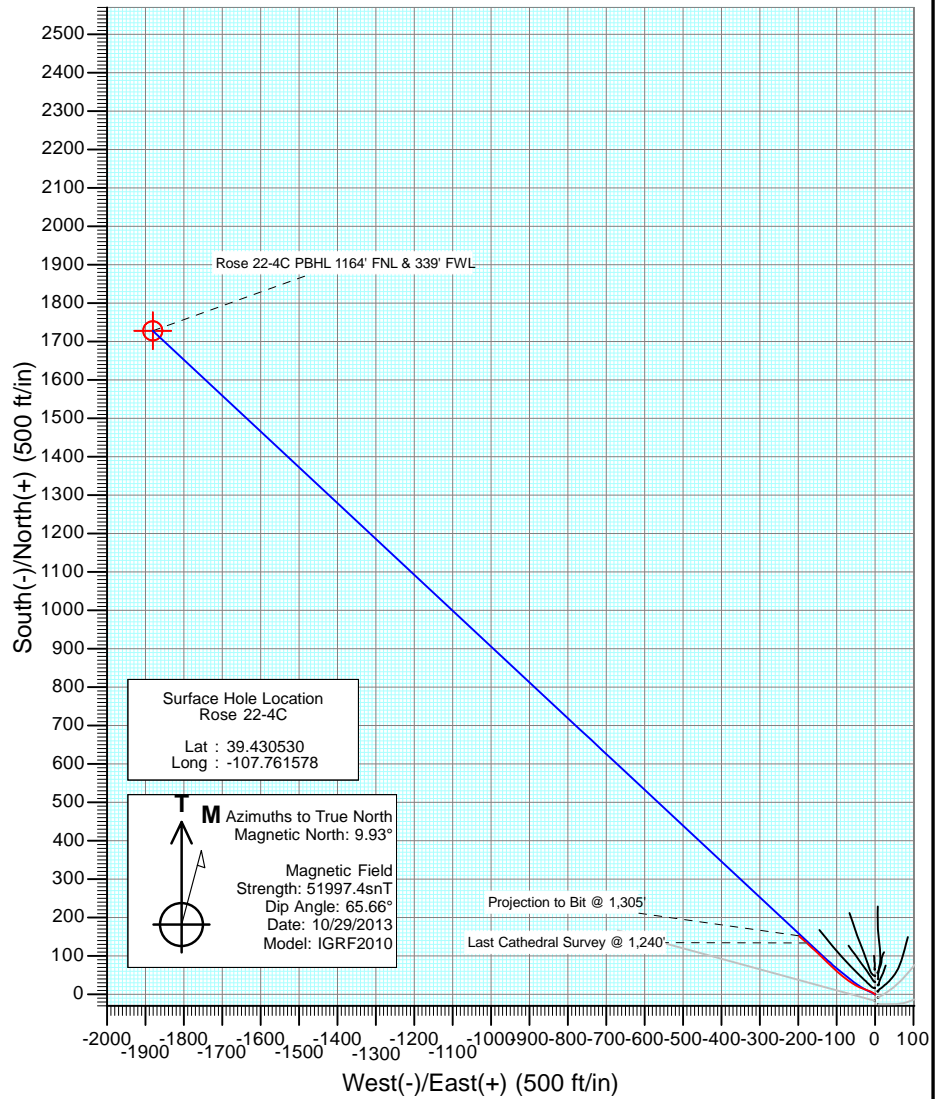
