900.0 | 90.82 | 90.17 | 6,896.9 | -301.6 | 1,551.1 | 1,566.2 | 0.00 | 0.00 | 0.00 |
| 9,000.0 | 90.82 | 90.17 | 6,895.4 | -301.9 | 1,651.1 | 1,666.0 | 0.00 | 0.00 | 0.00 |
| 9,100.0 | 90.82 | 90.17 | 6,894.0 | -302.2 | 1,751.1 | 1,765.8 | 0.00 | 0.00 | 0.00 |
| 9,200.0 | 90.82 | 90.17 | 6,892.6 | -302.5 | 1,851.1 | 1,865.7 | 0.00 | 0.00 | 0.00 |
| 9,300.0 | 90.82 | 90.17 | 6,891.2 | -302.8 | 1,951.1 | 1,965.5 | 0.00 | 0.00 | 0.00 |
| 9,400.0 | 90.82 | 90.17 | 6,889.7 | -303.1 | 2,051.1 | 2,065.3 | 0.00 | 0.00 | 0.00 |
| 9,500.0 | 90.82 | 90.17 | 6,888.3 | -303.4 | 2,151.1 | 2,165.2 | 0.00 | 0.00 | 0.00 |
| 9,600.0 | 90.82 | 90.17 | 6,886.9 | -303.7 | 2,251.1 | 2,265.0 | 0.00 | 0.00 | 0.00 |
| 9,700.0 | 90.82 | 90.17 | 6,885.4 | -304.0 | 2,351.0 | 2,364.8 | 0.00 | 0.00 | 0.00 |
| 9,800.0 | 90.82 | 90.17 | 6,884.0 | -304.3 | 2,451.0 | 2,464.7 | 0.00 | 0.00 | 0.00 |
| 9,900.0 | 90.82 | 90.17 | 6,882.6 | -304.6 | 2,551.0 | 2,564.5 | 0.00 | 0.00 | 0.00 |
| 10,000.0 | 90.82 | 90.17 | 6,881.1 | -304.9 | 2,651.0 | 2,664.3 | 0.00 | 0.00 | 0.00 |
| 10,100.0 | 90.82 | 90.17 | 6,879.7 | -305.2 | 2,751.0 | 2,764.2 | 0.00 | 0.00 | 0.00 |
| 10,200.0 | 90.82 | 90.17 | 6,878.3 | -305.5 | 2,851.0 | 2,864.0 | 0.00 | 0.00 | 0.00 |
| 10,300.0 | 90.82 | 90.17 | 6,876.8 | -305.7 | 2,951.0 | 2,963.8 | 0.00 | 0.00 | 0.00 |
| 10,400.0 | 90.82 | 90.17 | 6,875.4 | -306.0 | 3,051.0 | 3,063.7 | 0.00 | 0.00 | 0.00 |
| 10,500.0 | 90.82 | 90.17 | 6,874.0 | -306.3 | 3,151.0 | 3,163.5 | 0.00 | 0.00 | 0.00 |
| 10,600.0 | 90.82 | 90.17 | 6,872.6 | -306.6 | 3,250.9 | 3,263.3 | 0.00 | 0.00 | 0.00 |
| 10,700.0 | 90.82 | 90.17 | 6,871.1 | -306.9 | 3,350.9 | 3,363.2 | 0.00 | 0.00 | 0.00 |
| 10,800.0 | 90.82 | 90.17 | 6,869.7 | -307.2 | 3,450.9 | 3,463.0 | 0.00 | 0.00 | 0.00 |
| 10,900.0 | 90.82 | 90.17 | 6,868.3 | -307.5 | 3,550.9 | 3,562.8 | 0.00 | 0.00 | 0.00 |
| 11,000.0 | 90.82 | 90.17 | 6,866.8 | -307.8 | 3,650.9 | 3,662.7 | 0.00 | 0.00 | 0.00 |
| 11,100.0 | 90.82 | 90.17 | 6,865.4 | -308.1 | 3,750.9 | 3,762.5 | 0.00 | 0.00 | 0.00 |
| 11,200.0 | 90.82 | 90.17 | 6,864.0 | -308.4 | 3,850.9 | 3,862.3 | 0.00 | 0.00 | 0.00 |
| 11,300.0 | 90.82 | 90.17 | 6,862.5 | -308.7 | 3,950.9 | 3,962.2 | 0.00 | 0.00 | 0.00 |
| 11,400.0 | 90.82 | 90.17 | 6,861.1 | -309.0 | 4,050.9 | 4,062.0 | 0.00 | 0.00 | 0.00 |
| 11,500.0 | 90.82 | 90.17 | 6,859.7 | -309.3 | 4,150.8 | 4,161.8 | 0.00 | 0.00 | 0.00 |
| 11,600.0 | 90.82 | 90.17 | 6,858.2 | -309.6 | 4,250.8 | 4,261.7 | 0.00 | 0.00 | 0.00 |
| 11,700.0 | 90.82 | 90.17 | 6,856.8 | -309.9 | 4,350.8 | 4,361.5 | 0.00 | 0.00 | 0.00 |
| 11,800.0 | 90.82 | 90.17 | 6,855.4 | -310.2 | 4,450.8 | 4,461.4 | 0.00 | 0.00 | 0.00 |
| 11,900.0 | 90.82 | 90.17 | 6,853.9 | -310.5 | 4,550.8 | 4,561.2 | 0.00 | 0.00 | 0.00 |
| 12,000.0 | 90.82 | 90.17 | 6,852.5 | -310.8 | 4,650.8 | 4,661.0 | 0.00 | 0.00 | 0.00 |
| 12,100.0 | 90.82 | 90.17 | 6,851.1 | -311.0 | 4,750.8 | 4,760.9 | 0.00 | 0.00 | 0.00 |
| 12,200.0 | 90.82 | 90.17 | 6,849.7 | -311.3 | 4,850.8 | 4,860.7 | 0.00 | 0.00 | 0.00 |
| 12,300.0 | 90.82 | 90.17 | 6,848.2 | -311.6 | 4,950.8 | 4,960.5 | 0.00 | 0.00 | 0.00 |
| 12,400.0 | 90.82 | 90.17 | 6,846.8 | -311.9 | 5,050.8 | 5,060.4 | 0.00 | 0.00 | 0.00 |
| 12,500.0 | 90.82 | 90.17 | 6,845.4 | -312.2 | 5,150.7 | 5,160.2 | 0.00 | 0.00 | 0.00 |

| | | | |
|------------------|---|-------------------------------------|-----------------------------|
| Database: | Landmark | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Project: | SEC.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | North Reference: | True |
| Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Wellbore: | Wellbore #1 | | |
| Design: | Plan #2 (10-22-13) | | |

Planned Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Turn Rate (°/100ft) |
|--------------------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|---------------------|
| 12,600.0 | 90.82 | 90.17 | 6,843.9 | -312.5 | 5,250.7 | 5,260.0 | 0.00 | 0.00 | 0.00 |
| 12,664.9 | 90.82 | 90.17 | 6,843.0 | -312.7 | 5,315.6 | 5,324.8 | 0.00 | 0.00 | 0.00 |
| BHL 1830°FSL, 500°FEL, SEC. 23 | | | | | | | | | |

Casing Points

| Measured Depth (ft) | Vertical Depth (ft) | Name | Casing Diameter (") | Hole Diameter (") |
|---------------------|---------------------|------|---------------------|-------------------|
| 7,423.6 | 6,918.0 | 7" | 7 | 7-1/2 |

Formations

| Measured Depth (ft) | Vertical Depth (ft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---------------------|---------------------|----------------|-----------|---------|-------------------|
| 3,609.0 | 3,575.0 | PARKMAN | | 0.00 | |
| 4,300.7 | 4,258.0 | SUSSEX | | 0.00 | |
| 4,892.2 | 4,842.0 | SHANNON | | 0.00 | |
| 6,579.4 | 6,507.0 | SHARON SPRINGS | | 0.00 | |
| 6,817.9 | 6,698.0 | NIOBRARA A | | 0.00 | |
| 7,011.2 | 6,815.0 | NIOBRARA B | | 0.00 | |
| 7,197.5 | 6,888.0 | NIOBRARA C | | 0.00 | |

Plan Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates | | Comment |
|---------------------|---------------------|-------------------|------------|--------------|
| | | +N/-S (ft) | +E/-W (ft) | |
| 600.0 | 600.0 | 0.0 | 0.0 | KOP #1 |
| 6,212.7 | 6,154.2 | -295.0 | -700.0 | KOP #2 |
| 7,423.6 | 6,918.0 | -297.3 | 74.9 | End of Build |



PETROLEUM DEVELOPMENT CORP Weld County CO

SEC.22-T5N-R65W

Alles 22S-HZ Pad Sec.22-T5N-R65W

Alles 22D-312

Wellbore #1

Plan #2 (10-22-13)

Anticollision Report

25 October, 2013



| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| | | | |
|-------------------------------------|---|-----------------------|---------------------|
| Reference | Plan #2 (10-22-13) | | |
| Filter type: | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| Interpolation Method: | MD Interval 100.0ft | Error Model: | ISCWSA |
| Depth Range: | Unlimited | Scan Method: | Closest Approach 3D |
| Results Limited by: | Maximum center-center distance of 1,000.0ft | Error Surface: | Elliptical Conic |
| Warning Levels Evaluated at: | 2.00 Sigma | | |

| | | | | |
|----------------------------|----------------|----------------------------------|------------------|--------------------|
| Survey Tool Program | Date | 10/22/2013 | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description |
| 0.0 | 12,664.9 | Plan #2 (10-22-13) (Wellbore #1) | MWD | MWD - Standard |

| | | | | | | |
|--|--------------------------------------|-----------------------------------|--------------------------------------|---------------------------------------|--------------------------|---------------------|
| Summary | | | | | | |
| Site Name | Reference Measured Depth (ft) | Offset Measured Depth (ft) | Distance Between Centres (ft) | Distance Between Ellipses (ft) | Separation Factor | Warning |
| Offset Well - Wellbore - Design | | | | | | |
| Alles 22S-HZ Pad Sec.22-T5N-R65W | | | | | | |
| Alles 22D-402 - Wellbore #1 - Plan #1 (5-16-13) | 200.0 | 200.0 | 32.3 | 31.6 | 47.895 | CC, ES |
| Alles 22D-402 - Wellbore #1 - Plan #1 (5-16-13) | 12,664.9 | 12,774.4 | 426.1 | 114.3 | 1.367 | Level 3, SF |
| Alles 22S-432 - Wellbore #1 - Plan #1 (5-16-13) | 645.5 | 645.5 | 27.8 | 25.2 | 10.429 | CC |
| Alles 22S-432 - Wellbore #1 - Plan #1 (5-16-13) | 700.0 | 700.0 | 27.9 | 25.0 | 9.597 | ES |
| Alles 22S-432 - Wellbore #1 - Plan #1 (5-16-13) | 12,664.9 | 12,735.0 | 507.5 | 191.9 | 1.608 | SF |
| Lofland 22T & Alles 22S-HZ Existing Wells | | | | | | |
| Alles 9-22 (Exist) - Wellbore #1 - Wellbore #1 | 1,413.8 | 1,408.3 | 66.8 | 35.2 | 2.113 | CC |
| Alles 9-22 (Exist) - Wellbore #1 - Wellbore #1 | 1,500.0 | 1,493.5 | 68.2 | 34.6 | 2.030 | ES, SF |
| Badley 23-31 (Exist) - Wellbore #1 - Wellbore #1 | 10,076.0 | 6,878.0 | 137.7 | -89.4 | 0.606 | Level 1, CC, ES, SF |
| Buderus 12-23 (Exist) - Wellbore #1 - Wellbore #1 | 8,573.9 | 6,899.5 | 235.1 | 48.1 | 1.257 | Level 3, CC, ES, SF |
| Esther 1-23 (Exist) - Wellbore #1 - Wellbore #1 | 12,461.1 | 6,841.9 | 108.6 | -183.8 | 0.372 | Level 1, CC, ES, SF |
| Lille 1-23 (Exist) - Wellbore #1 - Wellbore #1 | 11,148.6 | 6,862.7 | 166.5 | -89.9 | 0.649 | Level 1, CC, ES, SF |

