

**Company:** Lamont Doherty  
**Well:** Expedition 320, Site U1331A  
**Field:** PEAT  
**Rig:** JOIDES Resolution **Country:** USA

## Lamont Doherty Natural Gamma Ray Spectroscopy Downlog

Pacific Ocean SE of Hawaii	Elev.: K.B. 11.10 m G.L. -5116.20 m D.F. 11.10 m
Permanent Datum: _____ Log Measured From: _____ Drilling Measured From: _____	MEAN SEA LEVEL _____ DRILL FLOOR _____ DRILL FLOOR _____
Ocean: Pacific	Elev.: 0.00 m 11.10 m above Perm. Datum
Max. Well Deviation 0 deg	Longitude 142° 09.695' W Latitude 12° 04.086' N

**Rig:** JOIDES Resolution  
**Field:** PEAT  
**Location:** Pacific Ocean  
**Well:** Expedition 320, Site U1331A  
**Company:** Lamont Doherty

Logging Date	17-Mar-2009	
Run Number	1	
Depth Driller	5318 m	
Schlumberger Depth	5318 m	
Bottom Log Interval	5315 m	
Top Log Interval	5206.3 m	
Casing Driller Size @ Depth	5.875 in @ 5206.3 m	
Casing Schlumberger	5206.3 m	
Bit Size	9.875 in	
Type Fluid In Hole	WBM	
Density	1.1 g/cm3	
Fluid Loss		
PH		
Source Of Sample		
RM @ Measured Temperature	@	
RMF @ Measured Temperature	@	
RMC @ Measured Temperature	@	
Source RMF	RMC	
RM @ MRT	RMF @ MRT	@
Maximum Recorded Temperatures		
Circulation Stopped	Time	
Logger On Bottom	Time	23:00
Unit Number	Location	
Recorded By	C. Furman	
Witnessed By	H. Evans, T. Williams	

Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth			
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
Density			
Fluid Loss			
PH			
Source Of Sample			
RM @ Measured Temperature			
RMF @ Measured Temperature			
RMC @ Measured Temperature			
Source RMF	RMC		
RM @ MRT	RMF @ MRT	@	@
Maximum Recorded Temperatures			
Circulation Stopped	Time		
Logger On Bottom	Time		
Unit Number	Location		
Recorded By			
Witnessed By			

Logging Date			
Run Number			
Depth Driller			
Schlumberger Depth			
Bottom Log Interval			
Top Log Interval			
Casing Driller Size @ Depth			
Casing Schlumberger			
Bit Size			
Type Fluid In Hole			
Density			
Fluid Loss			
PH			
Source Of Sample			
RM @ Measured Temperature			
RMF @ Measured Temperature			
RMC @ Measured Temperature			
Source RMF	RMC		
RM @ MRT	RMF @ MRT	@	@
Maximum Recorded Temperatures			
Circulation Stopped	Time		
Logger On Bottom	Time		
Unit Number	Location		
Recorded By			
Witnessed By			

DISCLAIMER

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OTHER SERVICES1  
OS1: ~~Magnetic Susceptibility~~  
OS2:


