



**Weatherford®**

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

Company: Anadarko  
Well: Farley 29C-23HZ  
Field: Wattenberg  
Rig: XTREME 23  
County: Weld

COMPANY Anadarko  
WELL Farley 29C-23HZ  
FIELD Wattenberg  
RIG XTREME 23  
COUNTY Weld STATE Colorado  
API # 05-123-36315

Location	
Latitude: 40.20493° N	x = 3,208,978 ft
Longitude: 104.75180° W	y = 1,318,380 ft
Other Services: Spectral Azimuthal Gamma Ray, Directional, and Temperature	

Mag Decl: 8.59°
Mag Dip: 66.81°

Permanent Datum: <u>Mean Sea Level</u>	
Log Measured From: <u>Drill Floor</u>	Elev: <u>4955 ft</u> above perm. datum
Depth Reference: <u>Drillers Tally</u>	Total Depth: <u>11620 ft</u>
Depth Logged: 6852 ft	to 11620 ft
Runs: 5	
Date Logged: 23-Jul-13	to 28-Jul-13
Spud Date: 21-Jul-13	

Elevation	
K.B. Top Drive	
G.L. 4939.0 ft	
D.F. 4955.0 ft	
W.D. Land	

Borehole Record			Casing Record		
Hole Size	From	To	Size	Weight	From To
8.750 in.	1072 ft	7775 ft	7.000 in.	26.0 lb/ft	Surface 7767 ft
6.125 in.	7775 ft	11620 ft			

Borehole Deviation Record			Mud Record		
Hole Size	Min. Inc.	Max. Inc.	Type	Weight	From To
8.750 in.	0.21°	82.78°	WBM	8.50 - 10.20 ppg	6897 ft 7775 ft
6.125 in.	86.79°	93.79°	WBM	10.00- 10.10 ppq	7775 ft 11620 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	
Bit Size	in.	8.750	8.750	8.750	6.125	6.125	
Bit Type		PDC	PDC	PDC	PDC	PDC	
Bit TFA	sq.in.	0.892	0.892	1.534	1.855	1.243	
Bit Start Depth	ft	953	1888	7496	7775	10910	
Bit End Depth	ft	1888	7496	7775	10910	11620	
Top Log Interval	ft	na	6852	7496	7721	10870	
Bottom Log Interval	ft	na	7496	7775	10910	11620	
Begin Log Time	hrs	na	4:16	14:03	16:35	9:41	
Begin Log Date	DD-MMM-YY	na	23-Jul-13	24-Jul-13	26-Jul-13	28-Jul-13	
End Log Time	hrs	na	1:25	5:15	13:46	18:28	
End Log Date	DD-MMM-YY	na	24-Jul-13	25-Jul-13	28-Jul-13	28-Jul-13	
Drill or Wipe		Drill	Drill	Drill	Drill	Drill	
Flow Rate	gal/min	595	595	595	278	278	
Max AV / CV @ MWD	ft/min	470 / 100	470 / 90	454 / 385	492 / 395	455 / 405	
Min Inc @ Depth	deg @ ft	0.21 @ 1163	0.22 @ 6865	55.42 @ 7464	86.79 @ 10256	88.09 @ 11280	
Max Inc @ Depth	deg @ ft	13.20 @ 1888	46.07 @ 7378	82.78 @ 7715	93.70 @ 10854	93.79 @ 10939	
MUD DATA							
Depth	ft	1888	7496	7775	10910	11620	
Fluid Type		WBM	WBM	WBM	WBM	WBM	
Mud Weight	ppg	8.50	10.20	10.20	10.10	10.10	
Plastic Viscosity	cP	1	13	16	14	13	
Solids / Sand	%	0.7 / 0.25	7.7 / 0.25	8.7 / 0.25	8.7 / 0.30	8.2 / 0.30	
NaCl Equiv. Chlorides	ppm	1200	1500	1500	1500	1500	
pH		8.7	9.4	9.3	9.3	9.2	
Oil:Water Ratio	% Vol	0.0 : 100.0	0.0 : 100.0	0.0 : 100.0	0.0 : 100.0	0.0 : 100.0	
Rm @ Temperature	ohm-m @ deg F	na	na	na	1.10 @ 75	1.10 @ 75	
Rmc @ Temperature	ohm-m @ deg F	na	na	na	1.50 @ 68	1.50 @ 68	
Rmf @ Temperature	ohm-m @ deg F	na	na	na	1.00 @ 68	1.00 @ 68	
KCl	% Vol	0	0	0	0	0	
Client Representative		J. Tettleton	J. Tettleton	J. Tettleton	J. Tettleton	J. Tettleton	
WeatherfordLWD Engineer		D. Palmer	D. Palmer	J. Jackson	C. Clay	C. Clay	

## EQUIPMENT SUMMARY

M/LWD Run Number	1	2	3	4	5
BTR / CDS Serial Number	44702 / 44736	44708 / 44742	44708 / 44742	na	na
Battery Serial Number	403715874	403715891	403715891	na	na
Gamma Ray Serial Number	3138	51262	51262	na	na
CMS Serial Number	1949	51376	51376	na	na
Pulser Serial Number	47668	45614	45614	na	na
HEL Serial Number	na	na	na	NW131862PDB4.75	NW131792PDB4.75
MFR Serial Number	na	na	na	NW131788RBBKV4.75	NW131788RBBKV4.75
IDS Serial Number	na	na	na	NW131790JB4.75	NW131790JB4.75
SAGR Serial Number	na	na	na	NW131806BI4.75	NW131806BI4.75

