



Weatherford®

6 3/4 & 4 3/4 in. WeatherfordM/LWD™
Gamma Ray
1 in. & 5 in. TRUE VERTICAL DEPTH
RECORDED DATA
FINAL PRINT

| | | | |
|---|---------------|--------------------------|-----------------|
| Company: | | Anadarko Petroleum Corp. | |
| Well: | | Howard 24C-22HZ | |
| Field: | | Wattenberg | |
| Rig: | | Xtreme 23 | |
| County: | | Weld | |
| Location | | COMPANY | |
| | | WELL | |
| | | FIELD | |
| | | RIG | |
| | | COUNTY | |
| API # | | STATE | |
| Anadarko Petroleum Corp. | | Colorado | |
| Howard 24C-22HZ | | | |
| Wattenberg | | | |
| Xtreme 23 | | | |
| Weld | | | |
| 05-123-38232 | | | |
| Latitude: | 40.01639° N | x = 3,175,071.52 ft | Mag Decl: 8.60° |
| Longitude: | -104.87493° W | y = 1,249,433.96ft | Mag Dip: 66.63° |
| Other Services: Directional and Temperature | | | |

| Permanent Datum: | | Mean Sea Level | | | | | |
|---------------------------|----------------|----------------|------------|-------------------|-----------|-----------|---|
| Log Measured From: | Drill Floor | Elev: | 5049.0 ft | above perm. datum | | | K.B. Top Drive |
| Depth Reference: | Drillers Tally | Total Depth: | 14975.0 ft | | | Elevation | G.L. 5033.0 ft D.F. 5049.0 ft W.D. Land |
| Depth Logged: | 7184.0 ft | to | 14975.0 ft | Runs: | 7 | | |
| Date Logged: | 26-Nov-13 | to | 7-Dec-13 | Spud Date: | 25-Nov-13 | | |
| Borehole Record | | | | Casing Record | | | |
| Hole Size | From | To | Size | Weight | From | To | |
| 13.500 in. | Surface | 1228 ft | 9.625 in. | 36.0 lb/ft | Surface | 1225 ft | |
| 8.750 in. | 1228 ft | 8224 ft | 7.000 in. | 26.0 lb/ft | Surface | 8210 ft | |
| 6.125 in. | 8224 ft | 14975 ft | | | | | |
| | | | | | | | |
| | | | | | | | |
| Borehole Deviation Record | | | Mud Record | | | | |
| Hole Size | Min. Inc. | Max. Inc. | Type | Weight | From | To | |
| 13.500 in. | 0.00° | 0.41 | WBM | 8.50 - 8.80 ppg | 1228 ft | 6500 ft | |
| 8.750 in. | 0.14° | 84.74° | WBM | 8.80 - 9.10 ppg | 6500 ft | 6600 ft | |
| 6.125 in. | 85.68° | 93.33° | WBM | 9.10 - 9.40 ppg | 6600 ft | 6746 ft | |
| | | | WBM | 9.40 - 9.70 ppg | 6746 ft | 7000 ft | |
| | | | WBM | 9.70 - 10.00 ppg | 7000 ft | 8210 ft | |
| | | | WBM | 9.30 - 9.60 ppg | 8210 ft | 14975 ft | |

All interpretations of log data are opinions based on inferences from electrical or other measurements. Weatherford International does not guarantee the accuracy or correctness of any interpretation or recommendation and we shall not be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation or recommendation made by any of our employees or agents.

| RUN SUMMARY | |
|-------------|--|
|-------------|--|

| M/LWD Run Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------|--------------|-------------|--------------|---------------|---------------|---------------|---------------|
| Bit Size in. | 8.750 | 8.750 | 8.750 | 6.125 | 6.125 | 6.125 | 6.125 |
| Bit Type | PDC | PDC | PDC | PDC | PDC | PDC | PDC |
| Bit TFA sq.in. | 1.491 | 1.491 | 1.335 | 1.534 | 1.534 | 1.534 | 1.534 |
| Bit Start Depth ft | 1228 | 7292 | 7341 | 8224 | 10684 | 10780 | 10780 |
| Bit End Depth ft | 7292 | 7341 | 8224 | 10684 | 10780 | 10780 | 14975 |
| Top Log Interval ft | 7184 | 7251 | 7291 | 8171 | 10630 | na | 10725 |
| Bottom Log Interval ft | 7292 | 7341 | 8224 | 10684 | 10780 | na | 14975 |
| Begin Log Time hrs | 18:17 | 9:14 | 2:04 | 1:50 | 0:29 | na | 14:46 |
| Begin Log Date DD-MMM-YY | 26-Nov-13 | 27-Nov-13 | 28-Nov-13 | 1-Dec-13 | 3-Dec-13 | na | 5-Dec-13 |
| End Log Time hrs | 21:55 | 15:19 | 11:53 | 9:35 | 1:57 | na | 18:43 |
| End Log Date DD-MMM-YY | 26-Nov-13 | 27-Nov-13 | 29-Nov-13 | 2-Dec-13 | 3-Dec-13 | na | 7-Dec-13 |
| Drill or Wipe | Drill | Drill | Drill | Drill | Drill | na | Drill |
| Flow Rate gal/min | 580 | 589 | 576 | 293 | 300 | 28 | 300 |
| Max AV / CV @ MWD ft/min | 458 / 129 | 466 / 136 | 453 / 333 | 489 / 325 | 491 / 360 | 46 / 361 | 452 / 406 |
| Min Inc @ Depth deg @ ft | 0.14 @ 6505 | 2.91 @ 7274 | 9.69 @ 7359 | 85.68 @ 9968 | 88.58 @ 10566 | 93.33 @ 10708 | 88.21 @ 11336 |
| Max Inc @ Depth deg @ ft | 18.44 @ 2665 | 2.91 @ 7274 | 84.74 @ 8159 | 92.65 @ 10310 | 93.33 @ 10708 | 93.33 @ 10708 | 93.33 @ 10708 |

| |
|----------|
| MUD DATA |
|----------|

[illegible]

EQUIPMENT SUMMARY

| M/LWD Run Number | 1 | 2 | 3 | 4 | 5 |
|--|--------------------|--------------------|--------------------|-----------------------|-----------------------|
| HyperPulse / HEL Serial Number | CP130537PDIRBY-T02 | CP130537PDIRBY-T02 | CP130537PDIRBY-T02 | NW132664PDSBK14.75-M1 | NW132664PDSBK14.75-M1 |
| Sensor to Bit Offsets / Acquisition Rates | | | | | |
| Directional | ft / sec | 65.30 / RT | 55.83 / RT | 63.94 / RT | 49.04 / RT |
| Gamma Ray | ft / sec | 51.09 / 16 | 41.62 / 16 | 49.73 / 16 | 53.14 / 5 |
| Other Information | | | | | |
| Total BHA Length | ft | 3841.27 | 3831.80 | 3839.91 | 9426.05 |
| BHA Assembly Type | | Steerable | Steerable | Steerable | Steerable |
| Stabilizer Location | ft | na | na | na | 29.68 |
| Run Circulating Time | hr | 29.93 | 7.06 | 31.55 | 30.42 |
| Run Drilling Time | hr | 20.62 | 2.98 | 20.04 | 16.07 |

| M/LWD Run Number | 6 | 7 | | | |
|--|---------------------|---------------------|------------|--|--|
| HEL Serial Number | NW132804PDDBKVI4.75 | NW132804PDDBKVI4.75 | | | |
| Sensor to Bit Offsets / Acquisition Rates | | | | | |
| Directional | ft / sec | 49.64 / RT | 50.83 / RT | | |
| Gamma Ray | ft / sec | 54.21 / 5 | 55.40 / 5 | | |
| Other Information | | | | | |
| Total BHA Length | ft | 9427.27 | 9428.46 | | |
| BHA Assembly Type | | Steerable | Steerable | | |
| Stabilizer Location | ft | 30.58 | 31.77 | | |
| Run Circulating Time | hr | 0.07 | 50.68 | | |
| Run Drilling Time | hr | 0.00 | 23.95 | | |