REMARKS: RUN NUMBER 1

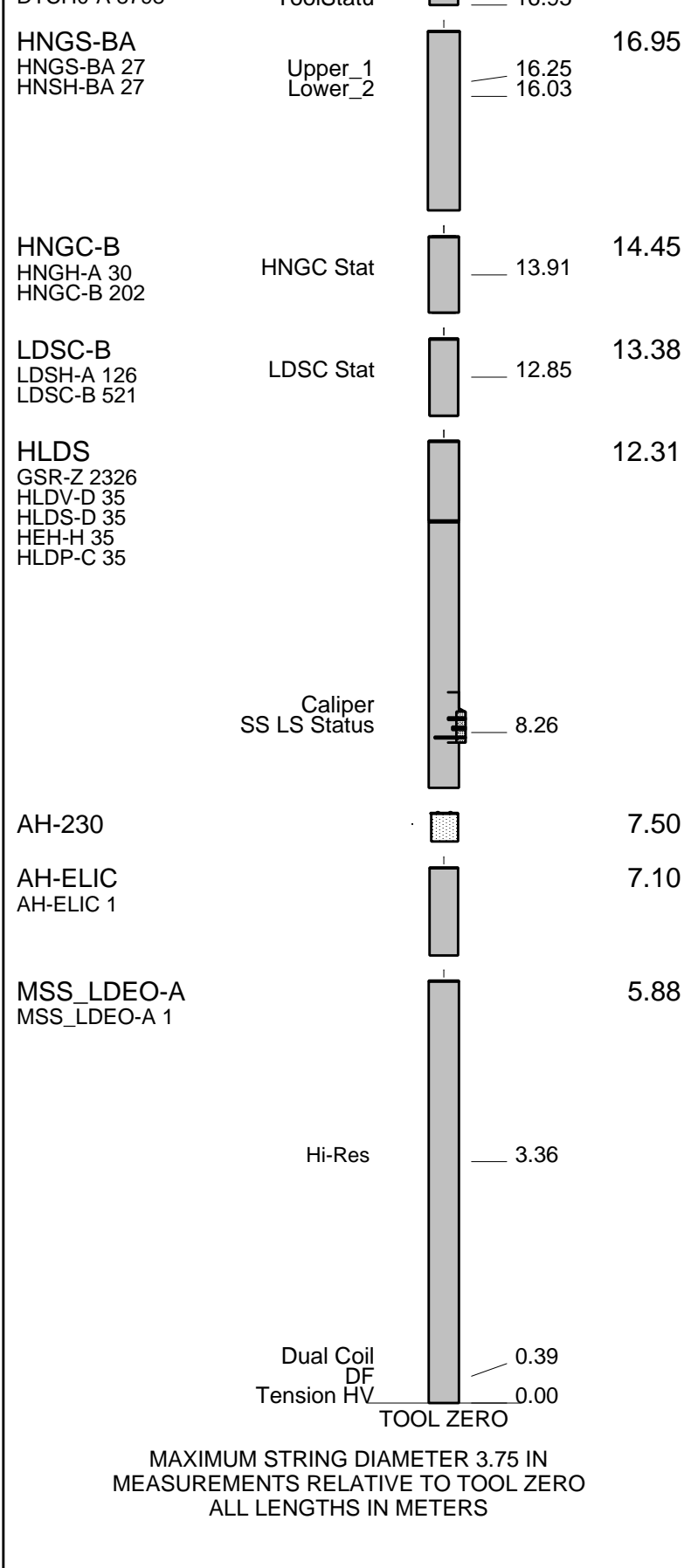
Tools run as per tool sketch with MSS eccentered using inline bowspring devices.  
Logging objective was to verify stratigraphic data in comparison to cores collected immediately prior to logging on Well A of Site U1331 and analyze lithology below cherts prior to next drilling.  
Logs run through drill pipe; GR recorded from TD to above sea floor for depth tie-in to sea bed.  
Depths shown are wireline depths below drill floor, in meters (MWRF) plus 7.0m due to offset created by AHC. (i.e. a depth of 5107m as shown on the is the equivalent of 5100m true depth, referenced to drill floor.)  
Logs were run without wave motion compensation and have been put on depth with driller's depths.  
Repeat Pass not conducted as per client instructions; depth presented as per client instructions.  
Logging recorded in open hole only with caliper closed.

RUN 1			RUN 2		
SERVICE ORDER #: PROGRAM VERSION: 17C0-154 FLUID LEVEL:			SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1		RUN 2	
SURFACE EQUIPMENT			
GSR-U 1154 WITM (DTS)-A			

DOWNHOLE EQUIPMENT			
LEH-QT LEH-QT 1726		18.75	
DTC-H ECH-KC 1777 DTCH0-A 8798	CTEM TelStatus ToolStatu	17.58 16.95	17.86



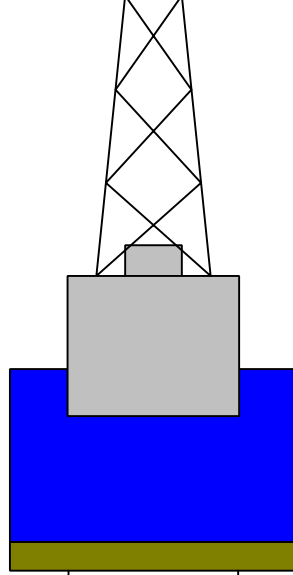
Production String	(in)	(m)	Well Schematic	(m)	(in)	Casing String
	OD	ID		MD	MD	

Derrick Floor Elevation

11.1

Mean Sea Level

0.0



0.0

5.875

Drill Pipe

All depths are in meters below drill floor.



5127.3

9.875

Sea Bed

5206.3

5.875

Bottom of Pipe

5317.9

9.875

Total Depth

Company: Lamont Doherty

Well: Expedition 320, Site U1331A

### Input DLIS Files

DEFAULT	Flip_MSS_LDEO_LDL_020LUP	PRODUCER	18-Mar-2009 09:56	5326.2 M	5221.2 M
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### Output DLIS Files