### Sensor to Bit Offsets / Acquisition Rates

Directional	ft / sec	37.86 / RT	37.86 / RT	41.01/ RT	54.12 / RT	54.09 / RT
Gamma Ray	ft / sec	41.51 / 10	41.51 / 10	44.86 / 10	39.60 / 5	39.57 / 5
Resistivity	ft / sec	na	na	na	75.31 / 5	75.28 / 5

### Other Information

Total BHA Length	ft	111.59	111.59	114.74	106.56	106.58
BHA Assembly Type		Steerable	Steerable	Steerable	Steerable	Steerable
Stabilizer Location	ft	na	na	na	29.44	29.41
Run Circulating Time	hr	5.46	38.22	19.49	44.91	12.98
Run Drilling Time	hr	2.10	22.76	10.84	23.09	4.85

## MUD SUMMARY

Date and Time	Run	Bit Depth	Mud Weight	% K	Rm @ Temp	Rmf @ Temp	Rmc @ Temp	BHCT
22 Jul 13 @ 20:00	01	1888 ft	8.50 ppg	0	na	na	na	na
24 Jul 13 @ 20:00	02	7496 ft	10.20 ppg	0	na	na	na	179 F
25 Jul 13 @ 20:00	03	7775 ft	10.20 ppg	0	na	na	na	179 F
28 Jul 13 @ 20:00	04	11910 ft	10.10 ppg	0	1.10 ohm-m @ 75	1.00 ohm-m @ 68	1.50 ohm-m @ 68	235 F
28 Jul 13 @ 20:00	05	11620 ft	10.10 ppg	0	1.10 ohm-m @ 75	1.00 ohm-m @ 68	1.50 ohm-m @ 68	252 F

M/LWD RUN REMARKS			
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:	Hole size, Mud weight, Collar O.D., Collar I.D., and K1 factor.
Mud Weight:	8.50 ppg	Collar O.D.:	6.750 in.
Borehole Temperature:	179° F	Collar I.D.:	3.250 in.
K1 Factor:	3.180		
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:	Hole size, Mud weight, Collar O.D., Collar I.D., and K1 factor.
Mud Weight:	10.20 ppg	Collar O.D.:	6.750 in.
Borehole Temperature:	179° F	Collar I.D.:	3.250 in.
K1 Factor:	3.180		
Run Number: 4 :: RECORDED DATA LOG			
WFT Services Provided:			
Recorded and Real Time Logging: Spectral Gamma Ray, Resistivity, 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:	10.10 ppg	Resistivities:	Corrected for borehole temperature, hole size, drilling fluid resistivity
Borehole Temperature:	235° F		and dielectric correction.
Drilling Fluid Resistivity:	0.375 ohm-m		
KCl Concentration:	0%		
Run Number: 5 :: RECORDED DATA LOG			
WFT Services Provided:			
Recorded and Real Time Logging: Spectral Gamma Ray, Resistivity, 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:	10.10 ppg	Resistivities:	Corrected for borehole temperature, hole size, drilling fluid resistivity
Borehole Temperature:	252° F		and dielectric correction.
Drilling Fluid Resistivity:	0.356 ohm-m		
KCl Concentration:	0%		

M/LWD LOG COMMENTS	
Comment No. 1-1	No logging occurred during this run.
Comment No. 2-1	RECORDED DATA LOG Start of MWD Drilling Run 02 Weatherford International provided 6 3/4 in. Directional, Gamma Ray, and Temperature for Run 02. Run 02 started formation logging July 23, 2013 at 04:16 at 6896 MD / 6798 TVD. Weatherford International logged the 8.750 in. borehole. The WBM at the start of drilling was 8.45 ppg.
Comment No. 2-2	End of LWD Drilling Run 02 Run 02 ended drilling formation July 24, 2013 at 01:25 at 7496 MD / 7308 TVD. The WBM at the end of drilling was 10.20 ppg.
Comment No. 3-1	RECORDED DATA LOG Start of MWD Drilling Run 03 Weatherford International provided 6 3/4 in. Directional, Gamma Ray, and Temperature for Run 03. Run 03 started formation drilling July 24, 2013 at 14:03 at 7496 MD / 7308 TVD. Weatherford International logged the 8.750 in. borehole. The WBM at the start of drilling was 10.20 ppg.
Comment No. 3-2	End of MWD Drilling Run 03 Run 03 ended drilling formation July 25, 2013 at 05:15 at 7775 MD / 7386 TVD. The WBM at the end of drilling was 10.20 ppg.
Comment No. 4-1	RECORDED DATA LOG Start of LWD Drilling Run 03 Weatherford International provided 4 3/4 in. Directional, Resistivity, Spectral Azimuthal Gamma Ray, and Temperature for Run 04. Run 04 started formation drilling July 26, 2013 at 16:35 at 7775 MD / 7386 TVD. Weatherford International logged the 6.125 in. borehole. The WBM at the start of drilling was 10.00 ppg.
Comment No. 4-2	Short Trip #1 Start of short trip July 28, 2013 at 06:25 at 10568 MD / 7393 TVD. End of short trip July 28, 2013 at 07:30.
Comment No. 4-3	End of LWD Drilling Run 04 Run 04 ended drilling formation July 28, 2013 at 13:46 at 10910 MD / 7377 TVD. The WBM at the end of drilling was 10.10 ppg.

