



Tool Record Rates:  
EcoScope Res, Density & Neutron @ 2 sec

Tool Software Version:  
TeleScope: 9.0\_C03 EcoScope: 11

Crew: L. Loh and D. Buster

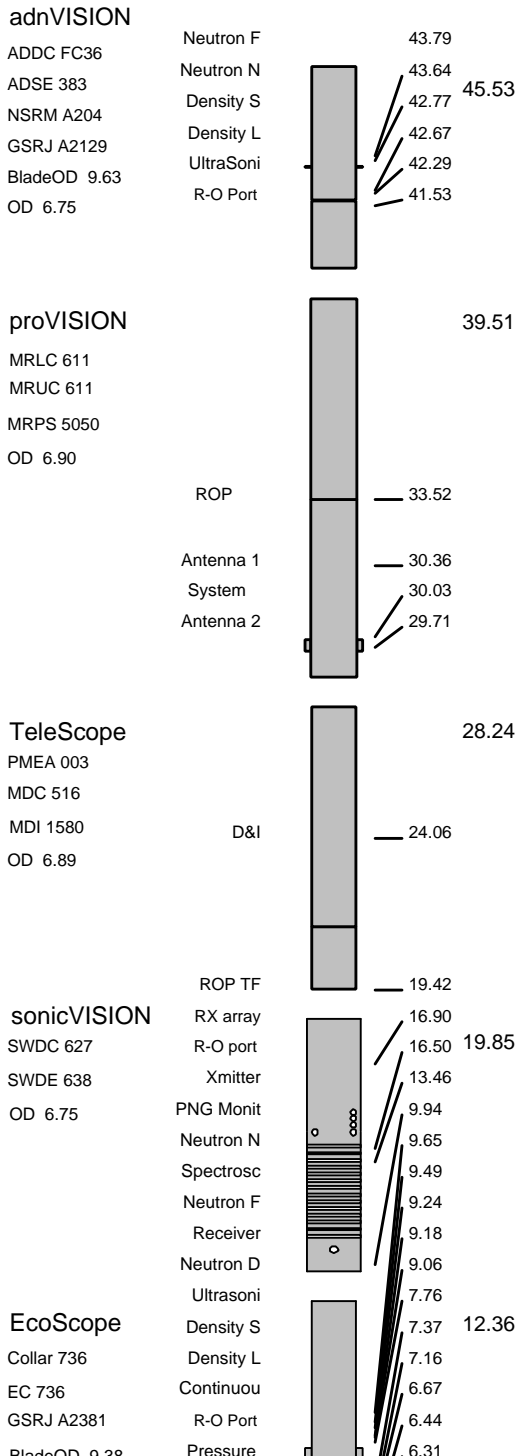
## EQUIPMENT DESCRIPTION

RUN1

RUN

RUN

### DOWNHOLE EQUIPMENT





Variable Name	Variable Description	Run Name & Value
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Run Number

1

General Information

BHT_RM	Bottom Hole Temperature (RM)	39.200001
BSAL_RM	Mud Salinity (RM)	0.000000
BS_RM	Bit Size (RM)	9.875000
COEF_M	User Defined FEXP in Clean Sand	1.650000
C_WS	Overpressure correction to Sw and M	1.000000
FEXP	Formation Factor Exponent(RM)	2.000000
FNUM	Formation Factor Enumerator(RM)	1.000000
FPHI_RM	Formation Factor Porosity Source (RM)	XPLOT
MST_RM	Mud Sample temperature (RM)	75.000000
MW_RM	Mud Weight (RM)	8.500000
OBMF_RM	Oil Based Mud (RM)	NO
RHOF_RM	Mud Filtrate Density (RM)	1.000000
RHOM_RM	Matrix density (RM)	2.650000
RMS_RM	Resistivity of Mud Sample (RM)	1.000000
RWA_COMP_M	Rwa computation model	BASIC
RWA_DEN_AD	Rwa Density Input ADN	RHOB
RWA_DEN_CD	Rwa Density Input CDN	RHOB
RWA_DEN_IN	Rwa Density Input	RHOB
RWA_FORM_M	Rwa computation formation model	CLASTIC
RWA_RES_IN	Rwa computation resistivity input	RT
RWS_RM	Resistivity of Connate Water (RM)	1.000000
SHT_RM	Surface Hole Temperature (RM)	15.000000
TD_RM	Total Measured Depth (RM)	7017.700195
TWS_RM	Temperature of Connate Water (RM)	75.000000
VF_ILLI	Fraction of illite in shales	0.500000
VF_KAOL	Fraction of kaolinite in shales	0.500000
VF_MONT	Fraction of montmorillonite in shales	0.000000
XPDM_RM	Cross plot density porosity multiplier	0.675000
XPNM_RM	Cross plot neutron porosity multiplier	0.325000

