

TOOL ZERO

MAXIMUM STRING DIAMETER 3.88 IN
 MEASUREMENTS RELATIVE TO TOOL ZERO
 ALL LENGTHS IN METERS

Output DLIS Files

DEFAULT	PI_LDL_APS_NGS_005LUP	FN:6	PRODUCER	17-Aug-2002 18:36	1456.2 M	1198.5 M
REDUCE	PI_LDL_APS_NGS_005LUP	FN:7	PRODUCER	17-Aug-2002 18:36	1456.2 M	1198.5 M

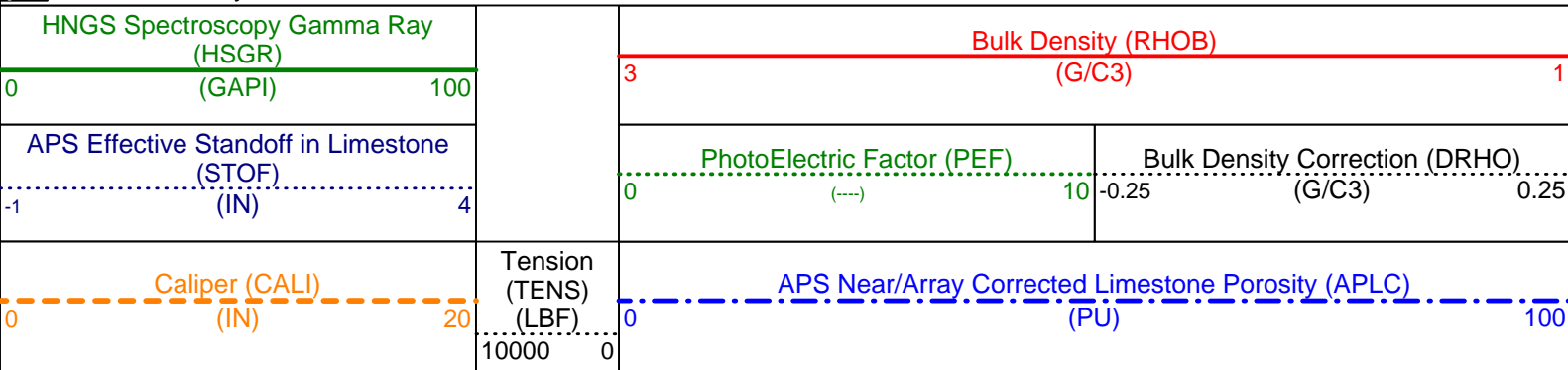
OP System Version: 10C0-306

MCM

DIT-E	10C0-306	HLDT-A	10C0-306
DTA-A	10C0-306	NPLC-B	OP10-KP1
APS-BA	OP10-KP1	HNGS-BA	OP10-KP1
DTC-H	10C0-306		

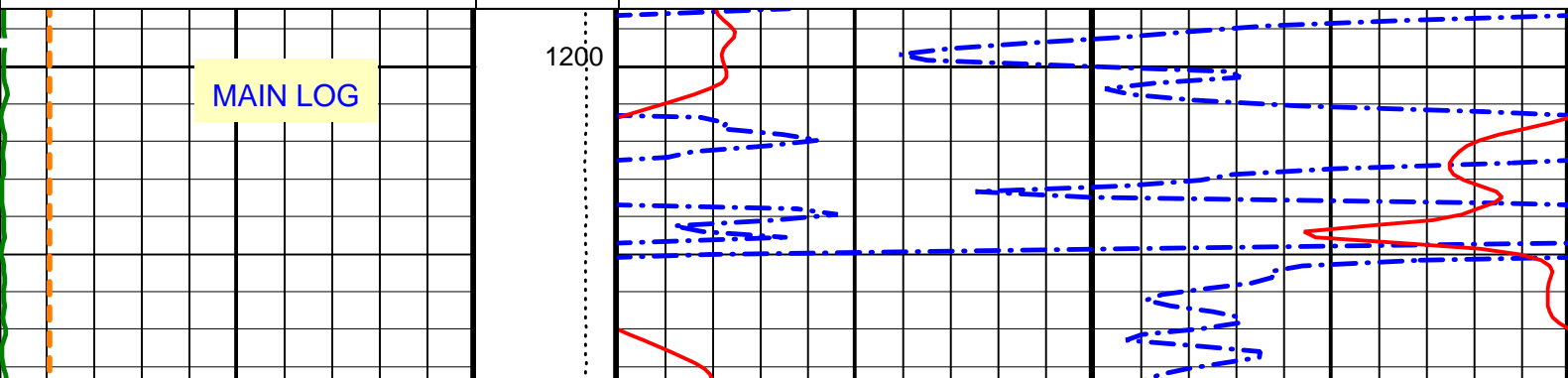
PIP SUMMARY

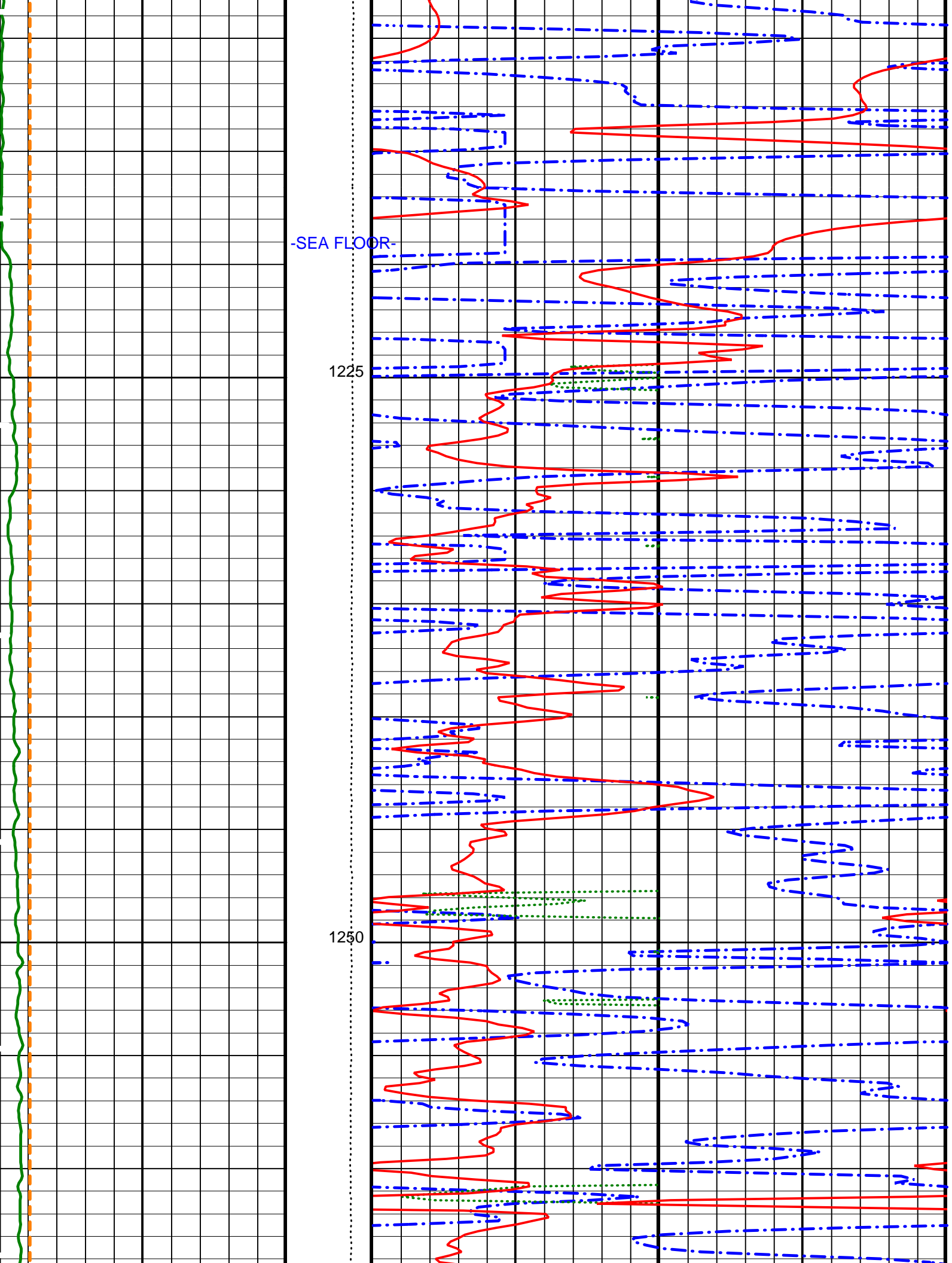
Time Mark Every 60 S

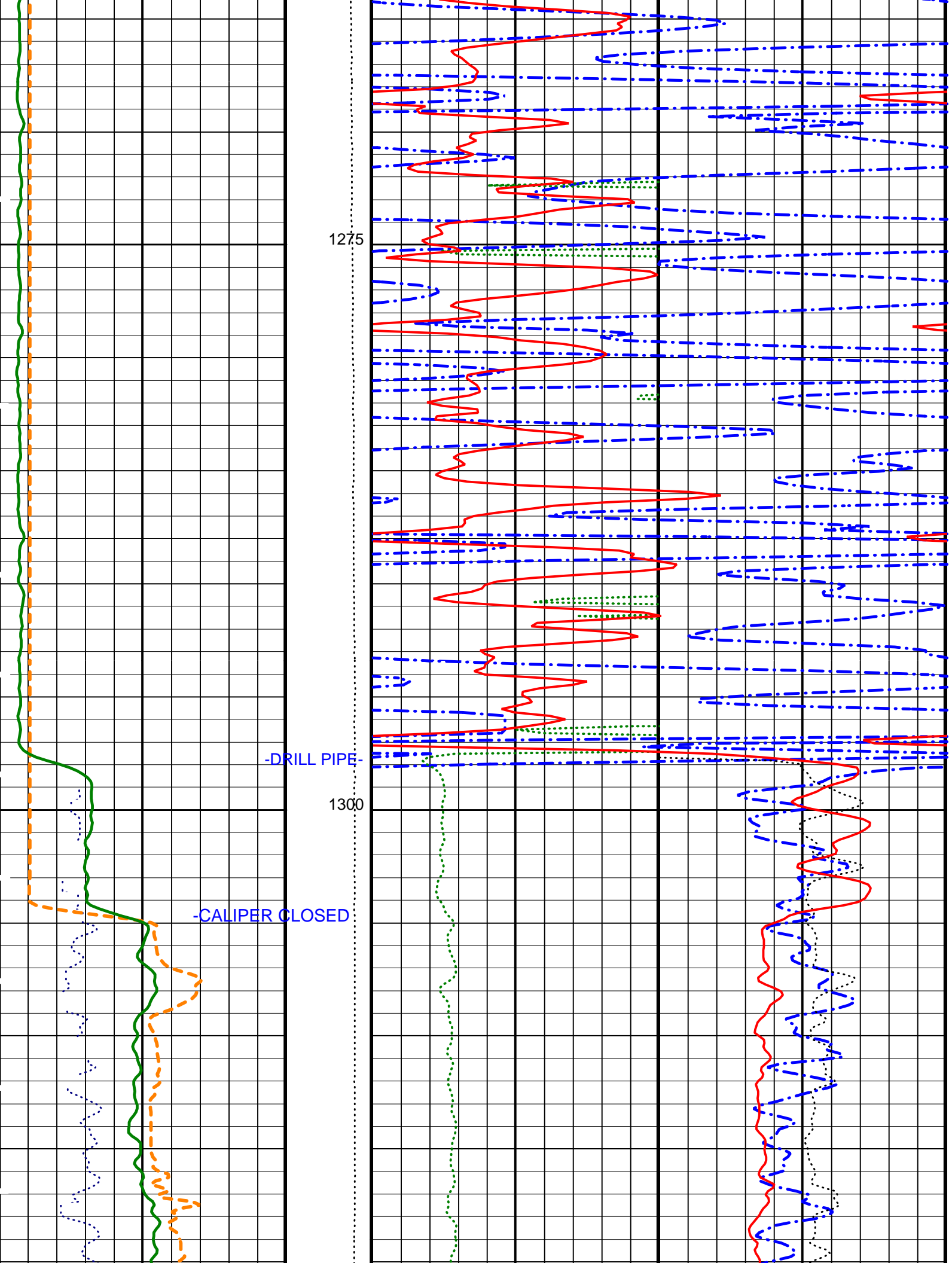


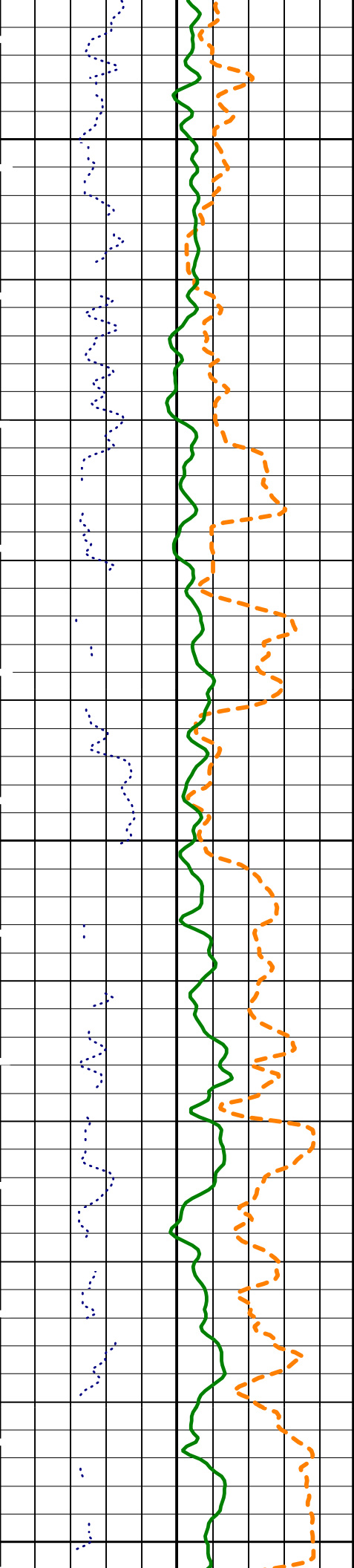
MAIN LOG

1200





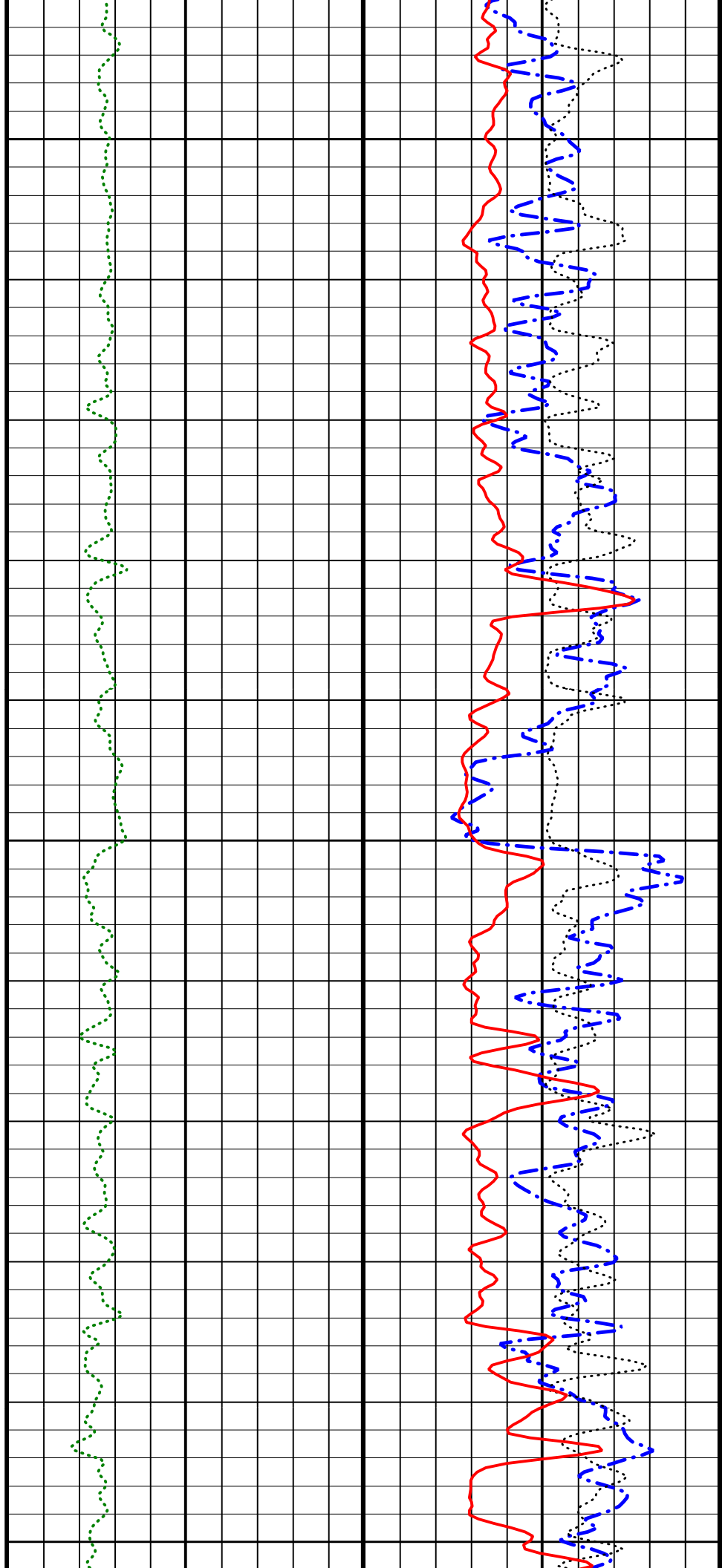


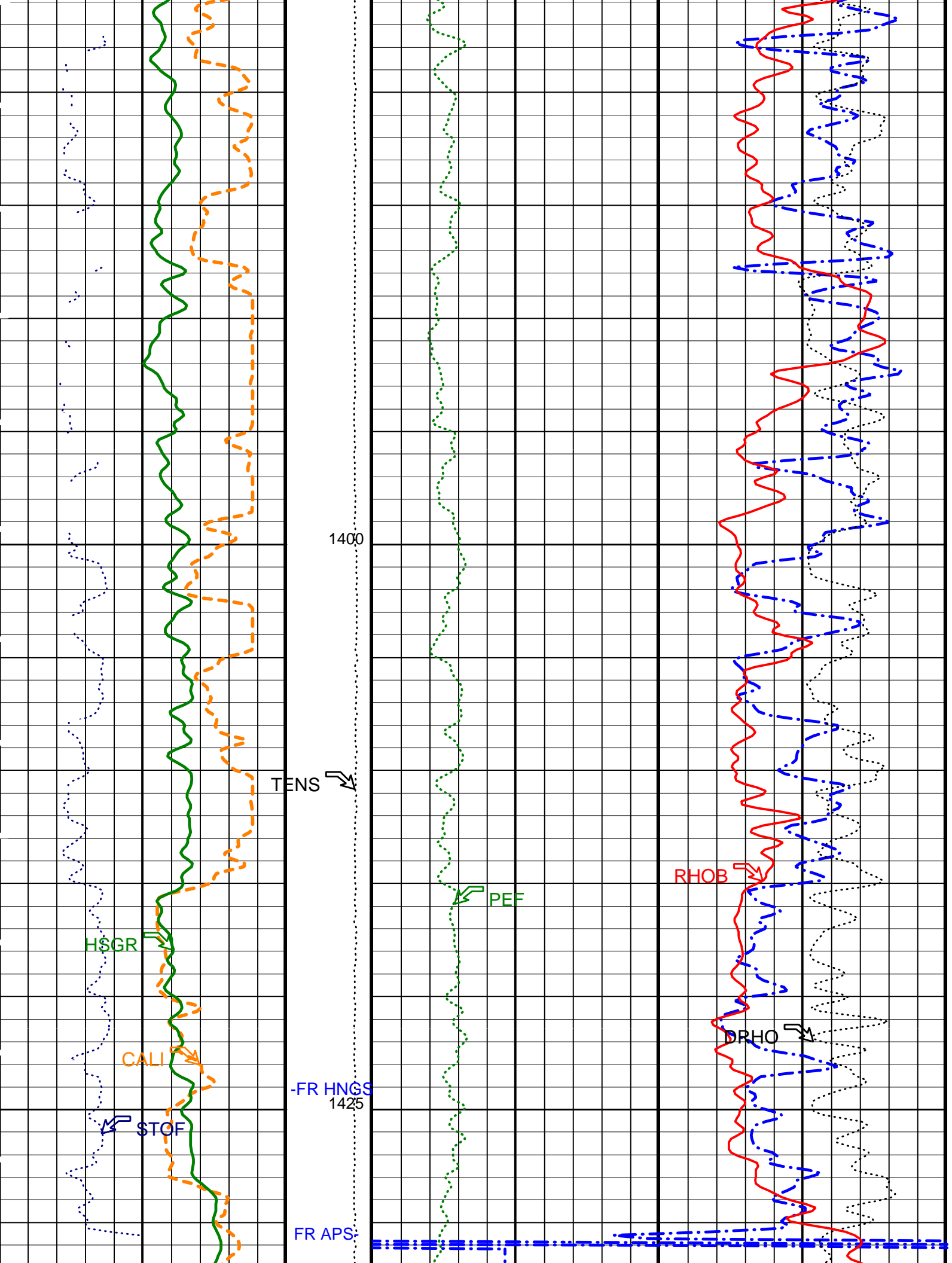


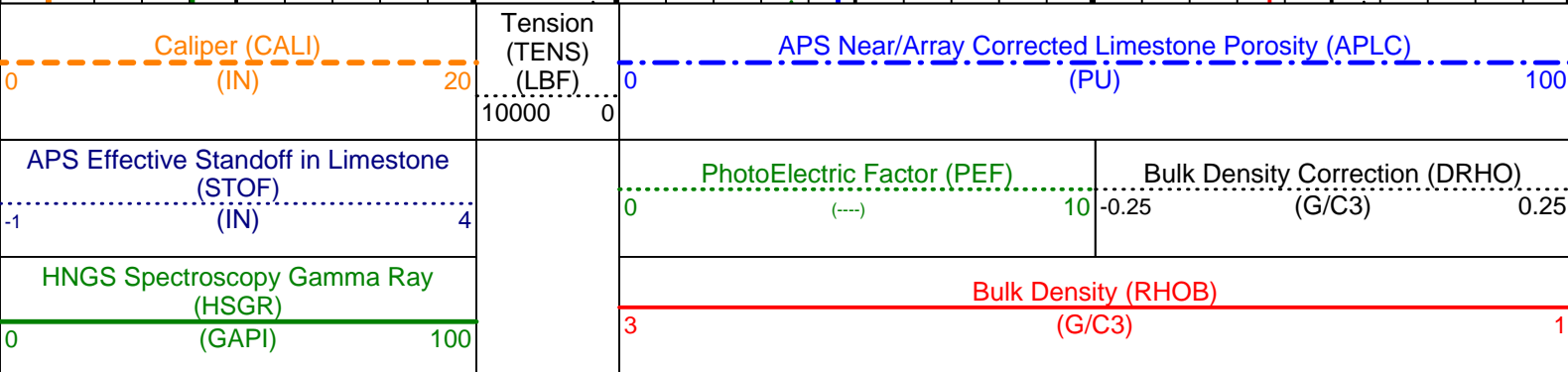
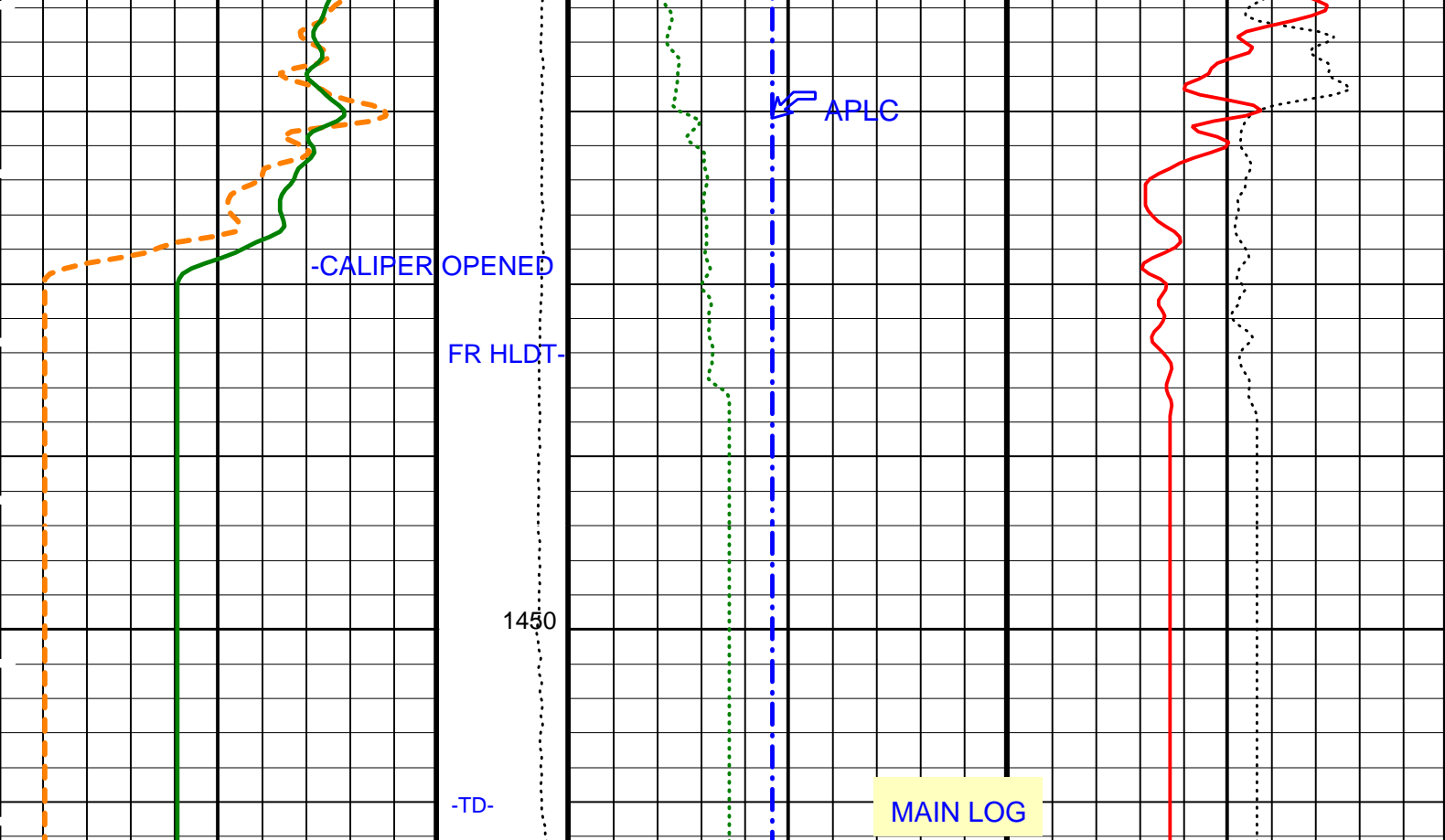
1325

1350

1375







PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
DIT-E: Dual Induction - E		
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	100 DEGC
DGF1	Deep 10 kHz Gain Factor	0.995593
DGF2	Deep 20 kHz Gain Factor	1.00789
DGF4	Deep 40 kHz Gain Factor	1.02614
DPH1	Deep 10 kHz Phase Shift	0.114289 DEG
DPH2	Deep 20 kHz Phase Shift	-0.152394 DEG
DPH4	Deep 40 kHz Phase Shift	-1.42629 DEG
DRE1	Deep Real 10 kHz Sonde Error Correction	44.9501 MM/M
DRE2	Deep Real 20 kHz Sonde Error Correction	16.357 MM/M
DRE4	Deep Real 40 kHz Sonde Error Correction	4.69026 MM/M
DRIM	DIT-E Radial Invasion Mode	Rxo>Rt
DSR1	Deep Sigma Reference (10 kHz)	7637 MM/M
DSR2	Deep Sigma Reference (20 kHz)	1843 MM/M
DSR4	Deep Sigma Reference (40 kHz)	405 MM/M
DSTA	DIT-E Transversal Standoff	0 IN