**Comment No. 5-1**

RECORDED DATA LOG

Start of LWD Drilling Run 05

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

Run 05 started formation drilling July 29, 2013 at 09:41 at 10910 MD / 7377 TVD. Weatherford International logged the 6.125 in. borehole.

The WBM at the start of drilling was 10.00 ppg.

**Comment No. 5-2**

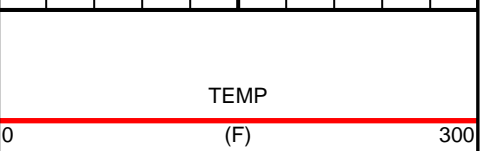
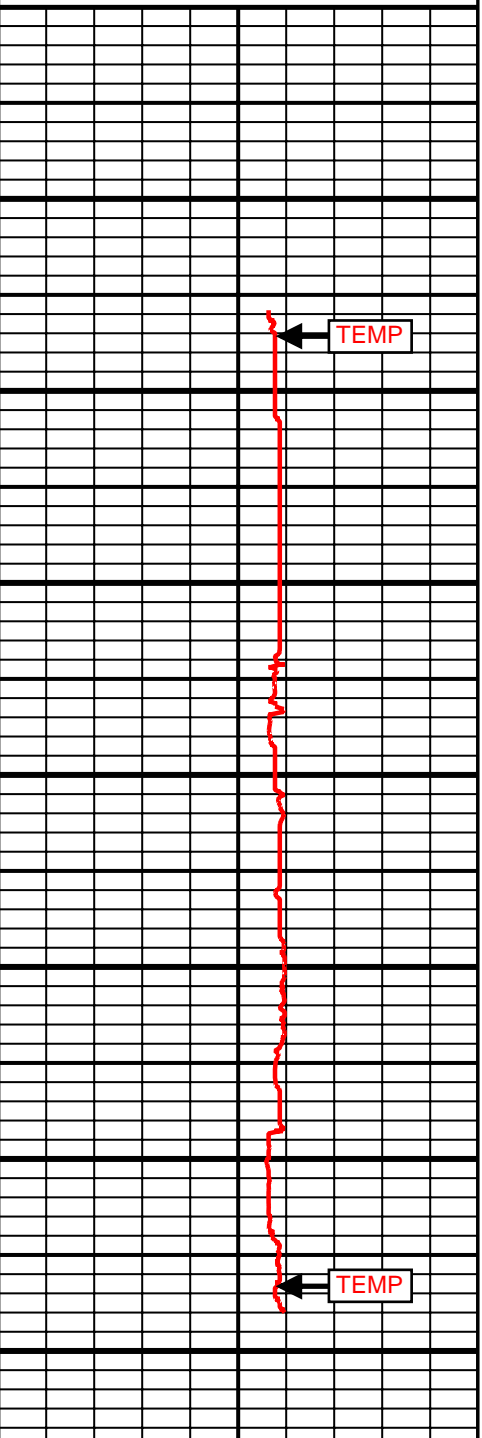
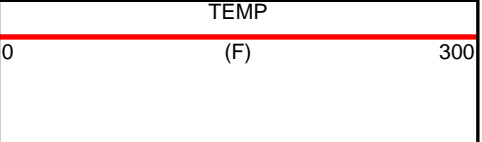
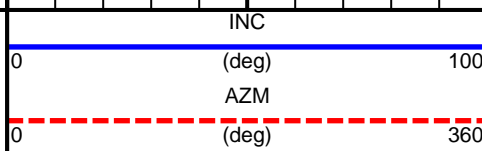
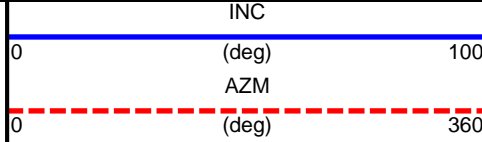
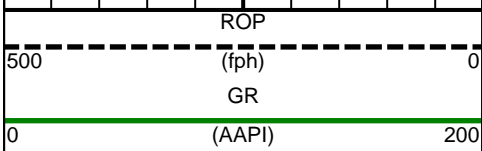
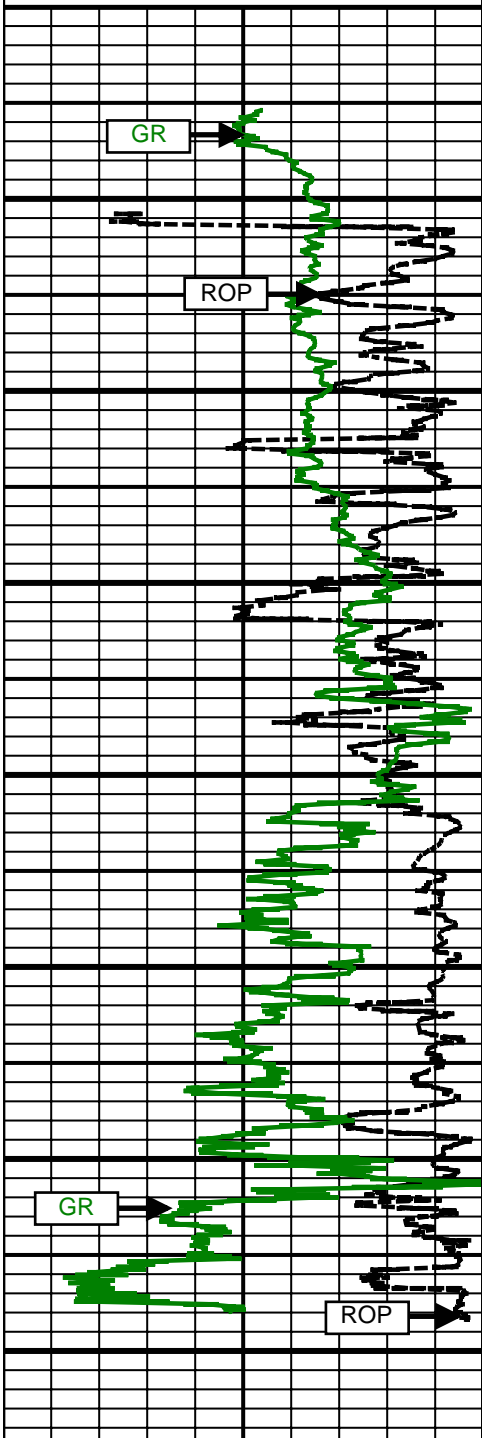
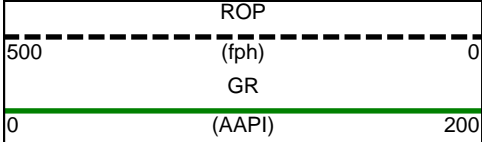
End of LWD Drilling Run 05