MUD SUMMARY

| Date and Time | Run | Bit Depth | Mud Weight | % K | Rm @ Temp | Rmf @ Temp | Rmc @ Temp | BHCT |
|-------------------|-----|-----------|------------|-----|-----------|------------|------------|-------|
| 27 Nov 13 @ 02:50 | 01 | 7292 ft | 9.80 ppg | 0 | na | na | na | 153 F |
| 27 Nov 13 @ 20:15 | 02 | 7341 ft | 9.50 ppg | 0 | na | na | na | 158 F |
| 30 Nov 13 @ 00:00 | 03 | 8224 ft | 10.00 ppg | 0 | na | na | na | 171 F |
| 02 Dec 13 @ 16:15 | 04 | 10684 ft | 9.60 ppg | 0 | na | na | na | 210 F |
| 04 Dec 13 @ 00:00 | 05 | 10780 ft | 9.20 ppg | 0 | na | na | na | 210 F |
| 04 Dec 13 @ 14:00 | 06 | 10780 ft | 9.30 ppg | 0 | na | na | na | 60 F |
| 04 Dec 13 @ 09:00 | 07 | 14975 ft | 9.30 ppg | 0 | na | na | na | 235 F |

| M/LWD RUN REMARKS | | | |
|--|-----------|--|-----------|
| Run Number: 1 :: RECORDED DATA LOG | | | |
| WFT Services Provided: | | | |
| Recorded and Real Time Logging: Gamma Ray and Temperature. | | | |
| Directional Services: On demand Inclination and Azimuth. | | | |
| Borehole and Environmental Correction: | | | |
| Hole Size: | 8.750 in. | Gamma Ray: Corrected for hole size, mudweight, Collar O.D., Collar I.D. and K1 factor. | |
| Mud Weight: | 9.80 ppg | Collar O.D.: | 6.750 in. |
| K1 Factor: | 3.352 | Collar I.D.: | 3.250 in. |
| Run Number: 2 :: RECORDED DATA LOG | | | |
| WFT Services Provided: | | | |
| Recorded and Real Time Logging: Gamma Ray and Temperature. | | | |
| Directional Services: On demand Inclination and Azimuth. | | | |
| Borehole and Environmental Correction: | | | |
| Hole Size: | 8.750 in. | Gamma Ray: Corrected for hole size, mudweight, Collar O.D., Collar I.D. and K1 factor. | |
| Mud Weight: | 9.50 ppg | Collar O.D.: | 6.750 in. |
| K1 Factor: | 3.352 | Collar I.D.: | 3.250 in. |
| Run Number: 3 :: RECORDED DATA LOG | | | |
| WFT Services Provided: | | | |
| Recorded and Real Time Logging: Gamma Ray and Temperature. | | | |
| Directional Services: On demand Inclination and Azimuth. | | | |
| Borehole and Environmental Correction: | | | |
| Hole Size: | 8.750 in. | Gamma Ray: Corrected for hole size, mudweight, Collar O.D., Collar I.D. and K1 factor. | |
| Mud Weight: | 10.00 ppg | Collar O.D.: | 6.750 in. |
| K1 Factor: | 3.352 | Collar I.D.: | 3.250 in. |
| Run Number: 4 :: RECORDED DATA LOG | | | |
| WFT Services Provided: | | | |
| Recorded and Real Time Logging: Gamma Ray and Temperature. | | | |
| Directional Services: On demand Inclination and Azimuth. | | | |
| Borehole and Environmental Correction: | | | |
| Hole Size: | 6.125 in. | Gamma Ray: Corrected for mud weight, hole size and KCl concentration. | |
| Mud Weight: | 9.60 ppg | | |
| KCl Concentration: | 0% | | |
| Run Number: 5 :: RECORDED DATA LOG | | | |
| WFT Services Provided: | | | |
| Recorded and Real Time Logging: Gamma Ray and Temperature. | | | |
| Directional Services: On demand Inclination and Azimuth. | | | |
| Borehole and Environmental Correction: | | | |
| Hole Size: | 6.125 in. | Gamma Ray: Corrected for mud weight, hole size and KCl concentration. | |
| Mud Weight: | 9.20 ppg | | |
| KCl Concentration: | 0% | | |

Run Number: 6 :: RECORDED DATA LOG

WFT Services Provided:

Recorded and Real Time Logging: Gamma Ray and Temperature.

Directional Services: On demand Inclination and Azimuth.

Borehole and Environmental Correction:

| | | |
|--------------------|-----------|--|
| Hole Size: | 6.125 in. | Gamma Ray: Corrected for mud weight, hole size and KCl concentration. |
| Mud Weight: | 9.30 ppg | |
| KCl Concentration: | 0% | |

Run Number: 7 :: RECORDED DATA LOG

WFT Services Provided:

Recorded and Real Time Logging: Gamma Ray and Temperature.

Directional Services: On demand Inclination and Azimuth.

Borehole and Environmental Correction:

| | | |
|--------------------|-----------|--|
| Hole Size: | 6.125 in. | Gamma Ray: Corrected for mud weight, hole size and KCl concentration. |
| Mud Weight: | 9.30 ppg | |
| KCl Concentration: | 0% | |

| M/LWD LOG COMMENTS | |
|--------------------|--|
| Comment No. 1-1 | <p>RECORDED DATA LOG</p> <p>Start of M/LWD Drilling Run 01</p> <p>Weatherford International provided 6 3/4 in. Directional, Gamma Ray, and Temperature for Run 01.</p> <p>Run 01 started formation drilling November 25, 2013 at 10:29 at 1228 MD / 1227 TVD. Weatherford International logged the 8.750 in. borehole.</p> <p>The WBM at the start of drilling was 8.50 ppg.</p> |
| Comment No. 1-2 | <p>Start of M/LWD Logging Run 01</p> <p>Run 01 started formation logging November 26, 2013 at 18:17 at 7184 MD / 7108 TVD. Weatherford International logged the 8.750 in. borehole.</p> <p>The WBM at the start of logging was 9.50 ppg.</p> |
| Comment No. 1-3 | <p>End of M/LWD Drilling Run 01</p> <p>Run 01 ended drilling formation November 26, 2013 at 21:55 at 7292 MD / 7216 TVD.</p> <p>The WBM at the end of drilling was 10.00 ppg.</p> |
| Comment No. 2-1 | <p>RECORDED DATA LOG</p> <p>Start of M/LWD Drilling Run 02</p> <p>Weatherford International provided 6 3/4 in. Directional, Gamma Ray, and Temperature for Run 02.</p> <p>Run 02 started formation drilling November 27, 2013 at 09:14 at 7292 MD / 7216 TVD. Weatherford International logged the 8.750 in. borehole.</p> <p>The WBM at the start of drilling was 9.50 ppg.</p> |
| Comment No. 2-2 | <p>End of M/LWD Drilling Run 02</p> <p>Run 02 ended drilling formation November 27, 2013 at 15:19 at 7341 MD / 7265 TVD.</p> <p>The WBM at the end of drilling was 9.50 ppg.</p> |
| Comment No. 3-1 | <p>RECORDED DATA LOG</p> <p>Start of M/LWD Drilling Run 03</p> <p>Weatherford International provided 6 3/4 in. Directional, Gamma Ray, and Temperature for Run 03.</p> <p>Run 03 started formation drilling November 28, 2013 at 02:04 at 7341 MD / 7265 TVD. Weatherford International logged the 8.750 in. borehole.</p> <p>The WBM at the start of drilling was 9.50 ppg.</p> |
| Comment No. 3-2 | <p>End of M/LWD Drilling Run 03</p> <p>Run 03 ended drilling formation November 29, 2013 at 11:53 at 8224 MD / 7766 TVD.</p> <p>The WBM at the end of drilling was 10.00 ppg.</p> |

Comment No. 4-1

RECORDED DATA LOG

Start of M/LWD Drilling Run 04

Weatherford International provided 4 3/4 in. Directional, Gamma Ray, and Temperature for Run 04.

Run 04 started formation drilling December 1, 2013 at 01:50 at 8224 MD / 7766 TVD. Weatherford International logged the 6.125 in. borehole.

The WBM at the start of drilling was 9.60 ppg.

Comment No. 4-2

End of M/LWD Drilling Run 04

Run 04 ended drilling formation December 2, 2013 at 09:35 at 10684 MD / 7767 TVD.

The WBM at the end of drilling was 9.60 ppg.

Comment No. 5-1

RECORDED DATA LOG

Start of M/LWD Drilling Run 05

Weatherford International provided 4 3/4 in. Directional, Gamma Ray, and Temperature for Run 05.

Run 05 started formation drilling December 3, 2013 at 00:29 at 10684 MD / 7767 TVD. Weatherford International logged the 6.125 in. borehole.