DVD

LWD_RM/STATION_FILE/PARAMETER	Station Time-frame file name	Station
-----	-----Density Parameter-----	-----Density
-----	-----Neutron Parameter-----	-----Neutron
-----	-----Interpretation Parameter-----	-----Interpretation
-----	-----Sigma Parameter-----	-----Sigma
A12A	ARC Air Cal Attenuation From T1 at 2 MHz	8.096470
A14A	ARC Air Cal Attenuation From T1 at 400 KHz	8.154540
A22A	ARC Air Cal Attenuation From T2 at 2 MHz	6.357980
A24A	ARC Air Cal Attenuation From T2 at 400 KHz	6.313930
A32A	ARC Air Cal Attenuation From T3 at 2 MHz	4.697780
A34A	ARC Air Cal Attenuation From T3 at 400 KHz	4.754960
A42A	ARC Air Cal Attenuation From T4 at 2 MHz	4.759350
A44A	ARC Air Cal Attenuation From T4 at 400 KHz	4.713040
A52A	ARC Air Cal Attenuation From T5 at 2 MHz	3.258230
A54A	ARC Air Cal Attenuation From T5 at 400 KHz	3.315620
ABNT	Abnormal Transmitter Indicator	No_Tx_Failed
ALPHA_DEN	Density Enhanced Vertical Resolution Processing Switch	YES
ANISO_COMP	Anisotropy Computation Option	YES
ATMP_ARC	ARC Select Temperature Channel	Annulus_Temp
AZMF	Formation DIP Azimuth	0.000000
BH_COMPUTE	Borehole Inversion Computation Option	YES
CALG	DVDM Gamma Ray Cal Gain Factor	-1.000000
CDPTH_ARC	Process Start Depth	100.000000
DEVI	Well Section Deviation	0.100000
DIELEC_COM	Dielectric Computation Option	YES
DIPF	Formation DIP Angle	0.000000
DVDM DHS	DVDM Down Hole Software Version	0.000000
DYN_IMAGE	Generate Dynamic Normalized Image?	YES
EDPTH	Wizard Process Stop Depth	50000
EN_WIZARD	Enable ARC Wizard Processing	NO
ERRCT	Percentage Error Cutoff	4.500000
EVRL	EVR Process averaging number of samples (RM)	49
FVVN	Firmware Version Number	1.100000
GCSE	Generalized Caliper Selection	BS
GRBC	RM: DVDM Gamma Ray Blanket (CPS)	75.000000
GRSH	GR Shale (Invasion Computation Cutoff)	1000.000000
GR_CF	Gamma Ray Correction Factor	2.250000
HIGH_BLEND	High Resistivity Threshold for Blending	2.000000
IDQT	Image Derived Quality Threshold	1.000000
IMAGE_MAX	Image Density Caliper Right Scale	8.000000
IMAGE_MAX	Image Density Quality Right Scale	1.000000
IMAGE_MAX	Image PEF(Segment) Right Scale	6.000000
IMAGE_MAX	Image RHOB(Segment) Right Scale	2.650000
IMAGE_MIN	Image Density Caliper Left Scale	2.000000
IMAGE_MIN	Image Density Quality Left Scale	0.000000
IMAGE_MIN	Image PEF(Segment) Left Scale	2.000000
IMAGE_MIN	Image RHOB(Segment) Left Scale	2.050000
IMAGE_ORIE	Image Orientation Options, e.g. Top of Hole or True North	NORTH
INCLIN_B0	ARC Bias Constant (mg)	0.000000
INCLIN_B1	ARC Bias First-order Coefficient (mg/degC)	0.000000
INCLIN_B2	ARC Bias Second-order Coefficient (mg/degC)	0.000000
INCLIN_B3	ARC Bias Third-order Coefficient (mg/degC)	0.000000
INCLIN_C0	ARC Current Scale Factor Constant (mA/g)	1.000000
INCLIN_C1	ARC Scale First-order Coefficient (mA/g/degC)	0.000000
INCLIN_C2	ARC Scale Second-order Coefficient (mA/g/degC)	0.000000
INCLIN_C3	ARC Scale Third-order Coefficient (mA/g/degC)	0.000000

INVAS_COMP	Invasion Penetration Option		YES
JSD	Acquisition start date		YES
JSD_ARC	ARC Acquisition start date		YES
LOW_BLEND	Low Resistivity Threshold for Blending		1.000000
MATR	Rock Matrix for Neutron Porosity Corrections		SANDSTONE
MSWS	ARC Wizard Model Switch Window		5.000000
MULTIEFFEC	Multi Effect Option		YES
NEU_DCOR_O	Density Correction Source for Neutron Processing		Average
NEU_FTUBE_	Far Thermal Tube Selection		Both
NTIK_SEL	Neutron Tick Channel Name		FAZ1
OACF	O2 Activation Correction Factor (RM)		0.000000
P12A	ARC Air Cal Phase-Shift From T1 at 2 MHz		1.143270
P14A	ARC Air Cal Phase-Shift From T1 at 400 KHz		1.838910
P22A	ARC Air Cal Phase-Shift From T2 at 2 MHz		-1.152680
P24A	ARC Air Cal Phase-Shift From T2 at 400 KHz		-1.826430
P32A	ARC Air Cal Phase-Shift From T3 at 2 MHz		1.064520
P34A	ARC Air Cal Phase-Shift From T3 at 400 KHz		1.835500
P42A	ARC Air Cal Phase-Shift From T4 at 2 MHz		-1.202580
P44A	ARC Air Cal Phase-Shift From T4 at 400 KHz		-1.845070
P52A	ARC Air Cal Phase-Shift From T5 at 2 MHz		1.092880
P54A	ARC Air Cal Phase-Shift From T5 at 400 KHz		1.844270
PMUD	Potassium Concentration in Mud		0.000000
POFFSET	Pressure Offset		0.000000
PRTD	Preferred Resistivity Log for Rt Display while Multi-Effects		P34B
PSOF_ADJ_T	ARC: User Input Phase offset		0.000000
RESTIK	ARC resistivity tick source		Phase
SDPTH	Wizard Process Start Depth		100
SIG_PCOR_O	Porosity Correction Source for Sigma Processing		Best
SPEC_CSG_D	Casing Depth for Spectroscopy Processing		100.000000
SPL_CLAY_M	SpectroLith Clay Model		ARENITE
SPL_COAL_O	SpectroLith Coal Processing Option		NONE
SPL_SULFUR	SpectroLith Sulfur Mineral Option		ANHYDRITE
STAB_SIZE	Stabilizer Size		9.375000
STOH	Density Top of Hole Sector (Left Boundary)		SECTOR_0
TRNO	Tool Run Number		7017.700195
TSIZ_ARC	ARC Tool Size		6.900000
TSNO	Tool Serial Number		6.900000
UNIFORM_CO	Uniform Rock Option		YES
VERS_ARC	ARC Down hole software version Number		1.100000
WRK	Way to Report Potassium Concentration		K_by_Wgt_%
WSDI	Window Size of Dynamic Normalization Image		50.000000