DXE1	Deep Quad 10 kHz Sonde Error Correction	108.903 MM/M
DXE2	Deep Quad 20 kHz Sonde Error Correction	64.6326 MM/M
DXE4	Deep Quad 40 kHz Sonde Error Correction	46.096 MM/M
GCSE	Generalized Caliper Selection	CALI
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	0.018227 DC/M
GRSE	Generalized Mud Resistivity Selection	

GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
IFRS	DIT-E Induction Frequency Selector	20	
IPHA	DIT-E Phasor Processing Mode	ALL	
IPRO	DIT-E Induction Processing Selector	PHASOR	
ITEN	DIT-E Temperature Enable	ENABLE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MGF1	Medium 10 kHz Gain Factor	1.02182	
MGF2	Medium 20 kHz Gain Factor	1.02964	
MGF4	Medium 40 kHz Gain Factor	1.06122	
MPH1	Medium 10 kHz Phase Shift	-0.255819	DEG
MPH2	Medium 20 kHz Phase Shift	-0.933067	DEG
MPH4	Medium 40 kHz Phase Shift	-2.46117	DEG
MRE1	Medium Real 10 kHz Sonde Error Correction	20.7292	MM/M
MRE2	Medium Real 20 kHz Sonde Error Correction	-1.78642	MM/M
MRE4	Medium Real 40 kHz Sonde Error Correction	-10.4594	MM/M
MSR1	Medium Sigma Reference (10 kHz)	13520	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MSR4	Medium Sigma Reference (40 kHz)	685	MM/M
MXE1	Medium Quad 10 kHz Sonde Error Correction	-105.752	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	-34.2041	MM/M
MXE4	Medium Quad 40 kHz Sonde Error Correction	11.4521	MM/M
SBR	Shoulder Bed Resistivity Factor	1	OHMM
SFCR	SFL Channel Ratio	1000	
SFLE	SFL Enable	ENABLE	
SHT	Surface Hole Temperature	20	DEGC
SPAE	DIT-E SPARC Processing Enable	ENABLE	
SPNV	SP Next Value	0	MV
HLDT-A: Hostile Environment Litho Density - A			
BFM	Borehole Fluid Medium	LIQUID	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LSHC	LS Hardware Loop Control	DISALLOW	