Run 05 ended drilling formation July 28, 2013 at 18:28 at 11620 MD / 7370 TVD.

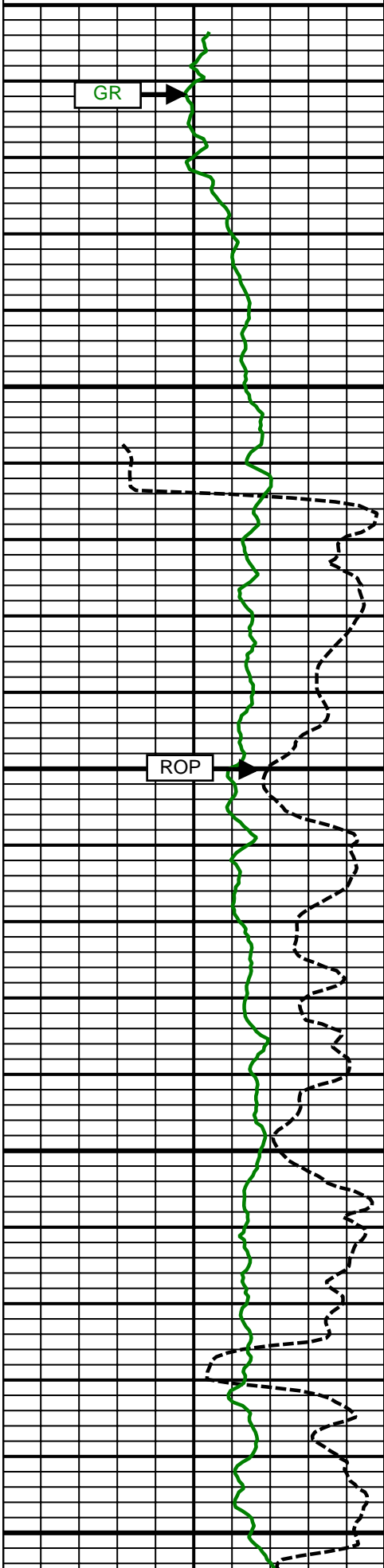
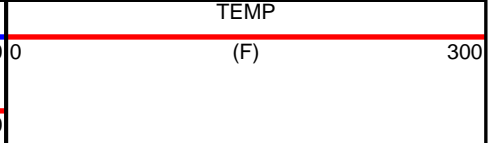
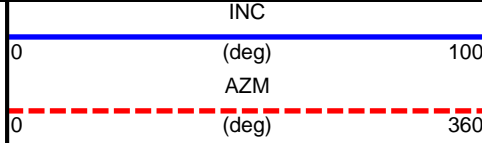
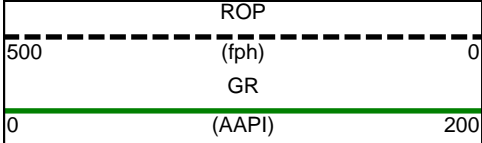
The WBM at the end of drilling was 10.10 ppg.