The WBM at the start of drilling was 9.20 ppg.

Comment No. 5-2

End of M/LWD Drilling Run 05

Run 05 ended drilling formation December 03, 2013 at 01:57 at 10780 MD / 7762 TVD.

The WBM at the end of drilling was 9.20 ppg.

Comment No. 6-1

Weatherford International provided 4 3/4 in. Directional, Gamma Ray, and Temperature for Run 06.

No formation logging occurred during this run. There was circulation issues which resulted in the drill string becoming packed off.

Comment No. 7-1

RECORDED DATA LOG

Start of M/LWD Drilling Run 07

Weatherford International provided 4 3/4 in. Directional, Gamma Ray, and Temperature for Run 07.

Run 07 started formation drilling December 5, 2013 at 14:46 at 10780 MD / 7762 TVD. Weatherford International logged the 6.125 in. borehole.

The WBM at the start of drilling was 9.30 ppg.

Comment No. 7-2

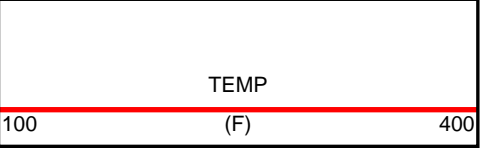
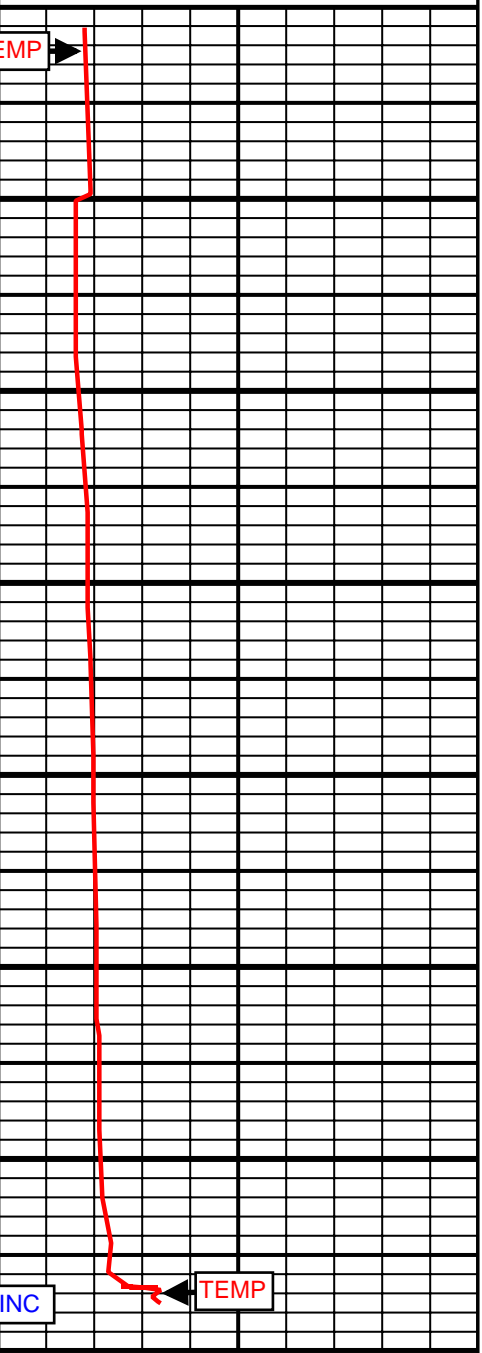
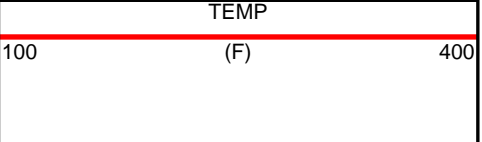
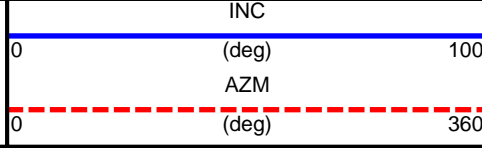
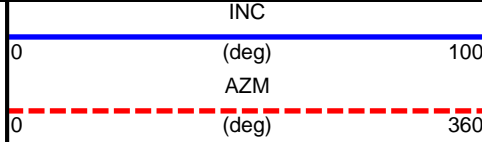
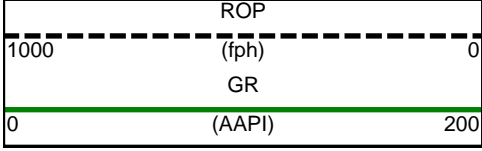
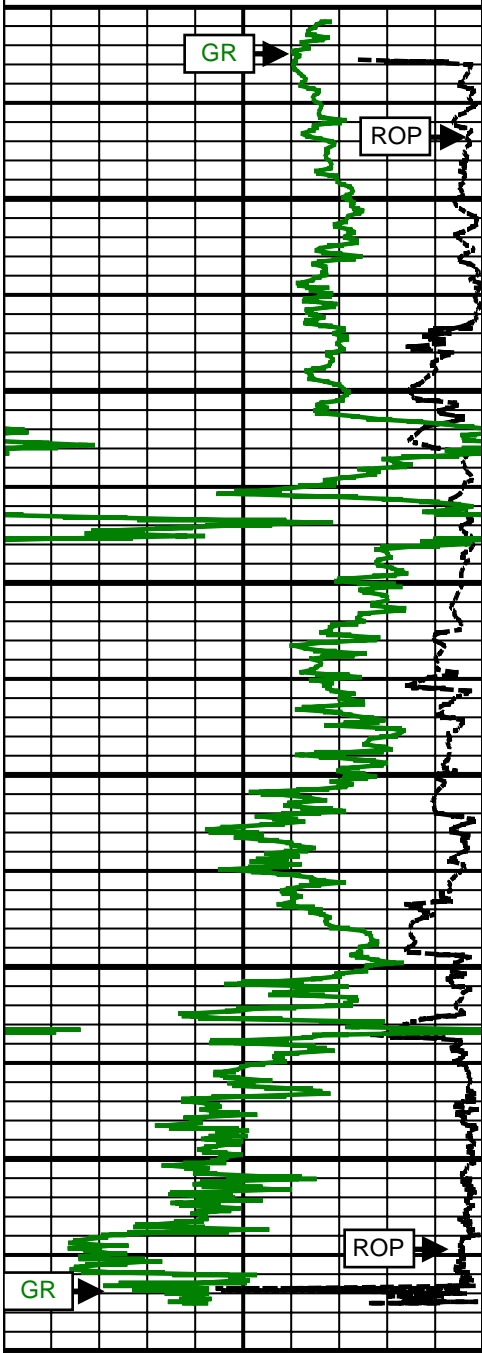
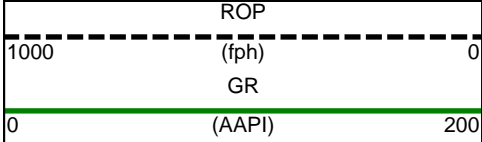
End of M/LWD Drilling Run 07

Run 07 ended drilling formation December 07, 2013 at 18:43 at 14975 MD / 7704 TVD.

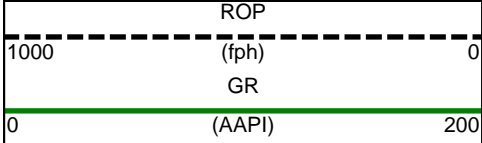
The WBM at the end of drilling was 9.30 ppg.

| CURVE SPECIFICATIONS | | | | |
|----------------------|----------|-------|--|-----------------------|
| CURVE TYPE | MNEMONIC | UNITS | COMMENTS | CORRECTIONS |
| Rate of Penetration | ROP | fph | Rate of Penetration 3.0 ft window 0.5 ft Exponential Smoothing | None |
| Gamma Ray | GR | AAPI | Gamma Ray 3.0 ft window 0.5 ft Exponential Smoothing | See M/LWD Run Remarks |
| Inclination | INC | deg | Survey Inclination No Smoothing | None |
| Azimuth | AZM | deg | Survey Azimuth No Smoothing | |
| Temperature | TEMP | F | Borehole Temperature 3.0 ft window 0.5 ft Exponential Smoothing | |