| | | | | | | | | | | | | | | |
|----------------------------|--|----------------------------|----------------------------|-----------------------|--------------------|------------------------------|--|-------------------|-----------------------------|------------------------------|--------------------------------|--------------------------|---------------------------|--------|
| Offset Design | Alles 22S-HZ Pad Sec.22-T5N-R65W - Alles 22D-402 - Wellbore #1 - Plan #1 (5-16-13) | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
| Survey Program: | 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | Offset | Semi Major Axis | | Distance | | | | Warning | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | | |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 154.45 | -29.1 | 13.9 | 32.3 | | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | 154.45 | -29.1 | 13.9 | 32.3 | 32.1 | 0.22 | 143.684 | | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | 154.45 | -29.1 | 13.9 | 32.3 | 31.6 | 0.67 | 47.895 | CC, ES | |
| 300.0 | 300.0 | 299.6 | 299.6 | 0.6 | 0.5 | 157.32 | -30.3 | 12.7 | 32.9 | 31.8 | 1.10 | 29.768 | | |
| 400.0 | 400.0 | 399.0 | 398.8 | 0.8 | 0.8 | 165.25 | -33.9 | 8.9 | 35.1 | 33.5 | 1.54 | 22.764 | | |
| 500.0 | 500.0 | 497.9 | 497.3 | 1.0 | 1.0 | 176.10 | -39.8 | 2.7 | 40.0 | 38.0 | 2.01 | 19.929 | | |
| 600.0 | 600.0 | 596.1 | 594.8 | 1.2 | 1.3 | -172.99 | -48.0 | -5.9 | 48.6 | 46.1 | 2.51 | 19.343 | | |
| 700.0 | 700.0 | 693.6 | 691.1 | 1.4 | 1.6 | -52.15 | -58.3 | -16.8 | 60.3 | 57.4 | 2.93 | 20.562 | | |
| 800.0 | 799.8 | 791.5 | 787.3 | 1.6 | 2.0 | -47.63 | -70.9 | -30.0 | 73.2 | 69.8 | 3.39 | 21.611 | | |
| 900.0 | 899.5 | 890.8 | 884.8 | 1.9 | 2.4 | -45.90 | -83.9 | -43.8 | 84.5 | 80.6 | 3.86 | 21.894 | | |
| 1,000.0 | 998.7 | 990.4 | 982.6 | 2.1 | 2.8 | -46.10 | -97.1 | -57.6 | 93.4 | 89.0 | 4.37 | 21.378 | | |
| 1,100.0 | 1,097.5 | 1,090.1 | 1,080.5 | 2.4 | 3.2 | -47.62 | -110.2 | -71.5 | 100.2 | 95.2 | 4.93 | 20.312 | | |
| 1,200.0 | 1,196.3 | 1,189.9 | 1,178.4 | 2.7 | 3.6 | -49.20 | -123.4 | -85.3 | 106.7 | 101.1 | 5.53 | 19.285 | | |
| 1,300.0 | 1,295.0 | 1,289.6 | 1,276.3 | 3.1 | 4.1 | -50.60 | -136.5 | -99.2 | 113.2 | 107.1 | 6.15 | 18.406 | | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|--|---------------------------|---------------------------|---------------------------|-------------------|----------------|-----------------------------|---|---------------|----------------------------|-----------------------------|-------------------------------|----------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Alles 22S-HZ Pad Sec.22-T5N-R65W - Alles 22D-402 - Wellbore #1 - Plan #1 (5-16-13) | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | Highside Toolface (°) | Distance | | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | | | | | |
| 1,400.0 | 1,393.8 | 1,389.4 | 1,374.2 | 3.4 | 4.5 | -51.85 | -149.7 | -113.0 | 119.9 | 113.1 | 6.79 | 17.647 | |
| 1,500.0 | 1,492.5 | 1,489.1 | 1,472.1 | 3.8 | 4.9 | -52.96 | -162.9 | -126.9 | 126.6 | 119.1 | 7.45 | 16.993 | |
| 1,600.0 | 1,591.2 | 1,588.9 | 1,570.0 | 4.1 | 5.4 | -53.97 | -176.0 | -140.7 | 133.3 | 125.2 | 8.11 | 16.426 | |
| 1,700.0 | 1,690.0 | 1,688.6 | 1,667.9 | 4.5 | 5.8 | -54.87 | -189.2 | -154.6 | 140.0 | 131.3 | 8.79 | 15.931 | |
| 1,800.0 | 1,788.7 | 1,788.4 | 1,765.8 | 4.8 | 6.2 | -55.70 | -202.3 | -168.4 | 146.8 | 137.4 | 9.48 | 15.496 | |
| 1,900.0 | 1,887.5 | 1,888.1 | 1,863.7 | 5.2 | 6.7 | -56.45 | -215.5 | -182.3 | 153.7 | 143.5 | 10.17 | 15.113 | |
| 2,000.0 | 1,986.2 | 1,987.9 | 1,961.6 | 5.6 | 7.1 | -57.13 | -228.6 | -196.1 | 160.5 | 149.6 | 10.87 | 14.773 | |
| 2,100.0 | 2,084.9 | 2,087.6 | 2,059.5 | 5.9 | 7.5 | -57.76 | -241.8 | -210.0 | 167.4 | 155.8 | 11.57 | 14.469 | |
| 2,200.0 | 2,183.7 | 2,187.4 | 2,157.4 | 6.3 | 8.0 | -58.34 | -254.9 | -223.8 | 174.3 | 162.0 | 12.27 | 14.197 | |
| 2,300.0 | 2,282.4 | 2,287.1 | 2,255.3 | 6.7 | 8.4 | -58.88 | -268.1 | -237.7 | 181.2 | 168.2 | 12.99 | 13.952 | |
| 2,400.0 | 2,381.2 | 2,386.9 | 2,353.2 | 7.1 | 8.8 | -59.38 | -281.2 | -251.6 | 188.1 | 174.4 | 13.70 | 13.730 | |
| 2,500.0 | 2,479.9 | 2,486.6 | 2,451.1 | 7.4 | 9.3 | -59.84 | -294.4 | -265.4 | 195.0 | 180.6 | 14.42 | 13.528 | |
| 2,600.0 | 2,578.7 | 2,586.4 | 2,549.0 | 7.8 | 9.7 | -60.27 | -307.5 | -279.3 | 202.0 | 186.8 | 15.13 | 13.345 | |
| 2,700.0 | 2,677.4 | 2,686.1 | 2,646.9 | 8.2 | 10.1 | -60.67 | -320.7 | -293.1 | 208.9 | 193.1 | 15.86 | 13.176 | |
| 2,800.0 | 2,776.1 | 2,785.9 | 2,744.8 | 8.6 | 10.6 | -61.04 | -333.8 | -307.0 | 215.9 | 199.3 | 16.58 | 13.022 | |
| 2,900.0 | 2,874.9 | 2,885.6 | 2,842.7 | 8.9 | 11.0 | -61.40 | -347.0 | -320.8 | 222.9 | 205.6 | 17.30 | 12.879 | |
| 3,000.0 | 2,973.6 | 2,985.4 | 2,940.6 | 9.3 | 11.4 | -61.73 | -360.2 | -334.7 | 229.8 | 211.8 | 18.03 | 12.748 | |
| 3,100.0 | 3,072.4 | 3,085.1 | 3,038.5 | 9.7 | 11.9 | -62.04 | -373.3 | -348.5 | 236.8 | 218.1 | 18.76 | 12.626 | |
| 3,200.0 | 3,171.1 | 3,184.8 | 3,136.4 | 10.1 | 12.3 | -62.33 | -386.5 | -362.4 | 243.8 | 224.3 | 19.49 | 12.512 | |
| 3,300.0 | 3,269.9 | 3,284.6 | 3,234.3 | 10.4 | 12.7 | -62.61 | -399.6 | -376.2 | 250.8 | 230.6 | 20.22 | 12.407 | |
| 3,400.0 | 3,368.6 | 3,384.3 | 3,332.2 | 10.8 | 13.2 | -62.87 | -412.8 | -390.1 | 257.8 | 236.9 | 20.95 | 12.308 | |
| 3,500.0 | 3,467.3 | 3,484.1 | 3,430.1 | 11.2 | 13.6 | -63.12 | -425.9 | -403.9 | 264.8 | 243.2 | 21.68 | 12.216 | |
| 3,600.0 | 3,566.1 | 3,583.8 | 3,528.0 | 11.6 | 14.0 | -63.35 | -439.1 | -417.8 | 271.8 | 249.4 | 22.41 | 12.130 | |
| 3,700.0 | 3,664.8 | 3,683.6 | 3,625.9 | 12.0 | 14.5 | -63.58 | -452.2 | -431.6 | 278.9 | 255.7 | 23.14 | 12.049 | |
| 3,800.0 | 3,763.6 | 3,783.3 | 3,723.8 | 12.3 | 14.9 | -63.79 | -465.4 | -445.5 | 285.9 | 262.0 | 23.88 | 11.973 | |
| 3,900.0 | 3,862.3 | 3,883.1 | 3,821.7 | 12.7 | 15.3 | -63.99 | -478.5 | -459.3 | 292.9 | 268.3 | 24.61 | 11.901 | |
| 4,000.0 | 3,961.0 | 3,982.8 | 3,919.6 | 13.1 | 15.8 | -64.18 | -491.7 | -473.2 | 299.9 | 274.6 | 25.35 | 11.833 | |
| 4,100.0 | 4,059.8 | 4,082.6 | 4,017.5 | 13.5 | 16.2 | -64.37 | -504.8 | -487.0 | 307.0 | 280.9 | 26.08 | 11.769 | |
| 4,200.0 | 4,158.5 | 4,182.3 | 4,115.4 | 13.9 | 16.6 | -64.54 | -518.0 | -500.9 | 314.0 | 287.2 | 26.82 | 11.708 | |
| 4,300.0 | 4,257.3 | 4,282.1 | 4,213.3 | 14.2 | 17.1 | -64.71 | -531.2 | -514.7 | 321.1 | 293.5 | 27.56 | 11.651 | |
| 4,400.0 | 4,356.0 | 4,381.8 | 4,311.2 | 14.6 | 17.5 | -64.87 | -544.3 | -528.6 | 328.1 | 299.8 | 28.29 | 11.596 | |
| 4,500.0 | 4,454.8 | 4,481.6 | 4,409.1 | 15.0 | 17.9 | -65.02 | -557.5 | -542.4 | 335.1 | 306.1 | 29.03 | 11.544 | |
| 4,600.0 | 4,553.5 | 4,581.3 | 4,507.0 | 15.4 | 18.4 | -65.17 | -570.6 | -556.3 | 342.2 | 312.4 | 29.77 | 11.495 | |
| 4,700.0 | 4,652.2 | 4,681.1 | 4,604.9 | 15.8 | 18.8 | -65.31 | -583.8 | -570.2 | 349.2 | 318.7 | 30.51 | 11.448 | |
| 4,800.0 | 4,751.0 | 4,780.8 | 4,702.8 | 16.1 | 19.2 | -65.45 | -596.9 | -584.0 | 356.3 | 325.0 | 31.25 | 11.403 | |
| 4,900.0 | 4,849.7 | 4,880.6 | 4,800.7 | 16.5 | 19.7 | -65.58 | -610.1 | -597.9 | 363.3 | 331.4 | 31.98 | 11.360 | |
| 5,000.0 | 4,948.5 | 4,980.3 | 4,898.6 | 16.9 | 20.1 | -65.71 | -623.2 | -611.7 | 370.4 | 337.7 | 32.72 | 11.319 | |
| 5,100.0 | 5,047.2 | 5,080.1 | 4,996.5 | 17.3 | 20.6 | -65.83 | -636.4 | -625.6 | 377.5 | 344.0 | 33.46 | 11.280 | |
| 5,200.0 | 5,146.0 | 5,179.8 | 5,094.4 | 17.7 | 21.0 | -65.94 | -649.5 | -639.4 | 384.5 | 350.3 | 34.20 | 11.242 | |
| 5,300.0 | 5,244.7 | 5,279.5 | 5,192.3 | 18.0 | 21.4 | -66.06 | -662.7 | -653.3 | 391.6 | 356.6 | 34.94 | 11.206 | |
| 5,400.0 | 5,343.4 | 5,383.5 | 5,294.5 | 18.4 | 21.8 | -66.20 | -676.2 | -667.5 | 398.4 | 362.7 | 35.68 | 11.166 | |
| 5,500.0 | 5,442.4 | 5,494.2 | 5,403.7 | 18.7 | 22.1 | -66.57 | -688.2 | -680.1 | 403.7 | 367.4 | 36.32 | 11.116 | |
| 5,600.0 | 5,541.8 | 5,604.9 | 5,513.7 | 18.9 | 22.4 | -66.85 | -697.3 | -689.7 | 407.8 | 370.9 | 36.82 | 11.076 | |
| 5,700.0 | 5,641.6 | 5,715.8 | 5,624.2 | 19.1 | 22.6 | -67.03 | -703.4 | -696.2 | 410.5 | 373.3 | 37.22 | 11.028 | |
| 5,800.0 | 5,741.5 | 5,826.8 | 5,735.1 | 19.3 | 22.8 | -67.12 | -706.6 | -699.5 | 411.9 | 374.4 | 37.55 | 10.970 | |
| 5,900.0 | 5,841.5 | 5,933.2 | 5,841.5 | 19.4 | 22.9 | -179.99 | -707.1 | -700.1 | 412.1 | 378.4 | 33.78 | 12.200 | |
| 6,000.0 | 5,941.5 | 6,033.2 | 5,941.5 | 19.5 | 23.0 | -179.99 | -707.1 | -700.1 | 412.1 | 378.1 | 34.07 | 12.098 | |
| 6,100.0 | 6,041.5 | 6,133.2 | 6,041.5 | 19.7 | 23.1 | -179.99 | -707.1 | -700.1 | 412.1 | 377.8 | 34.35 | 11.997 | |
| 6,200.0 | 6,141.5 | 6,233.2 | 6,141.5 | 19.8 | 23.2 | -179.99 | -707.1 | -700.1 | 412.1 | 377.5 | 34.64 | 11.896 | |
| 6,244.6 | 6,186.1 | 6,277.8 | 6,186.1 | 19.9 | 23.2 | 90.00 | -707.1 | -700.1 | 412.1 | 373.5 | 38.68 | 10.655 | |
| 6,300.0 | 6,241.3 | 6,333.1 | 6,241.4 | 19.9 | 23.3 | 90.52 | -707.1 | -700.0 | 412.2 | 373.5 | 38.69 | 10.653 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Alles 22S-HZ Pad Sec.22-T5N-R65W - Alles 22D-402 - Wellbore #1 - Plan #1 (5-16-13) | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | Highside Toolface (°) | Distance | | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | | | | | |
| 6,400.0 | 6,339.6 | 6,433.8 | 6,341.6 | 19.9 | 23.3 | 91.90 | -707.2 | -691.9 | 412.4 | 374.0 | 38.41 | 10.736 | |
| 6,500.0 | 6,434.8 | 6,535.8 | 6,441.3 | 19.7 | 23.3 | 93.24 | -707.2 | -670.4 | 412.8 | 374.9 | 37.94 | 10.879 | |
| 6,600.0 | 6,525.1 | 6,639.2 | 6,538.4 | 19.6 | 23.1 | 94.54 | -707.3 | -635.2 | 413.4 | 376.1 | 37.36 | 11.067 | |
| 6,700.0 | 6,609.1 | 6,743.9 | 6,631.0 | 19.4 | 22.9 | 95.77 | -707.5 | -586.5 | 414.2 | 377.5 | 36.76 | 11.269 | |
| 6,800.0 | 6,685.3 | 6,849.9 | 6,717.2 | 19.2 | 22.7 | 96.89 | -707.6 | -524.8 | 415.1 | 378.8 | 36.28 | 11.442 | |
| 6,900.0 | 6,752.4 | 6,957.2 | 6,794.8 | 19.2 | 22.4 | 97.89 | -707.8 | -450.9 | 416.1 | 380.0 | 36.10 | 11.524 | |
| 7,000.0 | 6,809.3 | 7,065.6 | 6,861.9 | 19.3 | 22.2 | 98.75 | -708.1 | -365.9 | 417.0 | 380.5 | 36.41 | 11.451 | |
| 7,100.0 | 6,855.0 | 7,175.0 | 6,916.7 | 19.6 | 22.1 | 99.45 | -708.3 | -271.4 | 417.8 | 380.4 | 37.36 | 11.182 | |
| 7,200.0 | 6,888.7 | 7,285.1 | 6,957.8 | 20.3 | 22.1 | 99.98 | -708.6 | -169.3 | 418.4 | 379.4 | 39.03 | 10.720 | |
| 7,300.0 | 6,909.8 | 7,395.8 | 6,983.8 | 21.4 | 22.4 | 100.32 | -708.9 | -61.8 | 418.8 | 377.4 | 41.40 | 10.116 | |
| 7,400.0 | 6,918.0 | 7,500.2 | 6,996.1 | 22.7 | 23.1 | 100.75 | -709.2 | 41.9 | 419.4 | 375.2 | 44.22 | 9.484 | |
| 7,500.0 | 6,916.9 | 7,606.5 | 7,003.7 | 24.3 | 24.5 | 101.88 | -709.5 | 147.9 | 421.0 | 373.7 | 47.31 | 8.899 | |
| 7,600.0 | 6,915.5 | 7,709.6 | 7,003.4 | 26.2 | 26.3 | 102.04 | -709.8 | 251.0 | 421.3 | 370.4 | 50.89 | 8.278 | |
| 7,700.0 | 6,914.1 | 7,809.6 | 7,002.4 | 28.1 | 28.2 | 102.10 | -710.1 | 350.9 | 421.4 | 366.6 | 54.75 | 7.697 | |
| 7,800.0 | 6,912.6 | 7,909.6 | 7,001.4 | 30.3 | 30.3 | 102.16 | -710.4 | 450.9 | 421.4 | 362.6 | 58.86 | 7.160 | |
| 7,900.0 | 6,911.2 | 8,009.6 | 7,000.4 | 32.5 | 32.5 | 102.22 | -710.7 | 550.9 | 421.5 | 358.3 | 63.19 | 6.671 | |
| 8,000.0 | 6,909.8 | 8,109.6 | 6,999.4 | 34.8 | 34.8 | 102.27 | -711.0 | 650.9 | 421.6 | 353.9 | 67.68 | 6.230 | |
| 8,100.0 | 6,908.3 | 8,209.6 | 6,998.4 | 37.2 | 37.2 | 102.33 | -711.2 | 750.9 | 421.7 | 349.4 | 72.30 | 5.832 | |
| 8,200.0 | 6,906.9 | 8,309.6 | 6,997.4 | 39.6 | 39.6 | 102.39 | -711.5 | 850.9 | 421.8 | 344.7 | 77.04 | 5.475 | |
| 8,300.0 | 6,905.5 | 8,409.6 | 6,996.4 | 42.1 | 42.1 | 102.45 | -711.8 | 950.9 | 421.9 | 340.0 | 81.87 | 5.153 | |
| 8,400.0 | 6,904.0 | 8,509.6 | 6,995.4 | 44.6 | 44.6 | 102.51 | -712.1 | 1,050.9 | 422.0 | 335.2 | 86.78 | 4.863 | |
| 8,500.0 | 6,902.6 | 8,609.6 | 6,994.4 | 47.2 | 47.2 | 102.57 | -712.4 | 1,150.9 | 422.1 | 330.3 | 91.74 | 4.600 | |
| 8,600.0 | 6,901.2 | 8,709.6 | 6,993.4 | 49.8 | 49.8 | 102.62 | -712.7 | 1,250.9 | 422.1 | 325.4 | 96.76 | 4.363 | |
| 8,700.0 | 6,899.7 | 8,809.6 | 6,992.4 | 52.4 | 52.4 | 102.68 | -713.0 | 1,350.9 | 422.2 | 320.4 | 101.83 | 4.146 | |
| 8,800.0 | 6,898.3 | 8,909.6 | 6,991.4 | 55.0 | 55.0 | 102.74 | -713.3 | 1,450.9 | 422.3 | 315.4 | 106.93 | 3.949 | |
| 8,900.0 | 6,896.9 | 9,009.6 | 6,990.4 | 57.7 | 57.6 | 102.80 | -713.5 | 1,550.9 | 422.4 | 310.3 | 112.07 | 3.769 | |
| 9,000.0 | 6,895.4 | 9,109.6 | 6,989.5 | 60.3 | 60.3 | 102.86 | -713.8 | 1,650.9 | 422.5 | 305.3 | 117.23 | 3.604 | |
| 9,100.0 | 6,894.0 | 9,209.6 | 6,988.5 | 63.0 | 62.9 | 102.91 | -714.1 | 1,750.9 | 422.6 | 300.2 | 122.42 | 3.452 | |
| 9,200.0 | 6,892.6 | 9,309.6 | 6,987.5 | 65.7 | 65.6 | 102.97 | -714.4 | 1,850.9 | 422.7 | 295.1 | 127.62 | 3.312 | |
| 9,300.0 | 6,891.2 | 9,409.6 | 6,986.5 | 68.4 | 68.3 | 103.03 | -714.7 | 1,950.8 | 422.8 | 289.9 | 132.85 | 3.182 | |
| 9,400.0 | 6,889.7 | 9,509.6 | 6,985.5 | 71.1 | 71.0 | 103.09 | -715.0 | 2,050.8 | 422.9 | 284.8 | 138.09 | 3.062 | |
| 9,500.0 | 6,888.3 | 9,609.5 | 6,984.5 | 73.8 | 73.7 | 103.15 | -715.3 | 2,150.8 | 423.0 | 279.6 | 143.34 | 2.951 | |
| 9,600.0 | 6,886.9 | 9,709.5 | 6,983.5 | 76.5 | 76.4 | 103.20 | -715.6 | 2,250.8 | 423.1 | 274.4 | 148.61 | 2.847 | |
| 9,700.0 | 6,885.4 | 9,809.5 | 6,982.5 | 79.2 | 79.1 | 103.26 | -715.8 | 2,350.8 | 423.1 | 269.3 | 153.88 | 2.750 | |
| 9,800.0 | 6,884.0 | 9,909.5 | 6,981.5 | 81.9 | 81.8 | 103.32 | -716.1 | 2,450.8 | 423.2 | 264.1 | 159.17 | 2.659 | |
| 9,900.0 | 6,882.6 | 10,009.5 | 6,980.5 | 84.7 | 84.6 | 103.38 | -716.4 | 2,550.8 | 423.3 | 258.9 | 164.46 | 2.574 | |
| 10,000.0 | 6,881.1 | 10,109.5 | 6,979.5 | 87.4 | 87.3 | 103.43 | -716.7 | 2,650.8 | 423.4 | 253.7 | 169.76 | 2.494 | |
| 10,100.0 | 6,879.7 | 10,209.5 | 6,978.5 | 90.2 | 90.0 | 103.49 | -717.0 | 2,750.8 | 423.5 | 248.5 | 175.07 | 2.419 | |
| 10,200.0 | 6,878.3 | 10,309.5 | 6,977.5 | 92.9 | 92.8 | 103.55 | -717.3 | 2,850.8 | 423.6 | 243.2 | 180.38 | 2.348 | |
| 10,300.0 | 6,876.8 | 10,409.5 | 6,976.5 | 95.7 | 95.5 | 103.61 | -717.6 | 2,950.8 | 423.7 | 238.0 | 185.70 | 2.282 | |
| 10,400.0 | 6,875.4 | 10,509.5 | 6,975.5 | 98.4 | 98.3 | 103.67 | -717.9 | 3,050.8 | 423.8 | 232.8 | 191.02 | 2.219 | |
| 10,500.0 | 6,874.0 | 10,609.5 | 6,974.5 | 101.2 | 101.0 | 103.72 | -718.1 | 3,150.8 | 423.9 | 227.6 | 196.34 | 2.159 | |
| 10,600.0 | 6,872.6 | 10,709.5 | 6,973.6 | 103.9 | 103.8 | 103.78 | -718.4 | 3,250.8 | 424.0 | 222.3 | 201.67 | 2.103 | |
| 10,700.0 | 6,871.1 | 10,809.5 | 6,972.6 | 106.7 | 106.5 | 103.84 | -718.7 | 3,350.8 | 424.1 | 217.1 | 207.00 | 2.049 | |
| 10,800.0 | 6,869.7 | 10,909.5 | 6,971.6 | 109.4 | 109.3 | 103.90 | -719.0 | 3,450.8 | 424.2 | 211.9 | 212.33 | 1.998 | |
| 10,900.0 | 6,868.3 | 11,009.5 | 6,970.6 | 112.2 | 112.1 | 103.95 | -719.3 | 3,550.7 | 424.3 | 206.6 | 217.66 | 1.949 | |
| 11,000.0 | 6,866.8 | 11,109.5 | 6,969.6 | 115.0 | 114.8 | 104.01 | -719.6 | 3,650.7 | 424.4 | 201.4 | 222.99 | 1.903 | |
| 11,100.0 | 6,865.4 | 11,209.5 | 6,968.6 | 117.8 | 117.6 | 104.07 | -719.9 | 3,750.7 | 424.5 | 196.2 | 228.33 | 1.859 | |
| 11,200.0 | 6,864.0 | 11,309.5 | 6,967.6 | 120.5 | 120.4 | 104.13 | -720.2 | 3,850.7 | 424.6 | 190.9 | 233.66 | 1.817 | |
| 11,300.0 | 6,862.5 | 11,409.5 | 6,966.6 | 123.3 | 123.1 | 104.18 | -720.5 | 3,950.7 | 424.7 | 185.7 | 239.00 | 1.777 | |
| 11,400.0 | 6,861.1 | 11,509.5 | 6,965.6 | 126.1 | 125.9 | 104.24 | -720.7 | 4,050.7 | 424.8 | 180.5 | 244.34 | 1.739 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | Offset Site Error: | | 0.0 ft |
|-----------------------|----------------|----------------|----------------|-----------------|--------|-------------------|------------------------|-----------------|------------------|--------------------|--------------------|-------------------|--------|
| Survey Program: 0-MWD | | | | | | | | | | | Offset Well Error: | | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | Warning | |
| Measured Depth | Vertical Depth | Measured Depth | Vertical Depth | Reference | Offset | Highside Toolface | Offset Wellbore Centre | Between Centres | Between Ellipses | Minimum Separation | | | |
| (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (°) | +N/-S (ft) | +E/-W (ft) | (ft) | (ft) | (ft) | Factor | |
| 11,500.0 | 6,859.7 | 11,609.5 | 6,964.6 | 128.9 | 128.7 | 104.30 | -721.0 | 4,150.7 | 424.9 | 175.2 | 249.67 | 1.702 | |
| 11,600.0 | 6,858.2 | 11,709.5 | 6,963.6 | 131.6 | 131.5 | 104.36 | -721.3 | 4,250.7 | 425.0 | 170.0 | 255.01 | 1.667 | |
| 11,700.0 | 6,856.8 | 11,809.5 | 6,962.6 | 134.4 | 134.2 | 104.41 | -721.6 | 4,350.7 | 425.1 | 164.8 | 260.35 | 1.633 | |
| 11,800.0 | 6,855.4 | 11,909.5 | 6,961.6 | 137.2 | 137.0 | 104.47 | -721.9 | 4,450.7 | 425.2 | 159.5 | 265.68 | 1.600 | |
| 11,900.0 | 6,853.9 | 12,009.5 | 6,960.6 | 140.0 | 139.8 | 104.53 | -722.2 | 4,550.7 | 425.3 | 154.3 | 271.02 | 1.569 | |
| 12,000.0 | 6,852.5 | 12,109.5 | 6,959.6 | 142.8 | 142.6 | 104.58 | -722.5 | 4,650.7 | 425.4 | 149.1 | 276.35 | 1.539 | |
| 12,100.0 | 6,851.1 | 12,209.5 | 6,958.6 | 145.5 | 145.4 | 104.64 | -722.8 | 4,750.7 | 425.5 | 143.8 | 281.69 | 1.511 | |
| 12,200.0 | 6,849.7 | 12,309.5 | 6,957.6 | 148.3 | 148.1 | 104.70 | -723.0 | 4,850.7 | 425.6 | 138.6 | 287.02 | 1.483 Level 3 | |
| 12,300.0 | 6,848.2 | 12,409.5 | 6,956.7 | 151.1 | 150.9 | 104.76 | -723.3 | 4,950.7 | 425.7 | 133.4 | 292.35 | 1.456 Level 3 | |
| 12,400.0 | 6,846.8 | 12,509.5 | 6,955.7 | 153.9 | 153.7 | 104.81 | -723.6 | 5,050.7 | 425.8 | 128.2 | 297.68 | 1.431 Level 3 | |
| 12,500.0 | 6,845.4 | 12,609.5 | 6,954.7 | 156.7 | 156.5 | 104.87 | -723.9 | 5,150.6 | 425.9 | 122.9 | 303.01 | 1.406 Level 3 | |
| 12,600.0 | 6,843.9 | 12,709.5 | 6,953.7 | 159.5 | 159.3 | 104.93 | -724.2 | 5,250.6 | 426.1 | 117.7 | 308.34 | 1.382 Level 3 | |
| 12,664.9 | 6,843.0 | 12,774.4 | 6,953.0 | 161.3 | 161.1 | 104.96 | -724.4 | 5,315.5 | 426.1 | 114.3 | 311.79 | 1.367 Level 3, SF | |

