



Weatherford®

6 3/4 in. WeatherfordLWD™ Triple Combo 1 in. & 5 in. MEASURED DEPTH RECORDED DATA FINAL PRINT

Company: Shell
 Well: Chain Land Ranch 3509 11-1
 Field: Wildcat
 Rig: Nabors F01
 County: Harper

COMPANY Shell
 WELL Chain Land Ranch 3509 11-1
 FIELD Wildcat
 RIG Nabors F01
 COUNTY Harper STATE Kansas
 API # 15-077-21808-00-00

Location
 Latitude: 37.02039° N X = 2,066,626,850 ft Mag Decl: 4.80°
 Longitude: 98.27216° W Y = 128,870,050 ft Mag Dip: 65.18°
 Other Services: None

Permanent Datum: Mean Sea Level
 Log Measured From: Drill Floor Elev: 1269.50 ft above perm. datum
 Depth Reference: Drillers Tally Total Depth: 5560 ft
 Depth Logged: 4587 ft to 5490 ft Runs: 1
 Date Logged: 16-Jun-12 to 16-Jun-12 Spud Date: 7-Jun-12

Borehole Record		Casing Record		Elevation		
Hole Size	From	To	Size	Weight	From	To
12.250 in.	0 ft	800 ft	9.625 in.	36.00 lb/ft	Surface	800 ft
8.750 in.	800 ft	5560ft				

Borehole Deviation Record			Mud Record			
Hole Size	Min. Inc.	Max. Inc.	Type	Weight	From	To
12.250 in.	0.40°	5.30°	WBM	9.00 - 9.20 ppg	800 ft	5560 ft
8.750 in.	0.00°	4.34°				

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

LWD Run Number		1	2	3	4	5	6	7
Bit Size	in.	8.750						
Bit Type		PDC						
Bit TFA	sq.in.	0.663						
Bit Start Depth	ft	4639						
Bit End Depth	ft	5490						
Top Log Interval	ft	4587						
Bottom Log Interval	ft	5481						
Begin Log Time	hrs	0:52						
Begin Log Date	DD-MMM-YY	16-Jun-12						
End Log Time	hrs	5:31						
End Log Date	DD-MMM-YY	16-Jun-12						
Drill or Wipe		Wipe						
Flow Rate	gal/min	350						
Max AV / CV @ MWD	ft/min	277 / 421						
Min Inc @ Depth	deg @ ft	0.00 @ 3150						
Max Inc @ Depth	deg @ ft	4.34 @ 886						
MUD DATA								
Depth	ft	5490						
Fluid Type		WBM						
Mud Weight	ppg	9.20						
Plastic Viscosity	cP	14						
Solids / Sand	%	5.20 / 0.10						
NaCl Equiv. Chlorides	ppm	21450						
pH		10.50						
Oil:Water Ratio	% Vol	0.0 : 100.0						
Rm @ Temperature	ohm-m @ deg F	0.52 @ 82						
Rmc @ Temperature	ohm-m @ deg F	0.44 @ 88						
Rmf @ Temperature	ohm-m @ deg F	0.32 @ 86						
KCl	% Vol	0						
Client Representative		M. Barry						
WeatherfordLWD Engineer		L. Howse						

EQUIPMENT SUMMARY

LWD Run Number	1	2	3	4	5
HEL Serial Number	NW21009PDBBK16.75				
MFR Serial Number	NW21011RBBK6.75				
TNP-AZD Serial Number	NW21010NZBB6.75				
Density Source Serial Number	26198B				
Neutron Source Serial Number	31081BB				
Sensor to Bit Offsets / Acquisition Rates					
Directional	ft / sec	66.67 / RT			
Gamma Ray	ft / sec	9.23 / 5			
Resistivity	ft / sec	18.80 / 5			
Density	ft / sec	41.40 / 5			
Neutron Porosity	ft / sec	49.37 / 5			
Other Information					
Total BHA Length	ft	115.99			
BHA Assembly Type		Rotary			
Run Circulating Time	hr	11.53			
Run Drilling Time	hr	0.00			

MUD SUMMARY

Date and Time	Run	Bit Depth	Mud Weight	% K	Rm @ Temp	Rmf @ Temp	Rmc @ Temp	BHCT
16 June 12 @ 05:31	01	5560 ft	9.20 ppg	0	0.52 @ 82	0.32 @ 86	0.44 @ 88	115 F

LWD RUN REMARKS

Run Number: 1 :: RECORDED DATA LOG

WFT Services Provided:

Recorded and Real Time Logging: Gamma Ray, Deep, Medium and Shallow Resistivity, Bulk Density, Neutron Porosity and Temperature.

Directional Services: On demand Inclination and Azimuth.

Borehole and Environmental Correction:

Hole Size: 8.750 in.

Gamma Ray: Corrected for mud weight, hole size and KCl concentration.

Mud Weight: 9.20 ppg

Resistivities: Corrected for borehole temperature, hole size, drilling fluid resistivity and dielectric correction.

Borehole Temperature: 115° F

Standard Temperature: 75° F

Bulk Density: No corrections.

Mud Salinity NaCl Equiv: 21450 ppm

Neutron Porosity: Corrected for mud type, mud salinity, mud weight, hole size, standard temperature and processed using a LIMESTONE matrix.

Mud Type: WBM

Matrix Processing: Limestone (2.71 g/cc)

Drilling Fluid Resistivity: 0.52 @ 82° F

KCl Concentration: 0%

LWD LOG COMMENTS

Comment No. 1-1

RECORDED DATA LOG

Start of LWD Wipe Run 01

Weatherford International provided 6 3/4 in. Directional, Resistivity, Gamma Ray, Density Porosity, Neutron Porosity and Temperature for Run 01.

Run 01 started formation wiping June 16, 2012 at 00:52 at 4639 MD / 4635 TVD. Weatherford International logged the 8.750 in. borehole.

The WBM at the start of drilling was 9.00 ppg.