DEFAULT	MSS_LDEO_LDL_NGS_036PUP	FN:39	PRODUCER	20-Mar-2009 16:42	5326.2 M	5221.2 M
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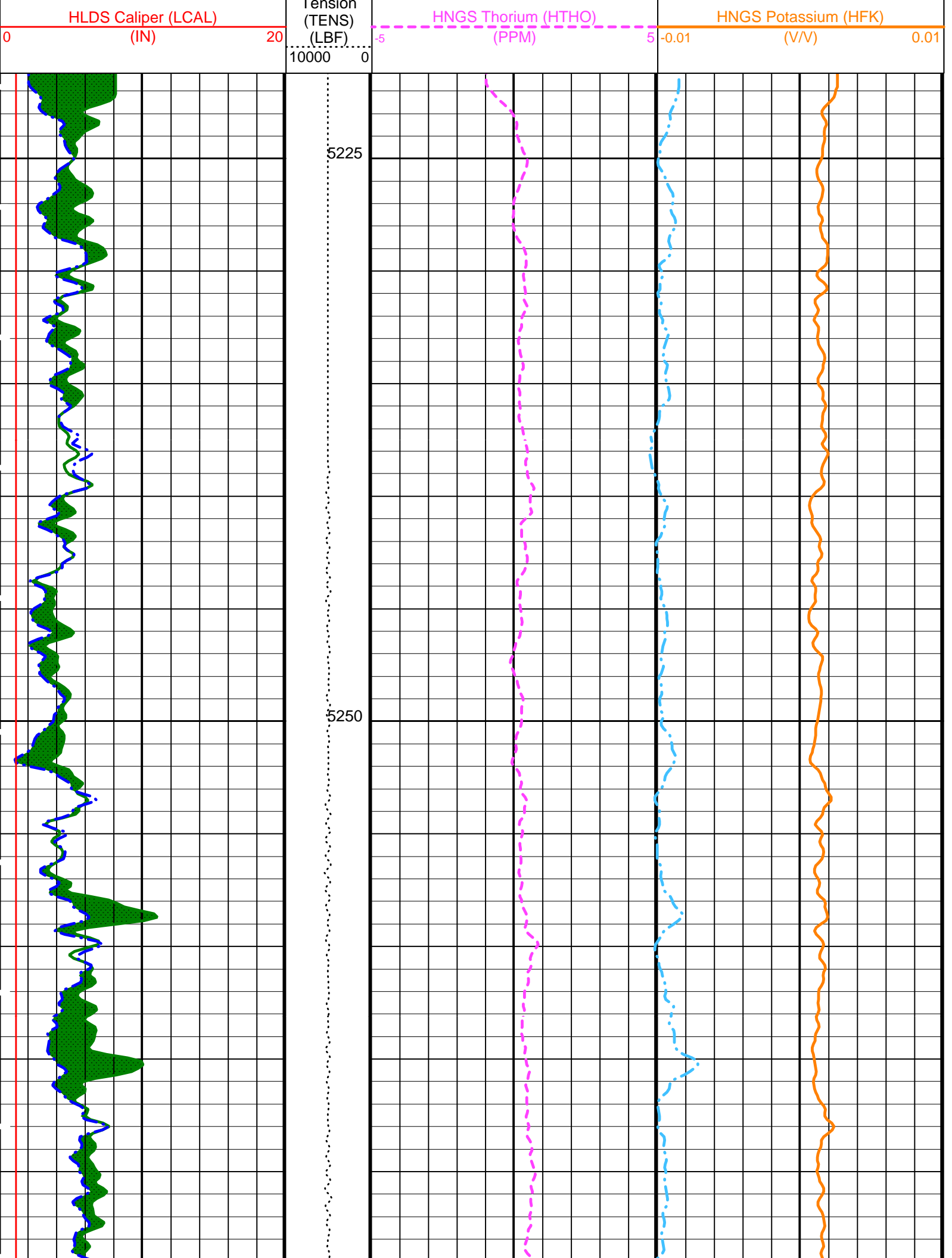
### OP System Version: 17C0-154