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|-----------------------|---------------------|---------------------|---------------------|-----------|--------|-----------------|-----------------------|-----------------------------------|------------|-------------------------------|-----------------------|-------------------------|--------------------|---------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | | | | | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference | Offset | Semi Major Axis | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Distance Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | | | | |
| 100.0 | 100.0 | 100.0 | 100.0 | 0.1 | 0.1 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | 27.6 | 0.22 | 123.852 | |
| 200.0 | 200.0 | 200.0 | 200.0 | 0.3 | 0.3 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | 27.2 | 0.67 | 41.284 | |
| 300.0 | 300.0 | 300.0 | 300.0 | 0.6 | 0.6 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | 26.7 | 1.12 | 24.770 | |
| 400.0 | 400.0 | 400.0 | 400.0 | 0.8 | 0.8 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | 26.3 | 1.57 | 17.693 | |
| 500.0 | 500.0 | 500.0 | 500.0 | 1.0 | 1.0 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | 25.8 | 2.02 | 13.761 | |
| 600.0 | 600.0 | 600.0 | 600.0 | 1.2 | 1.2 | -23.60 | -23.60 | 25.5 | -11.1 | 27.8 | 25.4 | 2.47 | 11.259 | |
| 645.5 | 645.5 | 645.5 | 645.5 | 1.3 | 1.3 | 90.00 | 90.00 | 25.5 | -11.1 | 27.8 | 25.2 | 2.67 | 10.429 CC | |
| 700.0 | 700.0 | 700.0 | 700.0 | 1.4 | 1.5 | 92.84 | 92.84 | 25.5 | -11.1 | 27.9 | 25.0 | 2.90 | 9.597 ES | |
| 800.0 | 799.8 | 799.8 | 799.8 | 1.6 | 1.7 | 103.34 | 103.34 | 25.5 | -11.1 | 28.6 | 25.3 | 3.33 | 8.594 | |
| 900.0 | 899.5 | 899.5 | 899.5 | 1.9 | 1.9 | 118.71 | 118.71 | 25.5 | -11.1 | 31.8 | 28.0 | 3.77 | 8.427 | |
| 1,000.0 | 998.7 | 998.7 | 998.7 | 2.1 | 2.1 | 134.39 | 134.39 | 25.5 | -11.1 | 39.1 | 34.9 | 4.22 | 9.279 | |
| 1,100.0 | 1,097.5 | 1,098.1 | 1,098.1 | 2.4 | 2.3 | 144.89 | 144.89 | 25.9 | -12.8 | 50.5 | 45.9 | 4.66 | 10.852 | |
| 1,200.0 | 1,196.3 | 1,198.0 | 1,197.9 | 2.7 | 2.6 | 148.78 | 148.78 | 27.2 | -17.8 | 62.1 | 57.0 | 5.10 | 12.169 | |
| 1,300.0 | 1,295.0 | 1,298.4 | 1,297.8 | 3.1 | 2.8 | 148.92 | 148.92 | 29.3 | -26.2 | 72.4 | 66.8 | 5.57 | 12.993 | |
| 1,400.0 | 1,393.8 | 1,398.9 | 1,397.6 | 3.4 | 3.0 | 146.71 | 146.71 | 32.4 | -38.0 | 81.5 | 75.4 | 6.09 | 13.382 | |
| 1,500.0 | 1,492.5 | 1,498.9 | 1,496.4 | 3.8 | 3.3 | 143.06 | 143.06 | 36.1 | -52.8 | 89.8 | 83.1 | 6.67 | 13.471 | |
| 1,600.0 | 1,591.2 | 1,598.4 | 1,594.7 | 4.1 | 3.6 | 139.76 | 139.76 | 40.0 | -68.0 | 98.3 | 91.0 | 7.28 | 13.501 | |
| 1,700.0 | 1,690.0 | 1,697.9 | 1,692.9 | 4.5 | 3.9 | 136.99 | 136.99 | 43.9 | -83.1 | 107.0 | 99.1 | 7.91 | 13.518 | |
| 1,800.0 | 1,788.7 | 1,797.4 | 1,791.2 | 4.8 | 4.2 | 134.64 | 134.64 | 47.7 | -98.3 | 115.9 | 107.4 | 8.57 | 13.528 | |
| 1,900.0 | 1,887.5 | 1,896.9 | 1,889.5 | 5.2 | 4.5 | 132.63 | 132.63 | 51.6 | -113.5 | 125.0 | 115.8 | 9.24 | 13.532 | |
| 2,000.0 | 1,986.2 | 1,996.4 | 1,987.7 | 5.6 | 4.9 | 130.89 | 130.89 | 55.5 | -128.7 | 134.3 | 124.4 | 9.92 | 13.534 | |
| 2,100.0 | 2,084.9 | 2,095.9 | 2,086.0 | 5.9 | 5.2 | 129.38 | 129.38 | 59.3 | -143.9 | 143.6 | 133.0 | 10.61 | 13.534 | |
| 2,200.0 | 2,183.7 | 2,195.4 | 2,184.2 | 6.3 | 5.6 | 128.05 | 128.05 | 63.2 | -159.1 | 153.1 | 141.8 | 11.31 | 13.534 | |
| 2,300.0 | 2,282.4 | 2,294.9 | 2,282.5 | 6.7 | 5.9 | 126.88 | 126.88 | 67.1 | -174.2 | 162.6 | 150.6 | 12.01 | 13.534 | |
| 2,400.0 | 2,381.2 | 2,394.4 | 2,380.7 | 7.1 | 6.3 | 125.84 | 125.84 | 70.9 | -189.4 | 172.2 | 159.4 | 12.72 | 13.534 | |
| 2,500.0 | 2,479.9 | 2,493.8 | 2,479.0 | 7.4 | 6.6 | 124.91 | 124.91 | 74.8 | -204.6 | 181.8 | 168.4 | 13.43 | 13.534 | |
| 2,600.0 | 2,578.7 | 2,593.3 | 2,577.2 | 7.8 | 7.0 | 124.07 | 124.07 | 78.7 | -219.8 | 191.4 | 177.3 | 14.15 | 13.534 | |
| 2,700.0 | 2,677.4 | 2,692.8 | 2,675.5 | 8.2 | 7.3 | 123.31 | 123.31 | 82.5 | -235.0 | 201.1 | 186.3 | 14.86 | 13.535 | |
| 2,800.0 | 2,776.1 | 2,792.3 | 2,773.7 | 8.6 | 7.7 | 122.63 | 122.63 | 86.4 | -250.1 | 210.9 | 195.3 | 15.58 | 13.536 | |
| 2,900.0 | 2,874.9 | 2,891.8 | 2,872.0 | 8.9 | 8.0 | 122.00 | 122.00 | 90.3 | -265.3 | 220.6 | 204.3 | 16.30 | 13.537 | |
| 3,000.0 | 2,973.6 | 2,991.3 | 2,970.2 | 9.3 | 8.4 | 121.43 | 121.43 | 94.1 | -280.5 | 230.4 | 213.4 | 17.02 | 13.538 | |
| 3,100.0 | 3,072.4 | 3,090.8 | 3,068.5 | 9.7 | 8.8 | 120.90 | 120.90 | 98.0 | -295.7 | 240.2 | 222.5 | 17.74 | 13.539 | |
| 3,200.0 | 3,171.1 | 3,190.3 | 3,166.8 | 10.1 | 9.1 | 120.41 | 120.41 | 101.9 | -310.9 | 250.0 | 231.6 | 18.47 | 13.541 | |
| 3,300.0 | 3,269.9 | 3,289.8 | 3,265.0 | 10.4 | 9.5 | 119.96 | 119.96 | 105.7 | -326.1 | 259.9 | 240.7 | 19.19 | 13.542 | |
| 3,400.0 | 3,368.6 | 3,389.3 | 3,363.3 | 10.8 | 9.9 | 119.55 | 119.55 | 109.6 | -341.2 | 269.7 | 249.8 | 19.92 | 13.544 | |
| 3,500.0 | 3,467.3 | 3,488.8 | 3,461.5 | 11.2 | 10.2 | 119.16 | 119.16 | 113.5 | -356.4 | 279.6 | 259.0 | 20.64 | 13.546 | |
| 3,600.0 | 3,566.1 | 3,588.3 | 3,559.8 | 11.6 | 10.6 | 118.80 | 118.80 | 117.3 | -371.6 | 289.5 | 268.1 | 21.37 | 13.548 | |
| 3,700.0 | 3,664.8 | 3,687.8 | 3,658.0 | 12.0 | 10.9 | 118.46 | 118.46 | 121.2 | -386.8 | 299.4 | 277.3 | 22.09 | 13.550 | |
| 3,800.0 | 3,763.6 | 3,787.3 | 3,756.3 | 12.3 | 11.3 | 118.15 | 118.15 | 125.1 | -402.0 | 309.3 | 286.4 | 22.82 | 13.551 | |
| 3,900.0 | 3,862.3 | 3,886.8 | 3,854.5 | 12.7 | 11.7 | 117.85 | 117.85 | 128.9 | -417.2 | 319.2 | 295.6 | 23.55 | 13.553 | |
| 4,000.0 | 3,961.0 | 3,986.3 | 3,952.8 | 13.1 | 12.0 | 117.57 | 117.57 | 132.8 | -432.3 | 329.1 | 304.8 | 24.28 | 13.555 | |
| 4,100.0 | 4,059.8 | 4,085.8 | 4,051.0 | 13.5 | 12.4 | 117.31 | 117.31 | 136.7 | -447.5 | 339.0 | 314.0 | 25.01 | 13.557 | |
| 4,200.0 | 4,158.5 | 4,185.3 | 4,149.3 | 13.9 | 12.8 | 117.07 | 117.07 | 140.5 | -462.7 | 348.9 | 323.2 | 25.74 | 13.559 | |
| 4,300.0 | 4,257.3 | 4,284.8 | 4,247.5 | 14.2 | 13.2 | 116.83 | 116.83 | 144.4 | -477.9 | 358.9 | 332.4 | 26.46 | 13.561 | |
| 4,400.0 | 4,356.0 | 4,384.3 | 4,345.8 | 14.6 | 13.5 | 116.61 | 116.61 | 148.3 | -493.1 | 368.8 | 341.6 | 27.19 | 13.563 | |
| 4,500.0 | 4,454.8 | 4,483.7 | 4,444.1 | 15.0 | 13.9 | 116.40 | 116.40 | 152.1 | -508.2 | 378.8 | 350.8 | 27.92 | 13.565 | |
| 4,600.0 | 4,553.5 | 4,583.2 | 4,542.3 | 15.4 | 14.3 | 116.21 | 116.21 | 156.0 | -523.4 | 388.7 | 360.1 | 28.65 | 13.566 | |
| 4,700.0 | 4,652.2 | 4,682.7 | 4,640.6 | 15.8 | 14.6 | 116.02 | 116.02 | 159.9 | -538.6 | 398.7 | 369.3 | 29.38 | 13.568 | |
| 4,800.0 | 4,751.0 | 4,782.2 | 4,738.8 | 16.1 | 15.0 | 115.84 | 115.84 | 163.7 | -553.8 | 408.6 | 378.5 | 30.11 | 13.570 | |
| 4,900.0 | 4,849.7 | 4,881.7 | 4,837.1 | 16.5 | 15.4 | 115.67 | 115.67 | 167.6 | -569.0 | 418.6 | 387.8 | 30.84 | 13.572 | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---------------------------|---------------------------|---------------------------|---------------------------|-------------------|----------------|-----------------------------|---|---------------|----------------------------|-----------------------------|-------------------------------|----------------------|--------------------|--------|
| Survey Program: 0-MWD | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | Highside Toolface (°) | Distance | | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | | | | | | |
| 5,000.0 | 4,948.5 | 4,981.2 | 4,935.3 | 16.9 | 15.7 | 115.50 | 171.5 | -584.2 | 428.6 | 397.0 | 31.57 | 13.573 | | |
| 5,100.0 | 5,047.2 | 5,080.7 | 5,033.6 | 17.3 | 16.1 | 115.35 | 175.3 | -599.3 | 438.5 | 406.2 | 32.30 | 13.575 | | |
| 5,200.0 | 5,146.0 | 5,180.2 | 5,131.8 | 17.7 | 16.5 | 115.20 | 179.2 | -614.5 | 448.5 | 415.5 | 33.04 | 13.576 | | |
| 5,300.0 | 5,244.7 | 5,279.7 | 5,230.1 | 18.0 | 16.9 | 115.06 | 183.1 | -629.7 | 458.5 | 424.7 | 33.77 | 13.578 | | |
| 5,400.0 | 5,343.4 | 5,379.2 | 5,328.3 | 18.4 | 17.2 | 114.92 | 186.9 | -644.9 | 468.5 | 434.0 | 34.50 | 13.580 | | |
| 5,500.0 | 5,442.4 | 5,478.7 | 5,426.6 | 18.7 | 17.6 | 114.78 | 190.8 | -660.1 | 477.8 | 442.6 | 35.19 | 13.577 | | |
| 5,600.0 | 5,541.8 | 5,581.2 | 5,528.0 | 18.9 | 17.9 | 114.36 | 194.5 | -674.6 | 485.4 | 449.6 | 35.77 | 13.570 | | |
| 5,700.0 | 5,641.6 | 5,684.9 | 5,631.1 | 19.1 | 18.2 | 113.93 | 197.4 | -685.9 | 490.9 | 454.7 | 36.23 | 13.549 | | |
| 5,800.0 | 5,741.5 | 5,789.0 | 5,734.8 | 19.3 | 18.4 | 113.52 | 199.3 | -693.5 | 494.2 | 457.6 | 36.61 | 13.499 | | |
| 5,900.0 | 5,841.5 | 5,893.2 | 5,838.9 | 19.4 | 18.6 | 0.29 | 200.3 | -697.5 | 495.4 | 466.7 | 28.67 | 17.276 | | |
| 6,000.0 | 5,941.5 | 5,995.8 | 5,941.5 | 19.5 | 18.7 | 0.21 | 200.5 | -698.1 | 495.5 | 466.5 | 29.02 | 17.077 | | |
| 6,100.0 | 6,041.5 | 6,095.8 | 6,041.5 | 19.7 | 18.8 | 0.21 | 200.5 | -698.1 | 495.5 | 466.1 | 29.37 | 16.869 | | |
| 6,200.0 | 6,141.5 | 6,195.8 | 6,141.5 | 19.8 | 19.0 | 0.21 | 200.5 | -698.1 | 495.5 | 465.8 | 29.73 | 16.665 | | |
| 6,234.0 | 6,175.4 | 6,229.7 | 6,175.4 | 19.8 | 19.0 | -90.03 | 200.5 | -698.1 | 495.5 | 457.6 | 37.88 | 13.081 | | |
| 6,300.0 | 6,241.3 | 6,295.6 | 6,241.4 | 19.9 | 19.1 | -90.52 | 200.5 | -698.1 | 495.5 | 457.5 | 38.05 | 13.023 | | |
| 6,400.0 | 6,339.6 | 6,396.4 | 6,341.7 | 19.9 | 19.2 | -91.66 | 200.5 | -690.0 | 495.7 | 457.6 | 38.10 | 13.011 | | |
| 6,500.0 | 6,434.8 | 6,498.5 | 6,441.4 | 19.7 | 19.2 | -92.78 | 200.4 | -668.4 | 496.1 | 458.2 | 37.94 | 13.074 | | |
| 6,600.0 | 6,525.1 | 6,602.0 | 6,538.7 | 19.6 | 19.0 | -93.86 | 200.3 | -633.2 | 496.6 | 459.0 | 37.64 | 13.196 | | |
| 6,700.0 | 6,609.1 | 6,706.8 | 6,631.4 | 19.4 | 18.9 | -94.88 | 200.2 | -584.4 | 497.3 | 460.1 | 37.26 | 13.346 | | |
| 6,800.0 | 6,685.3 | 6,813.0 | 6,717.6 | 19.2 | 18.7 | -95.81 | 200.0 | -522.6 | 498.1 | 461.1 | 36.96 | 13.476 | | |
| 6,900.0 | 6,752.4 | 6,920.3 | 6,795.2 | 19.2 | 18.6 | -96.64 | 199.8 | -448.5 | 498.9 | 462.0 | 36.90 | 13.520 | | |
| 7,000.0 | 6,809.3 | 7,028.8 | 6,862.3 | 19.3 | 18.8 | -97.35 | 199.5 | -363.4 | 499.6 | 462.4 | 37.26 | 13.408 | | |
| 7,100.0 | 6,855.0 | 7,138.2 | 6,917.1 | 19.6 | 19.3 | -97.93 | 199.2 | -268.8 | 500.3 | 462.1 | 38.22 | 13.090 | | |
| 7,200.0 | 6,888.7 | 7,248.4 | 6,958.0 | 20.3 | 20.1 | -98.36 | 198.9 | -166.7 | 500.8 | 461.0 | 39.87 | 12.561 | | |
| 7,300.0 | 6,909.8 | 7,359.1 | 6,984.0 | 21.4 | 21.4 | -98.63 | 198.6 | -59.1 | 501.2 | 458.9 | 42.23 | 11.868 | | |
| 7,400.0 | 6,918.0 | 7,463.5 | 6,996.2 | 22.7 | 22.9 | -98.99 | 198.3 | 44.5 | 501.7 | 456.6 | 45.07 | 11.133 | | |
| 7,500.0 | 6,916.9 | 7,569.9 | 7,003.7 | 24.3 | 24.6 | -99.93 | 198.0 | 150.6 | 503.0 | 454.7 | 48.33 | 10.408 | | |
| 7,600.0 | 6,915.5 | 7,672.9 | 7,003.4 | 26.2 | 26.5 | -100.06 | 197.7 | 253.6 | 503.2 | 451.2 | 51.98 | 9.681 | | |
| 7,700.0 | 6,914.1 | 7,772.9 | 7,002.4 | 28.1 | 28.5 | -100.11 | 197.4 | 353.6 | 503.3 | 447.4 | 55.91 | 9.002 | | |
| 7,800.0 | 6,912.6 | 7,872.9 | 7,001.4 | 30.3 | 30.6 | -100.16 | 197.1 | 453.6 | 503.4 | 443.3 | 60.09 | 8.377 | | |
| 7,900.0 | 6,911.2 | 7,972.9 | 7,000.4 | 32.5 | 32.9 | -100.21 | 196.8 | 553.6 | 503.5 | 439.0 | 64.47 | 7.809 | | |
| 8,000.0 | 6,909.8 | 8,072.9 | 6,999.4 | 34.8 | 35.2 | -100.26 | 196.5 | 653.6 | 503.5 | 434.5 | 69.02 | 7.296 | | |
| 8,100.0 | 6,908.3 | 8,172.9 | 6,998.4 | 37.2 | 37.6 | -100.31 | 196.2 | 753.6 | 503.6 | 429.9 | 73.69 | 6.834 | | |
| 8,200.0 | 6,906.9 | 8,272.9 | 6,997.4 | 39.6 | 40.0 | -100.35 | 195.9 | 853.6 | 503.7 | 425.2 | 78.48 | 6.418 | | |
| 8,300.0 | 6,905.5 | 8,372.9 | 6,996.4 | 42.1 | 42.5 | -100.40 | 195.6 | 953.6 | 503.8 | 420.4 | 83.35 | 6.044 | | |
| 8,400.0 | 6,904.0 | 8,472.9 | 6,995.4 | 44.6 | 45.0 | -100.45 | 195.3 | 1,053.6 | 503.8 | 415.5 | 88.30 | 5.706 | | |
| 8,500.0 | 6,902.6 | 8,572.9 | 6,994.4 | 47.2 | 47.6 | -100.50 | 195.0 | 1,153.5 | 503.9 | 410.6 | 93.32 | 5.400 | | |
| 8,600.0 | 6,901.2 | 8,672.9 | 6,993.4 | 49.8 | 50.1 | -100.55 | 194.7 | 1,253.5 | 504.0 | 405.6 | 98.38 | 5.123 | | |
| 8,700.0 | 6,899.7 | 8,772.9 | 6,992.4 | 52.4 | 52.7 | -100.60 | 194.4 | 1,353.5 | 504.1 | 400.6 | 103.49 | 4.871 | | |
| 8,800.0 | 6,898.3 | 8,872.9 | 6,991.4 | 55.0 | 55.4 | -100.65 | 194.1 | 1,453.5 | 504.2 | 395.5 | 108.64 | 4.641 | | |
| 8,900.0 | 6,896.9 | 8,972.9 | 6,990.5 | 57.7 | 58.0 | -100.69 | 193.9 | 1,553.5 | 504.2 | 390.4 | 113.81 | 4.430 | | |
| 9,000.0 | 6,895.4 | 9,072.9 | 6,989.5 | 60.3 | 60.7 | -100.74 | 193.6 | 1,653.5 | 504.3 | 385.3 | 119.02 | 4.237 | | |
| 9,100.0 | 6,894.0 | 9,172.9 | 6,988.5 | 63.0 | 63.3 | -100.79 | 193.3 | 1,753.5 | 504.4 | 380.2 | 124.25 | 4.060 | | |
| 9,200.0 | 6,892.6 | 9,272.9 | 6,987.5 | 65.7 | 66.0 | -100.84 | 193.0 | 1,853.5 | 504.5 | 375.0 | 129.51 | 3.895 | | |
| 9,300.0 | 6,891.2 | 9,372.9 | 6,986.5 | 68.4 | 68.7 | -100.89 | 192.7 | 1,953.5 | 504.6 | 369.8 | 134.78 | 3.744 | | |
| 9,400.0 | 6,889.7 | 9,472.9 | 6,985.5 | 71.1 | 71.4 | -100.94 | 192.4 | 2,053.5 | 504.7 | 364.6 | 140.06 | 3.603 | | |
| 9,500.0 | 6,888.3 | 9,572.9 | 6,984.5 | 73.8 | 74.1 | -100.99 | 192.1 | 2,153.5 | 504.7 | 359.4 | 145.36 | 3.472 | | |
| 9,600.0 | 6,886.9 | 9,672.9 | 6,983.5 | 76.5 | 76.8 | -101.03 | 191.8 | 2,253.5 | 504.8 | 354.1 | 150.68 | 3.350 | | |
| 9,700.0 | 6,885.4 | 9,772.9 | 6,982.5 | 79.2 | 79.5 | -101.08 | 191.5 | 2,353.5 | 504.9 | 348.9 | 156.00 | 3.236 | | |
| 9,800.0 | 6,884.0 | 9,872.9 | 6,981.5 | 81.9 | 82.3 | -101.13 | 191.2 | 2,453.5 | 505.0 | 343.6 | 161.34 | 3.130 | | |
| 9,900.0 | 6,882.6 | 9,972.9 | 6,980.5 | 84.7 | 85.0 | -101.18 | 190.9 | 2,553.5 | 505.1 | 338.4 | 166.68 | 3.030 | | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Alles 22S-HZ Pad Sec.22-T5N-R65W - Alles 22S-432 - Wellbore #1 - Plan #1 (5-16-13) | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Survey Program: 0-MWD | | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 10,000.0 | 6,881.1 | 10,072.9 | 6,979.5 | 87.4 | 87.7 | -101.23 | 190.6 | 2,653.5 | 505.1 | 333.1 | 172.03 | 2.936 | | |
| 10,100.0 | 6,879.7 | 10,172.9 | 6,978.5 | 90.2 | 90.5 | -101.28 | 190.3 | 2,753.4 | 505.2 | 327.8 | 177.39 | 2.848 | | |
| 10,200.0 | 6,878.3 | 10,272.9 | 6,977.5 | 92.9 | 93.2 | -101.33 | 190.0 | 2,853.4 | 505.3 | 322.6 | 182.75 | 2.765 | | |
| 10,300.0 | 6,876.8 | 10,372.9 | 6,976.5 | 95.7 | 96.0 | -101.37 | 189.7 | 2,953.4 | 505.4 | 317.3 | 188.12 | 2.687 | | |
| 10,400.0 | 6,875.4 | 10,472.9 | 6,975.5 | 98.4 | 98.7 | -101.42 | 189.4 | 3,053.4 | 505.5 | 312.0 | 193.49 | 2.612 | | |
| 10,500.0 | 6,874.0 | 10,572.9 | 6,974.5 | 101.2 | 101.5 | -101.47 | 189.1 | 3,153.4 | 505.6 | 306.7 | 198.87 | 2.542 | | |
| 10,600.0 | 6,872.6 | 10,672.9 | 6,973.5 | 103.9 | 104.2 | -101.52 | 188.8 | 3,253.4 | 505.7 | 301.4 | 204.25 | 2.476 | | |
| 10,700.0 | 6,871.1 | 10,772.9 | 6,972.5 | 106.7 | 107.0 | -101.57 | 188.5 | 3,353.4 | 505.7 | 296.1 | 209.63 | 2.413 | | |
| 10,800.0 | 6,869.7 | 10,872.9 | 6,971.5 | 109.4 | 109.8 | -101.62 | 188.2 | 3,453.4 | 505.8 | 290.8 | 215.02 | 2.353 | | |
| 10,900.0 | 6,868.3 | 10,972.9 | 6,970.5 | 112.2 | 112.5 | -101.66 | 188.0 | 3,553.4 | 505.9 | 285.5 | 220.41 | 2.295 | | |
| 11,000.0 | 6,866.8 | 11,072.9 | 6,969.5 | 115.0 | 115.3 | -101.71 | 187.7 | 3,653.4 | 506.0 | 280.2 | 225.80 | 2.241 | | |
| 11,100.0 | 6,865.4 | 11,172.9 | 6,968.6 | 117.8 | 118.1 | -101.76 | 187.4 | 3,753.4 | 506.1 | 274.9 | 231.19 | 2.189 | | |
| 11,200.0 | 6,864.0 | 11,272.9 | 6,967.6 | 120.5 | 120.8 | -101.81 | 187.1 | 3,853.4 | 506.2 | 269.6 | 236.58 | 2.140 | | |
| 11,300.0 | 6,862.5 | 11,372.9 | 6,966.6 | 123.3 | 123.6 | -101.86 | 186.8 | 3,953.4 | 506.3 | 264.3 | 241.98 | 2.092 | | |
| 11,400.0 | 6,861.1 | 11,472.9 | 6,965.6 | 126.1 | 126.4 | -101.91 | 186.5 | 4,053.4 | 506.4 | 259.0 | 247.38 | 2.047 | | |
| 11,500.0 | 6,859.7 | 11,572.9 | 6,964.6 | 128.9 | 129.2 | -101.95 | 186.2 | 4,153.4 | 506.5 | 253.7 | 252.77 | 2.004 | | |
| 11,600.0 | 6,858.2 | 11,672.8 | 6,963.6 | 131.6 | 131.9 | -102.00 | 185.9 | 4,253.3 | 506.5 | 248.4 | 258.17 | 1.962 | | |
| 11,700.0 | 6,856.8 | 11,772.8 | 6,962.6 | 134.4 | 134.7 | -102.05 | 185.6 | 4,353.3 | 506.6 | 243.1 | 263.57 | 1.922 | | |
| 11,800.0 | 6,855.4 | 11,872.8 | 6,961.6 | 137.2 | 137.5 | -102.10 | 185.3 | 4,453.3 | 506.7 | 237.8 | 268.97 | 1.884 | | |
| 11,900.0 | 6,853.9 | 11,972.8 | 6,960.6 | 140.0 | 140.3 | -102.15 | 185.0 | 4,553.3 | 506.8 | 232.4 | 274.37 | 1.847 | | |
| 12,000.0 | 6,852.5 | 12,072.8 | 6,959.6 | 142.8 | 143.1 | -102.20 | 184.7 | 4,653.3 | 506.9 | 227.1 | 279.77 | 1.812 | | |
| 12,100.0 | 6,851.1 | 12,172.8 | 6,958.6 | 145.5 | 145.8 | -102.24 | 184.4 | 4,753.3 | 507.0 | 221.8 | 285.17 | 1.778 | | |
| 12,200.0 | 6,849.7 | 12,272.8 | 6,957.6 | 148.3 | 148.6 | -102.29 | 184.1 | 4,853.3 | 507.1 | 216.5 | 290.57 | 1.745 | | |
| 12,300.0 | 6,848.2 | 12,372.8 | 6,956.6 | 151.1 | 151.4 | -102.34 | 183.8 | 4,953.3 | 507.2 | 211.2 | 295.97 | 1.714 | | |
| 12,400.0 | 6,846.8 | 12,472.8 | 6,955.6 | 153.9 | 154.2 | -102.39 | 183.5 | 5,053.3 | 507.3 | 205.9 | 301.36 | 1.683 | | |
| 12,500.0 | 6,845.4 | 12,572.8 | 6,954.6 | 156.7 | 157.0 | -102.44 | 183.2 | 5,153.3 | 507.4 | 200.6 | 306.76 | 1.654 | | |
| 12,600.0 | 6,843.9 | 12,672.8 | 6,953.6 | 159.5 | 159.8 | -102.48 | 182.9 | 5,253.3 | 507.5 | 195.3 | 312.16 | 1.626 | | |
| 12,629.3 | 6,843.5 | 12,702.1 | 6,953.3 | 160.3 | 160.6 | -102.50 | 182.9 | 5,282.5 | 507.5 | 193.7 | 313.74 | 1.618 | | |
| 12,664.9 | 6,843.0 | 12,735.0 | 6,953.0 | 161.3 | 161.5 | -102.51 | 182.8 | 5,315.5 | 507.5 | 191.9 | 315.59 | 1.608 SF | | |