Comment No. 1-2

End of LWD Wipe Run 01

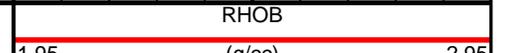
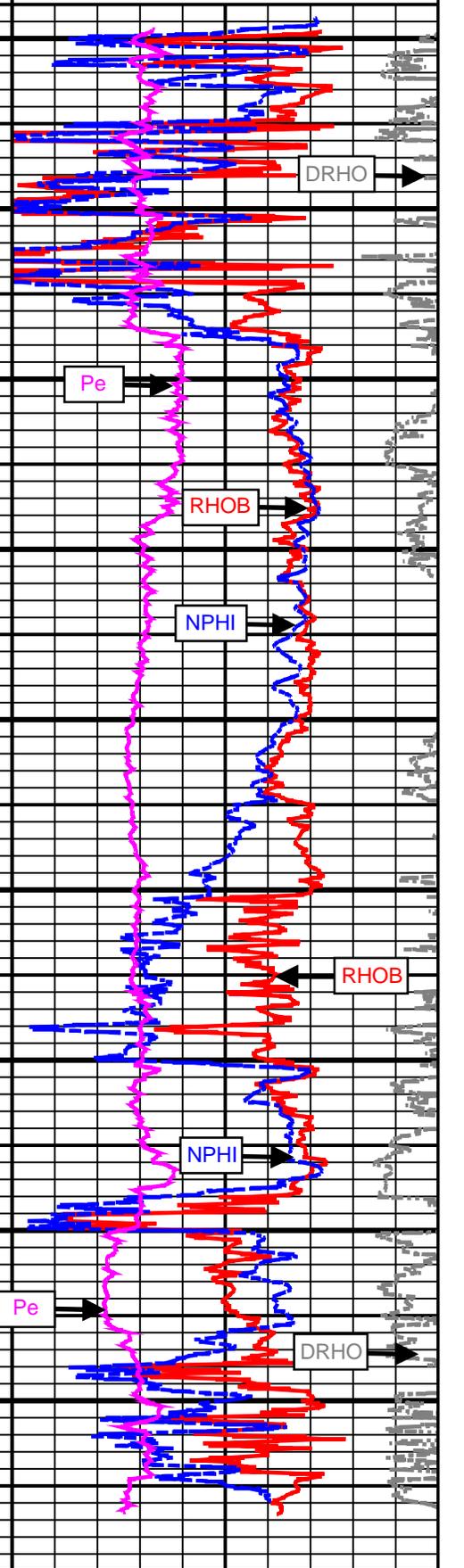
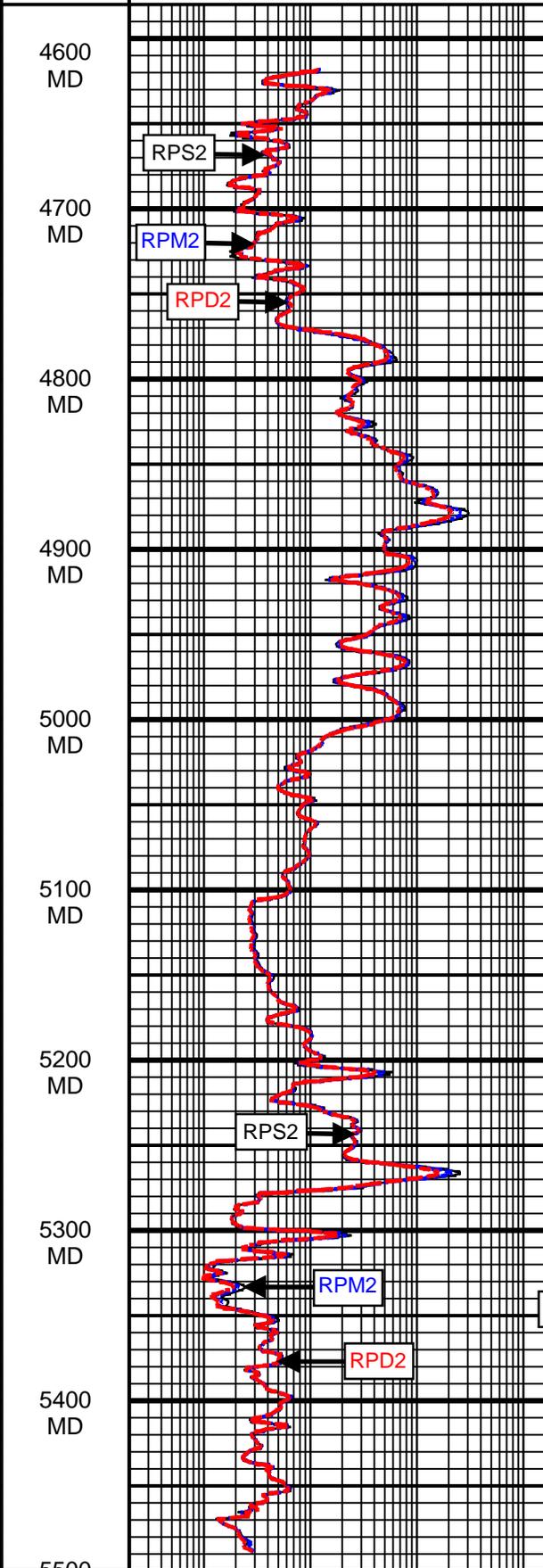
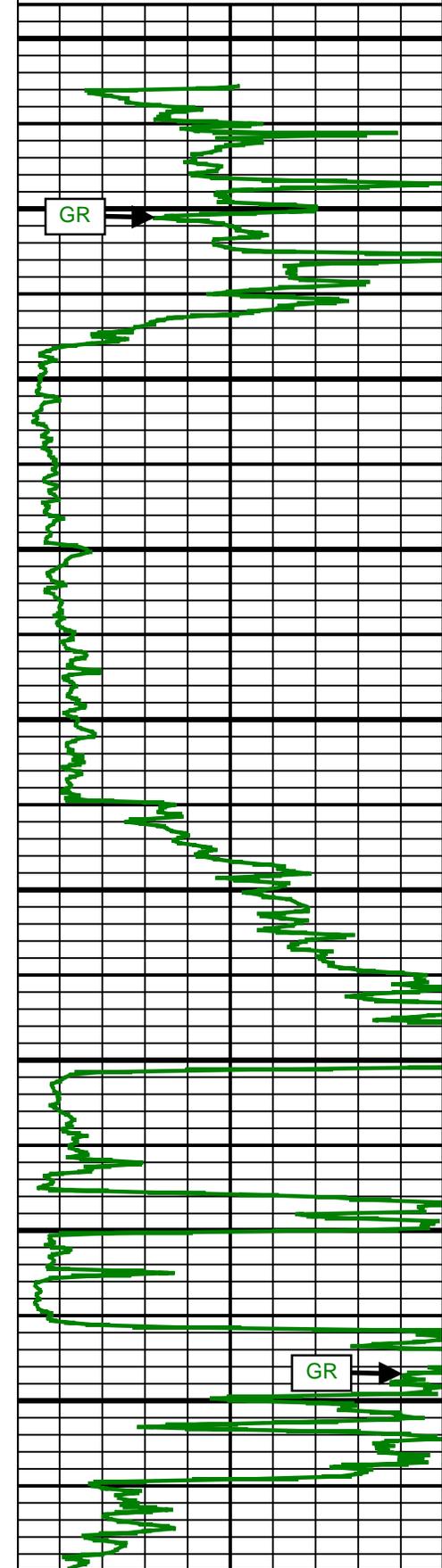
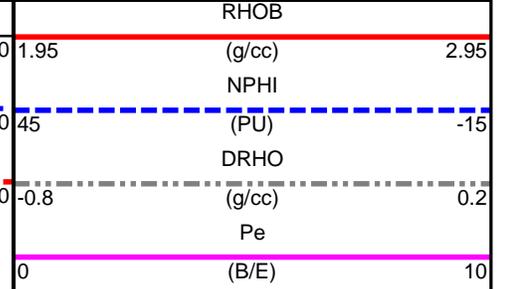
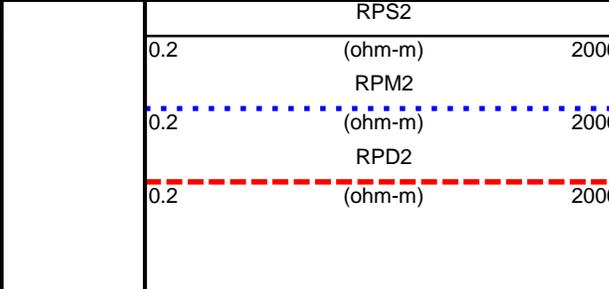
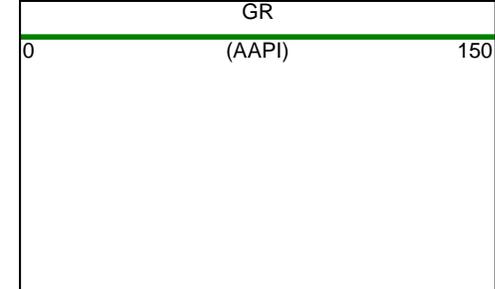
Run 01 ended formation wiping June 16, 2012 at 05:31 at 5490 MD / 5486 TVD. Weatherford International logged the 8.750 in. borehole.