MDEN	Matrix Density	2.71	G/C3
QPPS	Quicklook Processing Pe Select	PEFL	
SSHC	SS Hardware Loop Control	DISALLOW	
WMUD	Mud Weight	0.994556	G/C3
NPLC-B: Nuclear Porosity Lithology Cartridge - B			
NOTS	NPLC Old Temperature Sensor	NO	
APS-BA: Accelerator-Porosity Tool			
	APS Software Version	5	
AASD	APS Thermal and Array Detectors High Voltage Setting	1968.98	V
ABOS	APS Neutron Burst-Off Background Subtraction Switch	ON	
ADSO	APS Array Detectors Data Source Switch	Both	
AFSD	APS Far Detector High Voltage Setting	2052.03	V
AHCS	APS Holesize Correction Source	GCSE	
AHSS	APS Holesize Correction Switch	ON	
AMTY	APS Environmental Corrections Mud Type	WaterBaseBarite	
ANSD	APS Near Detector High Voltage Setting	1748.3	V
AOTS	APS Old Temperature Sensor Switch	NO	
ASOS	APS Standoff Correction Switch	ON	
ATSS	APS Temperature-Pressure-Salinity Correction Switch	OFF	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
DPPM	Density Porosity Processing Mode	HIRS	
FSAL	Formation Salinity	-50000	PPM
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
NARC	APS Near/Array Calibration Ratio	1.06555	
NFRC	APS Near/Far Calibration Ratio	0.907568	
SHT	Surface Hole Temperature	20	DEGC
HNCS-BA: Hostile Natural Gamma Ray Sonde			
BAR1	HNCS Detector 1 Barite Constant	1	
BAR2	HNCS Detector 2 Barite Constant	1	
BHK	HNCS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNCS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNCS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNCS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNCS Borehole Potassium Running Average	-0.00302511	
HALE	HNCS Alpha Filter Length	60	IN