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|------------------------------|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 7300-UNKNOWN | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | | | | | | | | | | | | | |
| Offset | | | | | | | | | | | | | | |
| Semi Major Axis | | | | | | | | | | | | | | |
| Distance | | | | | | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 0.0 | 0.0 | 1.0 | 1.0 | 0.0 | 0.0 | -77.10 | 25.5 | -111.4 | 114.3 | 114.3 | 0.02 | 5,659.489 | | |
| 100.0 | 100.0 | 101.0 | 101.0 | 0.1 | 2.0 | -77.10 | 25.5 | -111.4 | 114.3 | 112.2 | 2.13 | 53.607 | | |
| 200.0 | 200.0 | 201.0 | 201.0 | 0.3 | 4.0 | -77.10 | 25.5 | -111.4 | 114.3 | 110.0 | 4.36 | 26.237 | | |
| 274.2 | 274.2 | 275.2 | 275.2 | 0.5 | 5.5 | -77.10 | 25.5 | -111.4 | 114.3 | 108.3 | 6.01 | 19.029 | | |
| 300.0 | 300.0 | 301.0 | 301.0 | 0.6 | 6.0 | -77.10 | 25.5 | -111.4 | 114.3 | 107.7 | 6.58 | 17.369 | | |
| 378.9 | 378.9 | 379.9 | 379.9 | 0.7 | 7.6 | -77.10 | 25.5 | -111.4 | 114.3 | 106.0 | 8.34 | 13.713 | | |
| 400.0 | 400.0 | 401.0 | 401.0 | 0.8 | 8.0 | -77.10 | 25.5 | -111.4 | 114.3 | 105.5 | 8.81 | 12.981 | | |
| 478.9 | 478.9 | 479.9 | 479.9 | 1.0 | 9.6 | -77.10 | 25.5 | -111.4 | 114.3 | 103.8 | 10.56 | 10.824 | | |
| 500.0 | 500.0 | 501.0 | 501.0 | 1.0 | 10.0 | -77.10 | 25.5 | -111.4 | 114.3 | 103.3 | 11.03 | 10.363 | | |
| 574.0 | 574.0 | 575.0 | 575.0 | 1.2 | 11.5 | -77.10 | 25.5 | -111.4 | 114.3 | 101.6 | 12.68 | 9.017 | | |
| 600.0 | 600.0 | 601.0 | 601.0 | 1.2 | 12.0 | -77.10 | 25.5 | -111.4 | 114.3 | 101.1 | 13.26 | 8.624 | | |
| 700.0 | 700.0 | 701.0 | 701.0 | 1.4 | 14.0 | 36.29 | 25.5 | -111.4 | 112.9 | 97.5 | 15.46 | 7.305 | | |
| 800.0 | 799.8 | 800.8 | 800.8 | 1.6 | 16.0 | 37.97 | 25.5 | -111.4 | 108.7 | 91.1 | 17.63 | 6.167 | | |
| 900.0 | 899.5 | 900.5 | 900.5 | 1.9 | 18.0 | 41.07 | 25.5 | -111.4 | 102.0 | 82.2 | 19.80 | 5.151 | | |
| 1,000.0 | 998.7 | 999.7 | 999.7 | 2.1 | 20.0 | 46.11 | 25.5 | -111.4 | 93.1 | 71.1 | 21.98 | 4.237 | | |
| 1,100.0 | 1,097.5 | 1,098.5 | 1,098.5 | 2.4 | 22.0 | 53.75 | 25.5 | -111.4 | 83.2 | 59.0 | 24.23 | 3.433 | | |
| 1,200.0 | 1,196.3 | 1,197.3 | 1,197.3 | 2.7 | 23.9 | 63.45 | 25.5 | -111.4 | 74.9 | 48.3 | 26.57 | 2.818 | | |
| 1,300.0 | 1,295.0 | 1,296.0 | 1,296.0 | 3.1 | 25.9 | 75.11 | 25.5 | -111.4 | 69.2 | 40.2 | 28.94 | 2.390 | | |
| 1,400.0 | 1,393.8 | 1,394.8 | 1,394.8 | 3.4 | 27.9 | 88.16 | 25.5 | -111.4 | 66.8 | 35.5 | 31.30 | 2.135 | | |
| 1,413.8 | 1,407.3 | 1,408.3 | 1,408.3 | 3.4 | 28.2 | 90.00 | 25.5 | -111.4 | 66.8 | 35.2 | 31.62 | 2.113 CC | | |
| 1,500.0 | 1,492.5 | 1,493.5 | 1,493.5 | 3.8 | 29.9 | 101.40 | 25.5 | -111.4 | 68.2 | 34.6 | 33.58 | 2.030 ES, SF | | |
| 1,600.0 | 1,591.2 | 1,592.2 | 1,592.2 | 4.1 | 31.8 | 113.52 | 25.5 | -111.4 | 73.0 | 37.2 | 35.78 | 2.040 | | |
| 1,700.0 | 1,690.0 | 1,691.0 | 1,691.0 | 4.5 | 33.8 | 123.78 | 25.5 | -111.4 | 80.7 | 42.8 | 37.91 | 2.128 | | |
| 1,800.0 | 1,788.7 | 1,789.7 | 1,789.7 | 4.8 | 35.8 | 132.07 | 25.5 | -111.4 | 90.5 | 50.5 | 40.01 | 2.262 | | |
| 1,900.0 | 1,887.5 | 1,888.5 | 1,888.5 | 5.2 | 37.8 | 138.65 | 25.5 | -111.4 | 101.8 | 59.7 | 42.12 | 2.418 | | |
| 2,000.0 | 1,986.2 | 1,987.2 | 1,987.2 | 5.6 | 39.7 | 143.88 | 25.5 | -111.4 | 114.2 | 70.0 | 44.23 | 2.583 | | |
| 2,100.0 | 2,084.9 | 2,085.9 | 2,085.9 | 5.9 | 41.7 | 148.06 | 25.5 | -111.4 | 127.4 | 81.1 | 46.35 | 2.749 | | |
| 2,200.0 | 2,183.7 | 2,184.7 | 2,184.7 | 6.3 | 43.7 | 151.45 | 25.5 | -111.4 | 141.1 | 92.6 | 48.48 | 2.911 | | |
| 2,300.0 | 2,282.4 | 2,283.4 | 2,283.4 | 6.7 | 45.7 | 154.23 | 25.5 | -111.4 | 155.2 | 104.6 | 50.63 | 3.066 | | |
| 2,400.0 | 2,381.2 | 2,382.2 | 2,382.2 | 7.1 | 47.6 | 156.55 | 25.5 | -111.4 | 169.6 | 116.9 | 52.78 | 3.214 | | |
| 2,500.0 | 2,479.9 | 2,480.9 | 2,480.9 | 7.4 | 49.6 | 158.50 | 25.5 | -111.4 | 184.3 | 129.3 | 54.94 | 3.354 | | |
| 2,600.0 | 2,578.7 | 2,579.7 | 2,579.7 | 7.8 | 51.6 | 160.17 | 25.5 | -111.4 | 199.1 | 142.0 | 57.11 | 3.486 | | |
| 2,700.0 | 2,677.4 | 2,678.4 | 2,678.4 | 8.2 | 53.6 | 161.60 | 25.5 | -111.4 | 214.0 | 154.8 | 59.28 | 3.611 | | |
| 2,800.0 | 2,776.1 | 2,777.1 | 2,777.1 | 8.6 | 55.5 | 162.85 | 25.5 | -111.4 | 229.1 | 167.7 | 61.45 | 3.728 | | |
| 2,900.0 | 2,874.9 | 2,875.9 | 2,875.9 | 8.9 | 57.5 | 163.94 | 25.5 | -111.4 | 244.3 | 180.7 | 63.63 | 3.839 | | |
| 3,000.0 | 2,973.6 | 2,974.6 | 2,974.6 | 9.3 | 59.5 | 164.90 | 25.5 | -111.4 | 259.5 | 193.7 | 65.81 | 3.944 | | |
| 3,100.0 | 3,072.4 | 3,073.4 | 3,073.4 | 9.7 | 61.5 | 165.76 | 25.5 | -111.4 | 274.8 | 206.8 | 67.99 | 4.042 | | |
| 3,200.0 | 3,171.1 | 3,172.1 | 3,172.1 | 10.1 | 63.4 | 166.53 | 25.5 | -111.4 | 290.2 | 220.0 | 70.18 | 4.135 | | |
| 3,300.0 | 3,269.9 | 3,270.9 | 3,270.9 | 10.4 | 65.4 | 167.22 | 25.5 | -111.4 | 305.6 | 233.2 | 72.37 | 4.223 | | |
| 3,400.0 | 3,368.6 | 3,369.6 | 3,369.6 | 10.8 | 67.4 | 167.84 | 25.5 | -111.4 | 321.1 | 246.5 | 74.55 | 4.306 | | |
| 3,500.0 | 3,467.3 | 3,468.3 | 3,468.3 | 11.2 | 69.4 | 168.41 | 25.5 | -111.4 | 336.5 | 259.8 | 76.74 | 4.385 | | |
| 3,600.0 | 3,566.1 | 3,567.1 | 3,567.1 | 11.6 | 71.3 | 168.93 | 25.5 | -111.4 | 352.0 | 273.1 | 78.93 | 4.460 | | |
| 3,700.0 | 3,664.8 | 3,665.8 | 3,665.8 | 12.0 | 73.3 | 169.40 | 25.5 | -111.4 | 367.6 | 286.5 | 81.12 | 4.531 | | |
| 3,800.0 | 3,763.6 | 3,764.6 | 3,764.6 | 12.3 | 75.3 | 169.83 | 25.5 | -111.4 | 383.1 | 299.8 | 83.32 | 4.599 | | |
| 3,900.0 | 3,862.3 | 3,863.3 | 3,863.3 | 12.7 | 77.3 | 170.24 | 25.5 | -111.4 | 398.7 | 313.2 | 85.51 | 4.663 | | |
| 4,000.0 | 3,961.0 | 3,962.0 | 3,962.0 | 13.1 | 79.2 | 170.61 | 25.5 | -111.4 | 414.3 | 326.6 | 87.70 | 4.724 | | |
| 4,100.0 | 4,059.8 | 4,060.8 | 4,060.8 | 13.5 | 81.2 | 170.95 | 25.5 | -111.4 | 429.9 | 340.0 | 89.90 | 4.782 | | |
| 4,200.0 | 4,158.5 | 4,159.5 | 4,159.5 | 13.9 | 83.2 | 171.27 | 25.5 | -111.4 | 445.5 | 353.5 | 92.09 | 4.838 | | |
| 4,300.0 | 4,257.3 | 4,258.3 | 4,258.3 | 14.2 | 85.2 | 171.57 | 25.5 | -111.4 | 461.2 | 366.9 | 94.29 | 4.891 | | |
| 4,400.0 | 4,356.0 | 4,357.0 | 4,357.0 | 14.6 | 87.1 | 171.85 | 25.5 | -111.4 | 476.8 | 380.4 | 96.48 | 4.942 | | |
| 4,500.0 | 4,454.8 | 4,455.8 | 4,455.8 | 15.0 | 89.1 | 172.11 | 25.5 | -111.4 | 492.5 | 393.8 | 98.68 | 4.991 | | |