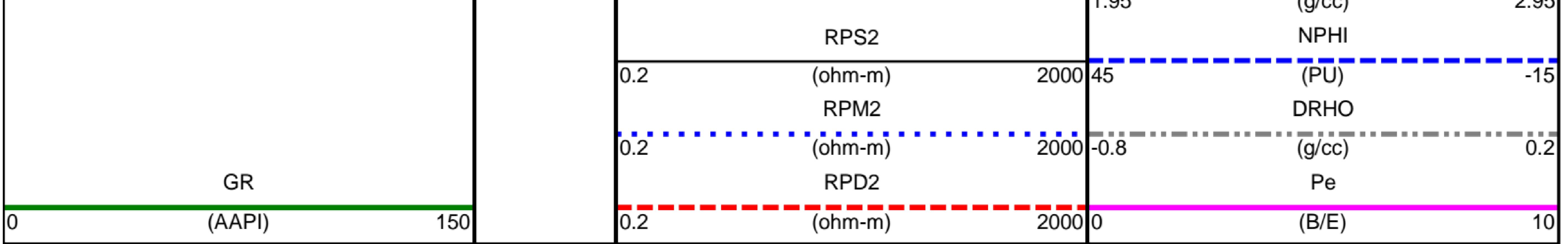
The WBM at the end of wiping was 9.20 ppg.

CURVE SPECIFICATIONS

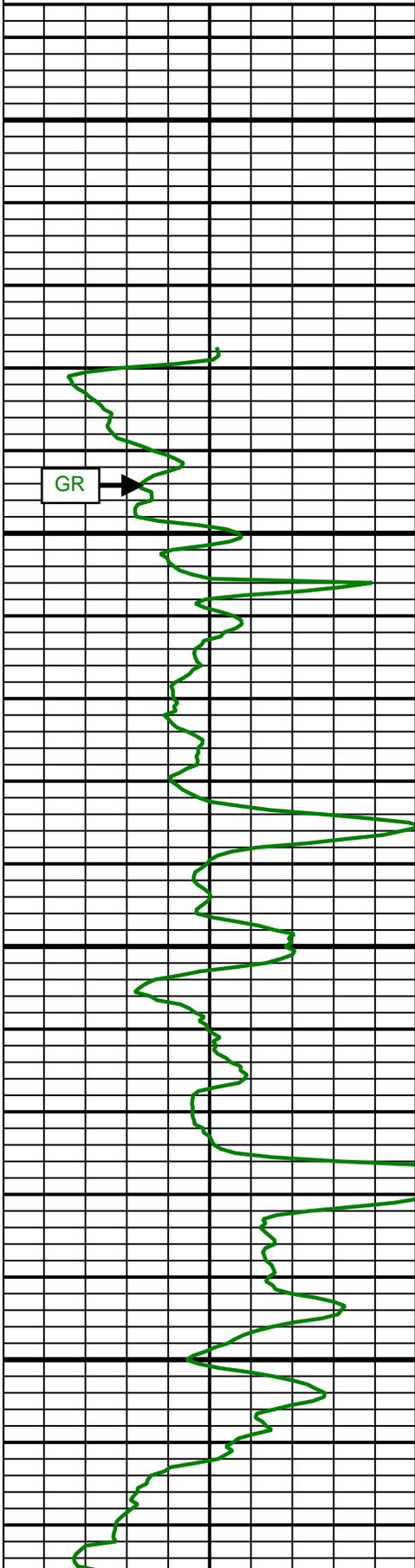
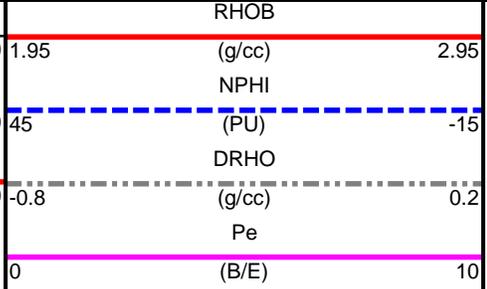
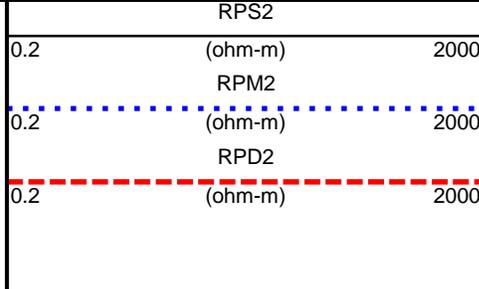
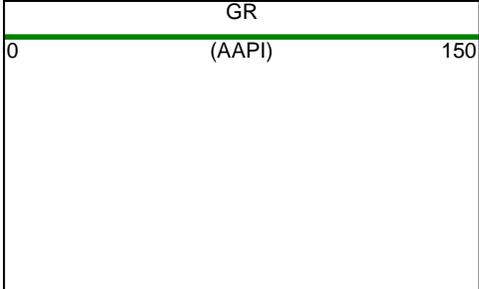
CURVE TYPE	MNEMONIC	UNITS	COMMENTS	CORRECTIONS
Gamma Ray	GR	AAPI	Gamma Ray 3.0 ft window 0.5 ft Exponential Smoothing	See LWD Run Remarks
Deep Phase Resistivity	RPD2	ohm-m	2MHz Deep Phase Resistivity 3.0 ft window 0.5 ft Exponential Smoothing	See LWD Run Remarks
Medium Phase Resistivity	RPM2	ohm-m	2MHz Medium Phase Resistivity 3.0 ft window 0.5 ft Exponential Smoothing	
Shallow Phase Resistivity	RPS2	ohm-m	2MHz Shallow Phase Resistivity 3.0 ft window 0.5 ft Exponential Smoothing	
Bulk Density	RHOB	g/cc	Bulk Density 3.0 ft window 0.5 ft Exponential Smoothing	None
Delta RHO	DRHO	g/cc	Spine and Rib Correction 3.0 ft window 0.5 ft Exponential Smoothing	
Thermal Neutron Porosity	NPHI	PU	Neutron Porosity 3.0 ft window 0.5 ft Exponential Smoothing	See LWD Run Remarks
Photoelectric Effect Factor	PE	B/E	Recorded Near Pe Count Rate 3.0 ft window 0.5 ft Exponential Smoothing	None