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**

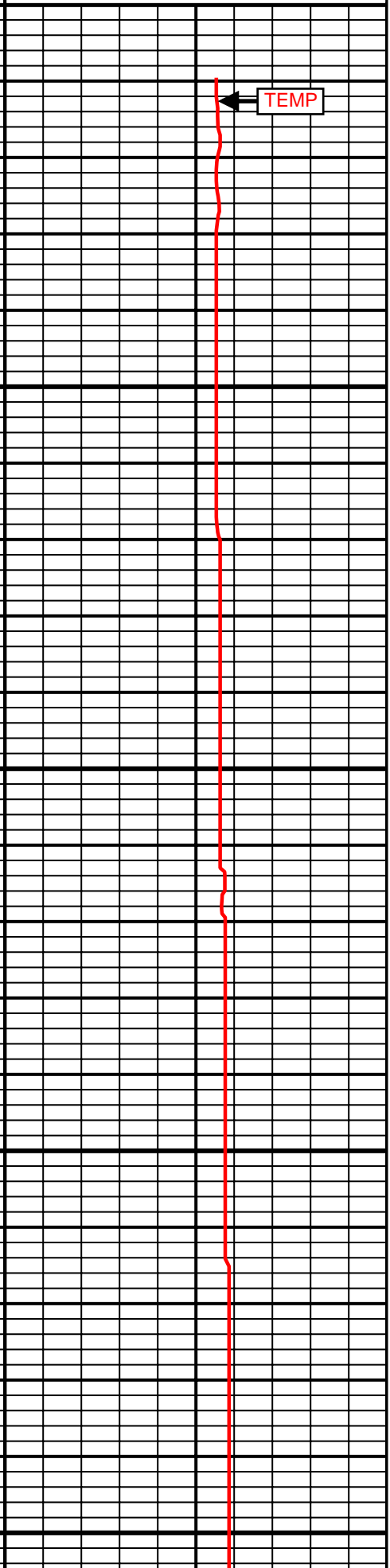
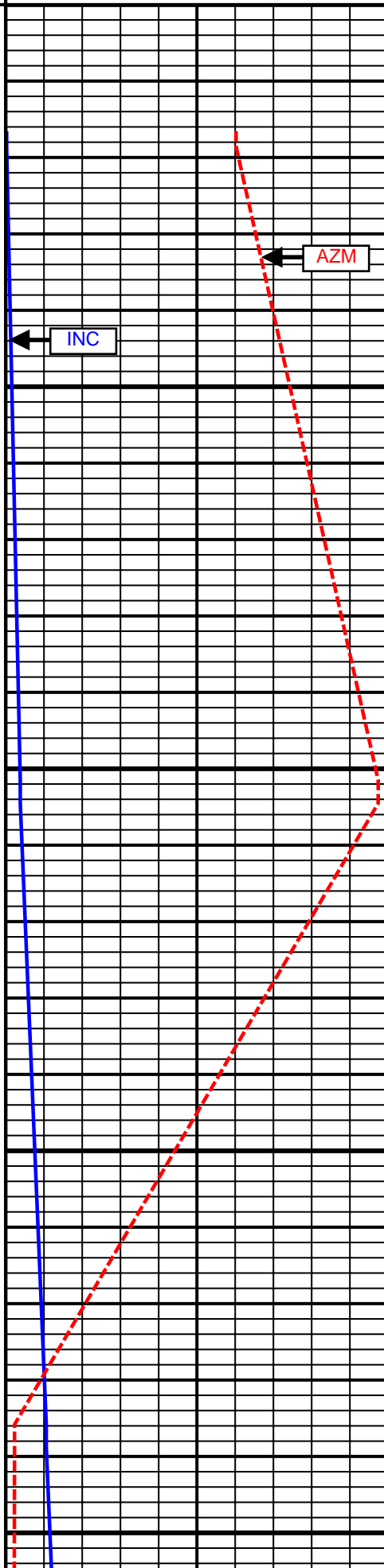