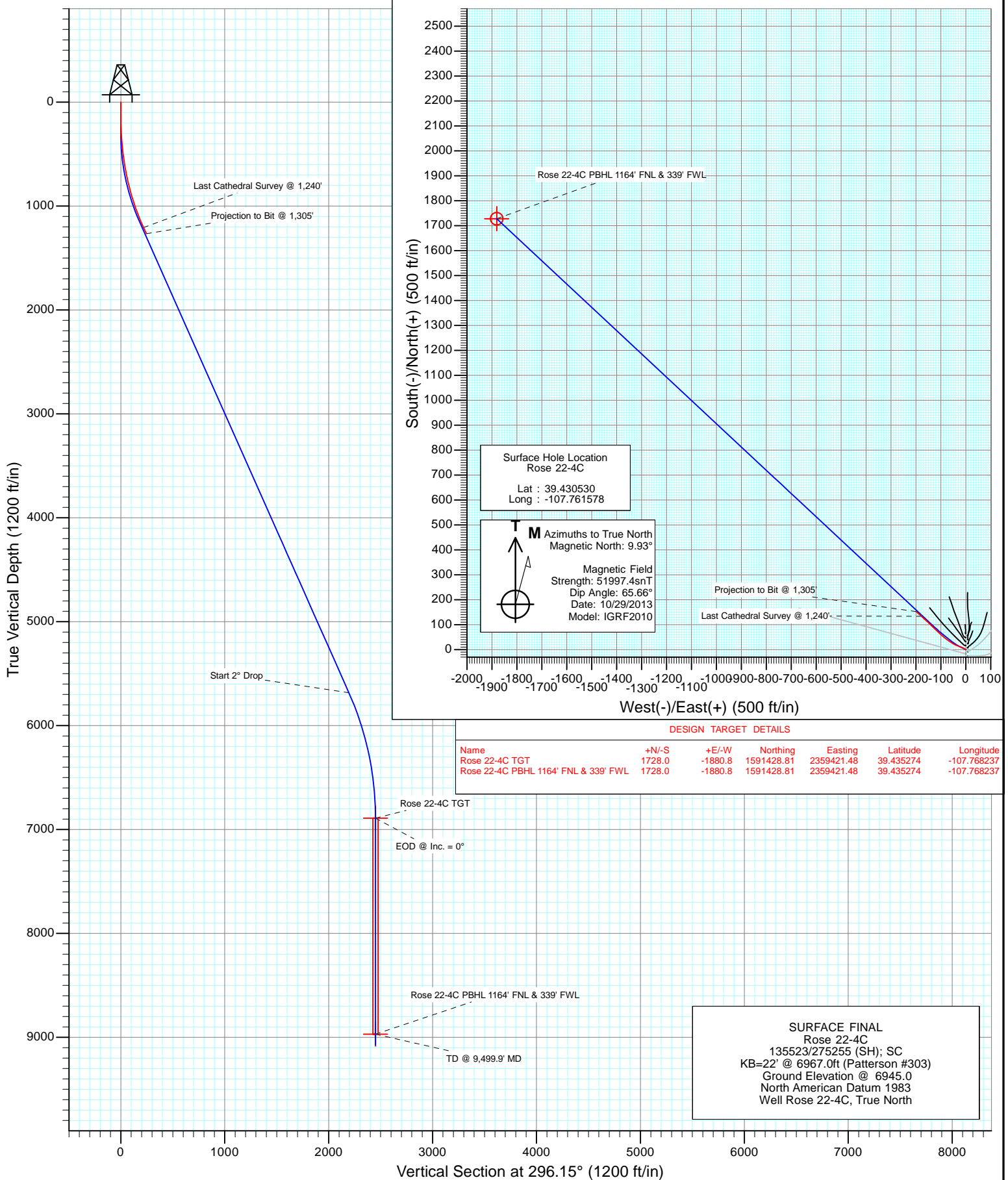