HALF	HNGS Alpha Filter Length	00	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	20	DEGC
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.979098	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.987736	
System and Miscellaneous			
ALDTPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	0.000	IN
CWEI	Casing Weight	0.00	LB/F
DFD	Drilling Fluid Density	1.10	G/C3
MST	Mud Sample Temperature	27.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	-50000	M
TDD	Total Depth - Driller	-50000.00	M
TDL	Total Depth - Logger	-50000.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: APSLiquidPorosity_1 Vertical Scale: 1:200 Graphics File Created: 17-Aug-2002 18:36

OP System Version: 10C0-306

MCM

DIT-E	10C0-306	HLDT-A	10C0-306
DTA-A	10C0-306	NPLC-B	OP10-KP1
APS-BA	OP10-KP1	HNGS-BA	OP10-KP1
DTC-H	10C0-306		

Output DLIS Files

DEFAULT	PI_LDL_APS_NGS_005LUP	FN:6	PRODUCER	17-Aug-2002 18:36
REDUCE	PI_LDL_APS_NGS_005LUP	FN:7	PRODUCER	17-Aug-2002 18:36

Output DLIS Files

DEFAULT	PI_LDL_APS_NGS_008LUP	FN:10	PRODUCER	17-Aug-2002 20:13	1442.5 M	1291.2 M
REDUCE	PI_LDL_APS_NGS_008LUP	FN:11	PRODUCER	17-Aug-2002 20:13	1442.5 M	1291.2 M

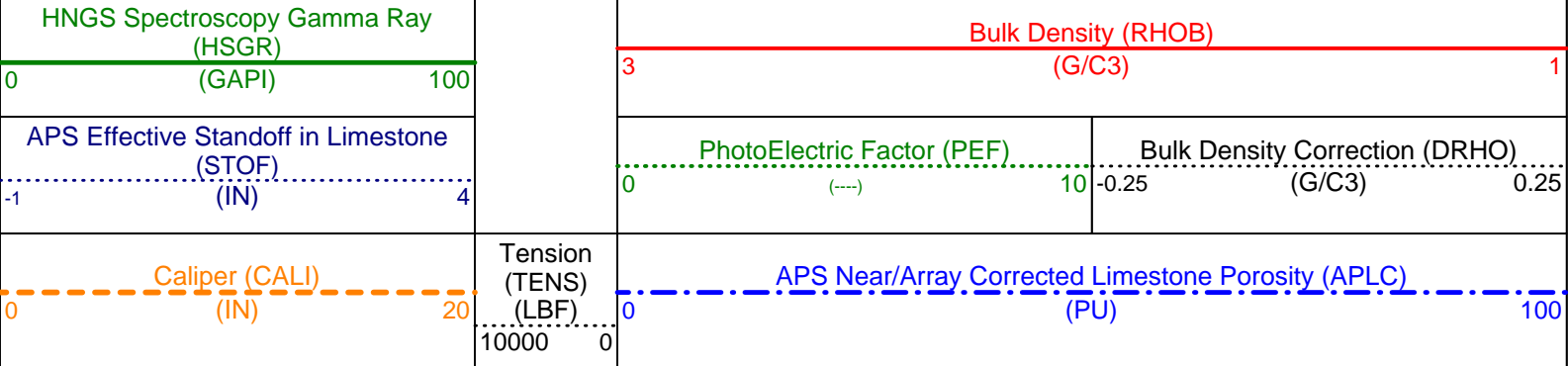
OP System Version: 10C0-306

MCM

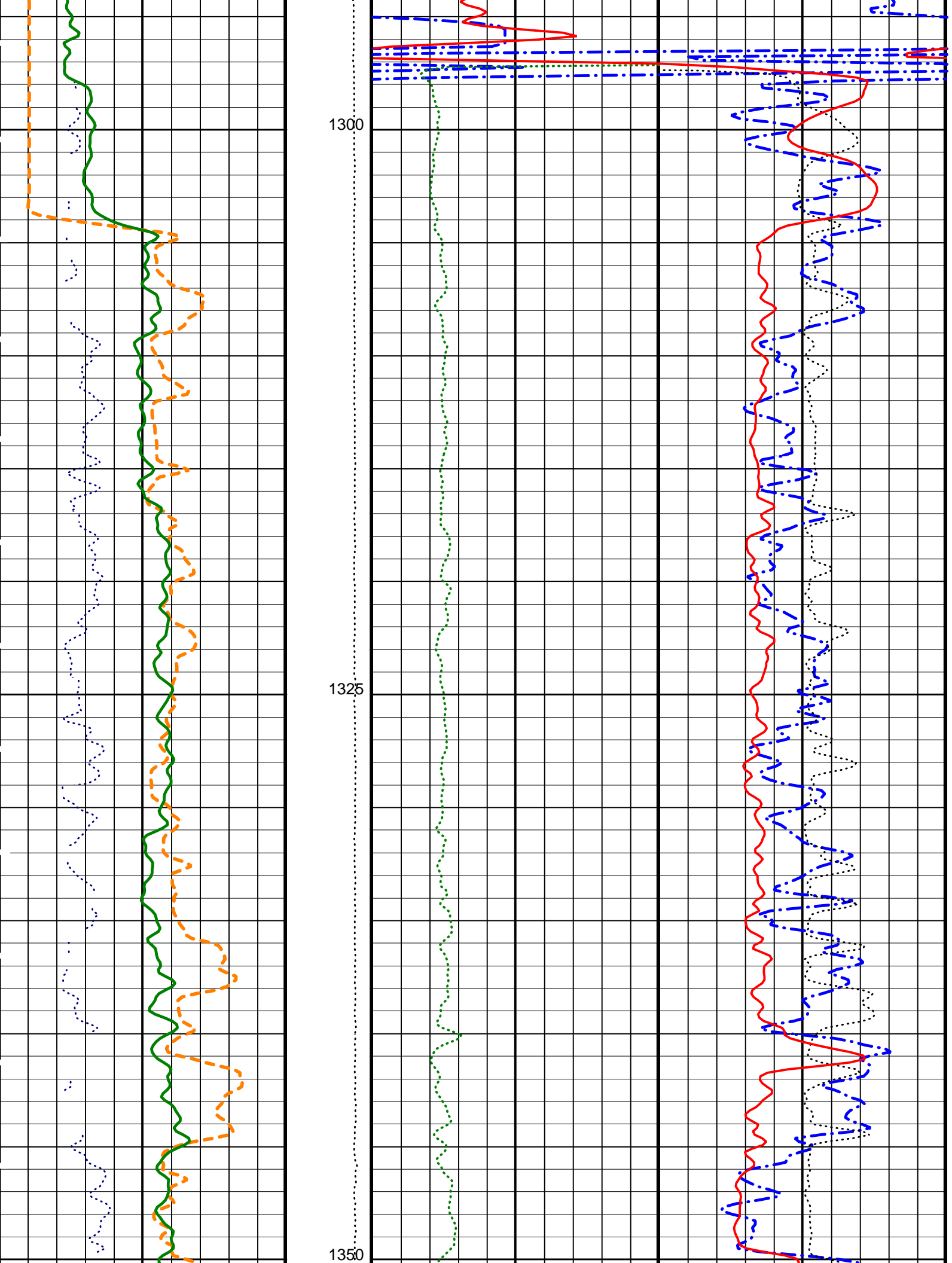
DIT-E	10C0-306	HLDT-A	10C0-306
DTA-A	10C0-306	NPLC-B	OP10-KP1
APS-BA	OP10-KP1	HNGS-BA	OP10-KP1
DTC-H	10C0-306		