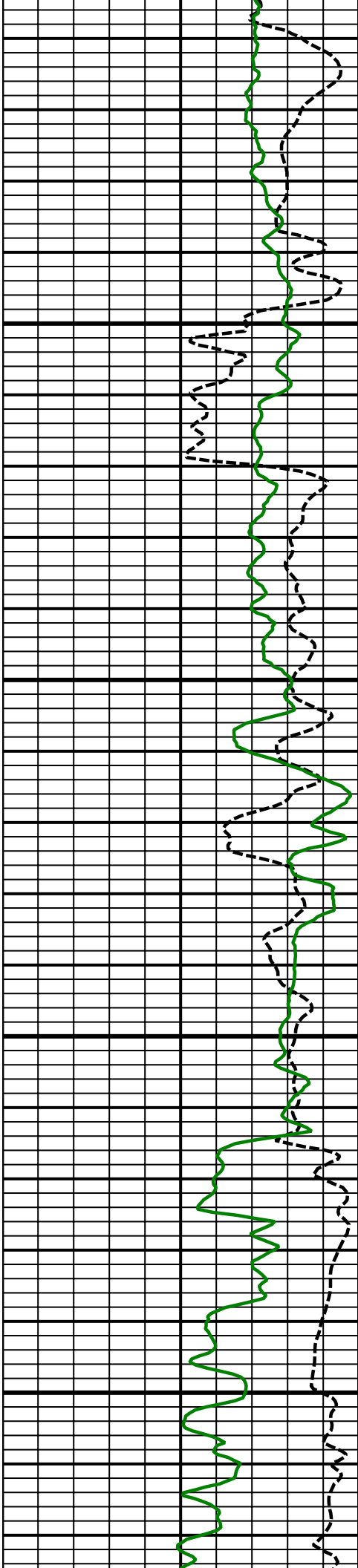
**5 Inch - True Vertical Depth**



6800  
TVD

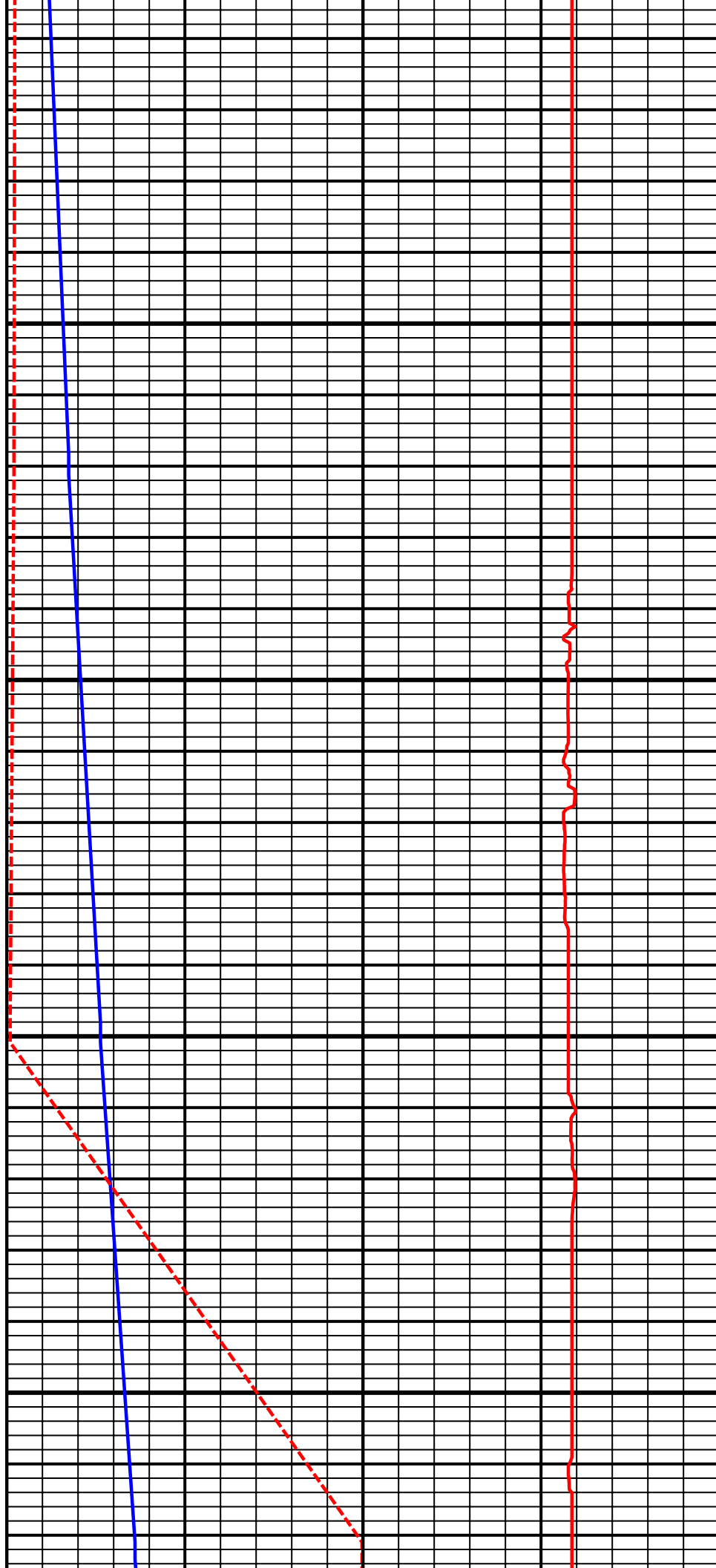
6900  
TVD

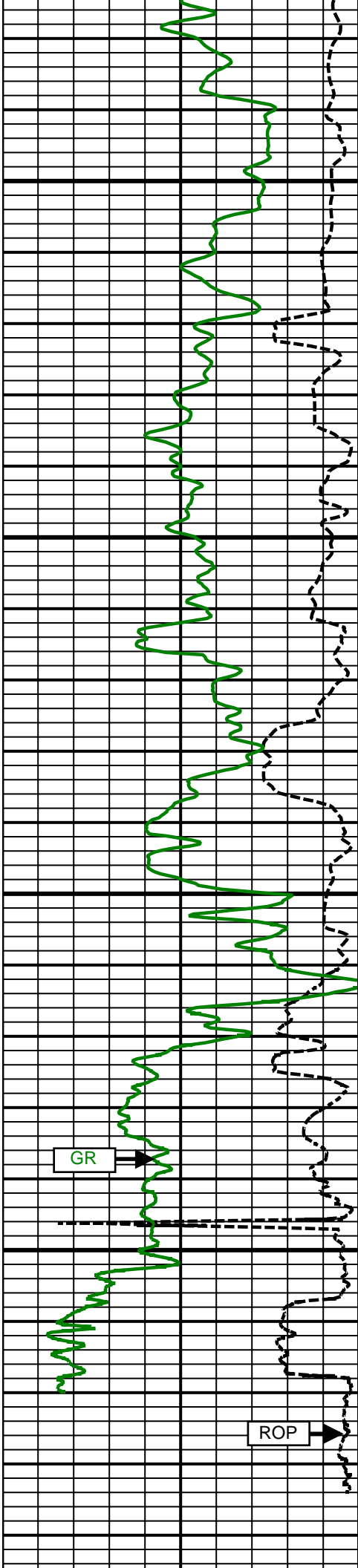




7000  
TVD

7100  
TVD

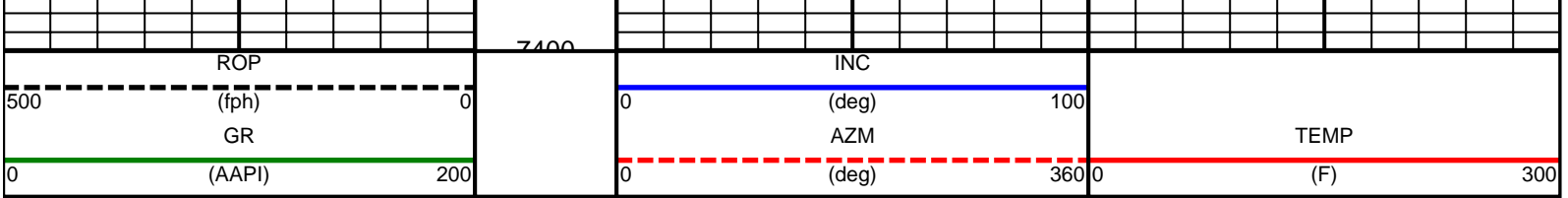




7200  
TVD

7300  
TVD





SURVEY						
Survey Calculation Method: <b>Minimum Curvature</b>						
Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
<b>True North</b>	<b>359.94 deg</b>	<b>52741 nT</b>	<b>66.81 deg</b>	<b>8.59 deg</b>	<b>0.00 deg</b>	<b>8.59 deg</b>
<b>Survey Tie-On</b>	Depth	INC	AZ	TVD	NS	EW
	<b>953.00 ft</b>	<b>1.10 deg</b>	<b>9.30 deg</b>	<b>952.94 ft</b>	<b>7.47 ft</b>	<b>-1.51 ft</b>

Well Head							
Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	NS (ft)	EW (ft)	VSect (ft)	Dogleg (deg/100ft)
1072.00	1.53	39.03	1071.91	9.83	-0.32	9.83	0.67
1163.00	0.21	209.94	1162.90	10.63	0.36	10.63	1.91
1253.00	1.68	142.97	1252.89	9.43	1.07	9.43	1.79
1343.00	3.68	129.52	1342.78	6.54	4.09	6.54	2.31
1435.00	5.99	135.34	1434.45	1.25	9.74	1.24	2.56
1527.00	6.67	142.21	1525.89	-6.39	16.39	-6.41	1.11
1617.00	8.17	142.86	1615.13	-15.62	23.46	-15.64	1.67
1707.00	9.28	140.63	1704.09	-26.32	31.92	-26.36	1.29
1798.00	10.96	138.23	1793.67	-38.45	42.34	-38.49	1.90
1888.00	13.20	142.90	1881.68	-53.03	54.24	-53.09	2.71
1979.00	14.33	138.99	1970.06	-69.81	67.90	-69.89	1.61
2069.00	14.75	142.82	2057.18	-87.35	82.13	-87.43	1.17
2159.00	16.87	141.18	2143.77	-106.65	97.24	-106.75	2.41
2250.00	17.50	139.58	2230.71	-127.36	114.39	-127.48	0.87
2341.00	18.85	143.11	2317.17	-149.53	132.09	-149.67	1.91