1 Inch - Measured Depth





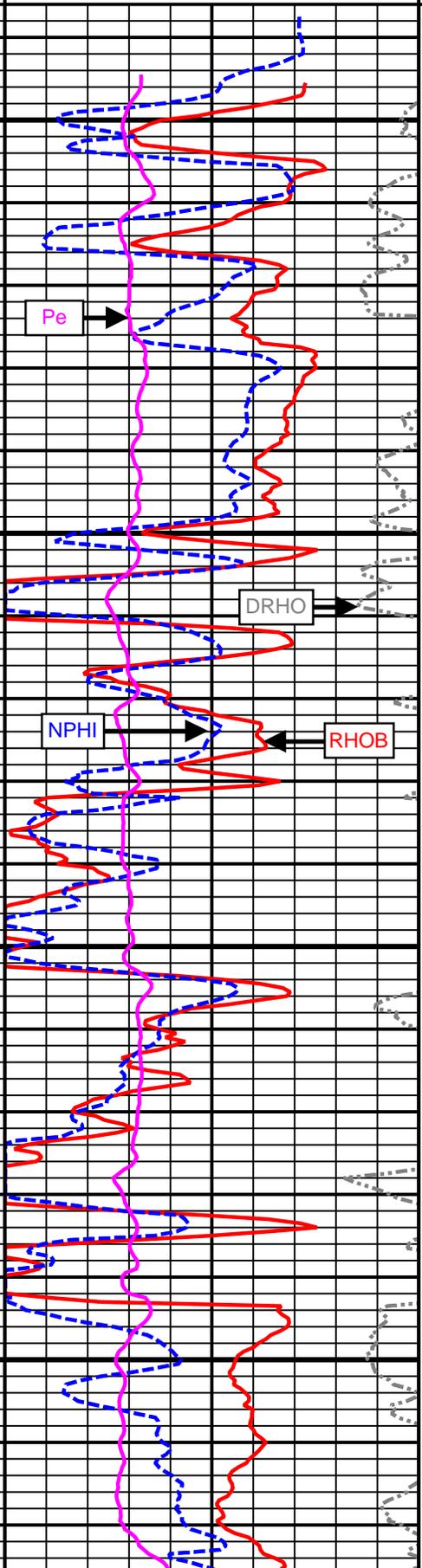
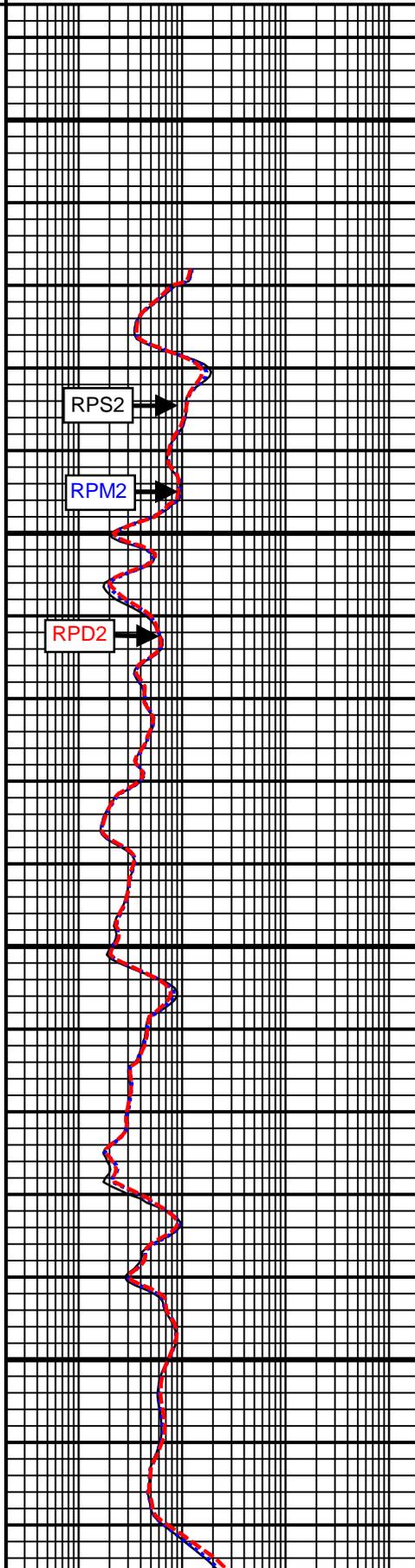
5 Inch - Measured Depth