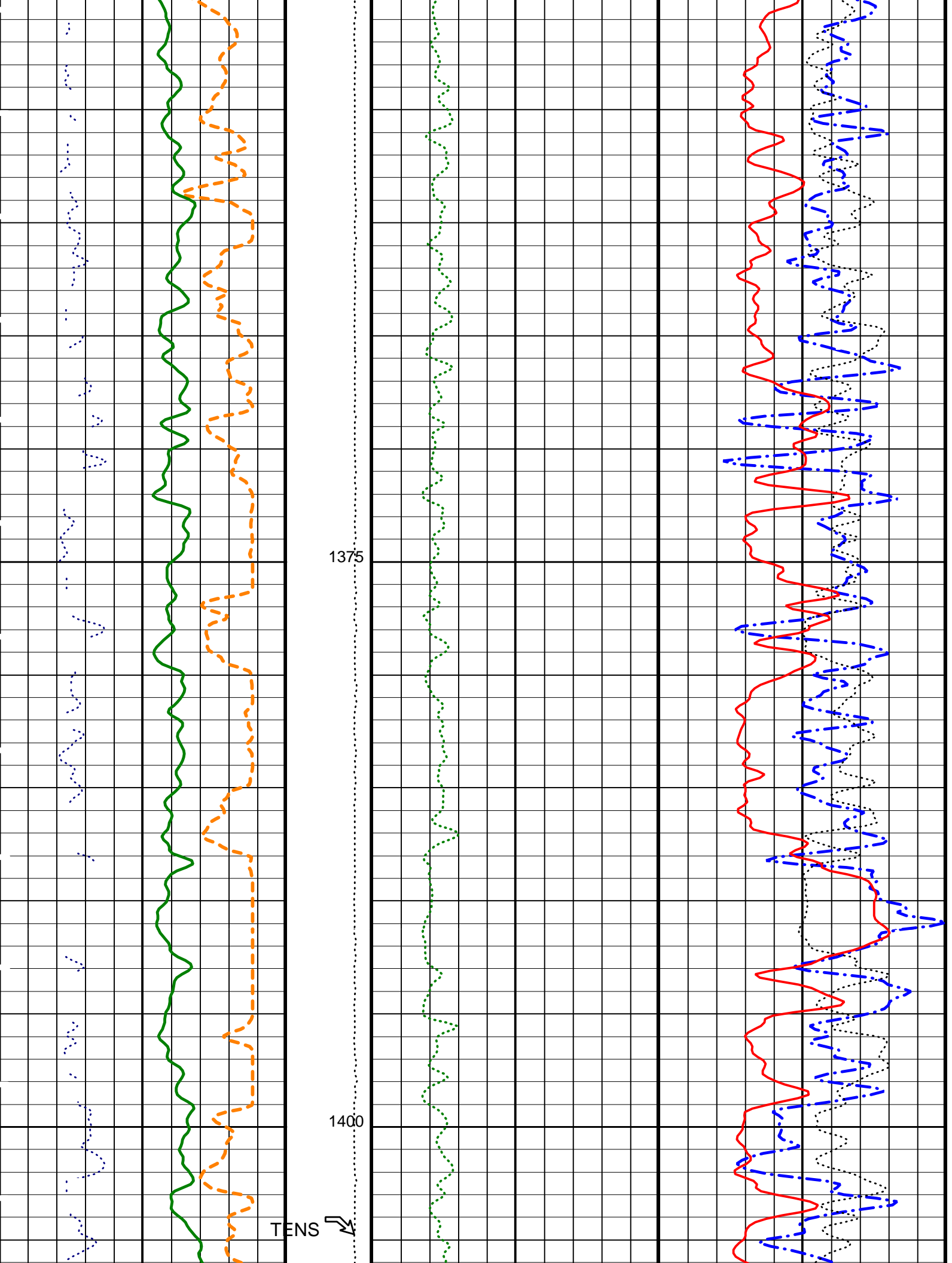
PIP SUMMARY

Time Mark Every 60 S



REPEAT SECTION

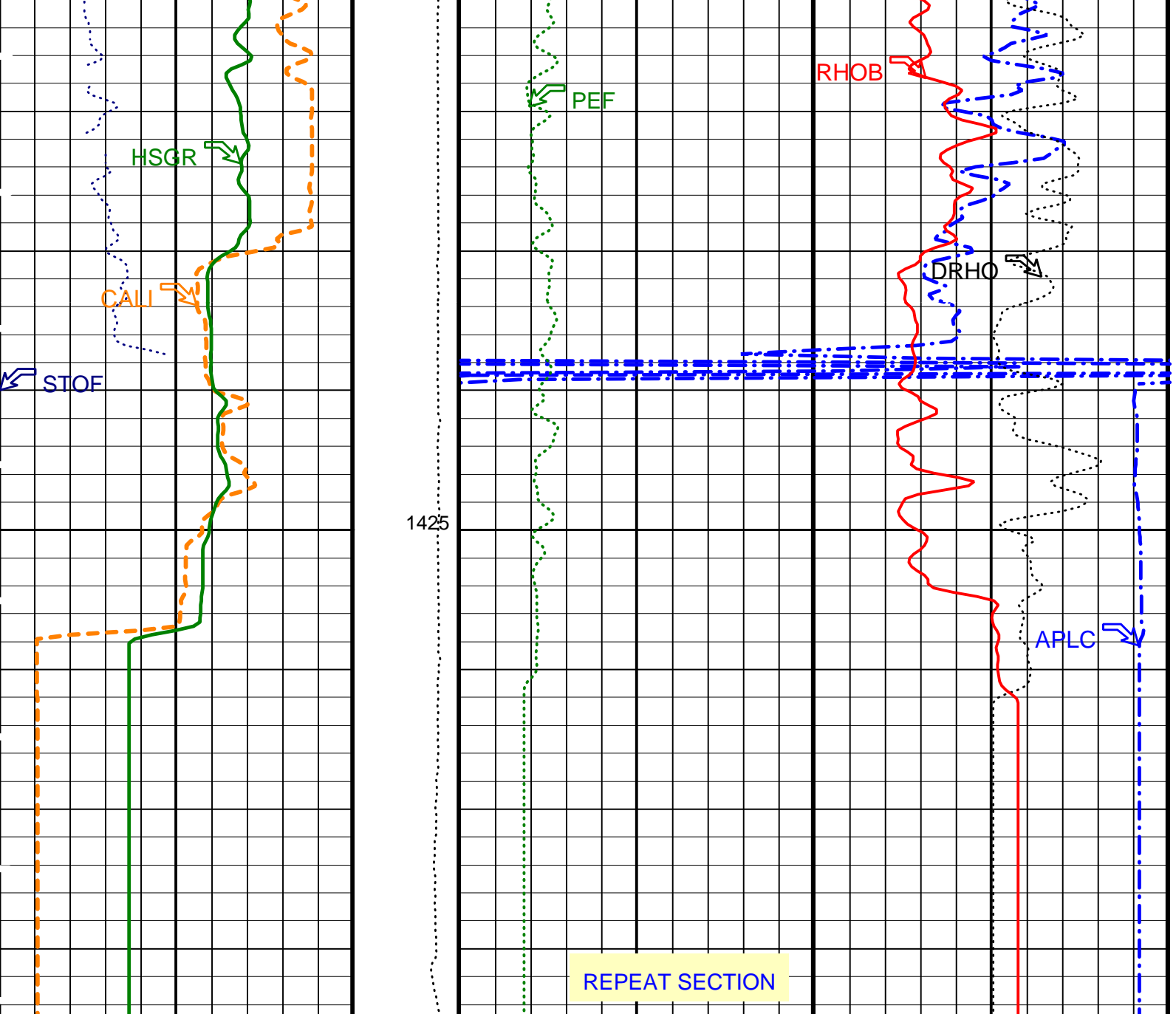




1375

1400

TENS ⚡



Caliper (CALI) (IN)	0	20	Tension (TENS) (LBF)	0	10000	APS Near/Array Corrected Limestone Porosity (APLC) (PU)	0	100
APS Effective Standoff in Limestone (STOF) (IN)	-1	4	PhotoElectric Factor (PEF) (---	0	10	Bulk Density Correction (DRHO) (G/C3)	-0.25	0.25
HNGS Spectroscopy Gamma Ray (HSGR) (GAPI)	0	100	Bulk Density (RHOB) (G/C3)	3				1

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
DIT-E	Dual Induction - E	
BHS	Borehole Status	OPEN
BHT	Bottom Hole Temperature (used in calculations)	100 DEGC
DGF2	Deep 20 kHz Gain Factor	1.00789
DPH2	Deep 20 kHz Phase Shift	-0.152394 DEG
DRE2	Deep Real 20 kHz Sonde Error Correction	16.357 MM/M

DSR2	Deep Real 20 kHz Sonde Error Correction	1843	MM/M
DXE2	Deep Sigma Reference (20 kHz)	64.6326	MM/M
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
IFRS	DIT-E Induction Frequency Selector	20	
IPHA	DIT-E Phasor Processing Mode	ALL	
IPRO	DIT-E Induction Processing Selector	PHASOR	
ITEN	DIT-E Temperature Enable	ENABLE	
MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
MGF2	Medium 20 kHz Gain Factor	1.02964	
MPH2	Medium 20 kHz Phase Shift	-0.933067	DEG
MRE2	Medium Real 20 kHz Sonde Error Correction	-1.78642	MM/M
MSR2	Medium Sigma Reference (20 kHz)	3250	MM/M
MXE2	Medium Quad 20 kHz Sonde Error Correction	-34.2041	MM/M
SBR	Shoulder Bed Resistivity Factor	1	OHMM
SFCR	SFL Channel Ratio	1000	
SFLE	SFL Enable	ENABLE	
SHT	Surface Hole Temperature	20	DEGC
SPAE	DIT-E SPARC Processing Enable	ENABLE	
SPNV	SP Next Value	0	MV
	HLDT-A: Hostile Environment Litho Density - A		
BFM	Borehole Fluid Medium	LIQUID	
DHC	Density Hole Correction	BS	
DPPM	Density Porosity Processing Mode	HIRS	
FD	Fluid Density	1	G/C3
LSHC	LS Hardware Loop Control	DISALLOW	
MDEN	Matrix Density	2.71	G/C3
QPPS	Quicklook Processing Pe Select	PEFL	
SSHC	SS Hardware Loop Control	DISALLOW	
WMUD	Mud Weight	0.994556	G/C3
	NPLC-B: Nuclear Porosity Lithology Cartridge - B		
NOTS	NPLC Old Temperature Sensor	NO	
	APS-BA: Accelerator-Porosity Tool		
AASD	APS Software Version	5	
ABOS	APS Thermal and Array Detectors High Voltage Setting	1968.98	V
ADSO	APS Neutron Burst-Off Background Subtraction Switch	ON	
AFSD	APS Array Detectors Data Source Switch	Both	
AHCS	APS Far Detector High Voltage Setting	2052.03	V
AHSS	APS Holesize Correction Source	GCSE	
AMTY	APS Holesize Correction Switch	ON	
ANSD	APS Environmental Corrections Mud Type	WaterBaseBarite	
AOTS	APS Near Detector High Voltage Setting	1748.3	V
ASOS	APS Old Temperature Sensor Switch	NO	
ATSS	APS Standoff Correction Switch	ON	
BHS	APS Temperature-Pressure-Salinity Correction Switch	OFF	
BHT	Borehole Status	OPEN	
DPPM	Bottom Hole Temperature (used in calculations)	100	DEGC
FSAL	Density Porosity Processing Mode	HIRS	
GCSE	Formation Salinity	-50000	PPM
GDEV	Generalized Caliper Selection	CALI	
GGRD	Average Angular Deviation of Borehole from Normal	0	DEG
GRSE	Geothermal Gradient	0.018227	DC/M
GTSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
MATR	Generalized Temperature Selection	LINEAR_ESTIMATE	
NARC	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
NFRC	APS Near/Array Calibration Ratio	1.06555	
SHT	APS Near/Far Calibration Ratio	0.907568	
	Surface Hole Temperature	20	DEGC
	HNGS-BA: Hostile Natural Gamma Ray Sonde		
BAR1	HNGS Detector 1 Barite Constant	1	
BAR2	HNGS Detector 2 Barite Constant	1	
BHK	HNGS Borehole Potassium Correction Concentration	0	
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
CSD1	Inner Casing Outer Diameter	0	IN
CSD2	Outer Casing Outer Diameter	0	IN
CSW1	Inner Casing Weight	0	LB/F
CSW2	Outer Casing Weight	0	LB/F
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	CALI	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	CHART_GEN_9	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.0132519	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	