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|------------------------------|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|--------|
| Survey Program: 7300-UNKNOWN | | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | | | | | | | | | | | | | |
| Offset | | | | | | | | | | | | | | |
| Semi Major Axis | | | | | | | | | | | | | | |
| Distance | | | | | | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning | |
| 4,600.0 | 4,553.5 | 4,554.5 | 4,554.5 | 15.4 | 91.1 | 172.35 | 25.5 | -111.4 | 508.2 | 407.3 | 100.87 | 5.038 | | |
| 4,700.0 | 4,652.2 | 4,653.2 | 4,653.2 | 15.8 | 93.1 | 172.58 | 25.5 | -111.4 | 523.8 | 420.8 | 103.07 | 5.082 | | |
| 4,800.0 | 4,751.0 | 4,752.0 | 4,752.0 | 16.1 | 95.0 | 172.80 | 25.5 | -111.4 | 539.5 | 434.3 | 105.27 | 5.125 | | |
| 4,900.0 | 4,849.7 | 4,850.7 | 4,850.7 | 16.5 | 97.0 | 173.00 | 25.5 | -111.4 | 555.2 | 447.8 | 107.46 | 5.167 | | |
| 5,000.0 | 4,948.5 | 4,949.5 | 4,949.5 | 16.9 | 99.0 | 173.20 | 25.5 | -111.4 | 570.9 | 461.3 | 109.66 | 5.206 | | |
| 5,100.0 | 5,047.2 | 5,048.2 | 5,048.2 | 17.3 | 101.0 | 173.38 | 25.5 | -111.4 | 586.6 | 474.8 | 111.86 | 5.244 | | |
| 5,200.0 | 5,146.0 | 5,147.0 | 5,147.0 | 17.7 | 102.9 | 173.55 | 25.5 | -111.4 | 602.3 | 488.3 | 114.05 | 5.281 | | |
| 5,300.0 | 5,244.7 | 5,245.7 | 5,245.7 | 18.0 | 104.9 | 173.72 | 25.5 | -111.4 | 618.0 | 501.8 | 116.25 | 5.316 | | |
| 5,400.0 | 5,343.4 | 5,344.4 | 5,344.4 | 18.4 | 106.9 | 173.87 | 25.5 | -111.4 | 633.8 | 515.3 | 118.45 | 5.350 | | |
| 5,500.0 | 5,442.4 | 5,443.4 | 5,443.4 | 18.7 | 108.9 | 174.04 | 25.5 | -111.4 | 647.9 | 526.8 | 121.14 | 5.348 | | |
| 5,600.0 | 5,541.8 | 5,542.8 | 5,542.8 | 18.9 | 110.9 | 174.16 | 25.5 | -111.4 | 658.6 | 534.9 | 123.70 | 5.324 | | |
| 5,700.0 | 5,641.6 | 5,642.6 | 5,642.6 | 19.1 | 112.9 | 174.23 | 25.5 | -111.4 | 665.8 | 539.7 | 126.13 | 5.279 | | |
| 5,800.0 | 5,741.5 | 5,742.5 | 5,742.5 | 19.3 | 114.8 | 174.27 | 25.5 | -111.4 | 669.6 | 541.2 | 128.41 | 5.214 | | |
| 5,900.0 | 5,841.5 | 5,842.5 | 5,842.5 | 19.4 | 116.8 | 61.43 | 25.5 | -111.4 | 670.2 | 533.9 | 136.23 | 4.919 | | |
| 6,000.0 | 5,941.5 | 5,942.5 | 5,942.5 | 19.5 | 118.8 | 61.43 | 25.5 | -111.4 | 670.2 | 531.8 | 138.37 | 4.844 | | |
| 6,100.0 | 6,041.5 | 6,042.5 | 6,042.5 | 19.7 | 120.8 | 61.43 | 25.5 | -111.4 | 670.2 | 529.7 | 140.50 | 4.770 | | |
| 6,200.0 | 6,141.5 | 6,142.5 | 6,142.5 | 19.8 | 122.8 | 61.43 | 25.5 | -111.4 | 670.2 | 527.5 | 142.63 | 4.699 | | |
| 6,300.0 | 6,241.3 | 6,242.3 | 6,242.3 | 19.9 | 124.8 | -29.11 | 25.5 | -111.4 | 665.8 | 527.4 | 138.45 | 4.809 | | |
| 6,400.0 | 6,339.6 | 6,340.6 | 6,340.6 | 19.9 | 126.8 | -30.46 | 25.5 | -111.4 | 650.2 | 512.2 | 138.02 | 4.711 | | |
| 6,500.0 | 6,434.8 | 6,435.8 | 6,435.8 | 19.7 | 128.7 | -32.97 | 25.5 | -111.4 | 623.9 | 487.7 | 136.18 | 4.581 | | |
| 6,600.0 | 6,525.1 | 6,526.1 | 6,526.1 | 19.6 | 130.5 | -36.87 | 25.5 | -111.4 | 587.7 | 453.9 | 133.81 | 4.392 | | |
| 6,700.0 | 6,609.1 | 6,610.1 | 6,610.1 | 19.4 | 132.2 | -42.53 | 25.5 | -111.4 | 543.3 | 410.8 | 132.44 | 4.102 | | |
| 6,800.0 | 6,685.3 | 6,686.3 | 6,686.3 | 19.2 | 133.7 | -50.26 | 25.5 | -111.4 | 492.7 | 358.6 | 134.13 | 3.674 | | |
| 6,900.0 | 6,752.4 | 6,753.4 | 6,753.4 | 19.2 | 135.1 | -60.04 | 25.5 | -111.4 | 439.4 | 299.4 | 139.96 | 3.139 | | |
| 7,000.0 | 6,809.3 | 6,810.3 | 6,810.3 | 19.3 | 136.2 | -70.94 | 25.5 | -111.4 | 388.3 | 240.2 | 148.05 | 2.622 | | |
| 7,100.0 | 6,855.0 | 6,856.0 | 6,856.0 | 19.6 | 137.1 | -81.04 | 25.5 | -111.4 | 346.6 | 192.1 | 154.51 | 2.243 | | |
| 7,200.0 | 6,888.7 | 6,889.7 | 6,889.7 | 20.3 | 137.8 | -88.36 | 25.5 | -111.4 | 324.0 | 166.2 | 157.79 | 2.053 | | |
| 7,234.7 | 6,897.5 | 6,898.5 | 6,898.5 | 20.7 | 138.0 | -90.00 | 25.5 | -111.4 | 322.3 | 163.8 | 158.46 | 2.034 | | |
| 7,300.0 | 6,909.8 | 6,910.8 | 6,910.8 | 21.4 | 138.2 | -91.67 | 25.5 | -111.4 | 328.6 | 169.1 | 159.43 | 2.061 | | |
| 7,400.0 | 6,918.0 | 6,919.0 | 6,919.0 | 22.7 | 138.4 | -90.48 | 25.5 | -111.4 | 361.4 | 200.4 | 161.06 | 2.244 | | |
| 7,500.0 | 6,916.9 | 6,917.9 | 6,917.9 | 24.3 | 138.4 | -89.33 | 25.5 | -111.4 | 416.4 | 253.7 | 162.66 | 2.560 | | |
| 7,600.0 | 6,915.5 | 6,916.5 | 6,916.5 | 26.2 | 138.3 | -89.07 | 25.5 | -111.4 | 485.9 | 321.4 | 164.45 | 2.955 | | |
| 7,700.0 | 6,914.1 | 6,915.1 | 6,915.1 | 28.1 | 138.3 | -88.82 | 25.5 | -111.4 | 564.6 | 398.2 | 166.40 | 3.393 | | |
| 7,800.0 | 6,912.6 | 6,913.6 | 6,913.6 | 30.3 | 138.3 | -88.57 | 25.5 | -111.4 | 649.3 | 480.8 | 168.47 | 3.854 | | |
| 7,900.0 | 6,911.2 | 6,912.2 | 6,912.2 | 32.5 | 138.2 | -88.31 | 25.5 | -111.4 | 737.7 | 567.1 | 170.65 | 4.323 | | |
| 8,000.0 | 6,909.8 | 6,910.8 | 6,910.8 | 34.8 | 138.2 | -88.06 | 25.5 | -111.4 | 828.8 | 655.9 | 172.91 | 4.793 | | |
| 8,100.0 | 6,908.3 | 6,909.3 | 6,909.3 | 37.2 | 138.2 | -87.80 | 25.5 | -111.4 | 921.8 | 746.5 | 175.23 | 5.260 | | |