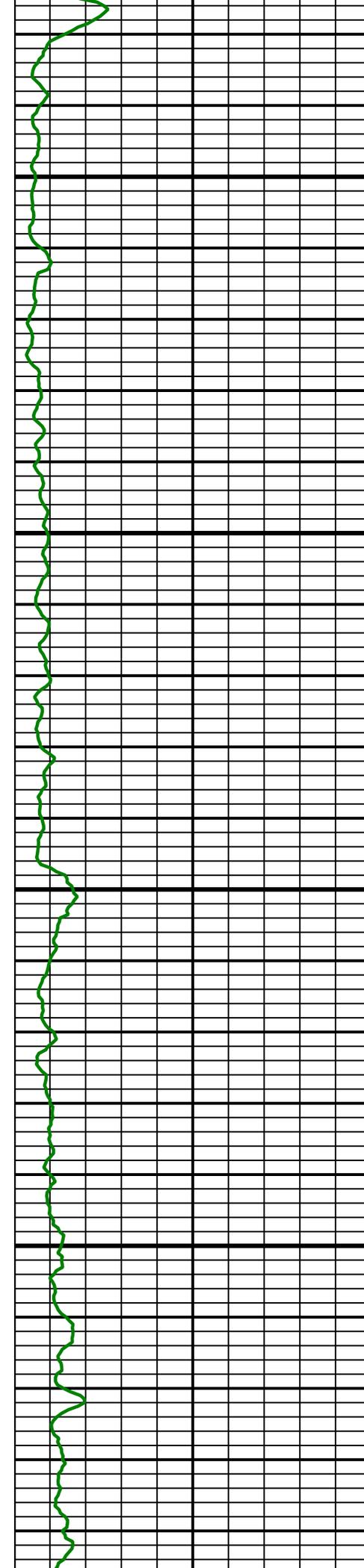


4600 MD

Comment 1-1

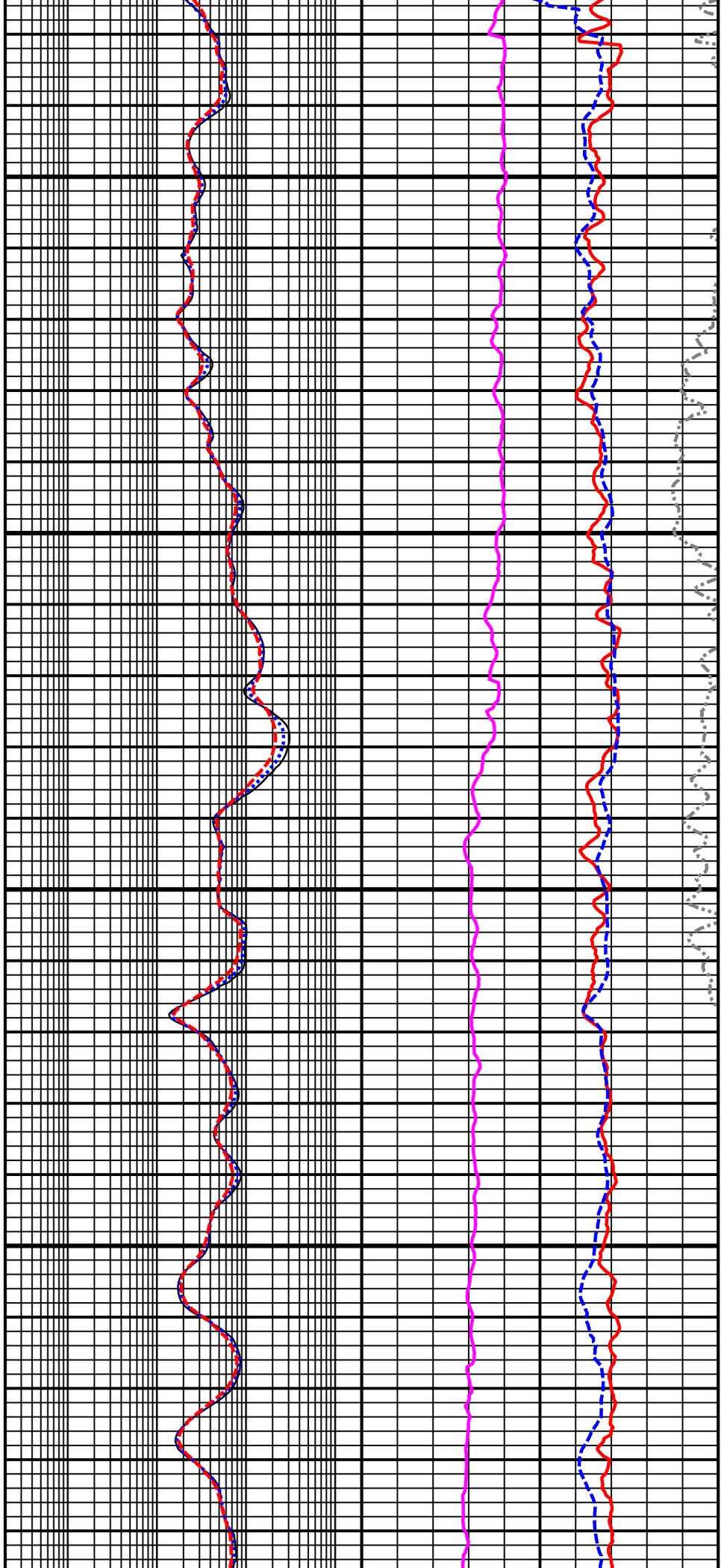
4700 MD

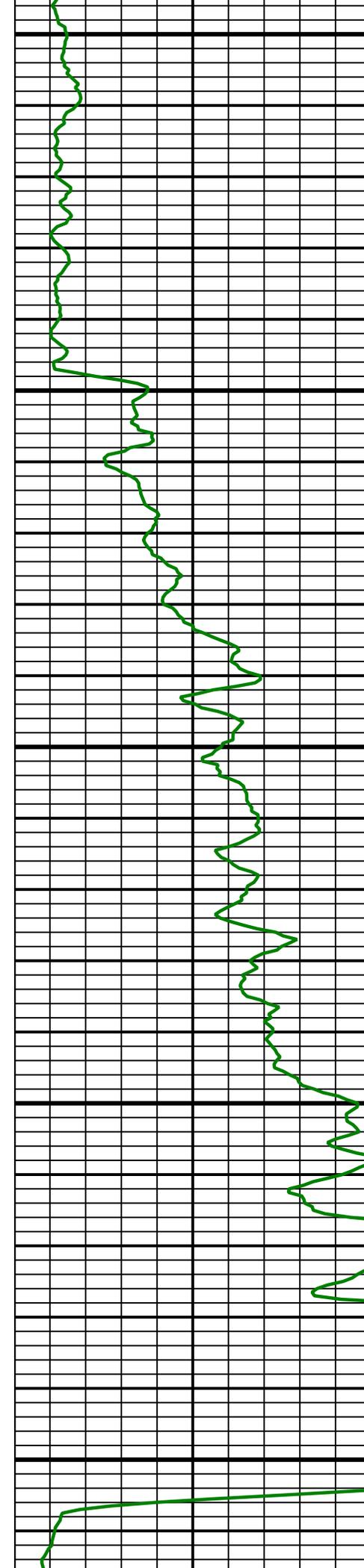




4800
MD

4900
MD

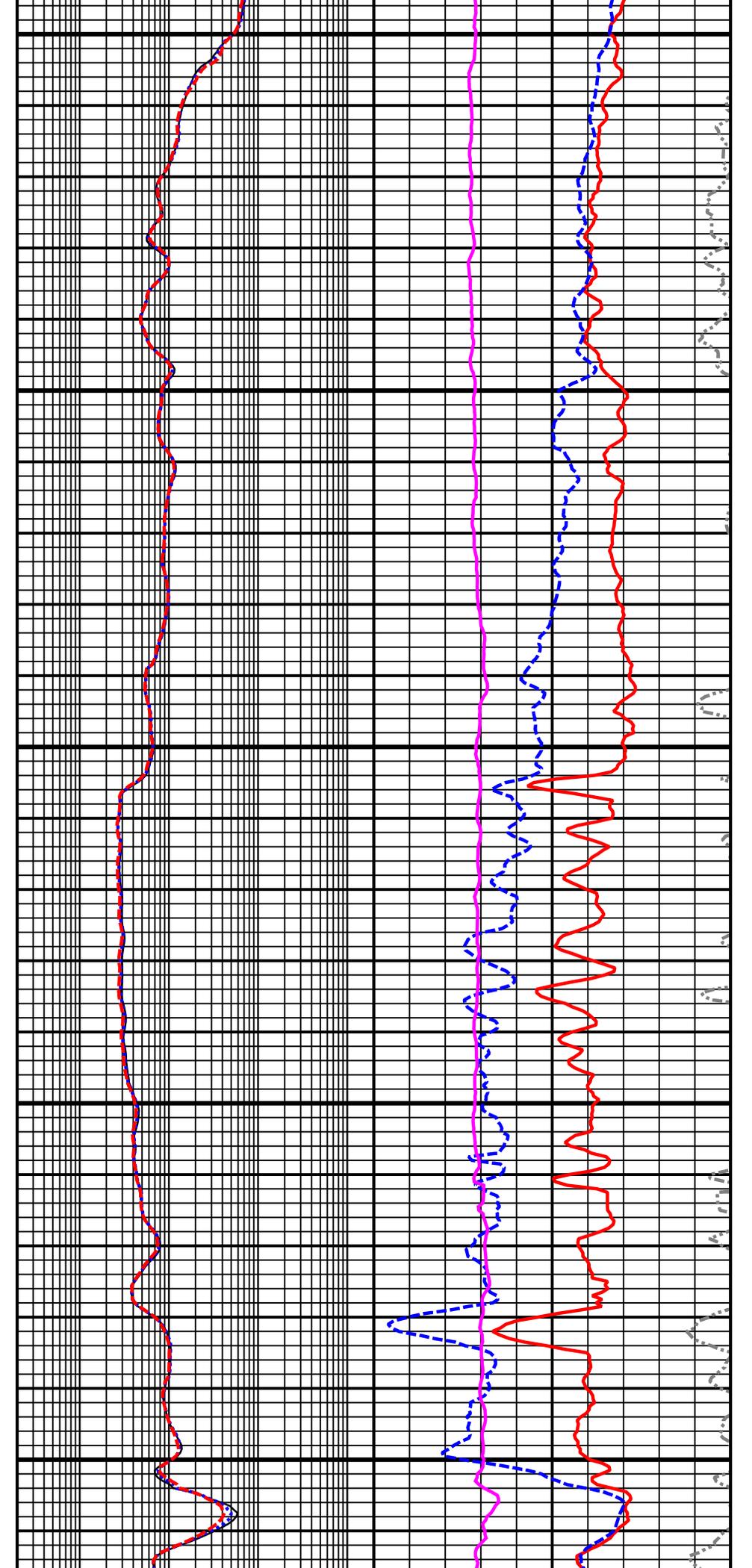


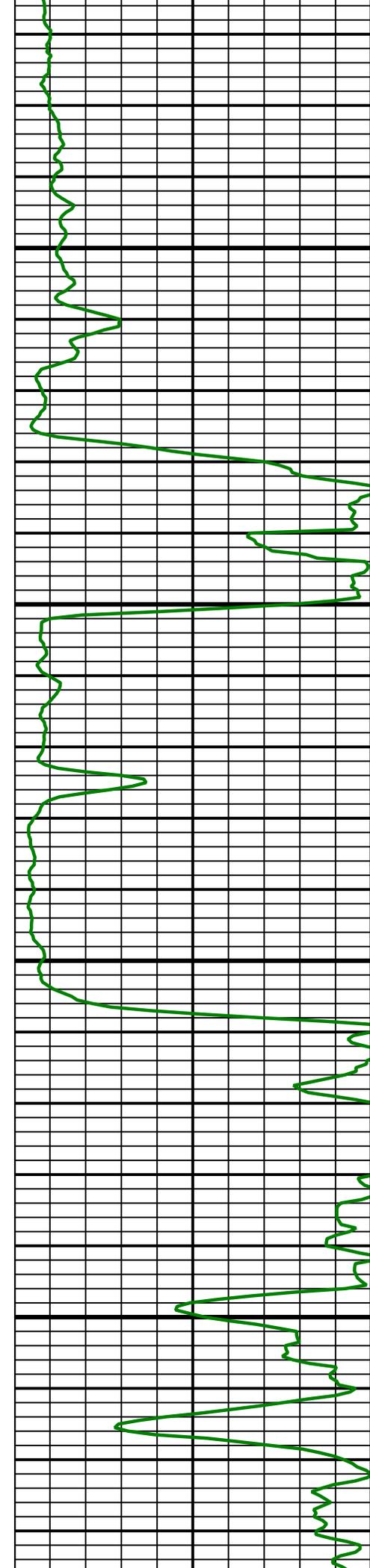


5000 MD

5100 MD

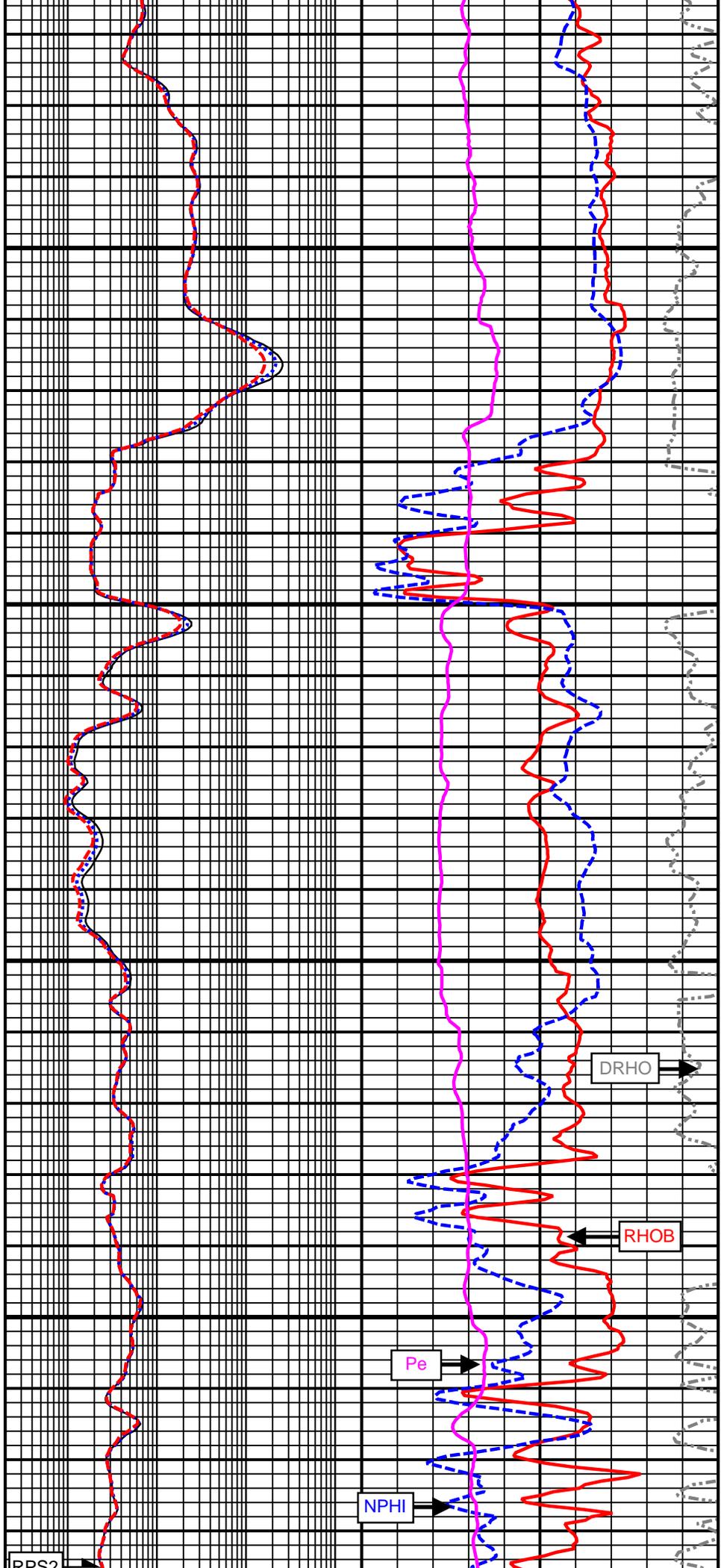
5200 MD

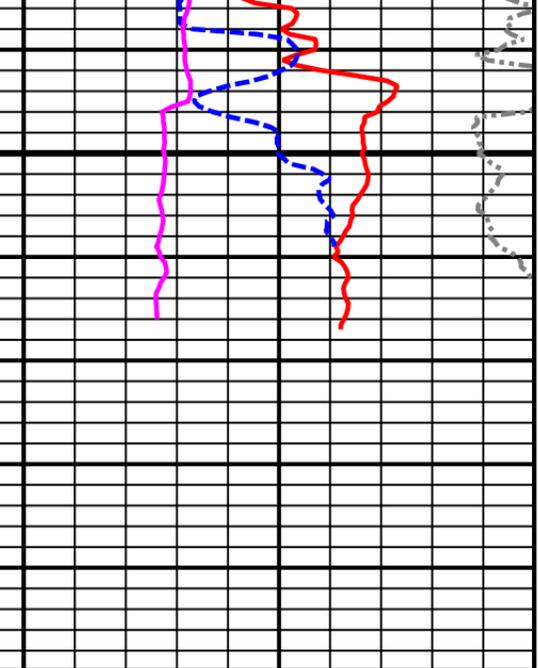
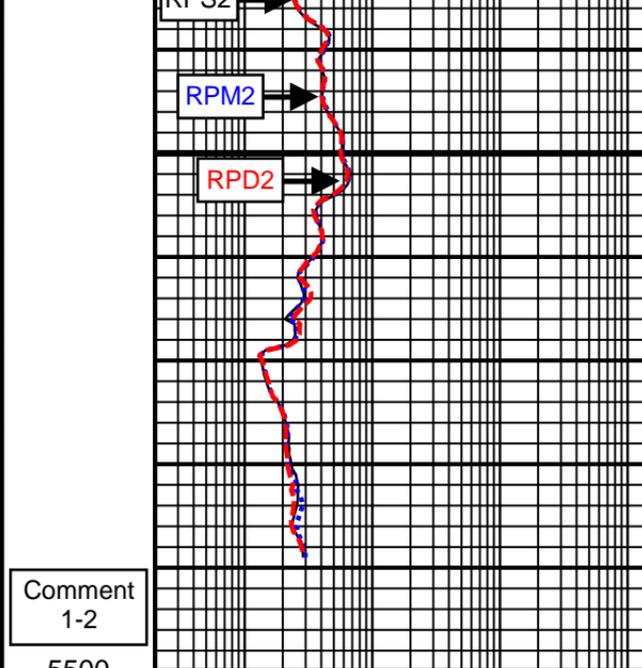
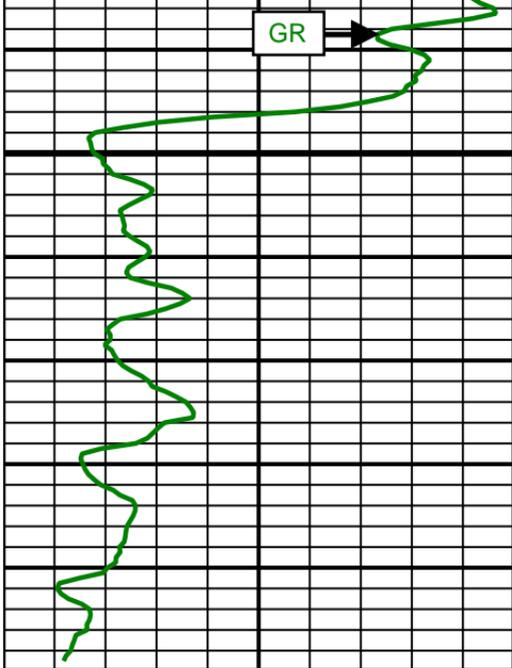




5300
MD

5400
MD





Comment
1-2

5500



RPS2	(ohm-m)	2000
RPM2	(ohm-m)	2000
RPD2	(ohm-m)	2000

RHOB	1.95	(g/cc)	2.95
NPFI	45	(PU)	-15
DRHO	-0.8	(g/cc)	0.2
Pe	0	(B/E)	10

AZD Density and Pe Calibration

All count rates are corrected for deadtime, without background subtraction.