MATR	Rock Matrix for Neutron Porosity Corrections	LIMESTONE	
S1BI	HNGS Detector 1 Calibration Bismuth Count Rate	1.3	CPS
S2BI	HNGS Detector 2 Calibration Bismuth Count Rate	1.3	CPS
SGRC	HNGS Standard Gamma-Ray Correction Flag	YES	
SHT	Surface Hole Temperature	20	DEGC
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	0.940387	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.946835	
System and Miscellaneous			
ALTDPCCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	0.000	IN
CWEI	Casing Weight	0.00	LB/F
DFD	Drilling Fluid Density	1.10	G/C3
MST	Mud Sample Temperature	27.00	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
RMFS	Resistivity of Mud Filtrate Sample	-50000.0000	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	-50000	M
TDD	Total Depth - Driller	-50000.00	M
TDL	Total Depth - Logger	-50000.00	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: APSLiquidPorosity_1 Vertical Scale: 1:200 Graphics File Created: 17-Aug-2002 20:13

OP System Version: 10C0-306

MCM

DIT-E	10C0-306	HLDT-A	10C0-306
DTA-A	10C0-306	NPLC-B	OP10-KP1
APS-BA	OP10-KP1	HNGS-BA	OP10-KP1
DTC-H	10C0-306		

Output DLIS Files

DEFAULT	PI_LDL_APS_NGS_008LUP	FN:10	PRODUCER	17-Aug-2002 20:13
REDUCE	PI_LDL_APS_NGS_008LUP	FN:11	PRODUCER	17-Aug-2002 20:13

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Hostile Environment Litho Density - A Wellsite Calibration - Background Measurement							
Master: 11-Jun-2002 19:31 Before: 24-Jul-2002 12:39 After: 17-Aug-2002 22:47							
LSW1 Background	100.0	88.67	86.74	87.00	0.2697	3.000	CPS
LSW2 Background	105.0	93.18	91.70	92.27	0.5778	3.150	CPS
LSW3 Background	210.0	177.4	176.2	178.4	2.285	6.300	CPS
LSW4 Background	290.0	236.8	236.6	234.4	-2.134	8.700	CPS
LSW5 Background	610.0	518.0	517.3	519.6	2.307	18.30	CPS
SSW1 Background	100.0	83.02	84.95	83.23	-1.720	3.000	CPS
SSW2 Background	200.0	165.1	166.3	165.4	-0.9567	6.000	CPS
SSW3 Background	530.0	440.7	439.6	439.0	-0.6002	15.90	CPS
SSW4 Background	280.0	232.4	232.4	232.4	-0.07803	8.400	CPS
SSW5 Background	205.0	174.0	173.3	174.2	0.8656	6.150	CPS
Hostile Environment Litho Density - A Wellsite Calibration - Tool Quality Control Information High Voltage							
Master: 11-Jun-2002 19:31 Before: 24-Jul-2002 12:39 After: 17-Aug-2002 22:47							
LS Bkg. High Voltage	1133	1133	1130	1132	2.423	N/A	V
SS Bkg. High Voltage	1177	1177	1171	1173	2.729	N/A	V
Hostile Environment Litho Density - A Wellsite Calibration - Detectors Resolution From BKG Measurements							
Master: 11-Jun-2002 19:31 Before: 24-Jul-2002 12:39 After: 17-Aug-2002 22:47							
LS Background Resolution	1.000	1.032	1.032	1.045	0.01232	N/A	
SS Background Resolution	1.000	0.9430	0.9416	0.9470	0.005421	N/A	
Hostile Environment Litho Density - A Wellsite Calibration - Caliper Calibration							
Before: 24-Jul-2002 12:38							
Caliper Small Ring	12.00	N/A	17.14	N/A	N/A	N/A	IN
Caliper Large Ring	15.25	N/A	21.07	N/A	N/A	N/A	IN
Hostile Environment Litho Density - A Master Calibration - Aluminum Measurement							
Master: 11-Jun-2002 22:36							
LSW1 Aluminum	648.4	576.7	--	--	--	--	CPS
LSW2 Aluminum	1018	928.8	--	--	--	--	CPS
LSW3 Aluminum	1105	996.5	--	--	--	--	CPS

LSW4 Aluminum	609.5	555.2	--	--	--	--	CPS
LSW5 Aluminum	533.8	495.5	--	--	--	--	CPS
SSW1 Aluminum	2664	2503	--	--	--	--	CPS
SSW2 Aluminum	7731	7298	--	--	--	--	CPS
SSW3 Aluminum	10380	9792	--	--	--	--	CPS
SSW4 Aluminum	4574	4340	--	--	--	--	CPS
SSW5 Aluminum	745.2	732.3	--	--	--	--	CPS
Hostile Environment Litho Density - A Master Calibration - Tool Quality Control Information: High Voltage							
Master: 11-Jun-2002 22:36							
LS Alum. High Voltage	1133	1137	--	--	--	--	V
SS Alum. High Voltage	1177	1170	--	--	--	--	V
Hostile Environment Litho Density - A Master Calibration - Detectors Resolution From Aluminum Measurement							
Master: 11-Jun-2002 22:36							
LS Aluminum Resolution	1.000	1.047	--	--	--	--	
SS Aluminum Resolution	1.000	1.055	--	--	--	--	
Hostile Environment Litho Density - A Master Calibration - Aluminum Measurement (Window Ratios)							
Master: 11-Jun-2002 22:36							
LSW1/(LSW4 + LSW5) Calc.	0.5400	0.5489	--	--	--	--	
LSW3/(LSW4 + LSW5) Calc.	0.9600	0.9485	--	--	--	--	
SSW1/(SSW4 + SSW5) Calc.	0.4600	0.4935	--	--	--	--	
SSW3/(SSW4 + SSW5) Calc.	1.900	1.931	--	--	--	--	
Hostile Environment Litho Density - A Master Calibration - Litholog Measurement							
Master: 11-Jun-2002 22:44							
LSW1 Iron	410.0	405.2	--	--	--	--	CPS
LSW2 Iron	870.0	771.0	--	--	--	--	CPS
LSW3 Iron	1030	901.5	--	--	--	--	CPS
LSW4 Iron	590.0	512.2	--	--	--	--	CPS
LSW5 Iron	530.0	459.1	--	--	--	--	CPS
SSW1 Iron	1850	1831	--	--	--	--	CPS
SSW2 Iron	6500	6181	--	--	--	--	CPS
SSW3 Iron	10000	9037	--	--	--	--	CPS
SSW4 Iron	4500	3979	--	--	--	--	CPS
SSW5 Iron	750.0	640.2	--	--	--	--	CPS
Hostile Environment Litho Density - A Master Calibration - Tool Quality Control Information: High Voltage							
Master: 11-Jun-2002 22:44							
LS Lith High Voltage	1133	1136	--	--	--	--	V
SS Lith High Voltage	1177	1170	--	--	--	--	V
Hostile Environment Litho Density - A Master Calibration - Detectors Resolution From Litholog Measurement							
Master: 11-Jun-2002 22:44							
LS Lith Resolution	1.000	1.048	--	--	--	--	
SS Lith Resolution	1.000	1.019	--	--	--	--	
Accelerator-Porosity Tool Wellsite Calibration - Detector Background							
Master: 24-Jul-2002 4:08 Before: 17-Aug-2002 19:06 After: 17-Aug-2002 21:56							
Near Det Bkg Cntrate	30.00	32.30	33.05	31.37	-1.683	N/A	CPS
Far Det Bkg Cntrate	30.00	33.62	31.89	33.37	1.480	N/A	CPS
Array-1 Det Bkg Cntrate	30.00	28.88	30.35	28.94	-1.405	N/A	CPS
Array-2 Det Bkg Cntrate	30.00	29.64	30.48	31.60	1.119	N/A	CPS
Array Therm Det Bkg Cntrate	30.00	32.75	32.38	34.97	2.589	N/A	CPS
Accelerator-Porosity Tool Wellsite Calibration - Calibration Ratios							
Master: 24-Jul-2002 4:08							
Near/Far Calibration Ratio	0.9250	0.9076	N/A	N/A	N/A	N/A	
Near/Array Calibration Ratio	1.030	1.066	N/A	N/A	N/A	N/A	
Near/Array Cal Ratio Up/Down	1.000	1.006	N/A	N/A	N/A	N/A	
Accelerator-Porosity Tool Wellsite Calibration - Tank Check							
Master: 24-Jul-2002 4:09							
Array-1 Standoff Porosity	11.75	11.51	N/A	N/A	N/A	N/A	PU
Array-2 Standoff Porosity	11.75	11.19	N/A	N/A	N/A	N/A	PU
Average Slowing Down Time	6.000	5.884	N/A	N/A	N/A	N/A	US
Array-1 SDT Ratio Up/Down	1.000	0.9901	N/A	N/A	N/A	N/A	
Array-2 SDT Ratio Up/Down	1.000	0.9732	N/A	N/A	N/A	N/A	
Sigma Formation	27.50	27.88	N/A	N/A	N/A	N/A	CU
Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 1 Check							
Master: 12-Jul-2002 22:08 Before: 24-Jul-2002 7:59 After: 17-Aug-2002 22:42							
Na 511 Peak Loc	40.00	40.59	40.60	40.60	0.001640	1.000	
Na 511 Peak Res	15.50	16.79	16.89	16.43	-0.4574	2.000	%
High Voltage	1150	1224	1220	1220	0.04187	30.00	V
Na 1785 Peak Loc	142.6	145.1	146.3	145.2	-1.068	7.000	
Na 1785 Peak Res	8.500	10.40	8.694	9.013	0.3196	2.000	%
Temperature	15.50	24.98	22.43	20.67	-1.759	N/A	DEGC
Na Count Rate	45.00	50.31	49.89	49.45	-0.4335	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 2 Check

Master: 12-Jul-2002 22:08 Before: 24-Jul-2002 7:59 After: 17-Aug-2002 22:42

Na 511 Peak Loc	40.00	40.58	40.59	40.64	0.05220	1.000	
Na 511 Peak Res	15.50	16.72	16.53	16.53	0.0008736	2.000	%
High Voltage	1150	1253	1250	1247	-2.899	30.00	V
Na 1785 Peak Loc	142.6	144.7	144.3	144.9	0.6215	7.000	
Na 1785 Peak Res	8.500	9.766	9.897	9.235	-0.6618	2.000	%
Temperature	15.50	24.15	21.87	20.92	-0.9464	N/A	DEGC
Na Count Rate	45.00	50.19	49.39	49.20	-0.1973	8.000	CPS