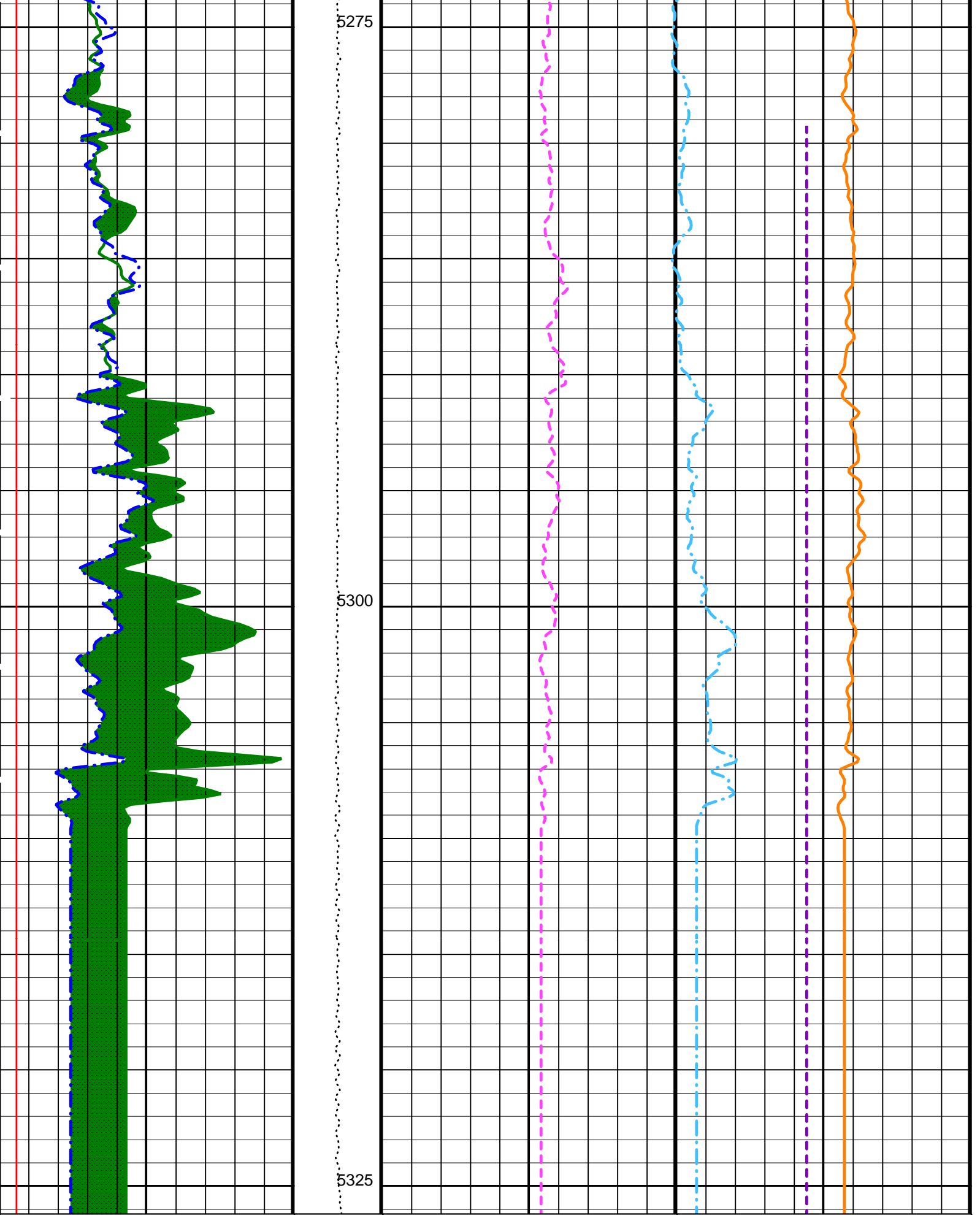
MSS_LDEO-A	17C0-154	HLDS	17C0-154
LDSC-B	17C0-154	HNGC-B	17C0-154
HNGS-BA	17C0-154	DTC-H	17C0-154

### PIP SUMMARY

▶ Time Mark Every 60 S







HNGS Computed Gamma Ray (HCGR)  
(GAPI) 0 15

HNGS Uranium (HURA)  
(PPM) -5 5

Area1  
From HCGR to HSGR  
HNGS Spectroscopy Gamma Ray  
(HSGR)  
(GAPI) 0 15

HNGS Borehole Potassium (HBHK)  
(V/V) -0.01 0.01

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
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	
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	BS	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	-0.00178051	
HALF	HNGS Alpha Filter Length	60	IN
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
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	
TPOS	Tool Position	ECCE	
VBA1	HNGS Detector 1 Variable Barite Factor Running Average	1.37788	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	0.974941	
System and Miscellaneous			
BS	Bit Size	9.875	IN
DFD	Drilling Fluid Density	1.10	G/C3
DO	Depth Offset for Playback	0.0	M
PP	Playback Processing	NORMAL	

Format: HNGSYields Vertical Scale: 1:200 Graphics File Created: 20-Mar-2009 16:42

OP System Version: 17C0-154

MSS_LDEO-A	17C0-154	HLDS	17C0-154
LDSC-B	17C0-154	HNGC-B	17C0-154
HNGS-BA	17C0-154	DTC-H	17C0-154

Input DLIS Files

DEFAULT	Flip_MSS_LDEO_LDL_020LUP	PRODUCER	18-Mar-2009 09:56	5326.2 M	5221.2 M
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Output DLIS Files

DEFAULT	MSS_LDEO_LDL_NGS_036PUP	FN:39	PRODUCER	20-Mar-2009 16:42
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Calibrations



Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
<b>Hostile Litho-Density Sonde Wellsite Calibration - Background Measurement</b>							
Master: 14-Mar-2009 14:36 Before: 17-Mar-2009 23:00 After: 18-Mar-2009 7:06							
SS Cs Resolution Bkg	9.000	8.424	8.461	8.468	0.006294	1.800	%
LS Cs Resolution Bkg	9.000	8.594	8.555	8.573	0.01742	1.800	%
LSW1 Background	100.0	77.03	75.31	76.00	0.6888	3.000	CPS
LSW2 Background	100.0	70.24	69.77	69.92	0.1473	3.000	CPS
LSW3 Background	200.0	155.8	156.5	156.7	0.2904	6.000	CPS
LSW4 Background	250.0	188.9	190.3	191.7	1.400	7.500	CPS
LSW5 Background	600.0	429.9	429.9	430.3	0.4689	18.00	CPS
SSW1 Background	100.0	74.59	73.68	74.64	0.9512	3.000	CPS
SSW2 Background	200.0	129.3	128.3	130.9	2.612	6.000	CPS
SSW3 Background	500.0	345.3	345.6	344.1	-1.505	15.00	CPS
SSW4 Background	270.0	183.6	185.8	184.8	-1.033	8.100	CPS
SSW5 Background	200.0	132.5	132.4	131.9	-0.5316	6.000	CPS
<b>Hostile Litho-Density Sonde Wellsite Calibration - Aluminum Measurement</b>							
Master: 14-Mar-2009 14:36							
LSW1 Aluminum	600.0	527.6	N/A	N/A	N/A	N/A	CPS
LSW2 Aluminum	900.0	782.6	N/A	N/A	N/A	N/A	CPS
LSW3 Aluminum	1100	950.7	N/A	N/A	N/A	N/A	CPS
LSW4 Aluminum	580.0	479.2	N/A	N/A	N/A	N/A	CPS
LSW5 Aluminum	570.0	439.7	N/A	N/A	N/A	N/A	CPS
SSW1 Aluminum	2800	2254	N/A	N/A	N/A	N/A	CPS
SSW2 Aluminum	8000	6469	N/A	N/A	N/A	N/A	CPS
SSW3 Aluminum	11600	9378	N/A	N/A	N/A	N/A	CPS
SSW4 Aluminum	5000	3975	N/A	N/A	N/A	N/A	CPS
SSW5 Aluminum	660.0	536.6	N/A	N/A	N/A	N/A	CPS
<b>Hostile Litho-Density Sonde Wellsite Calibration - Lithology Measurement</b>							
Master: 14-Mar-2009 14:36							
LSW1 Iron	400.0	352.8	N/A	N/A	N/A	N/A	CPS
LSW2 Iron	730.0	621.4	N/A	N/A	N/A	N/A	CPS
LSW3 Iron	1000	829.5	N/A	N/A	N/A	N/A	CPS
LSW4 Iron	520.0	430.9	N/A	N/A	N/A	N/A	CPS
LSW5 Iron	470.0	399.5	N/A	N/A	N/A	N/A	CPS
SSW1 Iron	2100	1671	N/A	N/A	N/A	N/A	CPS
SSW2 Iron	6800	5373	N/A	N/A	N/A	N/A	CPS
SSW3 Iron	10800	8503	N/A	N/A	N/A	N/A	CPS
SSW4 Iron	4600	3601	N/A	N/A	N/A	N/A	CPS
SSW5 Iron	580.0	469.3	N/A	N/A	N/A	N/A	CPS
<b>Hostile Litho-Density Sonde Wellsite Calibration - Caliper Calibration</b>							
Before: 17-Mar-2009 23:15							
HLDS Caliper Small Ring	8.000	N/A	10.74	N/A	N/A	N/A	IN
HLDS Caliper Large Ring	12.00	N/A	14.75	N/A	N/A	N/A	IN
<b>Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 1 Check</b>							
Master: 12-Mar-2009 19:24 Before: 17-Mar-2009 23:02 After: 18-Mar-2009 7:07							
Na 511 Peak Loc	40.00	40.60	40.49	40.68	0.1877	1.000	
Na 511 Peak Res	15.50	16.66	17.64	16.96	-0.6820	2.000	%
High Voltage	1150	1174	1183	1181	-2.068	N/A	V
Na 1785 Peak Loc	142.6	145.7	145.1	145.0	-0.1555	7.000	
Na 1785 Peak Res	8.500	9.231	9.840	10.03	0.1904	2.000	%
Temperature	15.50	27.43	30.64	28.97	-1.675	N/A	DEGC
Na Count Rate	45.00	37.76	38.10	37.68	-0.4226	8.000	CPS
<b>Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 2 Check</b>							
Master: 12-Mar-2009 19:24 Before: 17-Mar-2009 23:02 After: 18-Mar-2009 7:07							
Na 511 Peak Loc	40.00	40.61	40.64	40.59	-0.05334	1.000	
Na 511 Peak Res	15.50	14.67	16.20	15.98	-0.2151	2.000	%
High Voltage	1150	1250	1271	1257	-14.30	N/A	V
Na 1785 Peak Loc	142.6	143.6	144.4	144.8	0.4219	7.000	
Na 1785 Peak Res	8.500	8.251	8.655	7.947	-0.7082	2.000	%
Temperature	15.50	26.37	29.83	29.30	-0.5365	N/A	DEGC
Na Count Rate	45.00	38.49	38.60	37.85	-0.7454	8.000	CPS
<b>Hostile Natural Gamma Ray Sonde Wellsite Calibration - Ratio Of Detector 1 To Detector 2</b>							
Master: 12-Mar-2009 19:24 Before: 17-Mar-2009 23:02 After: 18-Mar-2009 7:07							
Coincidence Count Rate Ratio	1.000	0.9811	0.9865	0.9954	0.008901	0.05000	