Schlumberger Drilling & Measurements

Parameter Insert Header Software version 2.0c

## IDEAL Version: ID10\_2B\_08

IDF

Format: 5 MD ADN/ARC

Vertical Scale: 1:240

Graphics File Created: 01-Oct-2005 23:53

### PIP SUMMARY

Density Ticks, 0.1-ft

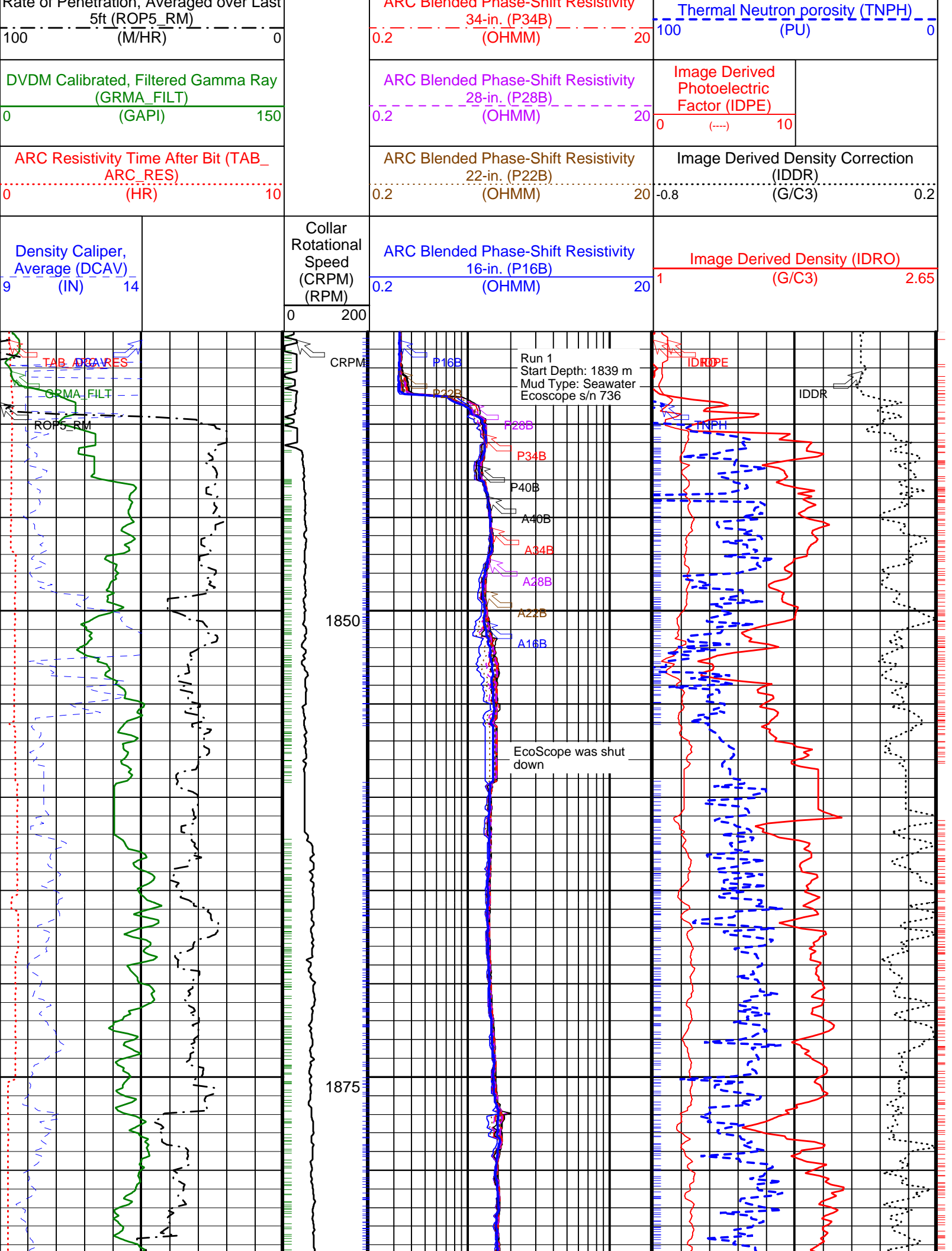
+ ARC Resistivity Samples

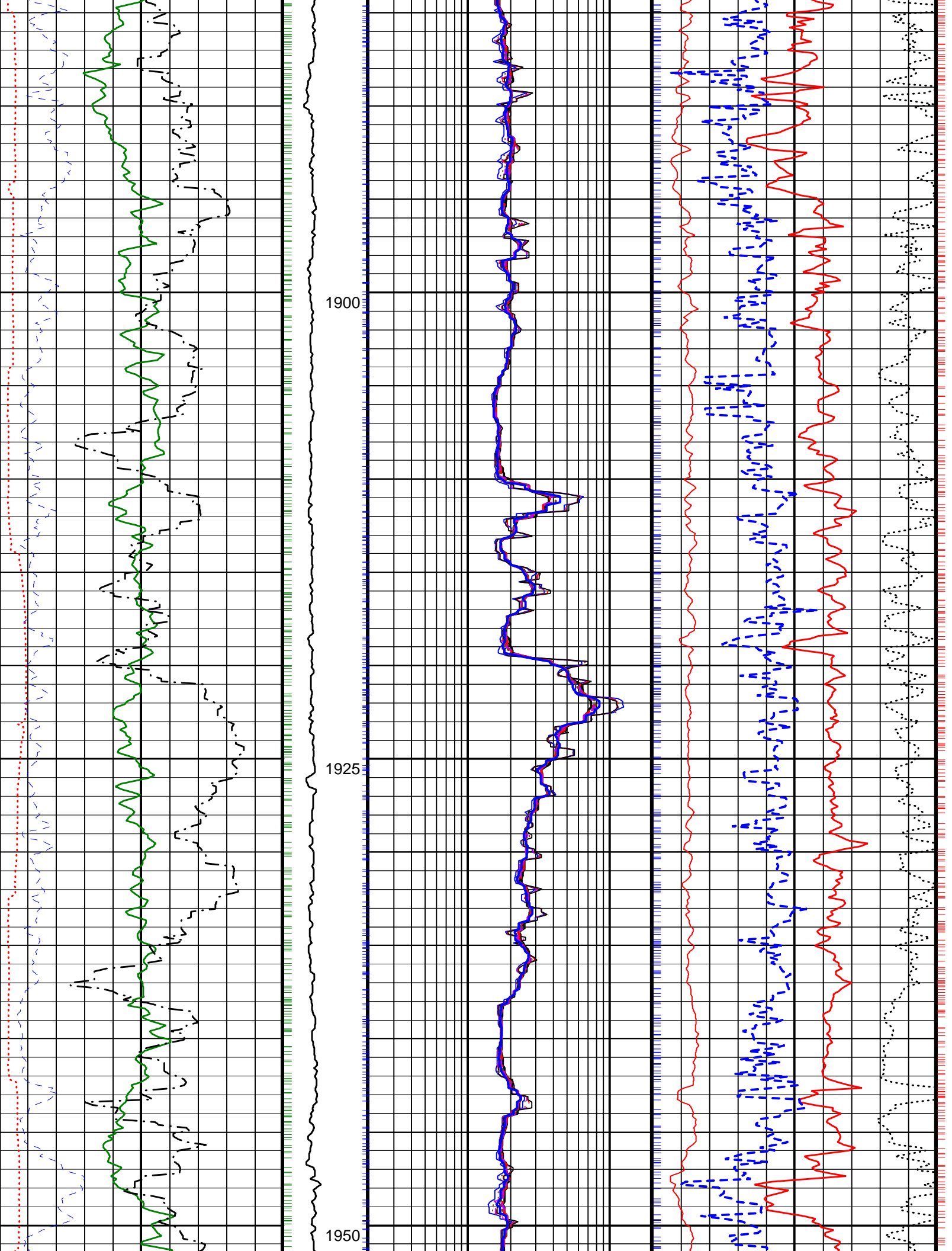
Neutron Ticks, 0.1 ft +

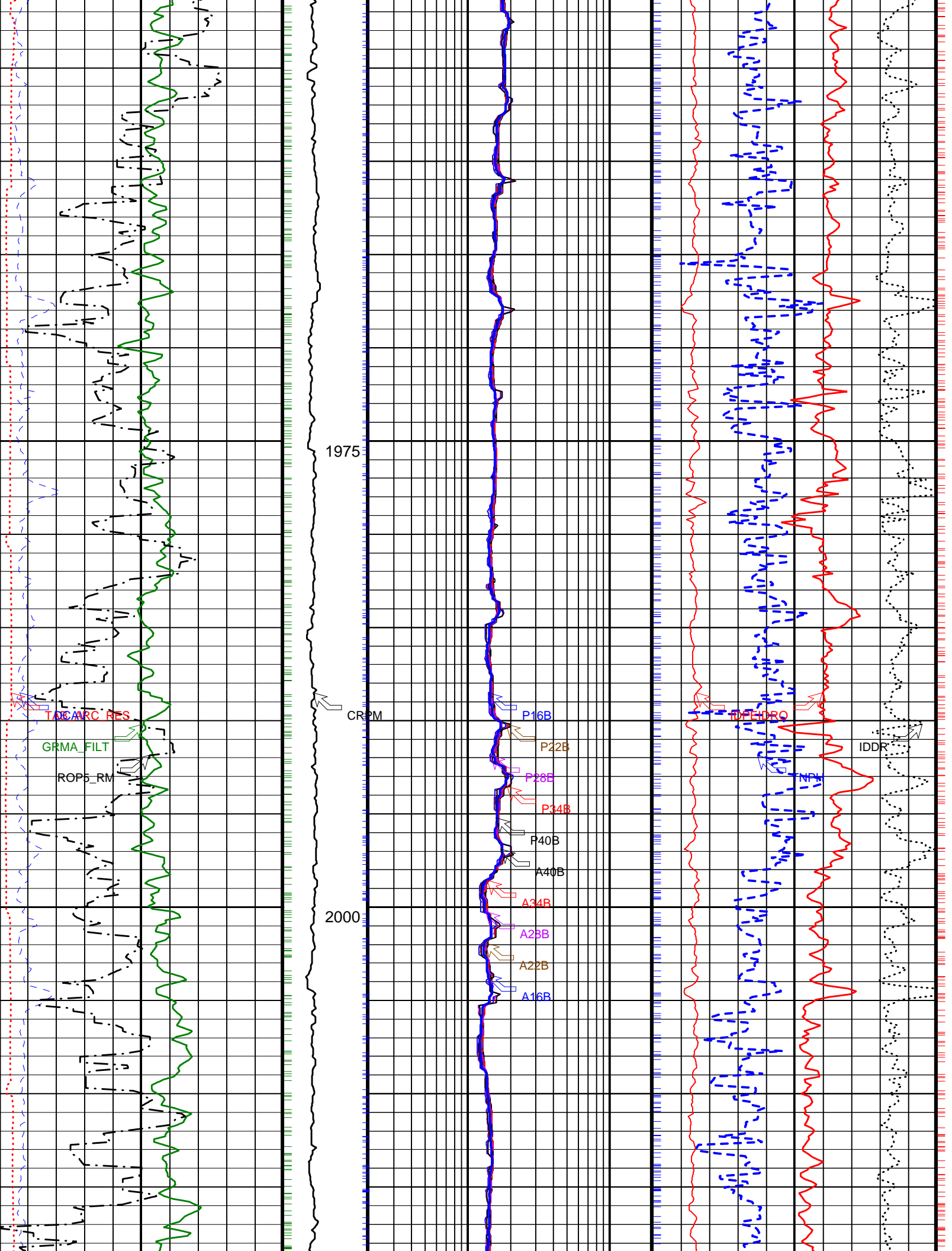
+ DVDM Gamma Ray Samples

ARC Blended Attenuation Resistivity		
16-in. (A16B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity		
22-in. (A22B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity		
28-in. (A28B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity		
34-in. (A34B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity		
40-in. (A40B)		
0.2	(OHMM)	20
ARC Blended Phase-Shift Resistivity		
40-in. (P40B)		
0.2	(OHMM)	20
ARC Blended Phase-Shift Resistivity:		