2436.00	18.86	146.72	2407.08	-174.64	149.73	-174.80	1.23
2621.00	20.26	140.23	2581.42	-224.27	186.63	-224.47	1.40
2715.00	19.98	140.88	2669.68	-249.24	207.17	-249.46	0.38
2808.00	21.30	142.08	2756.71	-274.89	227.58	-275.13	1.49
2900.00	21.74	143.63	2842.30	-301.79	247.95	-302.05	0.78
2993.00	22.22	143.36	2928.54	-329.77	268.66	-330.05	0.53
3087.00	22.00	141.96	3015.63	-357.90	290.12	-358.20	0.61
3180.00	21.59	140.85	3101.98	-384.89	311.65	-385.21	0.63
3357.00	17.76	137.41	3268.62	-430.03	350.50	-430.40	2.26
3442.00	14.55	135.59	3350.25	-447.21	366.75	-447.59	3.82
3613.00	9.34	145.58	3517.51	-474.02	389.64	-474.43	3.27
3698.00	8.58	147.58	3601.47	-485.06	396.94	-485.48	0.97
3869.00	3.36	171.01	3771.51	-500.79	404.57	-501.22	3.31
4040.00	1.39	175.21	3942.35	-507.81	405.52	-508.24	1.16
4211.00	0.56	172.23	4113.32	-510.71	405.81	-511.13	0.49
4388.00	0.43	131.53	4290.32	-512.00	406.42	-512.43	0.21
4559.00	2.33	85.15	4461.26	-512.14	410.37	-512.56	1.20
4730.00	0.88	95.33	4632.19	-511.96	415.14	-512.40	0.86
4901.00	0.92	230.94	4803.18	-512.95	415.38	-513.39	0.97
5072.00	0.63	168.28	4974.17	-514.74	414.51	-515.17	0.49
5243.00	0.99	251.67	5145.16	-516.12	413.29	-516.55	0.65
5414.00	0.45	287.10	5316.14	-516.39	411.25	-516.82	0.40
5585.00	0.77	349.32	5487.14	-515.06	410.40	-515.49	0.40
5755.00	0.73	15.22	5657.12	-512.89	410.47	-513.32	0.20
5926.00	0.73	17.69	5828.11	-510.81	411.09	-511.24	0.02
6097.00	0.64	49.85	5999.10	-509.15	412.15	-509.58	0.23
6267.00	0.47	39.58	6169.09	-508.00	413.32	-508.43	0.12