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|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design Lofland 22T & Alles 22S-HZ Existing Wells - Badley 23-31 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|---|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|---------------------------|---------------------|
| Survey Program: 7300-UNKNOWN | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 9,100.0 | 6,894.0 | 6,892.0 | 6,892.0 | 63.0 | 137.8 | -95.79 | -167.4 | 2,727.4 | 985.6 | 785.7 | 199.87 | 4.931 | |
| 9,200.0 | 6,892.6 | 6,890.6 | 6,890.6 | 65.7 | 137.8 | -95.20 | -167.4 | 2,727.4 | 886.7 | 684.0 | 202.70 | 4.374 | |
| 9,300.0 | 6,891.2 | 6,889.2 | 6,889.2 | 68.4 | 137.8 | -94.61 | -167.4 | 2,727.4 | 788.1 | 582.5 | 205.53 | 3.834 | |
| 9,400.0 | 6,889.7 | 6,887.7 | 6,887.7 | 71.1 | 137.8 | -94.02 | -167.4 | 2,727.4 | 689.8 | 481.5 | 208.34 | 3.311 | |
| 9,500.0 | 6,888.3 | 6,886.3 | 6,886.3 | 73.8 | 137.7 | -93.43 | -167.4 | 2,727.4 | 592.2 | 381.0 | 211.15 | 2.805 | |
| 9,600.0 | 6,886.9 | 6,884.9 | 6,884.9 | 76.5 | 137.7 | -92.83 | -167.4 | 2,727.4 | 495.5 | 281.5 | 213.94 | 2.316 | |
| 9,700.0 | 6,885.4 | 6,883.4 | 6,883.4 | 79.2 | 137.7 | -92.24 | -167.4 | 2,727.4 | 400.4 | 183.7 | 216.72 | 1.847 | |
| 9,800.0 | 6,884.0 | 6,882.0 | 6,882.0 | 81.9 | 137.6 | -91.64 | -167.4 | 2,727.4 | 308.4 | 88.9 | 219.49 | 1.405 | Level 3 |
| 9,900.0 | 6,882.6 | 6,880.6 | 6,880.6 | 84.7 | 137.6 | -91.05 | -167.4 | 2,727.4 | 223.4 | 1.2 | 222.24 | 1.005 | Level 2 |
| 10,000.0 | 6,881.1 | 6,879.1 | 6,879.1 | 87.4 | 137.6 | -90.45 | -167.4 | 2,727.4 | 157.3 | -67.7 | 224.97 | 0.699 | Level 1 |
| 10,076.0 | 6,880.0 | 6,878.0 | 6,878.0 | 89.5 | 137.6 | -90.00 | -167.4 | 2,727.4 | 137.7 | -89.4 | 227.04 | 0.606 | Level 1, CC, ES, SF |
| 10,100.0 | 6,879.7 | 6,877.7 | 6,877.7 | 90.2 | 137.6 | -89.86 | -167.4 | 2,727.4 | 139.7 | -87.9 | 227.69 | 0.614 | Level 1 |
| 10,200.0 | 6,878.3 | 6,876.3 | 6,876.3 | 92.9 | 137.5 | -89.26 | -167.4 | 2,727.4 | 185.3 | -45.1 | 230.39 | 0.804 | Level 1 |
| 10,300.0 | 6,876.8 | 6,874.8 | 6,874.8 | 95.7 | 137.5 | -88.67 | -167.4 | 2,727.4 | 262.9 | 29.8 | 233.06 | 1.128 | Level 2 |
| 10,400.0 | 6,875.4 | 6,873.4 | 6,873.4 | 98.4 | 137.5 | -88.07 | -167.4 | 2,727.4 | 352.0 | 116.3 | 235.71 | 1.493 | Level 3 |
| 10,500.0 | 6,874.0 | 6,872.0 | 6,872.0 | 101.2 | 137.4 | -87.48 | -167.4 | 2,727.4 | 445.7 | 207.4 | 238.34 | 1.870 | |
| 10,600.0 | 6,872.6 | 6,870.6 | 6,870.6 | 103.9 | 137.4 | -86.88 | -167.4 | 2,727.4 | 541.7 | 300.8 | 240.95 | 2.248 | |
| 10,700.0 | 6,871.1 | 6,869.1 | 6,869.1 | 106.7 | 137.4 | -86.29 | -167.4 | 2,727.4 | 638.9 | 395.4 | 243.53 | 2.624 | |
| 10,800.0 | 6,869.7 | 6,867.7 | 6,867.7 | 109.4 | 137.4 | -85.70 | -167.4 | 2,727.4 | 736.9 | 490.8 | 246.08 | 2.994 | |
| 10,900.0 | 6,868.3 | 6,866.3 | 6,866.3 | 112.2 | 137.3 | -85.10 | -167.4 | 2,727.4 | 835.3 | 586.7 | 248.61 | 3.360 | |
| 11,000.0 | 6,866.8 | 6,864.8 | 6,864.8 | 115.0 | 137.3 | -84.51 | -167.4 | 2,727.4 | 934.1 | 683.0 | 251.11 | 3.720 | |