Tool Serial Number: 19496	Stabilizer blade: 8.25 in.	Aluminum Block: AL03
Insert Serial Number: 33774	Calibration Date: Mar 17, 2012	Magnesium Block: MG03
Source Serial Number: 26198B	Calibration Time: 11:18:14 AM	Run Numbers:

Near Detector	Background	Al with Source	Al + SST with source	Mg with Source	Units
Peak (214-216):	215.027 214 216	214.545 214 216	214.973 214 216	214.710 214 216	Ch
Resolution (5-13.5%):	8.363 5 13.5	8.182 5 13.5	8.372 5 13.5	8.354 5 13.5	%
HV:	778.101 600 1300	777.570 600 1300	778.101 600 1300	778.101 600 1300	V
Density:	490.980	10477.670	9849.382	15513.310	CPS
Pe:	108.909	2950.247	2435.565	4373.469	CPS
Source:	234.812 150 300	254.019	253.399	259.670	CPS

Far Detector	Background	Al with Source	Al + SST with source	Mg with Source	Units
Peak (214-216):	215.047 214 216	215.090 214 216	214.753 214 216	214.913 214 216	Ch
Resolution (5-13.5%):	9.778 5 13.5	8.635 5 13.5	9.271 5 13.5	9.373 5 13.5	%
HV:	922.888 600 1300	922.888 600 1300	922.534 600 1300	922.534 600 1300	V
Density:	176.989	1005.665	777.422	6254.492	CPS
Pe:	34.375	175.725	126.732	1139.792	CPS
Source:	149.461 100 200	150.008	149.175	154.981	CPS

Results	Near Density	Far Density	Near Pe	Far Pe	
Slope:	-0.4511 -0.56 -0.43	-2.2050 -2.26 -2.16	3.9865 0.1 10	9.6641	
Offset:	10.3784	12.4272	-0.7745 -3 0.1	-1.2887	

TNP Neutron Calibration

All count rates are corrected for deadtime.