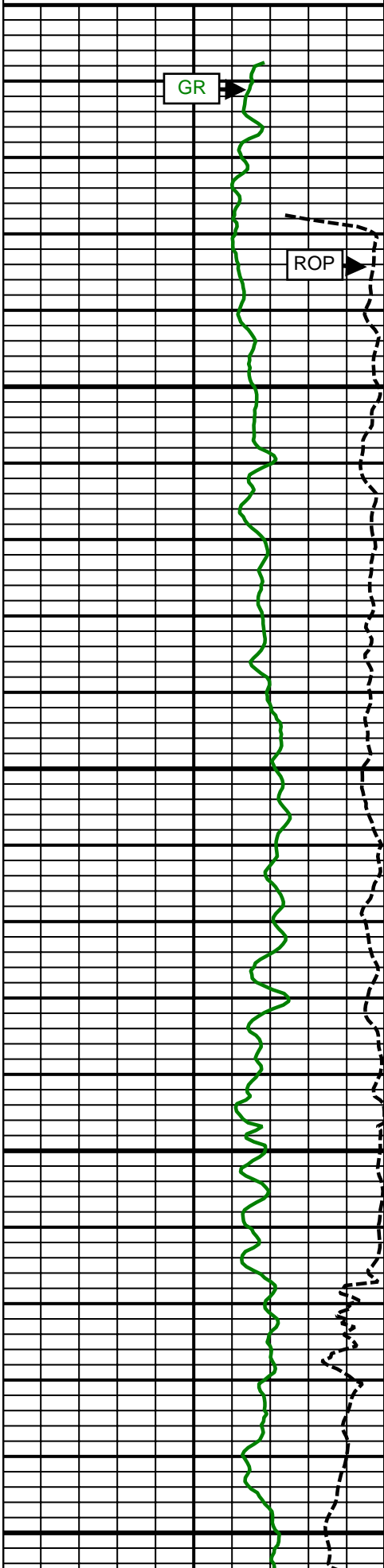
1 Inch - True Vertical Depth



5 Inch - True Vertical Depth

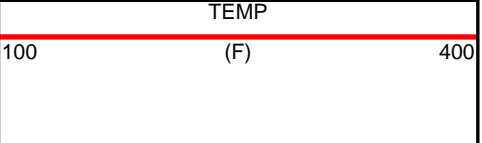
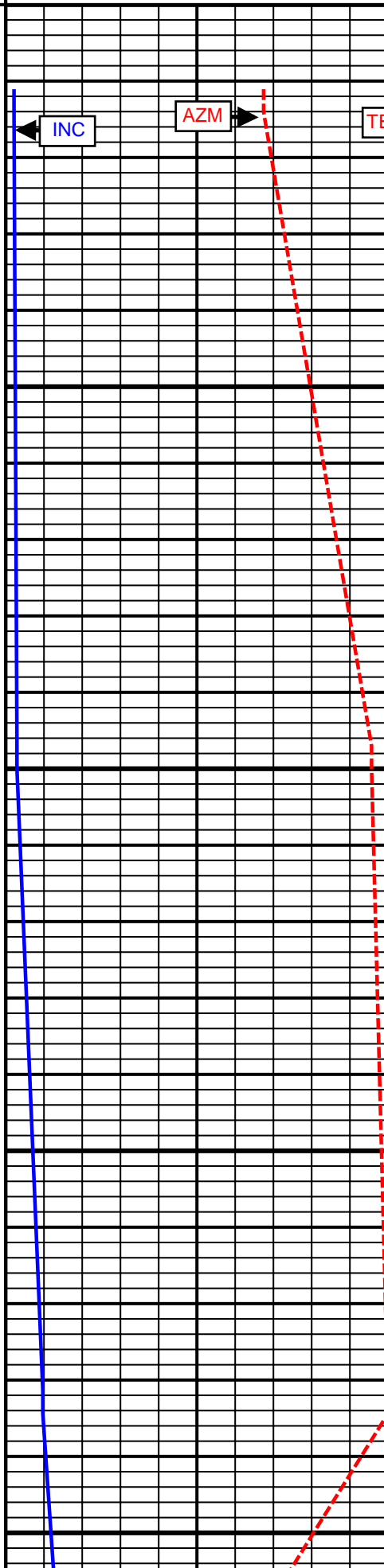
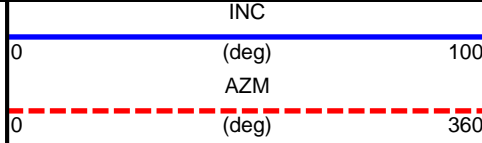