6438.00	0.35	85.37	6340.08	-507.42	414.28	-507.85	0.20
6609.00	0.42	16.66	6511.08	-506.78	414.98	-507.21	0.26
6780.00	0.31	343.81	6682.08	-505.73	415.03	-506.17	0.14
6865.00	0.22	216.75	6767.08	-505.64	414.87	-506.08	0.56
6951.00	3.79	350.63	6853.02	-502.97	414.31	-503.40	4.59
7036.00	10.60	8.18	6937.31	-492.45	414.97	-492.88	8.33
7121.00	17.34	7.14	7019.74	-472.12	417.66	-472.55	7.93
7207.00	26.29	3.36	7099.51	-440.32	420.37	-440.76	10.53
7292.00	35.99	358.94	7172.18	-396.45	421.01	-396.89	11.72
7378.00	46.07	356.69	7236.98	-340.12	418.75	-340.56	11.84
7464.00	55.42	356.99	7291.34	-273.70	415.10	-274.13	10.88
7549.00	66.10	358.03	7332.80	-199.71	411.92	-200.14	12.61
7635.00	73.63	0.07	7362.38	-119.04	410.61	-119.47	9.03
7715.00	82.78	358.41	7378.72	-40.82	409.56	-41.25	11.62
7865.00	92.73	356.95	7384.59	108.75	403.49	108.33	6.70
7934.00	91.85	357.66	7381.83	177.62	400.25	177.20	1.64
8036.00	90.62	357.72	7379.63	279.51	396.14	279.09	1.21
8121.00	89.44	358.23	7379.59	364.45	393.13	364.04	1.51
8206.00	88.77	358.54	7380.92	449.41	390.74	449.00	0.87
8292.00	89.75	359.54	7382.03	535.39	389.30	534.98	1.63
8378.00	90.79	359.78	7381.62	621.38	388.79	620.98	1.24
8463.00	89.94	359.67	7381.08	706.38	388.38	705.97	1.01
8548.00	89.69	358.76	7381.35	791.37	387.22	790.97	1.11
8634.00	88.33	359.14	7382.84	877.34	385.64	876.94	1.64
8719.00	89.51	359.09	7384.44	962.32	384.33	961.91	1.39
8805.00	89.69	359.72	7385.04	1048.31	383.43	1047.91	0.76
8890.00	90.37	0.17	7385.00	1133.31	383.35	1132.91	0.96
8976.00	90.74	359.37	7384.17	1219.30	383.01	1218.90	1.02
9061.00	89.75	359.39	7383.80	1304.29	382.09	1303.89	1.16
9146.00	90.92	359.56	7383.31	1389.29	381.31	1388.89	1.39
9232.00	89.21	358.89	7383.21	1475.28	380.15	1474.88	2.14
9317.00	90.49	359.19	7383.43	1560.26	378.72	1559.87	1.55
9402.00	90.93	0.22	7382.38	1645.25	378.28	1644.86	1.32
9488.00	89.63	359.73	7381.96	1731.25	378.25	1730.85	1.62
9573.00	89.88	359.98	7382.32	1816.25	378.03	1815.85	0.42
9659.00	88.94	359.25	7383.21	1902.24	377.45	1901.84	1.38
9744.00	88.03	358.66	7385.45	1987.20	375.90	1986.80	1.28
9830.00	90.00	359.60	7386.93	2073.17	374.60	2072.77	2.54
9915.00	92.28	0.43	7385.24	2158.15	374.62	2157.75	2.85
10000.00	88.89	358.76	7384.37	2243.12	374.02	2242.73	4.45
10085.00	90.18	0.28	7385.06	2328.11	373.31	2327.72	2.35
10171.00	88.27	0.69	7386.23	2414.10	374.04	2413.70	2.27
10256.00	86.79	359.71	7389.89	2499.01	374.33	2498.62	2.09
10341.00	88.40	359.78	7393.46	2583.94	373.95	2583.54	1.90
10427.00	89.69	359.68	7394.89	2669.92	373.55	2669.53	1.50
10512.00	91.05	0.59	7394.34	2754.92	373.75	2754.52	1.93
10598.00	91.91	0.97	7392.12	2840.88	374.92	2840.49	1.09
10683.00	92.16	0.14	7389.10	2925.82	375.74	2925.43	1.02
10768.00	92.16	359.04	7385.90	3010.76	375.14	3010.36	1.29
10854.00	93.70	358.68	7381.50	3096.62	373.43	3096.23	1.84
10939.00	93.79	358.19	7375.95	3181.41	371.11	3181.02	0.58
11024.00	91.97	359.01	7371.68	3266.27	369.04	3265.89	2.35
11109.00	90.68	359.04	7369.71	3351.24	367.59	3350.85	1.52
11195.00	88.94	358.54	7370.00	3437.21	365.77	3436.83	2.11
11280.00	88.09	359.35	7372.20	3522.17	364.21	3521.79	1.38
11366.00	89.01	1.01	7374.38	3608.14	364.48	3607.75	2.21
11451.00	91.48	1.79	7374.01	3693.10	366.56	3692.72	3.05
11564.00	91.30	1.17	7371.27	3806.03	369.47	3805.64	0.57
11620.00	91.30	1.17	7370.00	3862.01	370.62	3861.62	0.00

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\*Weatherford Survey from 1072 ft MD to 11564 ft MD.\*

\*TD at 11620 ft MD.\*

The total correction is 8.59 deg relative to True North.

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# Weatherford®

Final Print

COMPANY	<u>Anadarko</u>		
WELL	<u>Farley 29C-23HZ</u>		
FIELD	<u>Wattenberg</u>		
RIG	<u>XTREME 23</u>		
LOC.	<u>Colorado</u>	COUNTY	<u>Weld</u>