Tool Serial Number:	19496	Collar Diameter:	7.19 in.	Calibrator Number:	RD9THIN
Insert Serial Number:	33770	Calibration Date:	Mar 17, 2012	Verifier Number:	RD9THICK
Source Serial Number:	6909B (AmBe)	Calibration Time:	09:54:12 AM	Run Numbers:	

	Calibration Pipe	Verification Pipe	Units
Near Count Rate:	660.600	862.160	CPS
Far Count Rate:	38.990	66.300	CPS
Ratio:	16.942	13.003	
Assigned Ratio:	16.440	12.400	
Calibration Factor:	0.970		
	0.95  1.05		
Calibrated Ratio:		12.613	
Deviation:	3.05	1.72	%
	-5  5	-3  3	

SURVEY

Survey Calculation Method: **Minimum Curvature**

Magnetic Reference	Target Direction	Total Magnetic Field	Magnetic Dip Angle	Magnetic Declination	Grid Convergence	Total Correction
Grid North	270.00 deg	51769 nT	65.18 deg	4.80 deg	0.14 deg	4.66 deg
Survey Tie-On	Depth	INC	AZ	TVD	NS	EW
	782.00 ft	4.70 deg	280.60 deg	780.38 ft	4.43 ft	-41.97 ft

Depth (ft)	Inc (deg)	Azm (deg)	TVD (ft)	Well Head			Vsect (ft)	Dogleg (deg/100ft)
				NS (ft)	EW (ft)			
886.00	4.34	282.38	884.06	6.06	-50.00	50.00	0.37	
980.00	3.90	281.68	977.81	7.47	-56.61	56.61	0.47	
1072.00	3.70	283.21	1069.61	8.78	-62.56	62.56	0.24	
1164.00	3.39	286.52	1161.43	10.23	-68.06	68.06	0.40	
1256.00	3.27	285.27	1253.28	11.70	-73.20	73.20	0.15	
1350.00	3.22	285.65	1347.13	13.11	-78.33	78.33	0.06	
1445.00	1.43	285.27	1442.05	14.15	-82.04	82.04	1.88	
1539.00	1.21	281.70	1536.02	14.66	-84.14	84.14	0.25	
1634.00	1.00	273.81	1631.00	14.91	-85.95	85.95	0.27	
1729.00	0.99	221.21	1725.99	14.35	-87.32	87.32	0.93	
1823.00	0.70	209.16	1819.98	13.24	-88.13	88.13	0.36	
1918.00	0.41	221.83	1914.98	12.48	-88.64	88.64	0.33	
2012.00	0.39	197.85	2008.97	11.92	-88.97	88.97	0.18	
2107.00	0.37	243.54	2103.97	11.48	-89.34	89.34	0.31	
2202.00	0.44	199.25	2198.97	11.00	-89.73	89.73	0.33	
2297.00	0.31	198.21	2293.97	10.41	-89.93	89.93	0.14	
2392.00	0.19	183.48	2388.97	10.01	-90.02	90.02	0.14	
2487.00	0.09	270.61	2483.97	9.85	-90.11	90.11	0.22	
2582.00	0.14	203.77	2578.97	9.75	-90.23	90.23	0.14	
2676.00	0.00	98.01	2672.97	9.64	-90.28	90.28	0.15	
2771.00	0.14	170.79	2767.97	9.53	-90.26	90.26	0.15	
2866.00	0.09	194.05	2862.97	9.34	-90.26	90.26	0.07	
2960.00	0.06	243.59	2956.97	9.25	-90.32	90.32	0.07	
3055.00	0.09	46.44	3051.97	9.28	-90.31	90.31	0.16	
3150.00	0.00	150.04	3146.97	9.33	-90.26	90.26	0.09	
3244.00	0.09	174.81	3240.97	9.25	-90.25	90.25	0.10	
3339.00	0.06	54.57	3335.97	9.21	-90.20	90.20	0.14	
3433.00	0.14	81.66	3429.97	9.25	-90.05	90.05	0.10	
3528.00	0.09	98.87	3524.97	9.26	-89.86	89.86	0.06	
3623.00	0.14	122.37	3619.97	9.19	-89.69	89.69	0.07	
3717.00	0.25	56.90	3713.96	9.24	-89.42	89.42	0.24	
3812.00	0.48	97.20	3808.96	9.30	-88.85	88.85	0.35	
3906.00	0.50	131.80	3902.96	8.98	-88.15	88.15	0.31	
4001.00	0.48	113.89	3997.96	8.54	-87.48	87.48	0.16	
4096.00	0.53	102.95	4092.95	8.28	-86.69	86.69	0.11	
4191.00	0.53	93.53	4187.95	8.15	-85.82	85.82	0.09	
4285.00	0.31	95.27	4281.95	8.10	-85.14	85.14	0.23	
4380.00	0.35	92.28	4376.94	8.07	-84.59	84.59	0.05	
4475.00	0.31	90.79	4471.94	8.05	-84.04	84.04	0.04	
4570.00	0.18	82.79	4566.94	8.07	-83.64	83.64	0.14	
4664.00	0.09	57.84	4660.94	8.13	-83.43	83.43	0.11	
4759.00	0.22	30.62	4755.94	8.32	-83.27	83.27	0.15	

4855.00	0.31	92.16	4851.94	8.47	-82.92	82.92	0.29
4950.00	0.12	6.52	4946.94	8.56	-82.65	82.65	0.34
5045.00	0.19	42.90	5041.94	8.78	-82.53	82.53	0.12
5141.00	0.31	90.97	5137.94	8.89	-82.16	82.16	0.24
5237.00	0.44	87.31	5233.94	8.90	-81.54	81.54	0.14
5330.00	0.31	104.32	5326.93	8.86	-80.94	80.94	0.18

WeatherfordLWD surveys from 896 ft MD to 5330 ft MD.

TD at 5560 ft MD.

The total correction is 4.66 deg relative to Grid North.



Weatherford[®]

Final Print

COMPANY	<u>Shell</u>		
WELL	<u>Chain Land Ranch 3509 11-1</u>		
FIELD	<u>Wildcat</u>		
RIG	<u>Nabors F01</u>		
STATE	<u>Kansas</u>	COUNTY	<u>Harper</u>