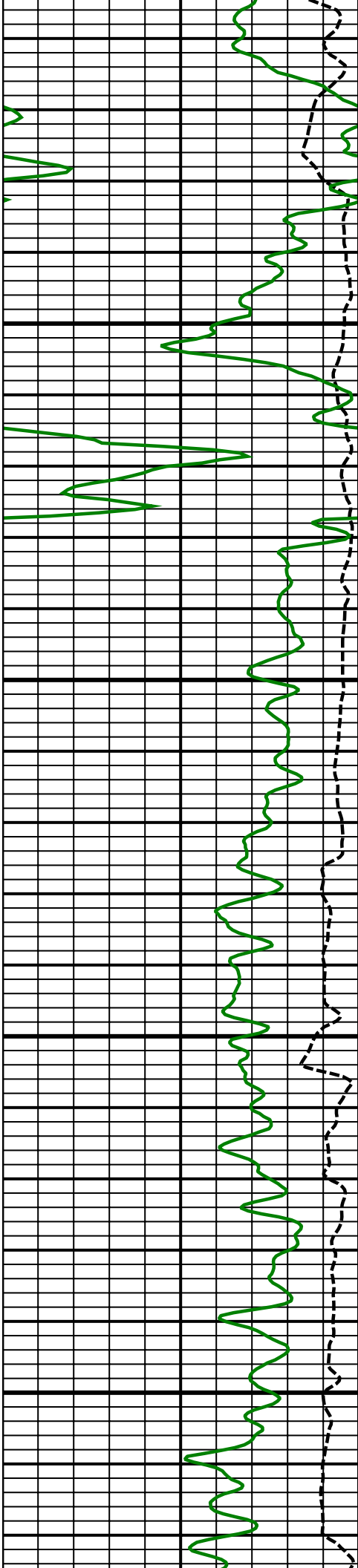
7100
TVD



7200
TVD

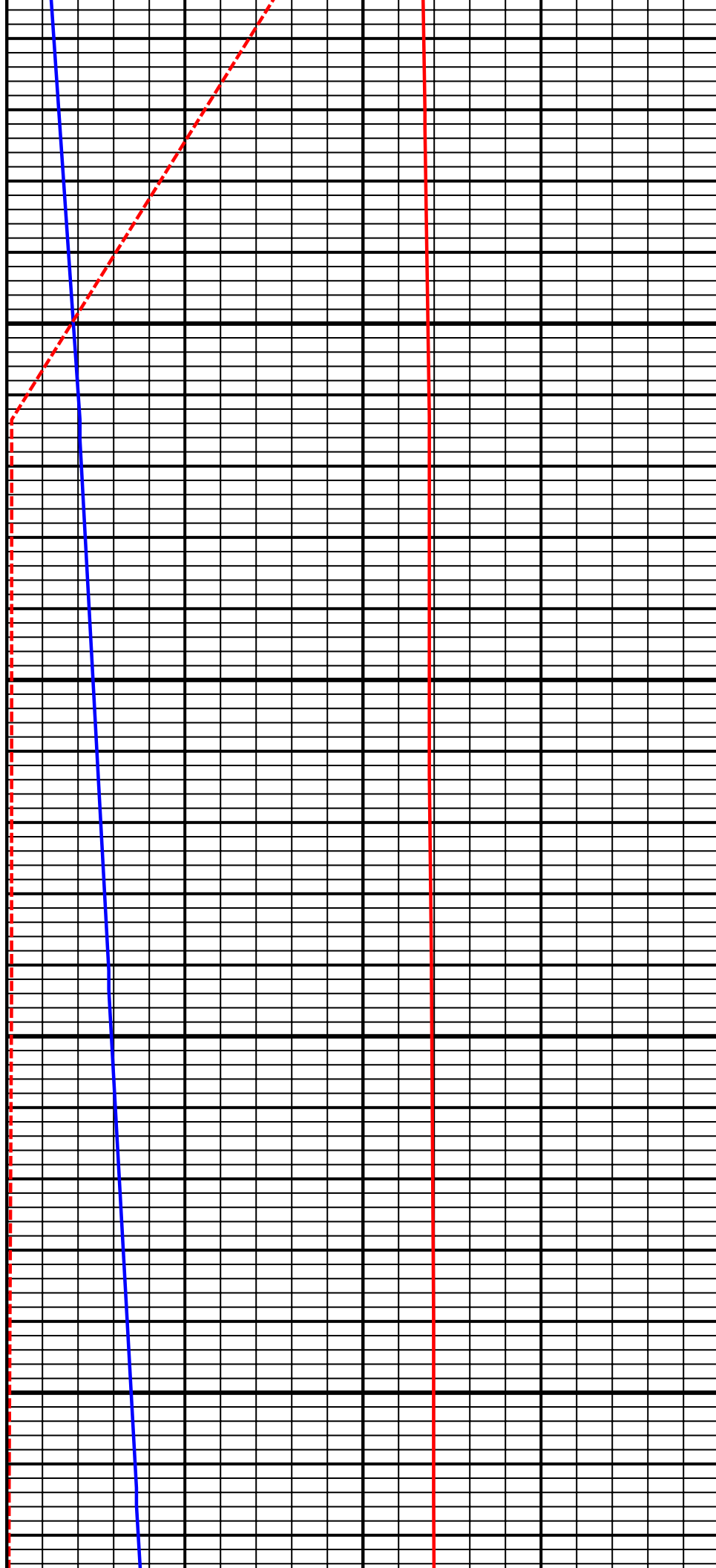
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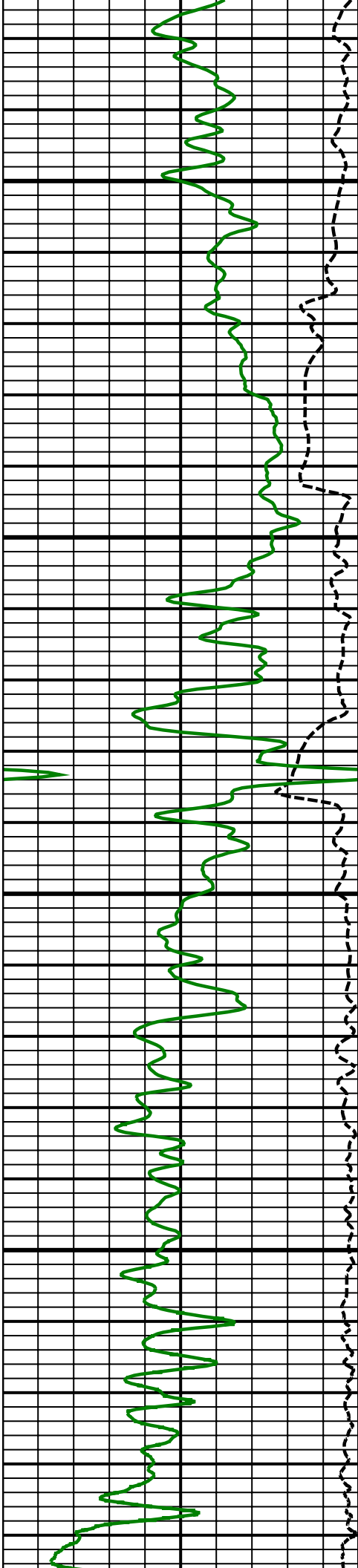




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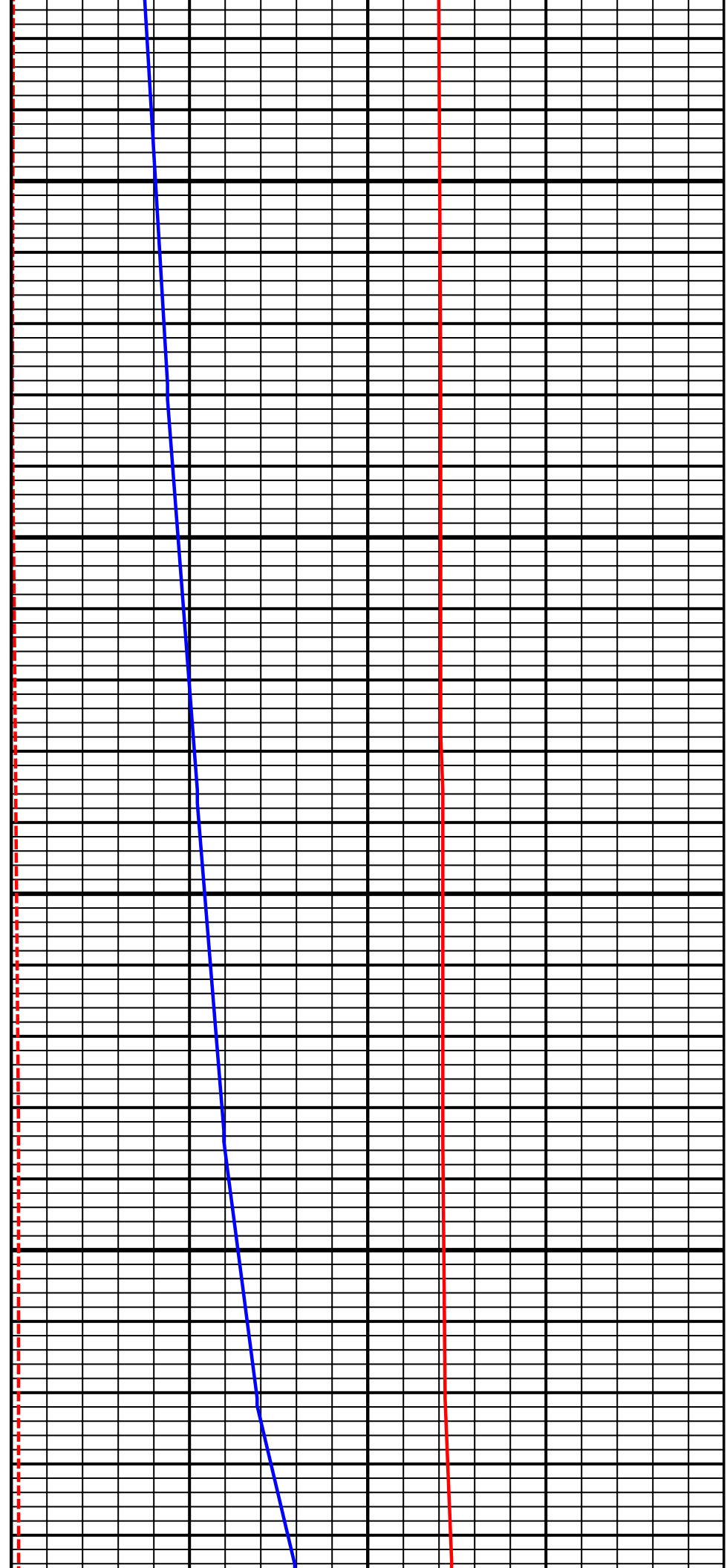
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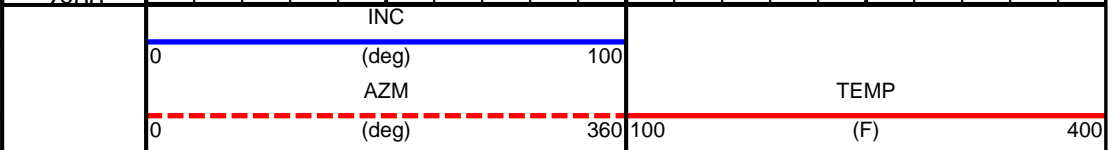
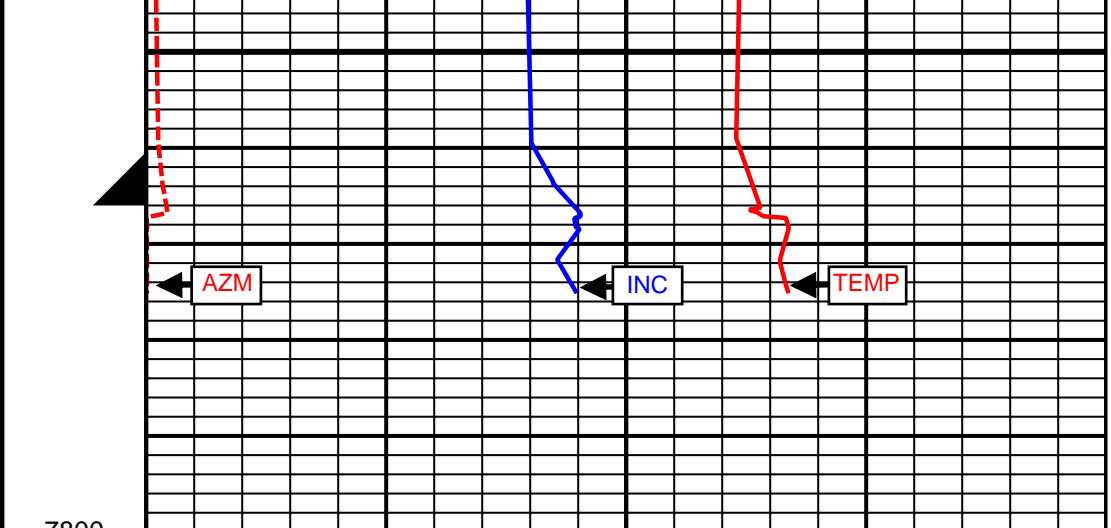
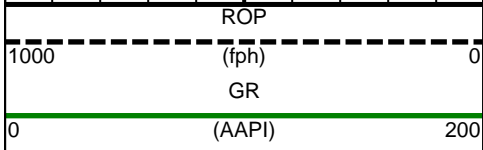
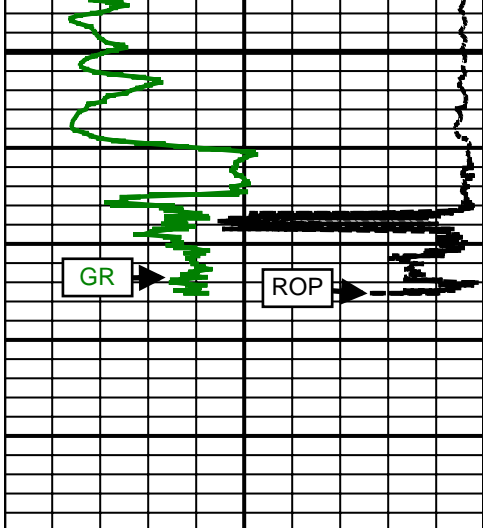