Hostile Natural Gamma Ray Sonde Wellsite Calibration - Ratio Of Detector 1 To Detector 2

Master: 12-Jul-2002 22:08 Before: 24-Jul-2002 7:59 After: 17-Aug-2002 22:42

Coincidence Count Rate Ratio	1.000	1.004	1.010	1.005	-0.004628	0.05000	
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Hostile Natural Gamma Ray Sonde Master Calibration - Detector 1 Calibration

Master: 12-Jul-2002 22:01

Na 511 Peak Set Point	40.00	41.00	--	--	--	--	
Th Peak Loc	209.6	208.9	--	--	--	--	
Th Peak Res	7.000	8.227	--	--	--	--	%
Background Count Rate	142.5	24.67	--	--	--	--	CPS
Gain Ratio	1.000	0.9793	--	--	--	--	

Hostile Natural Gamma Ray Sonde Master Calibration - Detector 2 Calibration

Master: 12-Jul-2002 22:01

Na 511 Peak Set Point	40.00	41.00	--	--	--	--	
Th Peak Loc	209.6	208.8	--	--	--	--	
Th Peak Res	7.000	8.191	--	--	--	--	%
Background Count Rate	142.5	22.68	--	--	--	--	CPS
Gain Ratio	1.000	0.9792	--	--	--	--	

Accelerator-Porosity Tool - Detector Plateau Settings :

Near Detector Plateau Setting	1748 V
Far Detector Plateau Setting	2052 V
Array Detector Plateau Setting	1969 V

Dual Induction - E / Equipment Identification

Primary Equipment:

Dual Induction Sonde	DIS - HB	442
Dual Induction Cartridge	DIC - EB	438

Auxiliary Equipment:

Mass Isolated Housing	MIH - ZA	417
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Hostile Environment Litho Density - A / Equipment Identification

Primary Equipment:

HOSTILE ENVIRONMENT LITHO DENSITY HIGH V	HLDV - A	10
HOSTILE ENVIRONMENT LITHO DENSITY CARTRI	HLDC - AA	11
Gamma Source Radioactive	GSR - Z	1846

Auxiliary Equipment:

HOSTILE ENVIRONMENT LITHO DENSITY SONDE	HLDS - B	10
HOSTILE ENVIRONMENT ELECTRONICS CARTRIDG	HEH - H	12
HOSTILE ENVIRONMENT ELECTRONICS CARTRIDG	HEH - G	11
HOSTILE ENVIRONMENT LITHO DENSITY PAD	HLDP - B	10

Hostile Environment Litho Density - A Wellsite Calibration

Background Measurement

Phase	LSW1 Background CPS	Value	Phase	LSW2 Background CPS	Value	Phase	LSW3 Background CPS	Value
Master		88.67	Master		93.18	Master		177.4
Before		86.74	Before		91.70	Before		176.2
After		87.00	After		92.27	After		178.4
	65.00 (Minimum) 100.0 (Nominal) 125.0 (Maximum)			70.00 (Minimum) 105.0 (Nominal) 130.0 (Maximum)			150.0 (Minimum) 210.0 (Nominal) 250.0 (Maximum)	

Phase	LSW4 Background CPS	Value	Phase	LSW5 Background CPS	Value	Phase	SSW1 Background CPS	Value
Master		236.8	Master		518.0	Master		83.02

Before		236.6	Before		517.3	Before		84.95
After		234.4	After		519.6	After		83.23
220.0 (Minimum) 290.0 (Nominal) 330.0 (Maximum)			430.0 (Minimum) 610.0 (Nominal) 730.0 (Maximum)			70.0 (Minimum) 100.0 (Nominal) 120.0 (Maximum)		
Phase	SSW2 Background CPS	Value	Phase	SSW3 Background CPS	Value	Phase	SSW4 Background CPS	Value
Master		165.1	Master		440.7	Master		232.4
Before		166.3	Before		439.6	Before		232.4
After		165.4	After		439.0	After		232.4
140.0 (Minimum) 200.0 (Nominal) 240.0 (Maximum)			380.0 (Minimum) 530.0 (Nominal) 630.0 (Maximum)			190.0 (Minimum) 280.0 (Nominal) 340.0 (Maximum)		
Phase	SSW5 Background CPS	Value						
Master		174.0						
Before		173.3						
After		174.2						
140.0 (Minimum) 205.0 (Nominal) 250.0 (Maximum)								
Master: 11-Jun-2002 19:31			Before: 24-Jul-2002 12:39			After: 17-Aug-2002 22:47		

Hostile Environment Litho Density - A Wellsite Calibration					
Detectors Resolution From BKG Measurements					
Phase	LS Background Resolution	Value	Phase	SS Background Resolution	Value
Master		1.032	Master		0.9430
Before		1.032	Before		0.9416
After		1.045	After		0.9470
0.7000 (Minimum) 1.000 (Nominal) 1.111 (Maximum)			0.7000 (Minimum) 1.000 (Nominal) 1.111 (Maximum)		
Master: 11-Jun-2002 19:31			Before: 24-Jul-2002 12:39		
After: 17-Aug-2002 22:47					

Hostile Environment Litho Density - A Master Calibration								
Aluminum Measurement								
Phase	LSW1 Aluminum CPS	Value	Phase	LSW2 Aluminum CPS	Value	Phase	LSW3 Aluminum CPS	Value
Master		576.7	Master		928.8	Master		996.5
440.0 (Minimum) 648.4 (Nominal) 840.0 (Maximum)			840.0 (Minimum) 1018 (Nominal) 1200 (Maximum)			920.0 (Minimum) 1105 (Nominal) 1280 (Maximum)		
Phase	LSW4 Aluminum CPS	Value	Phase	LSW5 Aluminum CPS	Value	Phase	SSW1 Aluminum CPS	Value
Master		555.2	Master		495.5	Master		2503
520.0 (Minimum) 609.5 (Nominal) 720.0 (Maximum)			450.0 (Minimum) 533.8 (Nominal) 670.0 (Maximum)			1850 (Minimum) 2664 (Nominal) 2900 (Maximum)		
Phase	SSW2 Aluminum CPS	Value	Phase	SSW3 Aluminum CPS	Value	Phase	SSW4 Aluminum CPS	Value
Master		7298	Master		9792	Master		4340
6200 (Minimum) 7731 (Nominal) 8500 (Maximum)			8750 (Minimum) 10380 (Nominal) 11750 (Maximum)			4000 (Minimum) 4574 (Nominal) 5400 (Maximum)		
Phase	SSW5 Aluminum CPS	Value						
Master		732.3						
570.0 (Minimum) 745.2 (Nominal) 1110 (Maximum)								
Master: 11-Jun-2002 22:36								

Hostile Environment Litho Density - A Master Calibration					
Detectors Resolution From Aluminum Measurement					
Phase	LS Aluminum Resolution	Value	Phase	SS Aluminum Resolution	Value
Master		1.047	Master		1.055
0.7000 (Minimum) 1.000 (Nominal) 1.111 (Maximum)			0.7000 (Minimum) 1.000 (Nominal) 1.111 (Maximum)		
Master: 11-Jun-2002 22:36					

Hostile Environment Litho Density - A Master Calibration					
Aluminum Measurement (Window Ratios)					
Phase	LSW1/(LSW4 + LSW5) Calc.	Value	Phase	LSW3/(LSW4 + LSW5) Calc.	Value
Master		0.5489	Master		0.9485

0.3400 (Minimum)	0.5400 (Nominal)	0.7400 (Maximum)	0.7600 (Minimum)	0.9600 (Nominal)	1.160 (Maximum)
Phase	SSW1/(SSW4 + SSW5) Calc.		Phase	SSW3/(SSW4 + SSW5) Calc.	
Master			Master		
0.3600 (Minimum)	0.4600 (Nominal)	0.5600 (Maximum)	1.700 (Minimum)	1.900 (Nominal)	2.100 (Maximum)

Master: 11-Jun-2002 22:36

Hostile Environment Litho Density - A Master Calibration														
Litholog Measurement														
Phase	LSW1 Iron CPS			Value	Phase	LSW2 Iron CPS			Value	Phase	LSW3 Iron CPS			Value
Master				405.2	Master				771.0	Master				901.5
310.0 (Minimum)	410.0 (Nominal)	510.0 (Maximum)			660.0 (Minimum)	870.0 (Nominal)	980.0 (Maximum)			810.0 (Minimum)	1030 (Nominal)	1170 (Maximum)		
Phase	LSW4 Iron CPS			Value	Phase	LSW5 Iron CPS			Value	Phase	SSW1 Iron CPS			Value
Master				512.2	Master				459.1	Master				1831
470.0 (Minimum)	590.0 (Nominal)	670.0 (Maximum)			400.0 (Minimum)	530.0 (Nominal)	620.0 (Maximum)			1400 (Minimum)	1850 (Nominal)	2120 (Maximum)		
Phase	SSW2 Iron CPS			Value	Phase	SSW3 Iron CPS			Value	Phase	SSW4 Iron CPS			Value
Master				6181	Master				9037	Master				3979
5170 (Minimum)	6500 (Nominal)	7270 (Maximum)			8100 (Minimum)	10000 (Nominal)	11000 (Maximum)			3620 (Minimum)	4500 (Nominal)	5020 (Maximum)		
Phase	SSW5 Iron CPS			Value										
Master				640.2										
470.0 (Minimum)	750.0 (Nominal)	10100 (Maximum)												

Master: 11-Jun-2002 22:44

Hostile Environment Litho Density - A Master Calibration									
Detectors Resolution From Litholog Measurement									
Phase	LS Lith Resolution			Value	Phase	SS Lith Resolution			Value
Master				1.048	Master				1.019
0.7000 (Minimum)	1.000 (Nominal)	1.111 (Maximum)			0.7000 (Minimum)	1.000 (Nominal)	1.111 (Maximum)		

Master: 11-Jun-2002 22:44

Nuclear Porosity Lithology Cartridge - B / Equipment Identification

Primary Equipment:			
NPLC Cartridge	NPLC - B	79	
Auxiliary Equipment:			
NPLC Housing	NPH - B	82	