Hostile Natural Gamma Ray Sonde Master Calibration - Detector 1 Calibration

Master: 12-Mar-2009 19:24

Na 511 Peak Set Point	40.00	42.00	--	--	--	--
Th Peak Loc	209.6	210.1	--	--	--	--
Th Peak Res	7.000	8.224	--	--	--	%
Background Count Rate	142.5	20.31	--	--	--	CPS
Gain Ratio	1.000	0.9844	--	--	--	--

Hostile Natural Gamma Ray Sonde Master Calibration - Detector 2 Calibration

Master: 12-Mar-2009 19:24

Na 511 Peak Set Point	40.00	42.00	--	--	--	--
Th Peak Loc	209.6	207.9	--	--	--	--
Th Peak Res	7.000	7.336	--	--	--	%
Background Count Rate	142.5	22.05	--	--	--	CPS
Gain Ratio	1.000	0.9744	--	--	--	--

Hostile Litho-Density Sonde / Equipment Identification

Primary Equipment:

Hostile Litho Density Sonde	HLDS - D	35
Hostile Litho Density High Voltage	HLDV - D	35
Gamma Source Radioactive	GSR - Z	2326

Auxiliary Equipment:

Hostile Litho Density Pad	HLDP - C	35
Hostile Litho Density High Voltage Housi	HEH - H	35

Hostile Litho-Density Sonde Wellsite Calibration

Background Measurement

Phase	SS Cs Resolution Bkg %	Value	Phase	LS Cs Resolution Bkg %	Value	Phase	LSW1 Background CPS	Value
Master		8.424	Master		8.594	Master		77.03
Before		8.461	Before		8.555	Before		75.31
After		8.468	After		8.573	After		76.00
7.000 (Minimum) 9.000 (Nominal) 11.000 (Maximum)			7.000 (Minimum) 9.000 (Nominal) 11.000 (Maximum)			55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)		
Phase	LSW2 Background CPS	Value	Phase	LSW3 Background CPS	Value	Phase	LSW4 Background CPS	Value
Master		70.24	Master		155.8	Master		188.9
Before		69.77	Before		156.5	Before		190.3
After		69.92	After		156.7	After		191.7
50.00 (Minimum) 100.0 (Nominal) 140.0 (Maximum)			110.0 (Minimum) 200.0 (Nominal) 290.0 (Maximum)			140.0 (Minimum) 250.0 (Nominal) 360.0 (Maximum)		
Phase	LSW5 Background CPS	Value	Phase	SSW1 Background CPS	Value	Phase	SSW2 Background CPS	Value
Master		429.9	Master		74.59	Master		129.3
Before		429.9	Before		73.68	Before		128.3
After		430.3	After		74.64	After		130.9
330.0 (Minimum) 600.0 (Nominal) 830.0 (Maximum)			55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)			100.0 (Minimum) 200.0 (Nominal) 260.0 (Maximum)		
Phase	SSW3 Background CPS	Value	Phase	SSW4 Background CPS	Value	Phase	SSW5 Background CPS	Value
Master		345.3	Master		183.6	Master		132.5
Before		345.6	Before		185.8	Before		132.4
After		344.1	After		184.8	After		131.9
280.0 (Minimum) 500.0 (Nominal) 700.0 (Maximum)			150.0 (Minimum) 270.0 (Nominal) 380.0 (Maximum)			110.0 (Minimum) 200.0 (Nominal) 270.0 (Maximum)		
Master: 14-Mar-2009 14:36			Before: 17-Mar-2009 23:00			After: 18-Mar-2009 7:06		

Hostile Litho-Density Sonde Master Calibration

Detector Background Measurement

Phase	LSW1 Background CPS	Value	Phase	LSW2 Background CPS	Value	Phase	LSW3 Background CPS	Value
Master		77.03	Master		70.24	Master		155.8
55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)			50.00 (Minimum) 100.0 (Nominal) 140.0 (Maximum)			110.0 (Minimum) 200.0 (Nominal) 290.0 (Maximum)		
Phase	LSW4 Background CPS	Value	Phase	LSW5 Background CPS	Value	Phase	LS Cs Resolution Bkg %	Value
Master		188.9	Master		429.9	Master		8.594