7600
TVD

7700
TVD





| SURVEY | | | | | | |
|---|------------------|----------------------|--------------------|----------------------|------------------|------------------|
| Survey Calculation Method: Minimum Curvature | | | | | | |
| Magnetic Reference | Target Direction | Total Magnetic Field | Magnetic Dip Angle | Magnetic Declination | Grid Convergence | Total Correction |
| True North | 2.93 deg | 52586 nT | 66.63 deg | 8.60 deg | 0.00 deg | 8.60 deg |
| Survey Tie-On | Depth | INC | AZ | TVD | NS | EW |
| | 0.00 ft | 0.00 deg | 0.00 deg | 0.00 ft | 0.00 ft | 0.00 ft |

| Well Head | | | | | | | |
|------------|-----------|-----------|----------|---------|---------|------------|--------------------|
| Depth (ft) | Inc (deg) | Azm (deg) | TVD (ft) | NS (ft) | EW (ft) | VSect (ft) | Dogleg (deg/100ft) |
| 16.00 | 0.00 | 0.00 | 16.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 116.00 | 0.28 | 337.47 | 116.00 | 0.23 | -0.09 | 0.22 | 0.28 |
| 216.00 | 0.29 | 242.29 | 216.00 | 0.33 | -0.41 | 0.31 | 0.42 |
| 316.00 | 0.28 | 167.54 | 316.00 | -0.02 | -0.58 | -0.05 | 0.35 |
| 416.00 | 0.24 | 144.74 | 416.00 | -0.43 | -0.41 | -0.45 | 0.11 |
| 516.00 | 0.28 | 119.57 | 516.00 | -0.72 | -0.08 | -0.73 | 0.12 |
| 616.00 | 0.19 | 79.58 | 615.99 | -0.81 | 0.30 | -0.80 | 0.18 |
| 716.00 | 0.41 | 267.09 | 715.99 | -0.80 | 0.11 | -0.80 | 0.60 |
| 816.00 | 0.33 | 254.87 | 815.99 | -0.90 | -0.53 | -0.92 | 0.11 |
| 916.00 | 0.14 | 166.32 | 915.99 | -1.09 | -0.78 | -1.13 | 0.36 |
| 1016.00 | 0.08 | 90.02 | 1015.99 | -1.21 | -0.68 | -1.24 | 0.14 |
| 1116.00 | 0.19 | 9.27 | 1115.99 | -1.04 | -0.58 | -1.07 | 0.19 |
| 1131.00 | 0.24 | 0.21 | 1130.99 | -0.99 | -0.58 | -1.02 | 0.40 |
| 1271.00 | 0.47 | 289.44 | 1270.99 | -0.50 | -1.12 | -0.56 | 0.32 |
| 1365.00 | 2.13 | 144.79 | 1364.97 | -1.80 | -0.48 | -1.83 | 2.69 |
| 1459.00 | 3.57 | 137.44 | 1458.85 | -5.39 | 2.51 | -5.25 | 1.58 |
| 1553.00 | 4.30 | 140.48 | 1552.63 | -10.26 | 6.73 | -9.90 | 0.81 |
| 1647.00 | 5.66 | 143.39 | 1646.27 | -16.70 | 11.74 | -16.08 | 1.47 |
| 1741.00 | 6.43 | 140.58 | 1739.75 | -24.49 | 17.85 | -23.54 | 0.88 |
| 1835.00 | 8.54 | 141.33 | 1832.94 | -34.00 | 25.55 | -32.65 | 2.25 |
| 1929.00 | 9.32 | 131.86 | 1925.81 | -44.53 | 35.58 | -42.66 | 1.77 |
| 2024.00 | 9.79 | 138.91 | 2019.49 | -55.75 | 46.62 | -53.30 | 1.33 |
| 2115.00 | 10.65 | 140.05 | 2109.05 | -68.03 | 57.10 | -65.02 | 0.97 |
| 2206.00 | 12.05 | 141.38 | 2198.27 | -81.90 | 68.43 | -78.30 | 1.57 |
| 2298.00 | 14.46 | 141.08 | 2287.81 | -98.34 | 81.64 | -94.04 | 2.62 |
| 2389.00 | 15.09 | 140.11 | 2375.80 | -116.27 | 96.38 | -111.19 | 0.74 |
| 2481.00 | 15.39 | 142.79 | 2464.57 | -135.18 | 111.44 | -129.31 | 0.83 |
| 2574.00 | 16.87 | 144.18 | 2553.90 | -155.95 | 126.80 | -149.27 | 1.64 |
| 2665.00 | 18.44 | 140.45 | 2640.62 | -177.76 | 143.70 | -170.18 | 2.13 |
| 2756.00 | 14.42 | 137.63 | 2727.88 | -197.24 | 160.50 | -188.77 | 4.50 |
| 2850.00 | 14.56 | 134.40 | 2818.90 | -214.15 | 176.83 | -204.83 | 0.87 |
| 2942.00 | 13.91 | 135.34 | 2908.07 | -230.11 | 192.87 | -219.95 | 0.75 |
| 3034.00 | 14.40 | 140.29 | 2997.28 | -246.78 | 207.95 | -235.82 | 1.42 |
| 3127.00 | 17.70 | 141.93 | 3086.64 | -266.81 | 224.06 | -255.00 | 3.58 |
| 3218.00 | 16.92 | 143.77 | 3173.52 | -288.38 | 240.42 | -275.71 | 1.05 |
| 3311.00 | 16.16 | 139.98 | 3262.68 | -309.21 | 256.74 | -295.68 | 1.42 |
| 3404.00 | 15.59 | 143.41 | 3352.13 | -329.15 | 272.51 | -314.79 | 1.18 |
| 3497.00 | 15.60 | 142.89 | 3441.71 | -349.16 | 287.51 | -334.01 | 0.15 |
| 3589.00 | 16.37 | 144.67 | 3530.15 | -369.60 | 302.47 | -353.66 | 0.99 |
| 3682.00 | 14.21 | 139.45 | 3619.86 | -388.97 | 317.47 | -372.24 | 2.75 |
| 3774.00 | 14.45 | 141.31 | 3708.99 | -406.51 | 331.99 | -389.01 | 0.56 |
| 3859.00 | 12.90 | 144.02 | 3791.58 | -422.47 | 344.19 | -404.32 | 1.97 |