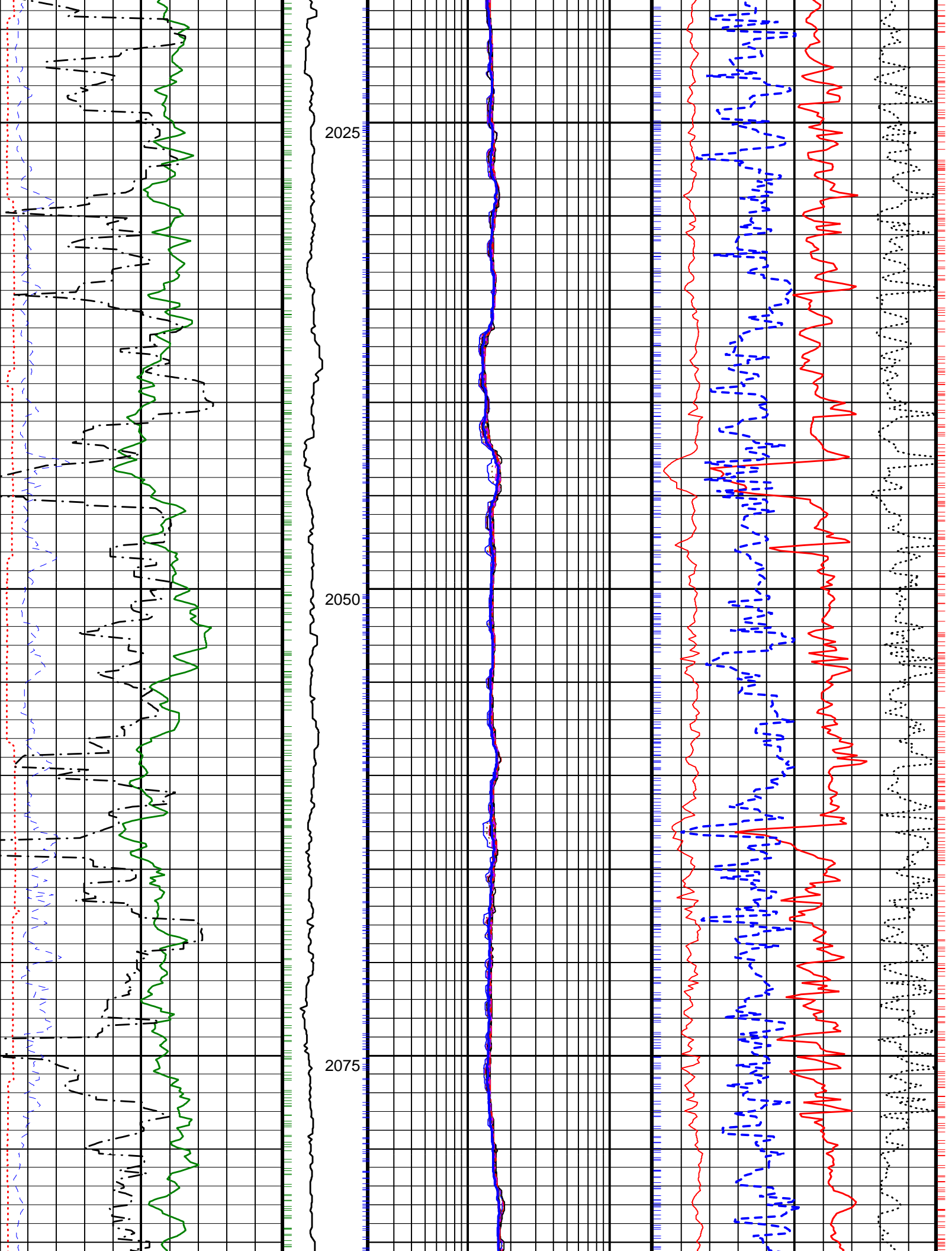
Date of Penetration: Averaged over Last

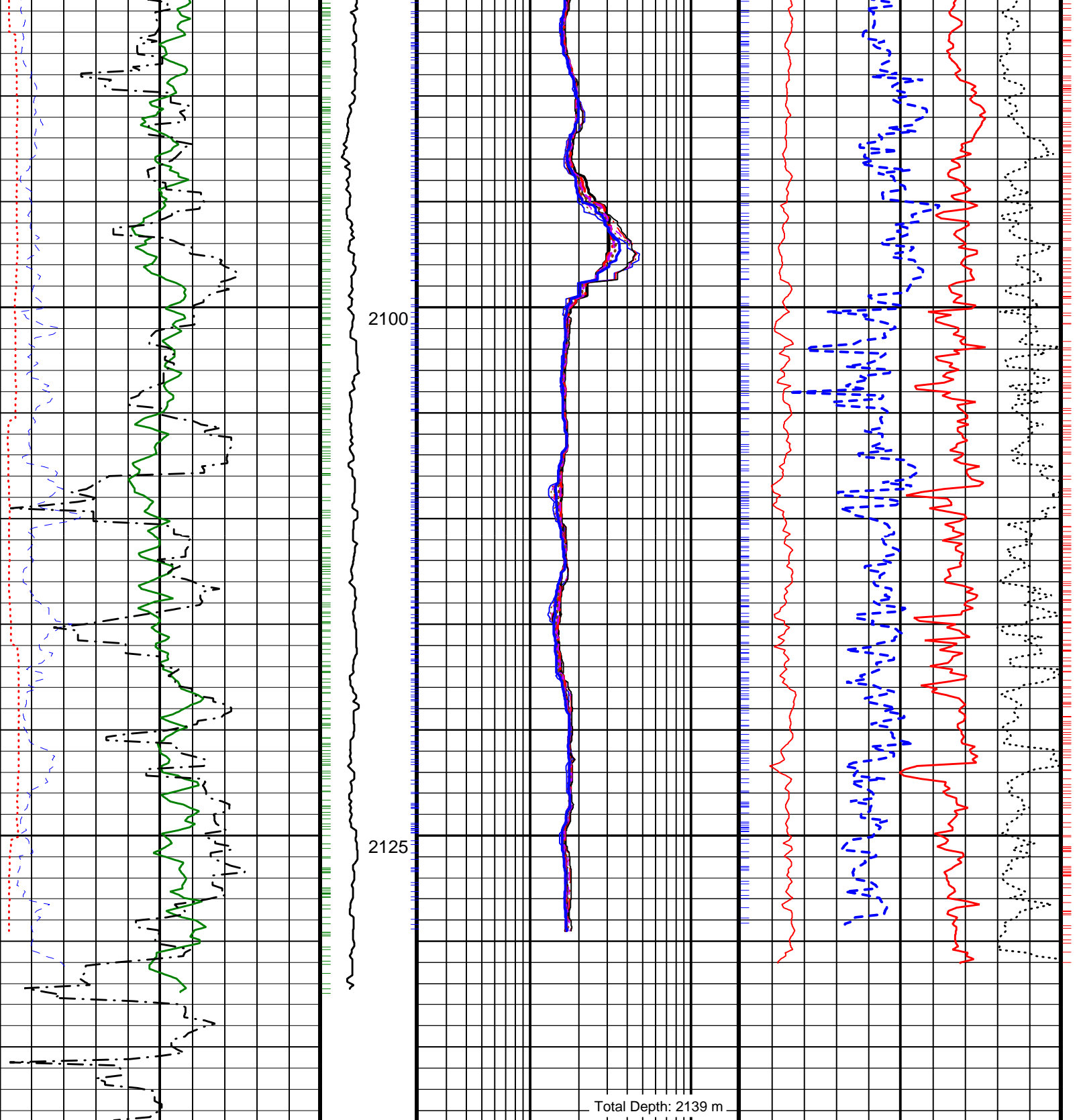












Density Caliper, Average (DCAV) 9 (IN) 14	Collar Rotational Speed (CRPM) (RPM) 0 200	ARC Blended Phase-Shift Resistivity 16-in. (P16B) 0.2 (OHMM) 20	Image Derived Density (IDRO) (G/C3) 1 2.65	
ARC Resistivity Time After Bit (TAB_ ARC_RES) 0 (HR) 10		ARC Blended Phase-Shift Resistivity 22-in. (P22B) 0.2 (OHMM) 20	Image Derived Density Correction (IDDR) (G/C3) -0.8 0.2	
DVDM Calibrated, Filtered Gamma Ray (GRMA_FILT) 0 (GAPI) 150		ARC Blended Phase-Shift Resistivity 28-in. (P28B) 0.2 (OHMM) 20	Image Derived Photoelectric Factor (IDPE) 0 (----) 10	

Rate of Penetration, Averaged over Last 5ft (ROP5_RM)		
100	(M/HR)	0

ARC Blended Phase-Shift Resistivity 34-in. (P34B)		
0.2	(OHMM)	20
ARC Blended Phase-Shift Resistivity 40-in. (P40B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity 40-in. (A40B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity 34-in. (A34B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity 28-in. (A28B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity 22-in. (A22B)		
0.2	(OHMM)	20
ARC Blended Attenuation Resistivity 16-in. (A16B)		
0.2	(OHMM)	20

Thermal Neutron porosity (TNPH)		
100	(PU)	0

PIP SUMMARY

Density Ticks, 0.1-ft

+ ARC Resistivity Samples  
Neutron Ticks, 0.1 ft +

+ DVDM Gamma Ray Samples

IDEAL Version: ID10\_2B\_08  
IDF

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch / Equipment Identification			
Primary Equipment:	ECO - 675	736	
Tool Name and Serial Number			
Calibration Status			
Collar Type and Serial Number	ADDC - AA		
Chassis Type and Serial Number	ADSE - EA		
Stabilizer Type and Serial Number	ADCS - CA		
Neutron Logging Source	NSR - M		
Density Logging Source	GSR - J/Z		
Stabilizer Size	9.38 - in.		