Master		766.9	Master		429.9	Master		6.994
	140.0 (Minimum) 250.0 (Nominal) 360.0 (Maximum)			330.0 (Minimum) 600.0 (Nominal) 830.0 (Maximum)			7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum)	
Phase	SSW1 Background CPS	Value	Phase	SSW2 Background CPS	Value	Phase	SSW3 Background CPS	Value
Master		74.59	Master		129.3	Master		345.3
	55.00 (Minimum) 100.0 (Nominal) 150.0 (Maximum)			100.0 (Minimum) 200.0 (Nominal) 260.0 (Maximum)			280.0 (Minimum) 500.0 (Nominal) 700.0 (Maximum)	
Phase	SSW4 Background CPS	Value	Phase	SSW5 Background CPS	Value	Phase	SS Cs Resolution Bkg %	Value
Master		183.6	Master		132.5	Master		8.424
	150.0 (Minimum) 270.0 (Nominal) 380.0 (Maximum)			110.0 (Minimum) 200.0 (Nominal) 270.0 (Maximum)			7.000 (Minimum) 9.000 (Nominal) 11.00 (Maximum)	
Master: 14-Mar-2009 14:36								

Hostile Litho-Density Sonde Master Calibration								
Detector Aluminum Measurement (bkgd-subtracted)								
Phase	LSW1 Aluminum CPS	Value	Phase	LSW2 Aluminum CPS	Value	Phase	LSW3 Aluminum CPS	Value
Master		527.6	Master		782.6	Master		950.7
	420.0 (Minimum) 600.0 (Nominal) 770.0 (Maximum)			650.0 (Minimum) 900.0 (Nominal) 1150 (Maximum)			800.0 (Minimum) 1100 (Nominal) 1450 (Maximum)	
Phase	LSW4 Aluminum CPS	Value	Phase	LSW5 Aluminum CPS	Value	Phase	SSW1 Aluminum CPS	Value
Master		479.2	Master		439.7	Master		2254
	410.0 (Minimum) 580.0 (Nominal) 740.0 (Maximum)			410.0 (Minimum) 570.0 (Nominal) 740.0 (Maximum)			2000 (Minimum) 2800 (Nominal) 3200 (Maximum)	
Phase	SSW2 Aluminum CPS	Value	Phase	SSW3 Aluminum CPS	Value	Phase	SSW4 Aluminum CPS	Value
Master		6469	Master		9378	Master		3975
	5800 (Minimum) 8000 (Nominal) 9300 (Maximum)			8300 (Minimum) 11600 (Nominal) 13500 (Maximum)			3500 (Minimum) 5000 (Nominal) 5800 (Maximum)	
Phase	SSW5 Aluminum CPS	Value						
Master		536.6						
	470.0 (Minimum) 660.0 (Nominal) 770.0 (Maximum)							
Master: 14-Mar-2009 14:36								

Hostile Litho-Density Sonde Master Calibration								
Detector Litholog Measurement (bkgd-subtracted)								
Phase	LSW1 Iron CPS	Value	Phase	LSW2 Iron CPS	Value	Phase	LSW3 Iron CPS	Value
Master		352.8	Master		621.4	Master		829.5
	290.0 (Minimum) 400.0 (Nominal) 560.0 (Maximum)			520.0 (Minimum) 730.0 (Nominal) 950.0 (Maximum)			720.0 (Minimum) 1000 (Nominal) 1350 (Maximum)	
Phase	LSW4 Iron CPS	Value	Phase	LSW5 Iron CPS	Value	Phase	SSW1 Iron CPS	Value
Master		430.9	Master		399.5	Master		1671
	370.0 (Minimum) 520.0 (Nominal) 700.0 (Maximum)			340.0 (Minimum) 470.0 (Nominal) 750.0 (Maximum)			1500 (Minimum) 2100 (Nominal) 2400 (Maximum)	
Phase	SSW2 Iron CPS	Value	Phase	SSW3 Iron CPS	Value	Phase	SSW4 Iron CPS	Value
Master		5373	Master		8503	Master		3601
	4900 (Minimum) 6800 (Nominal) 7900 (Maximum)			7800 (Minimum) 10800 (Nominal) 12600 (Maximum)			3300 (Minimum) 4600 (Nominal) 5400 (Maximum)	
Phase	SSW5 Iron CPS	Value						
Master		469.3						
	420.0 (Minimum) 580.0 (Nominal) 680.0 (Maximum)							
Master: 14-Mar-2009 14:36								