| | | | | | | | |
|---------|-------|--------|---------|---------|--------|---------|-------|
| 3945.00 | 12.59 | 142.18 | 3875.46 | -437.64 | 355.58 | -418.89 | 0.59 |
| 4029.00 | 10.07 | 142.64 | 3957.82 | -450.71 | 365.65 | -431.43 | 3.00 |
| 4115.00 | 6.52 | 141.41 | 4042.91 | -460.51 | 373.26 | -440.83 | 4.13 |
| 4200.00 | 7.54 | 149.39 | 4127.27 | -469.08 | 379.11 | -449.09 | 1.66 |
| 4285.00 | 7.56 | 145.07 | 4211.53 | -478.46 | 385.15 | -458.15 | 0.67 |
| 4370.00 | 5.51 | 146.77 | 4295.98 | -486.46 | 390.59 | -465.86 | 2.42 |
| 4456.00 | 3.69 | 153.66 | 4381.70 | -492.40 | 394.08 | -471.61 | 2.21 |
| 4541.00 | 2.83 | 167.71 | 4466.56 | -496.90 | 395.74 | -476.02 | 1.37 |
| 4626.00 | 2.74 | 184.29 | 4551.46 | -500.97 | 396.04 | -480.08 | 0.95 |
| 4714.00 | 2.68 | 202.04 | 4639.36 | -504.98 | 395.11 | -484.12 | 0.95 |
| 4799.00 | 2.15 | 193.87 | 4724.29 | -508.37 | 393.98 | -487.57 | 0.74 |
| 4884.00 | 1.78 | 209.12 | 4809.24 | -511.07 | 392.95 | -490.32 | 0.75 |
| 4969.00 | 2.38 | 231.20 | 4894.18 | -513.33 | 390.94 | -492.67 | 1.17 |
| 5226.00 | 1.68 | 230.34 | 5151.02 | -519.08 | 383.88 | -498.78 | 0.27 |
| 5396.00 | 1.15 | 246.15 | 5320.97 | -521.36 | 380.40 | -501.23 | 0.38 |
| 5482.00 | 2.02 | 272.46 | 5406.94 | -521.64 | 378.09 | -501.63 | 1.29 |
| 5652.00 | 0.77 | 233.18 | 5576.88 | -522.20 | 374.19 | -502.39 | 0.89 |
| 5737.00 | 0.98 | 171.13 | 5661.88 | -523.26 | 373.84 | -503.46 | 1.08 |
| 5822.00 | 0.69 | 162.22 | 5746.87 | -524.46 | 374.11 | -504.65 | 0.37 |
| 5908.00 | 0.25 | 148.68 | 5832.86 | -525.12 | 374.37 | -505.29 | 0.52 |
| 6079.00 | 0.30 | 311.77 | 6003.86 | -525.14 | 374.23 | -505.32 | 0.32 |
| 6164.00 | 0.25 | 332.62 | 6088.86 | -524.82 | 373.97 | -505.02 | 0.13 |
| 6249.00 | 0.20 | 333.71 | 6173.86 | -524.53 | 373.82 | -504.73 | 0.06 |
| 6334.00 | 0.22 | 4.49 | 6258.86 | -524.23 | 373.77 | -504.44 | 0.13 |
| 6420.00 | 0.31 | 8.56 | 6344.86 | -523.84 | 373.82 | -504.04 | 0.11 |
| 6505.00 | 0.14 | 356.13 | 6429.86 | -523.51 | 373.84 | -503.71 | 0.21 |
| 6591.00 | 0.14 | 7.75 | 6515.86 | -523.30 | 373.85 | -503.50 | 0.03 |
| 6676.00 | 0.42 | 27.27 | 6600.86 | -522.92 | 374.01 | -503.12 | 0.34 |
| 6761.00 | 0.45 | 354.06 | 6685.86 | -522.31 | 374.12 | -502.50 | 0.29 |
| 6847.00 | 1.19 | 282.13 | 6771.85 | -521.78 | 373.21 | -502.02 | 1.32 |
| 7017.00 | 2.83 | 248.43 | 6941.74 | -522.96 | 367.58 | -503.48 | 1.15 |
| 7103.00 | 2.77 | 243.88 | 7027.64 | -524.65 | 363.74 | -505.37 | 0.27 |
| 7188.00 | 2.16 | 242.75 | 7112.56 | -526.29 | 360.47 | -507.18 | 0.72 |
| 7274.00 | 2.91 | 344.40 | 7198.51 | -524.93 | 358.44 | -505.92 | 4.60 |
| 7359.00 | 9.69 | 359.55 | 7282.95 | -515.69 | 357.81 | -496.72 | 8.14 |
| 7444.00 | 20.52 | 4.90 | 7364.90 | -493.62 | 359.03 | -474.62 | 12.83 |
| 7529.00 | 28.63 | 4.77 | 7442.13 | -458.43 | 362.00 | -439.32 | 9.54 |
| 7615.00 | 36.40 | 2.19 | 7514.60 | -412.32 | 364.69 | -393.14 | 9.18 |
| 7700.00 | 43.82 | 0.92 | 7579.56 | -357.62 | 366.13 | -338.44 | 8.78 |
| 7785.00 | 52.20 | 4.48 | 7636.39 | -294.60 | 369.23 | -275.34 | 10.34 |
| 7870.00 | 59.62 | 7.22 | 7684.00 | -224.64 | 376.47 | -205.10 | 9.13 |
| 7956.00 | 68.96 | 7.24 | 7721.27 | -147.85 | 386.21 | -127.92 | 10.86 |
| 8041.00 | 79.51 | 7.33 | 7744.33 | -66.82 | 396.57 | -46.47 | 12.41 |
| 8126.00 | 80.23 | 9.00 | 7759.28 | 16.00 | 408.46 | 36.86 | 2.11 |
| 8159.00 | 84.74 | 12.11 | 7763.60 | 48.15 | 414.45 | 69.27 | 16.55 |
| 8234.00 | 90.43 | 15.99 | 7766.76 | 120.80 | 432.64 | 142.75 | 9.18 |
| 8287.00 | 91.42 | 14.70 | 7765.90 | 171.90 | 446.66 | 194.50 | 3.07 |
| 8353.00 | 90.86 | 12.11 | 7764.59 | 236.08 | 461.96 | 259.39 | 4.01 |
| 8424.00 | 90.19 | 10.52 | 7763.94 | 305.70 | 475.89 | 329.62 | 2.43 |
| 8538.00 | 89.07 | 7.91 | 7764.67 | 418.21 | 494.14 | 442.92 | 2.49 |
| 8631.00 | 88.71 | 5.14 | 7766.48 | 510.58 | 504.71 | 535.71 | 3.00 |
| 8724.00 | 90.49 | 4.06 | 7767.13 | 603.27 | 512.16 | 628.67 | 2.24 |
| 8815.00 | 90.37 | 4.02 | 7766.44 | 694.05 | 518.57 | 719.65 | 0.14 |
| 8908.00 | 90.93 | 2.48 | 7765.39 | 786.89 | 523.85 | 812.64 | 1.76 |
| 9001.00 | 90.99 | 2.06 | 7763.83 | 879.80 | 527.53 | 905.62 | 0.46 |
| 9094.00 | 90.99 | 1.36 | 7762.22 | 972.75 | 530.30 | 998.58 | 0.75 |
| 9186.00 | 88.95 | 359.47 | 7762.27 | 1064.73 | 530.97 | 1090.48 | 3.02 |
| 9279.00 | 87.96 | 357.99 | 7764.78 | 1157.67 | 528.91 | 1183.20 | 1.91 |
| 9371.00 | 89.38 | 359.26 | 7766.91 | 1249.62 | 526.70 | 1274.91 | 2.07 |
| 9456.00 | 90.56 | 1.30 | 7766.96 | 1334.61 | 527.12 | 1359.81 | 2.77 |
| 9541.00 | 89.88 | 359.97 | 7766.63 | 1419.60 | 528.06 | 1444.74 | 1.76 |