Master: 22-Jul-2005 12:37					
EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration					
SSn LSn : Water Tank					
Phase	SSn Gain	Value	Phase	SSn Offset	Value
Master		1.000	Master		0
	0.6000 (Minimum) 1.000 (Nominal) 1.400 (Maximum)			-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
Phase	LSn Gain	Value	Phase	LSn Offset	Value
Master		1.000	Master		0
	0.6000 (Minimum) 1.000 (Nominal) 1.400 (Maximum)			-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	

Master: 22-Jul-2005 12:37					
EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration					
Neutron: Water Tank					
Phase	Far 2 Gain	Value	Phase	Far 2 Offset	Value
Master		1.056	Master		-0.7620
	0.7000 (Minimum) 1.000 (Nominal) 1.300 (Maximum)			-3.000 (Minimum) 0 (Nominal) 3.000 (Maximum)	
Phase	Far 1 Gain	Value	Phase	Far 1 Offset	Value

Master	0.7000 (Minimum)	1.000 (Nominal)	1.300 (Maximum)	1.055	Master	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	-0.4690
Phase	Thermal Near gain			Value	Phase	Thermal Near offset			Value
Master				1.155	Master				-137.6
Master	0.7000 (Minimum)	1.000 (Nominal)	1.300 (Maximum)		Master	-500.0 (Minimum)	0 (Nominal)	500.0 (Maximum)	
Phase	Epithermal Near gain			Value	Phase	Epithermal Near offset			Value
Master				1.221	Master				-13.57
Master	0.7000 (Minimum)	1.000 (Nominal)	1.300 (Maximum)		Master	-300.0 (Minimum)	0 (Nominal)	300.0 (Maximum)	

Master: Calibration out of date 11-Apr-2005 19:14

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration

Gamma Density: Magnesium Block

Phase	LS window 3 - Mg CPS	Value	Phase	SS window 1 - Mg CPS	Value	Phase	SS window 3 - Mg CPS	Value
Master		2041	Master		5077	Master		11910
Master	1000 (Minimum) 2000 (Nominal) 3000 (Maximum)		Master	2500 (Minimum) 5250 (Nominal) 8000 (Maximum)		Master	6000 (Minimum) 12000 (Nominal) 18000 (Maximum)	

Master: Calibration out of date 11-Apr-2005 19:14

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration

Gamma Density: Aluminum Block

Phase	LS window 3 - Al CPS	Value	Phase	SS window 1 - Al CPS	Value	Phase	SS window 3 - Al CPS	Value
Master		372.3	Master		2692	Master		8750
Master	200.0 (Minimum) 400.0 (Nominal) 600.0 (Maximum)		Master	1500 (Minimum) 3000 (Nominal) 4500 (Maximum)		Master	4000 (Minimum) 8500 (Nominal) 13000 (Maximum)	

Master: Calibration date not found

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration

Gamma Density: Background

Phase	LS window 3 - Background CPS	Value	Phase	SS window 1 - Background CPS	Value	Phase	SS window 3 - Background CPS	Value
Master		57.82	Master		85.68	Master		413.0
Master	50.00 (Minimum) 70.00 (Nominal) 90.00 (Maximum)		Master	50.00 (Minimum) 75.00 (Nominal) 100.0 (Maximum)		Master	270.0 (Minimum) 370.0 (Nominal) 470.0 (Maximum)	

Master: Calibration date not found

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration

Gamma Density: Water Block Check

Phase	Long spacing water density G/C3	Value	Phase	Short spacing water density G/C3	Value
Master		1.047	Master		1.262
Master	0.9000 (Minimum) 1.150 (Nominal) 1.400 (Maximum)		Master	0.9000 (Minimum) 1.150 (Nominal) 1.400 (Maximum)	

Master: Calibration date not found

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration







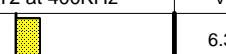
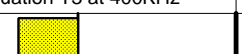
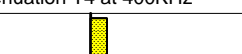
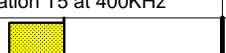
Resistivity: Air

Phase	Phase-Shift T1	Value	Phase	Phase-Shift T2	Value	Phase	Phase-Shift T3	Value
Master		1.143	Master		-1.153	Master		1.065
Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)		Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)		Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)	
Phase	Phase-Shift T4	Value	Phase	Phase-Shift T5	Value	Phase	Phase-Shift T1 at 400KHz	Value
Master		-1.203	Master		1.093	Master		1.839
Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)		Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)		Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)	
Phase	Phase-Shift T2 at 400KHz	Value	Phase	Phase-Shift T3 at 400KHz	Value	Phase	Phase-Shift T4 at 400KHz	Value
Master		-1.826	Master		1.836	Master		-1.845
Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)		Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)		Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)	
Phase	Phase-Shift T5 at 400KHz	Value						
Master		1.844						
Master	-4.000 (Minimum) 0 (Nominal) 4.000 (Maximum)							