Project: Mamm Creek
Site: K22W Pad
Well: Rose 22-4C
Wellbore: OH
Design: SURFACE FINAL



DESIGN TARGET DETAILS

| Name | +N/-S | +E/-W | Northing | Easting | Latitude | Longitude |
|--------------------------------------|--------|---------|------------|------------|-----------|-------------|
| Rose 22-4C TGT | 1728.0 | -1880.8 | 1591428.81 | 2359421.48 | 39.435274 | -107.768237 |
| Rose 22-4C PBHL 1164' FNL & 339' FWL | 1728.0 | -1880.8 | 1591428.81 | 2359421.48 | 39.435274 | -107.768237 |

SURFACE FINAL
Rose 22-4C
135523/275255 (SH); SC
KB=22' @ 6967.0ft (Patterson #303)
Ground Elevation @ 6945.0
North American Datum 1983
Well Rose 22-4C, True North

Cathedral Energy Services

Survey Report

| | | | |
|------------------|----------------------------|-------------------------------------|------------------------------------|
| Company: | EnCana Oil & Gas (USA) Inc | Local Co-ordinate Reference: | Well Rose 22-4C |
| Project: | Mamm Creek | TVD Reference: | KB=22' @ 6967.0ft (Patterson #303) |
| Site: | K22W Pad | MD Reference: | KB=22' @ 6967.0ft (Patterson #303) |
| Well: | Rose 22-4C | North Reference: | True |
| Wellbore: | OH | Survey Calculation Method: | Minimum Curvature |
| Design: | SURFACE FINAL | Database: | USA EDM 5000 Multi Users DB |

| | | | |
|--------------------|---------------------------|----------------------|----------------|
| Project | Mamm Creek | | |
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | Colorado Central Zone | | |

| Site | | K22W Pad | | | |
|-----------------------|----------|--------------|-----------------|-------------------|-------------|
| Site Position: | | Northing: | 1,589,615.65 ft | Latitude: | 39.430424 |
| From: | Lat/Long | Easting: | 2,361,269.29 ft | Longitude: | -107.761537 |
| Position Uncertainty: | 0.0 ft | Slot Radius: | 13.200 in | Grid Convergence: | -1.43 ° |

| | | | | | | |
|----------------------|------------|--------|---------------------|-----------------|---------------|-------------|
| Well | Rose 22-4C | | | | | |
| Well Position | +N/-S | 0.0 ft | Northing: | 1,589,654.51 ft | Latitude: | 39.430530 |
| | +E/-W | 0.0 ft | Easting: | 2,361,258.68 ft | Longitude: | -107.761578 |
| Position Uncertainty | | 0.0 ft | Wellhead Elevation: | ft | Ground Level: | 6,945.0 ft |

| | | | | | |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| Wellbore | OH | | | | |
| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
| | IGRF2010 | 10/29/2013 | 9.93 | 65.66 | 51,997 |

| | | | | | |
|--------------------------|------------------------------|-------------------|-------------------|----------------------|-----|
| Design | SURFACE FINAL | | | | |
| Audit Notes: | | | | | |
| Version: | 1.0 | Phase: | ACTUAL | Tie On Depth: | 0.0 |
| Vertical Section: | Depth From (TVD) (ft) | +N/-S (ft) | +E/-W (ft) | Direction (°) | |
| | 0.0 | 0.0 | 0.0 | 296.15 | |

| | | | | | |
|-----------------------|----------------|--------------------------|------------------|--------------------|--|
| Survey Program | Date | 12/16/2013 | | | |
| From (ft) | To (ft) | Survey (Wellbore) | Tool Name | Description | |
| 145.0 | 1,305.0 | Survey #1 (OH) | Geolink MWD | Geolink MWD | |

| | | | | | | | | | | |
|----------------------------|------------------------|--------------------|----------------------------|-------------------|-------------------|------------------------------|------------------------------|-----------------------------|------------------------------|--|
| Survey | | | | | | | | | | |
| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Formations / Comments | |
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | | |
| 145.0 | 0.10 | 330.80 | 145.0 | 0.1 | -0.1 | 0.1 | 0.07 | 0.07 | | |
| 175.0 | 0.10 | 331.00 | 175.0 | 0.2 | -0.1 | 0.1 | 0.00 | 0.00 | | |
| 205.0 | 1.10 | 314.20 | 205.0 | 0.4 | -0.3 | 0.4 | 3.35 | 3.33 | | |
| 235.0 | 2.20 | 310.70 | 235.0 | 1.0 | -0.9 | 1.3 | 3.68 | 3.67 | | |
| 266.0 | 2.90 | 300.80 | 266.0 | 1.7 | -2.1 | 2.6 | 2.66 | 2.26 | | |
| 296.0 | 3.30 | 298.70 | 295.9 | 2.5 | -3.5 | 4.3 | 1.39 | 1.33 | | |
| 357.0 | 4.70 | 307.80 | 356.8 | 4.9 | -7.0 | 8.5 | 2.51 | 2.30 | | |
| 418.0 | 4.70 | 294.80 | 417.6 | 7.5 | -11.2 | 13.4 | 1.74 | 0.00 | | |
| 448.0 | 5.20 | 288.50 | 447.4 | 8.5 | -13.6 | 16.0 | 2.46 | 1.67 | | |
| 479.0 | 5.60 | 290.90 | 478.3 | 9.4 | -16.4 | 18.9 | 1.48 | 1.29 | | |
| 570.0 | 8.30 | 288.80 | 568.6 | 13.1 | -26.8 | 29.8 | 2.98 | 2.97 | | |
| 661.0 | 11.40 | 294.20 | 658.3 | 18.9 | -41.2 | 45.3 | 3.55 | 3.41 | | |