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|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|------------------------------|---------------------|---------------------|---------------------|----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------|
| Survey Program: 7300-UNKNOWN | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Reference | | | | | | | | | | | | | |
| Offset | | | | | | | | | | | | | |
| Semi Major Axis | | | | | | | | | | | | | |
| Distance | | | | | | | | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 7,700.0 | 6,914.1 | 6,912.1 | 6,912.1 | 28.1 | 138.2 | -93.04 | -65.5 | 1,225.8 | 904.9 | 738.7 | 166.20 | 5.445 | |
| 7,800.0 | 6,912.6 | 6,910.6 | 6,910.6 | 30.3 | 138.2 | -92.70 | -65.5 | 1,225.8 | 808.8 | 640.5 | 168.33 | 4.805 | |
| 7,900.0 | 6,911.2 | 6,909.2 | 6,909.2 | 32.5 | 138.2 | -92.35 | -65.5 | 1,225.8 | 713.7 | 543.2 | 170.57 | 4.184 | |
| 8,000.0 | 6,909.8 | 6,907.8 | 6,907.8 | 34.8 | 138.2 | -92.00 | -65.5 | 1,225.8 | 620.2 | 447.3 | 172.89 | 3.587 | |
| 8,100.0 | 6,908.3 | 6,906.3 | 6,906.3 | 37.2 | 138.1 | -91.65 | -65.5 | 1,225.8 | 529.0 | 353.8 | 175.27 | 3.018 | |
| 8,200.0 | 6,906.9 | 6,904.9 | 6,904.9 | 39.6 | 138.1 | -91.30 | -65.5 | 1,225.8 | 441.7 | 264.0 | 177.70 | 2.486 | |
| 8,300.0 | 6,905.5 | 6,903.5 | 6,903.5 | 42.1 | 138.1 | -90.96 | -65.5 | 1,225.8 | 361.0 | 180.8 | 180.17 | 2.004 | |
| 8,400.0 | 6,904.0 | 6,902.0 | 6,902.0 | 44.6 | 138.0 | -90.61 | -65.5 | 1,225.8 | 292.5 | 109.8 | 182.67 | 1.601 | |
| 8,500.0 | 6,902.6 | 6,900.6 | 6,900.6 | 47.2 | 138.0 | -90.26 | -65.5 | 1,225.8 | 246.5 | 61.3 | 185.20 | 1.331 Level 3 | |
| 8,573.9 | 6,901.5 | 6,899.5 | 6,899.5 | 49.1 | 138.0 | -90.00 | -65.5 | 1,225.8 | 235.1 | 48.1 | 187.09 | 1.257 Level 3, CC, ES, SF | |
| 8,600.0 | 6,901.2 | 6,899.2 | 6,899.2 | 49.8 | 138.0 | -89.91 | -65.5 | 1,225.8 | 236.6 | 48.8 | 187.75 | 1.260 Level 3 | |
| 8,700.0 | 6,899.7 | 6,897.7 | 6,897.7 | 52.4 | 138.0 | -89.56 | -65.5 | 1,225.8 | 266.8 | 76.5 | 190.32 | 1.402 Level 3 | |
| 8,800.0 | 6,898.3 | 6,896.3 | 6,896.3 | 55.0 | 137.9 | -89.21 | -65.5 | 1,225.8 | 326.2 | 133.3 | 192.90 | 1.691 | |
| 8,900.0 | 6,896.9 | 6,894.9 | 6,894.9 | 57.7 | 137.9 | -88.86 | -65.5 | 1,225.8 | 402.0 | 206.5 | 195.49 | 2.056 | |
| 9,000.0 | 6,895.4 | 6,893.4 | 6,893.4 | 60.3 | 137.9 | -88.51 | -65.5 | 1,225.8 | 486.6 | 288.5 | 198.09 | 2.456 | |
| 9,100.0 | 6,894.0 | 6,892.0 | 6,892.0 | 63.0 | 137.8 | -88.17 | -65.5 | 1,225.8 | 576.2 | 375.5 | 200.69 | 2.871 | |
| 9,200.0 | 6,892.6 | 6,890.6 | 6,890.6 | 65.7 | 137.8 | -87.82 | -65.5 | 1,225.8 | 668.7 | 465.4 | 203.30 | 3.289 | |
| 9,300.0 | 6,891.2 | 6,889.2 | 6,889.2 | 68.4 | 137.8 | -87.47 | -65.5 | 1,225.8 | 763.1 | 557.2 | 205.91 | 3.706 | |
| 9,400.0 | 6,889.7 | 6,887.7 | 6,887.7 | 71.1 | 137.8 | -87.12 | -65.5 | 1,225.8 | 858.8 | 650.3 | 208.52 | 4.119 | |
| 9,500.0 | 6,888.3 | 6,886.3 | 6,886.3 | 73.8 | 137.7 | -86.77 | -65.5 | 1,225.8 | 955.3 | 744.2 | 211.13 | 4.525 | |