Master: Calibration date not found

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch Calibration


Resistivity: Air

Phase	Attenuation T1	Value	Phase	Attenuation T2	Value	Phase	Attenuation T3	Value
Master		8.096	Master		6.358	Master		4.698
	7.000 (Minimum)      9.000 (Nominal)      11.00 (Maximum)			4.000 (Minimum)      6.000 (Nominal)      8.000 (Maximum)			3.500 (Minimum)      5.500 (Nominal)      7.500 (Maximum)	
Phase	Attenuation T4	Value	Phase	Attenuation T5	Value	Phase	Attenuation T1 at 400KHz	Value
Master		4.759	Master		3.258	Master		8.155
	2.500 (Minimum)      4.500 (Nominal)      6.500 (Maximum)			2.000 (Minimum)      4.000 (Nominal)      6.000 (Maximum)			7.000 (Minimum)      9.000 (Nominal)      11.00 (Maximum)	
Phase	Attenuation T2 at 400KHz	Value	Phase	Attenuation T3 at 400KHz	Value	Phase	Attenuation T4 at 400KHz	Value
Master		6.314	Master		4.755	Master		4.713
	4.000 (Minimum)      6.000 (Nominal)      8.000 (Maximum)			3.500 (Minimum)      5.500 (Nominal)      7.500 (Maximum)			2.500 (Minimum)      4.500 (Nominal)      6.500 (Maximum)	
Phase	Attenuation T5 at 400KHz	Value						
Master		3.316						
	2.000 (Minimum)      4.000 (Nominal)      6.000 (Maximum)							

Master: Calibration date not found

EcoScope Integrated Logging-While-Drilling Tool - 6.75 inch  
Calibration

Gamma Ray: Blanket

Phase	Gamma ray factor	Value
Master		2.250
	2.000 (Minimum)      2.500 (Nominal)      3.000 (Maximum)	

Company: Lamont-Doherty Borehole Research



Well: IODP Expedition 311 CAS-03C

Field: Cascadia Margin

Rig: JOIDES Resolution

State: Pacific Ocean

EcoScope Service  
1:240 Measured Depth  
Recorded Mode Log

# Data Quality Report

## Type of Measurement

Geomarket	NGC	Location	Vancouver Island
Job Date	22-SEP-2005	Customer	Lamont-Doherty Borehole Research
Rig	JOIDES Resolution	Field/Well	Cascadia Margin/CAS-03C
Engineer	Lake Loh	Job Number	40012416

Res	GR	Neu	Den	APWP
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When data does not meet standards, put a number in the column corresponding to the measurement with a corresponding number and remark below. Use additional pages for remarks. Positive remarks are welcome, do not append them with a number.

## Operation

Description of Well - Names, Geometry, Services, Location and References; General Content Header, user of trademarks, directional data, well plot, order of components, spelling and style, units sensor to toolface angle recorded	
Equipment and Software Description	
Tool sketch, equipment numbers, software versions, data rates, filtering weights	
Processing Traceability and Environment Description	
Acquisition environment, parameters and key constants for each run or zone, complete and relevant remarks	
Annotations, Presented Formats, QC Curves, Print Quality	
Documented splice points; data gap explanations; mud changes, movement indicator, color selection	

1		4		

1. Correcting the resistivity data by assuming mud resistivity as 1 ohmm @ 75 degF.  
 2. Depth is not compensated for heave. The heave cause the spikes of ROP and this eventually cause the low data density and distortion on the image. The heave also cause the curves (gamma ray, resistivity, density and neutron porosity) do not correlate to each other very well and cause the resistivity curves blocky.  
 3. No power supply from TeleScope cause the EcoScope shut down.  
 4. Correcting the Neutron Porosity data by assuming borehole salinity as 0 ppk.

## Calibration and Verifications

Calibration / Before survey verification / After survey verification	
Validity, completeness (includes equipment number), timeliness, unedited, discrepancy explained	

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## Operating Procedures

Depth Control	
Comparison with driller's depth, other logs, other bit runs, between RT and RM, Depth summary listing	
Logging speed and sampling rates	
As recommended in reference manual or job planner. No loss of data or spatial resolution	
Data Comparison	
Between runs and passes, with data from nearby wells, other conveyance, mud log and markers	
Operating Anomalies/Failures/Missing Data/Sensor Orientation/Transmission Losses	
Absence of noise and spurious variations, anomaly repeated, corrected, reported or explained.	

2	2	2	2	
3	3	3	3	3

## Digital Delivery

Digital Products	
Labeled, verification listing with complete digital record, backup for archival, record matches hard copy.	

70	80	70	80	90

## Job Quality Rating (JQR)

Number of boxes without number X 10	
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## Environmental effects

Irregular Operation	
Excessive ROP or speed, high deviation, shocks, vibrations, sticking conditions	
Borehole Geometry	
Shape (caves, etc), rugosity, spiralled hole, mud induced fractures. Casing, tubing conditions	
Borehole Fluid	
Bartite, KCl, salinity, additives, gas cut, unstable	
Interferences	
External noise, nearby casing or drillpipe, debris, unusual formation composition	
Operation Outside Tool Specifications	
Geomarkertemperature, pressure, hole size, hole deviation, dog-leg severity, flow rate, ppm, solids value or parameter	
Environmental Quality Rating (EQR)	
Number of boxes without number X 20	

1	1	1	1	
2		2	2	
60	80	60	40	100

1. Excessive ROP is causing low data density.  
 2. Borehole washouts cause the resistivity curves separation. EcoScope Neutron Porosity is only corrected for bit size. Large borehole washouts cause low density readings.  
 3. Low RPM during the early stage of the well reduce the image's resolution.

Cell Manager: Lake Loh      FSM: Vijay Moras