Cathedral Energy Services

Survey Report

| | | | |
|------------------|----------------------------|-------------------------------------|------------------------------------|
| Company: | EnCana Oil & Gas (USA) Inc | Local Co-ordinate Reference: | Well Rose 22-4C |
| Project: | Mamm Creek | TVD Reference: | KB=22' @ 6967.0ft (Patterson #303) |
| Site: | K22W Pad | MD Reference: | KB=22' @ 6967.0ft (Patterson #303) |
| Well: | Rose 22-4C | North Reference: | True |
| Wellbore: | OH | Survey Calculation Method: | Minimum Curvature |
| Design: | SURFACE FINAL | Database: | USA EDM 5000 Multi Users DB |

Survey

| Measured Depth (ft) | Inclination (°) | Azimuth (°) | Vertical Depth (ft) | +N/-S (ft) | +E/-W (ft) | Vertical Section (ft) | Dogleg Rate (°/100ft) | Build Rate (°/100ft) | Formations / Comments |
|---------------------|-----------------|-------------|---------------------|------------|------------|-----------------------|-----------------------|----------------------|--------------------------------|
| 752.0 | 13.50 | 302.30 | 747.1 | 28.3 | -58.4 | 64.9 | 3.00 | 2.31 | |
| 844.0 | 14.80 | 307.40 | 836.4 | 41.2 | -76.8 | 87.1 | 1.96 | 1.41 | |
| 934.0 | 16.70 | 311.90 | 923.0 | 56.8 | -95.5 | 110.8 | 2.51 | 2.11 | |
| 1,024.0 | 19.60 | 313.70 | 1,008.5 | 75.9 | -116.1 | 137.6 | 3.28 | 3.22 | |
| 1,116.0 | 22.60 | 313.20 | 1,094.3 | 98.6 | -140.1 | 169.3 | 3.27 | 3.26 | |
| 1,207.0 | 25.40 | 312.80 | 1,177.4 | 123.9 | -167.2 | 204.7 | 3.08 | 3.08 | |
| 1,240.0 | 25.80 | 312.50 | 1,207.2 | 133.5 | -177.7 | 218.4 | 1.27 | 1.21 | Last Cathedral Survey @ 1,240' |
| 1,305.0 | 25.80 | 312.50 | 1,265.7 | 152.6 | -198.5 | 245.5 | 0.00 | 0.00 | Projection to Bit @ 1,305' |

Targets

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (ft) | +N/-S (ft) | +E/-W (ft) | Northing (ft) | Easting (ft) | Latitude | Longitude |
|--|---------------|--------------|----------|------------|------------|---------------|--------------|-----------|-------------|
| Rose 22-4C PBHL 1164' - actual wellpath misses target center by 8040.7ft at 1305.0ft MD (1265.7 TVD, 152.6 N, -198.5 E) - Circle (radius 25.0) | 0.00 | 0.00 | 8,969.0 | 1,728.0 | -1,880.8 | 1,591,428.81 | 2,359,421.48 | 39.435274 | -107.768237 |
| Rose 22-4C TGT - actual wellpath misses target center by 6079.1ft at 1305.0ft MD (1265.7 TVD, 152.6 N, -198.5 E) - Point | 0.00 | 0.00 | 6,891.0 | 1,728.0 | -1,880.8 | 1,591,428.81 | 2,359,421.48 | 39.435274 | -107.768237 |

Design Annotations

| Measured Depth (ft) | Vertical Depth (ft) | Local Coordinates +N/-S (ft) | +E/-W (ft) | Comment |
|---------------------|---------------------|---------------------------------|------------|--------------------------------|
| 1,240.0 | 1,207.2 | 133.5 | -177.7 | Last Cathedral Survey @ 1,240' |
| 1,305.0 | 1,265.7 | 152.6 | -198.5 | Projection to Bit @ 1,305' |

Checked By: _____ Approved By: _____ Date: _____