| | | | | | | | |
|----------|-------|------|---------|---------|--------|---------|------|
| 9627.00 | 89.20 | 0.32 | 7767.32 | 1505.60 | 528.28 | 1530.63 | 0.89 |
| 9712.00 | 89.51 | 0.66 | 7768.28 | 1590.59 | 529.01 | 1615.55 | 0.54 |
| 9797.00 | 90.31 | 0.31 | 7768.41 | 1675.59 | 529.73 | 1700.47 | 1.03 |
| 9883.00 | 89.81 | 0.93 | 7768.32 | 1761.58 | 530.66 | 1786.40 | 0.93 |
| 9968.00 | 85.68 | 0.59 | 7771.67 | 1846.49 | 531.78 | 1871.26 | 4.88 |
| 10054.00 | 89.69 | 0.58 | 7775.14 | 1932.40 | 532.66 | 1957.10 | 4.66 |
| 10139.00 | 91.30 | 1.48 | 7774.41 | 2017.38 | 534.19 | 2042.04 | 2.17 |
| 10225.00 | 92.47 | 2.84 | 7771.58 | 2103.26 | 537.43 | 2127.99 | 2.09 |
| 10310.00 | 92.65 | 3.39 | 7767.78 | 2188.05 | 542.04 | 2212.90 | 0.68 |
| 10396.00 | 87.22 | 2.00 | 7767.88 | 2273.92 | 546.08 | 2298.87 | 6.52 |
| 10481.00 | 92.22 | 2.59 | 7768.29 | 2358.83 | 549.49 | 2383.83 | 5.92 |
| 10566.00 | 88.58 | 1.67 | 7767.70 | 2443.75 | 552.64 | 2468.81 | 4.42 |
| 10651.00 | 90.99 | 1.68 | 7768.02 | 2528.71 | 555.13 | 2553.78 | 2.84 |
| 10708.00 | 93.33 | 2.03 | 7765.87 | 2585.63 | 556.97 | 2610.72 | 4.15 |
| 10824.00 | 92.10 | 1.36 | 7760.38 | 2701.45 | 560.40 | 2726.56 | 1.21 |
| 10909.00 | 91.73 | 1.41 | 7757.54 | 2786.38 | 562.45 | 2811.49 | 0.44 |
| 10995.00 | 91.36 | 1.97 | 7755.22 | 2872.31 | 564.99 | 2897.43 | 0.78 |
| 11080.00 | 91.48 | 3.22 | 7753.11 | 2957.19 | 568.84 | 2982.40 | 1.48 |
| 11165.00 | 90.56 | 3.10 | 7751.60 | 3042.05 | 573.52 | 3067.39 | 1.09 |
| 11251.00 | 89.08 | 4.43 | 7751.87 | 3127.86 | 579.17 | 3153.38 | 2.31 |
| 11336.00 | 88.21 | 4.37 | 7753.88 | 3212.59 | 585.69 | 3238.32 | 1.03 |
| 11421.00 | 89.94 | 3.74 | 7755.25 | 3297.36 | 591.70 | 3323.29 | 2.17 |
| 11506.00 | 90.56 | 2.28 | 7754.88 | 3382.24 | 596.16 | 3408.29 | 1.87 |
| 11592.00 | 91.60 | 2.49 | 7753.26 | 3468.15 | 599.74 | 3494.27 | 1.23 |
| 11677.00 | 90.44 | 1.55 | 7751.74 | 3553.08 | 602.73 | 3579.24 | 1.76 |
| 11762.00 | 89.12 | 0.31 | 7752.07 | 3638.06 | 604.11 | 3664.19 | 2.13 |
| 11848.00 | 89.94 | 0.77 | 7752.78 | 3724.05 | 604.92 | 3750.11 | 1.09 |
| 11933.00 | 90.43 | 1.87 | 7752.50 | 3809.03 | 606.88 | 3835.07 | 1.42 |
| 12018.00 | 89.69 | 2.74 | 7752.41 | 3893.96 | 610.30 | 3920.07 | 1.34 |
| 12103.00 | 90.49 | 3.55 | 7752.28 | 3978.83 | 614.96 | 4005.06 | 1.34 |
| 12189.00 | 90.43 | 3.00 | 7751.59 | 4064.69 | 619.87 | 4091.06 | 0.64 |
| 12274.00 | 91.11 | 3.35 | 7750.45 | 4149.55 | 624.58 | 4176.05 | 0.90 |
| 12359.00 | 91.36 | 3.75 | 7748.61 | 4234.36 | 629.84 | 4261.02 | 0.55 |
| 12445.00 | 90.56 | 3.66 | 7747.17 | 4320.17 | 635.40 | 4347.00 | 0.94 |
| 12530.00 | 91.48 | 3.34 | 7745.66 | 4405.00 | 640.59 | 4431.98 | 1.15 |
| 12615.00 | 90.93 | 4.08 | 7743.87 | 4489.80 | 646.09 | 4516.96 | 1.08 |
| 12701.00 | 89.88 | 4.45 | 7743.27 | 4575.56 | 652.48 | 4602.93 | 1.29 |
| 12786.00 | 91.11 | 3.45 | 7742.53 | 4660.35 | 658.34 | 4687.91 | 1.86 |
| 12872.00 | 90.99 | 3.24 | 7740.95 | 4746.19 | 663.36 | 4773.89 | 0.28 |
| 12957.00 | 91.05 | 4.11 | 7739.44 | 4831.00 | 668.80 | 4858.87 | 1.03 |
| 13042.00 | 90.18 | 4.02 | 7738.53 | 4915.78 | 674.83 | 4943.85 | 1.03 |
| 13127.00 | 89.88 | 4.48 | 7738.48 | 5000.55 | 681.13 | 5028.83 | 0.65 |
| 13298.00 | 89.94 | 3.34 | 7738.75 | 5171.15 | 692.79 | 5199.80 | 0.67 |
| 13384.00 | 90.49 | 2.13 | 7738.43 | 5257.05 | 696.89 | 5285.80 | 1.55 |
| 13469.00 | 92.84 | 2.35 | 7735.96 | 5341.94 | 700.21 | 5370.75 | 2.78 |
| 13554.00 | 92.22 | 2.37 | 7732.21 | 5426.78 | 703.71 | 5455.66 | 0.73 |
| 13639.00 | 92.53 | 3.07 | 7728.69 | 5511.62 | 707.74 | 5540.59 | 0.90 |
| 13725.00 | 91.17 | 2.14 | 7725.91 | 5597.48 | 711.64 | 5626.54 | 1.92 |
| 13810.00 | 90.06 | 2.13 | 7725.00 | 5682.41 | 714.81 | 5711.52 | 1.31 |
| 13895.00 | 88.89 | 1.92 | 7725.78 | 5767.36 | 717.81 | 5796.51 | 1.40 |
| 13981.00 | 89.32 | 3.02 | 7727.12 | 5853.26 | 721.52 | 5882.49 | 1.37 |
| 14066.00 | 89.88 | 2.08 | 7727.71 | 5938.18 | 725.30 | 5967.49 | 1.29 |
| 14151.00 | 90.80 | 1.59 | 7727.21 | 6023.13 | 728.02 | 6052.47 | 1.23 |
| 14237.00 | 91.48 | 2.67 | 7725.50 | 6109.05 | 731.22 | 6138.44 | 1.48 |
| 14322.00 | 92.34 | 3.17 | 7722.67 | 6193.89 | 735.55 | 6223.39 | 1.17 |
| 14407.00 | 92.84 | 4.23 | 7718.82 | 6278.63 | 741.03 | 6308.30 | 1.38 |
| 14493.00 | 92.22 | 4.35 | 7715.03 | 6364.30 | 747.45 | 6394.19 | 0.73 |
| 14578.00 | 91.61 | 4.27 | 7712.19 | 6449.01 | 753.84 | 6479.12 | 0.72 |
| 14663.00 | 90.92 | 4.43 | 7710.31 | 6533.75 | 760.28 | 6564.07 | 0.83 |
| 14749.00 | 92.16 | 4.33 | 7708.00 | 6619.46 | 766.85 | 6650.01 | 1.45 |
| 14923.00 | 90.31 | 3.68 | 7704.25 | 6792.99 | 779.00 | 6823.93 | 1.13 |

Projected to Total Depth:

14975.00

90.31

3.68

7703.97

6844.88

782.33

6879.93

0.00

Weatherford Surveys from 1271 ft MD to 14923 ft MD.

TD @ 14975 ft MD.

The total correction is 8.60 deg relative to True North.



Weatherford®

Final Print

| | | | |
|---------|---------------------------------|--------|-------------|
| COMPANY | <u>Anadarko Petroleum Corp.</u> | | |
| WELL | <u>Howard 24C-22HZ</u> | | |
| FIELD | <u>Wattenberg</u> | | |
| RIG | <u>Xtreme 23</u> | | |
| LOC. | <u>Colorado</u> | COUNTY | <u>Weld</u> |