Accelerator-Porosity Tool / Equipment Identification

Primary Equipment:			
Accelerator-Porosity Sonde	APS - BA	22	
APS Minitron	MNTR - F	4185	
Auxiliary Equipment:			
Accelerator-Porosity Housing	APH - AC	22	
APS Calibration Water Tank	SFT - 178	4722	
APS Aluminium Calibrator Sleeve	SFT - 281	24	

Accelerator-Porosity Tool Wellsite Calibration														
Detector Background														
Phase	Near Det Bkg Cntrate CPS			Value	Phase	Far Det Bkg Cntrate CPS			Value	Phase	Array-1 Det Bkg Cntrate CPS			Value
Master				32.30	Master				33.62	Master				28.88
Before				33.05	Before				31.89	Before				30.35
After				31.37	After				33.37	After				28.94
0 (Minimum)	30.00 (Nominal)	50.00 (Maximum)			0 (Minimum)	30.00 (Nominal)	50.00 (Maximum)			0 (Minimum)	30.00 (Nominal)	50.00 (Maximum)		

Phase	Array-2 Det Bkg Cntrate CPS	Value	Phase	Array Therm Det Bkg Cntrate CPS	Value
Master		29.64	Master		32.75
Before		30.48	Before		32.38
After		31.60	After		34.97
0 (Minimum)		30.00 (Nominal)	0 (Minimum)		30.00 (Nominal)
		50.00 (Maximum)			50.00 (Maximum)

Master: 24-Jul-2002 4:08 Before: 17-Aug-2002 19:06 After: 17-Aug-2002 21:56

Accelerator-Porosity Tool Wellsite Calibration								
Calibration Ratios								
Phase	Near/Far Calibration Ratio	Value	Phase	Near/Array Calibration Ratio	Value	Phase	Near/Array Cal Ratio Up/Down	Value
Master		0.9076	Master		1.066	Master		1.006
0.8000 (Minimum)		0.9250 (Nominal)	0.9000 (Minimum)		1.030 (Nominal)	0.9700 (Minimum)		1.000 (Nominal)
		1.050 (Maximum)			1.170 (Maximum)			1.030 (Maximum)

Master: 24-Jul-2002 4:08

Accelerator-Porosity Tool Wellsite Calibration								
Tank Check								
Phase	Array-1 Standoff Porosity PU	Value	Phase	Array-2 Standoff Porosity PU	Value	Phase	Average Slowing Down Time US	Value
Master		11.51	Master		11.19	Master		5.884
9.900 (Minimum)		11.75 (Nominal)	9.900 (Minimum)		11.75 (Nominal)	5.500 (Minimum)		6.000 (Nominal)
		13.60 (Maximum)			13.60 (Maximum)			6.250 (Maximum)
Phase	Array-1 SDT Ratio Up/Down	Value	Phase	Array-2 SDT Ratio Up/Down	Value	Phase	Sigma Formation CU	Value
Master		0.9901	Master		0.9732	Master		27.88
0.9500 (Minimum)		1.000 (Nominal)	0.9500 (Minimum)		1.000 (Nominal)	20.00 (Minimum)		27.50 (Nominal)
		1.050 (Maximum)			1.050 (Maximum)			35.00 (Maximum)

Master: 24-Jul-2002 4:09

Accelerator-Porosity Tool Master Calibration								
Detector Calibration								
Phase	Near/Far Calibration Ratio	Value	Phase	Near/Array Calibration Ratio	Value	Phase	Near/Array Cal Ratio Up/Down	Value
Master		0.9076	Master		1.066	Master		1.006
0.8000 (Minimum)		0.9250 (Nominal)	0.9000 (Minimum)		1.030 (Nominal)	0.9700 (Minimum)		1.000 (Nominal)
		1.050 (Maximum)			1.170 (Maximum)			1.030 (Maximum)

Master: 24-Jul-2002 4:08

Accelerator-Porosity Tool Master Calibration								
Tank Check								
Phase	Array-1 Standoff Porosity PU	Value	Phase	Array-2 Standoff Porosity PU	Value	Phase	Average Slowing Down Time US	Value
Master		11.51	Master		11.19	Master		5.884
9.900 (Minimum)		11.75 (Nominal)	9.900 (Minimum)		11.75 (Nominal)	5.500 (Minimum)		6.000 (Nominal)
		13.60 (Maximum)			13.60 (Maximum)			6.250 (Maximum)
Phase	Array-1 SDT Ratio Up/Down	Value	Phase	Array-2 SDT Ratio Up/Down	Value	Phase	Sigma Formation CU	Value
Master		0.9901	Master		0.9732	Master		27.88
0.9500 (Minimum)		1.000 (Nominal)	0.9500 (Minimum)		1.000 (Nominal)	20.00 (Minimum)		27.50 (Nominal)
		1.050 (Maximum)			1.050 (Maximum)			35.00 (Maximum)

Master: 24-Jul-2002 4:09

Hostile Natural Gamma Ray Sonde / Equipment Identification			
Primary Equipment:			
HNGS Sonde		HNGS - BA	77
Auxiliary Equipment:			
HNGS Sonde Housing		HNSH - BA	79
Gamma Source Radioactive		GSR - U	135




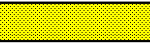

Hostile Natural Gamma Ray Sonde Wellsite Calibration								
Detector 1 Check								
Phase	Na 511 Peak Loc	Value	Phase	Na 511 Peak Res %	Value	Phase	High Voltage V	Value
Master		40.59	Master		16.79	Master		1224
Before		40.60	Before		16.89	Before		1220

After	37.50 (Minimum)	40.00 (Nominal)	42.50 (Maximum)	40.60	After	12.00 (Minimum)	15.50 (Nominal)	19.00 (Maximum)	16.43	After	900.0 (Minimum)	1150 (Nominal)	1600 (Maximum)	1220
Phase	Na 1785 Peak Loc			Value	Phase	Na 1785 Peak Res %			Value	Phase	Temperature DEGC			Value
Master				145.1	Master				10.40	Master				24.98
Before				146.3	Before				8.694	Before				22.43
After				145.2	After				9.013	After				20.67
	135.0 (Minimum)	142.6 (Nominal)	150.3 (Maximum)			7.000 (Minimum)	8.500 (Nominal)	11.00 (Maximum)			-28.89 (Minimum)	15.50 (Nominal)	60.00 (Maximum)	
Phase	Na Count Rate CPS			Value										
Master				50.31										
Before				49.89										
After				49.45										
	10.00 (Minimum)	45.00 (Nominal)	100.0 (Maximum)											
Master: 12-Jul-2002 22:08					Before: 24-Jul-2002 7:59					After: 17-Aug-2002 22:42				

Hostile Natural Gamma Ray Sonde Wellsite Calibration														
Detector 2 Check														
Phase	Na 511 Peak Loc			Value	Phase	Na 511 Peak Res %			Value	Phase	High Voltage V			Value
Master				40.58	Master				16.72	Master				1253
Before				40.59	Before				16.53	Before				1250
After				40.64	After				16.53	After				1247
	37.50 (Minimum)	40.00 (Nominal)	42.50 (Maximum)			12.00 (Minimum)	15.50 (Nominal)	19.00 (Maximum)			900.0 (Minimum)	1150 (Nominal)	1600 (Maximum)	
Phase	Na 1785 Peak Loc			Value	Phase	Na 1785 Peak Res %			Value	Phase	Temperature DEGC			Value
Master				144.7	Master				9.766	Master				24.15
Before				144.3	Before				9.897	Before				21.87
After				144.9	After				9.235	After				20.92
	135.0 (Minimum)	142.6 (Nominal)	150.3 (Maximum)			7.000 (Minimum)	8.500 (Nominal)	11.00 (Maximum)			-28.89 (Minimum)	15.50 (Nominal)	60.00 (Maximum)	
Phase	Na Count Rate CPS			Value										
Master				50.19										
Before				49.39										
After				49.20										
	10.00 (Minimum)	45.00 (Nominal)	100.0 (Maximum)											
Master: 12-Jul-2002 22:08					Before: 24-Jul-2002 7:59					After: 17-Aug-2002 22:42				

Hostile Natural Gamma Ray Sonde Wellsite Calibration		
Ratio Of Detector 1 To Detector 2		
Phase	Coincidence Count Rate Ratio	Value
Master		1.004
Before		1.010
After		1.005
	0.9500 (Minimum)	1.000 (Nominal)
		1.050 (Maximum)
Master: 12-Jul-2002 22:08		
Before: 24-Jul-2002 7:59		
After: 17-Aug-2002 22:42		

Hostile Natural Gamma Ray Sonde Master Calibration														
Detector 1 Calibration														
Phase	Na 511 Peak Set Point			Value	Phase	Th Peak Loc			Value	Phase	Th Peak Res %			Value
Master				41.00	Master				208.9	Master				8.227
	38.00 (Minimum)	40.00 (Nominal)	42.00 (Maximum)			201.0 (Minimum)	209.6 (Nominal)	218.3 (Maximum)			5.000 (Minimum)	7.000 (Nominal)	9.000 (Maximum)	
Phase	Background Count Rate CPS			Value	Phase	Gain Ratio			Value					
Master				24.67	Master				0.9793					
	20.00 (Minimum)	40.00 (Nominal)	80.00 (Maximum)			0.9000 (Minimum)	1.0000 (Nominal)	1.0000 (Maximum)						

20.00 (Minimum)	142.5 (Nominal)	265.0 (Maximum)	0.9400 (Minimum)	1.000 (Nominal)	1.060 (Maximum)						
Master: 12-Jul-2002 22:01											
Hostile Natural Gamma Ray Sonde Master Calibration											
Detector 2 Calibration											
Phase	Na 511 Peak Set Point		Value	Phase	Th Peak Loc		Value	Phase	Th Peak Res %		Value
Master			41.00	Master			208.8	Master			8.191
	38.00 (Minimum)	40.00 (Nominal)	42.00 (Maximum)		201.0 (Minimum)	209.6 (Nominal)	218.3 (Maximum)		5.000 (Minimum)	7.000 (Nominal)	9.000 (Maximum)
Phase	Background Count Rate CPS		Value	Phase	Gain Ratio		Value				
Master			22.68	Master			0.9792				
	20.00 (Minimum)	142.5 (Nominal)	265.0 (Maximum)		0.9400 (Minimum)	1.000 (Nominal)	1.060 (Maximum)				
Master: 12-Jul-2002 22:01											

Company: Lamont Doherty

Schlumberger

Well: ODP Leg 204, Site 1251H

Field: Hydrate Ridge

Ocean: Pacific

State: Oregon

Density/APS Porosity

Natural Gamma Ray