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|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design Lofland 22T & Alles 22S-HZ Existing Wells - Esther 1-23 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | Offset Site Error: | | 0.0 ft |
|---|----------------|----------------|----------------|-----------------|--------|-------------------|------------------------|------------|-----------------|------------------|--------------------|---------------------------|---------|
| Survey Program: 7300-UNKNOWN | | | | | | | | | | | Offset Well Error: | | 0.0 ft |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | Warning |
| Measured Depth | Vertical Depth | Measured Depth | Vertical Depth | Reference | Offset | Highside Toolface | Offset Wellbore Centre | | Between Centres | Between Ellipses | Minimum Separation | Separation Factor | |
| (ft) | (ft) | (ft) | (ft) | (ft) | (ft) | (°) | +N/-S (ft) | +E/-W (ft) | (ft) | (ft) | (ft) | | |
| 11,500.0 | 6,859.7 | 6,855.7 | 6,855.7 | 128.9 | 137.1 | -97.21 | -203.5 | 5,112.2 | 967.1 | 703.2 | 263.97 | 3.664 | |
| 11,600.0 | 6,858.2 | 6,854.2 | 6,854.2 | 131.6 | 137.1 | -96.47 | -203.5 | 5,112.2 | 867.9 | 600.8 | 267.09 | 3.249 | |
| 11,700.0 | 6,856.8 | 6,852.8 | 6,852.8 | 134.4 | 137.1 | -95.72 | -203.5 | 5,112.2 | 768.8 | 498.6 | 270.18 | 2.845 | |
| 11,800.0 | 6,855.4 | 6,851.4 | 6,851.4 | 137.2 | 137.0 | -94.98 | -203.5 | 5,112.2 | 669.9 | 396.7 | 273.24 | 2.452 | |
| 11,900.0 | 6,853.9 | 6,849.9 | 6,849.9 | 140.0 | 137.0 | -94.23 | -203.5 | 5,112.2 | 571.5 | 295.2 | 276.25 | 2.069 | |
| 12,000.0 | 6,852.5 | 6,848.5 | 6,848.5 | 142.8 | 137.0 | -93.48 | -203.5 | 5,112.2 | 473.7 | 194.5 | 279.23 | 1.696 | |
| 12,100.0 | 6,851.1 | 6,847.1 | 6,847.1 | 145.5 | 136.9 | -92.72 | -203.5 | 5,112.2 | 377.1 | 94.9 | 282.17 | 1.336 Level 3 | |
| 12,200.0 | 6,849.7 | 6,845.7 | 6,845.7 | 148.3 | 136.9 | -91.97 | -203.5 | 5,112.2 | 282.8 | -2.3 | 285.07 | 0.992 Level 1 | |
| 12,300.0 | 6,848.2 | 6,844.2 | 6,844.2 | 151.1 | 136.9 | -91.22 | -203.5 | 5,112.2 | 194.3 | -93.6 | 287.92 | 0.675 Level 1 | |
| 12,400.0 | 6,846.8 | 6,842.8 | 6,842.8 | 153.9 | 136.9 | -90.46 | -203.5 | 5,112.2 | 124.6 | -166.1 | 290.73 | 0.429 Level 1 | |
| 12,461.1 | 6,845.9 | 6,841.9 | 6,841.9 | 155.6 | 136.8 | -90.00 | -203.5 | 5,112.2 | 108.6 | -183.8 | 292.42 | 0.372 Level 1, CC, ES, SF | |
| 12,500.0 | 6,845.4 | 6,841.4 | 6,841.4 | 156.7 | 136.8 | -89.71 | -203.5 | 5,112.2 | 115.4 | -178.1 | 293.49 | 0.393 Level 1 | |
| 12,600.0 | 6,843.9 | 6,839.9 | 6,839.9 | 159.5 | 136.8 | -88.95 | -203.5 | 5,112.2 | 176.3 | -119.9 | 296.20 | 0.595 Level 1 | |
| 12,664.9 | 6,843.0 | 6,839.0 | 6,839.0 | 161.3 | 136.8 | -88.46 | -203.5 | 5,112.2 | 230.9 | -67.1 | 297.93 | 0.775 Level 1 | |

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|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

| Offset Design | | | | | | | | | | | | Offset Site Error: | 0.0 ft |
|--|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|------------|----------------------|-----------------------|-------------------------|---------------------------|---------------------|
| Survey Program: 7300-UNKNOWN | | | | | | | | | | | | Offset Well Error: | 0.0 ft |
| Lofland 22T & Alles 22S-HZ Existing Wells - Lille 1-23 (Exist) - Wellbore #1 - Wellbore #1 | | | | | | | | | | | | | |
| Reference | | Offset | | Semi Major Axis | | | Distance | | | | | | |
| Measured Depth (ft) | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft) | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning |
| 10,200.0 | 6,878.3 | 6,876.3 | 6,876.3 | 92.9 | 137.5 | -94.66 | -141.8 | 3,800.0 | 963.0 | 733.3 | 229.71 | 4.192 | |
| 10,300.0 | 6,876.8 | 6,874.8 | 6,874.8 | 95.7 | 137.5 | -94.17 | -141.8 | 3,800.0 | 864.7 | 632.1 | 232.57 | 3.718 | |
| 10,400.0 | 6,875.4 | 6,873.4 | 6,873.4 | 98.4 | 137.5 | -93.68 | -141.8 | 3,800.0 | 766.8 | 531.4 | 235.42 | 3.257 | |
| 10,500.0 | 6,874.0 | 6,872.0 | 6,872.0 | 101.2 | 137.4 | -93.19 | -141.8 | 3,800.0 | 669.6 | 431.3 | 238.25 | 2.810 | |
| 10,600.0 | 6,872.6 | 6,870.6 | 6,870.6 | 103.9 | 137.4 | -92.70 | -141.8 | 3,800.0 | 573.3 | 332.2 | 241.08 | 2.378 | |
| 10,700.0 | 6,871.1 | 6,869.1 | 6,869.1 | 106.7 | 137.4 | -92.21 | -141.8 | 3,800.0 | 478.5 | 234.6 | 243.89 | 1.962 | |
| 10,800.0 | 6,869.7 | 6,867.7 | 6,867.7 | 109.4 | 137.4 | -91.72 | -141.8 | 3,800.0 | 386.3 | 139.6 | 246.69 | 1.566 | |
| 10,900.0 | 6,868.3 | 6,866.3 | 6,866.3 | 112.2 | 137.3 | -91.22 | -141.8 | 3,800.0 | 299.2 | 49.7 | 249.48 | 1.199 | Level 2 |
| 11,000.0 | 6,866.8 | 6,864.8 | 6,864.8 | 115.0 | 137.3 | -90.73 | -141.8 | 3,800.0 | 223.2 | -29.1 | 252.25 | 0.885 | Level 1 |
| 11,100.0 | 6,865.4 | 6,863.4 | 6,863.4 | 117.8 | 137.3 | -90.24 | -141.8 | 3,800.0 | 173.4 | -81.6 | 255.00 | 0.680 | Level 1 |
| 11,148.6 | 6,864.7 | 6,862.7 | 6,862.7 | 119.1 | 137.3 | -90.00 | -141.8 | 3,800.0 | 166.5 | -89.9 | 256.34 | 0.649 | Level 1, CC, ES, SF |
| 11,200.0 | 6,864.0 | 6,862.0 | 6,862.0 | 120.5 | 137.2 | -89.75 | -141.8 | 3,800.0 | 174.2 | -83.5 | 257.74 | 0.676 | Level 1 |
| 11,300.0 | 6,862.5 | 6,860.5 | 6,860.5 | 123.3 | 137.2 | -89.25 | -141.8 | 3,800.0 | 225.0 | -35.5 | 260.47 | 0.864 | Level 1 |
| 11,400.0 | 6,861.1 | 6,859.1 | 6,859.1 | 126.1 | 137.2 | -88.76 | -141.8 | 3,800.0 | 301.5 | 38.3 | 263.17 | 1.146 | Level 2 |
| 11,500.0 | 6,859.7 | 6,857.7 | 6,857.7 | 128.9 | 137.2 | -88.27 | -141.8 | 3,800.0 | 388.8 | 122.9 | 265.86 | 1.462 | Level 3 |
| 11,600.0 | 6,858.2 | 6,856.2 | 6,856.2 | 131.6 | 137.1 | -87.78 | -141.8 | 3,800.0 | 481.1 | 212.5 | 268.53 | 1.791 | |
| 11,700.0 | 6,856.8 | 6,854.8 | 6,854.8 | 134.4 | 137.1 | -87.29 | -141.8 | 3,800.0 | 575.9 | 304.7 | 271.18 | 2.124 | |
| 11,800.0 | 6,855.4 | 6,853.4 | 6,853.4 | 137.2 | 137.1 | -86.80 | -141.8 | 3,800.0 | 672.3 | 398.4 | 273.81 | 2.455 | |
| 11,900.0 | 6,853.9 | 6,851.9 | 6,851.9 | 140.0 | 137.0 | -86.30 | -141.8 | 3,800.0 | 769.5 | 493.1 | 276.42 | 2.784 | |
| 12,000.0 | 6,852.5 | 6,850.5 | 6,850.5 | 142.8 | 137.0 | -85.81 | -141.8 | 3,800.0 | 867.4 | 588.4 | 279.00 | 3.109 | |
| 12,100.0 | 6,851.1 | 6,849.1 | 6,849.1 | 145.5 | 137.0 | -85.32 | -141.8 | 3,800.0 | 965.7 | 684.2 | 281.57 | 3.430 | |

| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

Reference Depths are relative to WELL @ 4660.0ft (RKB - 15')

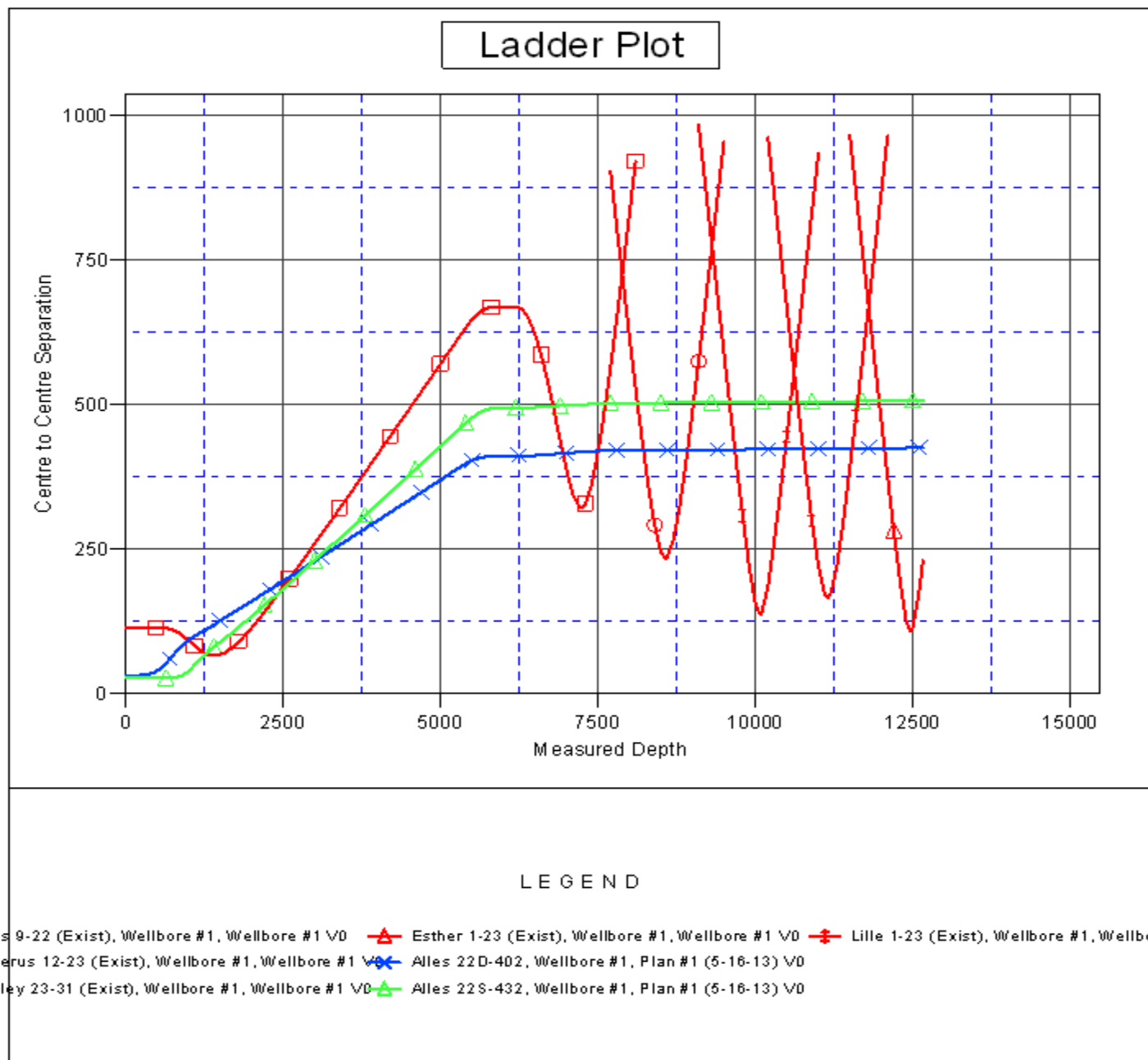
Offset Depths are relative to Offset Datum

Central Meridian is -105.500000 °

Coordinates are relative to: Alles 22D-312

Coordinate System is US State Plane 1983, Colorado Northern Zone

Grid Convergence at Surface is: 0.55°



| | | | |
|---------------------------|---|-------------------------------------|-----------------------------|
| Company: | PETROLEUM DEVELOPMENT CORP Weld County CO | Local Co-ordinate Reference: | Well Alles 22D-312 |
| Project: | SEC.22-T5N-R65W | TVD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Reference Site: | Alles 22S-HZ Pad Sec.22-T5N-R65W | MD Reference: | WELL @ 4660.0ft (RKB - 15') |
| Site Error: | 0.0ft | North Reference: | True |
| Reference Well: | Alles 22D-312 | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 0.0ft | Output errors are at | 2.00 sigma |
| Reference Wellbore | Wellbore #1 | Database: | Landmark |
| Reference Design: | Plan #2 (10-22-13) | Offset TVD Reference: | Offset Datum |

Reference Depths are relative to WELL @ 4660.0ft (RKB - 15')
Offset Depths are relative to Offset Datum
Central Meridian is -105.500000 °

Coordinates are relative to: Alles 22D-312
Coordinate System is US State Plane 1983, Colorado Northern Zone
Grid Convergence at Surface is: 0.55°