Hostile Litho-Density Sonde Master Calibration								
Quality Ratios								
Phase	AL CALIBRATION RATIO 1	Value	Phase	AL CALIBRATION RATIO 2	Value	Phase	AL CALIBRATION RATIO 3	Value
Master		1.035	Master		2.079	Master		0.5742
	0.9000 (Minimum) 1.000 (Nominal) 1.100 (Maximum)			1.900 (Minimum) 2.100 (Nominal) 2.300 (Maximum)			0.4500 (Minimum) 0.5500 (Nominal) 0.6500 (Maximum)	
Phase	AL CALIBRATION RATIO 4	Value	Phase	Pad-Wear SS Ratio	Value	Phase	Pad-Wear LS Ratio	Value
Master		0.4997	Master		0.9930	Master		0.9925
	0.4000 (Minimum) 0.5500 (Nominal) 0.6500 (Maximum)			0.9800 (Minimum) 0.9880 (Nominal) 0.9960 (Maximum)			0.9800 (Minimum) 0.9880 (Nominal) 0.9960 (Maximum)	
Phase	Pad-Position SS Ratio	Value	Phase	Pad-Position LS Ratio	Value			
Master		1.006	Master		0.9851			

0.9900 (Minimum)	0.9940 (Nominal)	1.015 (Maximum)	0.9850 (Minimum)	0.9940 (Nominal)	1.010 (Maximum)
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Master: 14-Mar-2009 14:36

Litho-Density Spectroscopy Cartridge - B / Equipment Identification

Primary Equipment: LDSC Cartridge	LDSC - B	521
Auxiliary Equipment: LDSC Housing	LDSH - A	126

Hostile Natural Gamma Ray Cartridge - B / Equipment Identification

Primary Equipment: HNGC Cartridge	HNGC - B	202
Auxiliary Equipment: HNGC Housing	HNGH - A	30

Hostile Natural Gamma Ray Sonde / Equipment Identification

Primary Equipment: HNGS Sonde	HNGS - BA	27
Auxiliary Equipment: HNGS Sonde Housing	HNSH - BA	27
Gamma Source Radioactive	GSR - U	1154

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		40.60	Master		16.66	Master		1174	
Before		40.49	Before		17.64	Before		1183	
After		40.68	After		16.96	After		1181	
	37.50 (Minimum)	40.00 (Nominal)	43.50 (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		145.7	Master		9.231	Master		27.43	
Before		145.1	Before		9.840	Before		30.64	
After		145.0	After		10.03	After		28.97	
	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		37.76							
Before		38.10							
After		37.68							
	10.00 (Minimum)	45.00 (Nominal)	100.0 (Maximum)						

Master: 12-Mar-2009 19:24

Before: 17-Mar-2009 23:02

After: 18-Mar-2009 7:07

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		40.61	Master		14.67	Master		1250	
Before		40.64	Before		16.20	Before		1271	
After		40.59	After		15.98	After		1257	
	37.50 (Minimum)	40.00 (Nominal)	43.50 (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		143.6	Master		8.251	Master		26.37	
Before		144.4	Before		8.655	Before		29.83	
After		144.8	After		7.947	After		29.30	
	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			38.49						
Before			38.60						
After			37.85						
	10.00 (Minimum)	45.00 (Nominal)	100.0 (Maximum)						
Master: 12-Mar-2009 19:24			Before: 17-Mar-2009 23:02			After: 18-Mar-2009 7:07			

Hostile Natural Gamma Ray Sonde Wellsite Calibration			
Ratio Of Detector 1 To Detector 2			
Phase	Coincidence Count Rate Ratio	Value	
Master		0.9811	
Before		0.9865	
After		0.9954	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)
Master: 12-Mar-2009 19:24			
Before: 17-Mar-2009 23:02			
After: 18-Mar-2009 7:07			

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		42.00	Master		210.1	Master		8.224	
	38.00 (Minimum)	40.00 (Nominal)	43.00 (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		20.31	Master		0.9844				
	10.00 (Minimum)	142.5 (Nominal)	265.0 (Maximum)	0.9400 (Minimum)	1.000 (Nominal)	1.060 (Maximum)			
Master: 12-Mar-2009 19:24									

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		42.00	Master		207.9	Master		7.336	
	38.00 (Minimum)	40.00 (Nominal)	43.00 (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		22.05	Master		0.9744				
	10.00 (Minimum)	142.5 (Nominal)	265.0 (Maximum)	0.9400 (Minimum)	1.000 (Nominal)	1.060 (Maximum)			
Master: 12-Mar-2009 19:24									

DTS Telemetry Tool / Equipment Identification		
Primary Equipment:		
DTC-H Auxiliary Cartridge	DTCH - A	8789
DTC-H Telemetry Cartridge	DTCH - A	8798
Auxiliary Equipment:		
DTCH Telemetry Cartridge Housing	ECH - KC	1777

Company: Lamont Doherty

**Schlumberger**

Well: Expedition 320, Site U1331A

Field: PEAT

Rig: JOIDES Resolution

Country: USA

Lamont Doherty  
Natural Gamma Ray Spectroscopy  
Downlog