Schlumberger

Company: **PETRO-CANADA**
Well: **PETRO-CANADA BLACKWATER KWIJIKA M-59**
Field: **KWIJIKA**
Province: **NORTHWEST TERRITORIES** *** MD ***

ENVIRONMENTAL MEASUREMENT SONDE
BOREHOLE GRAPHICS LOG

NEB COPY

LSD: M-59
UWID: 300M596440122300

Elev.: K.B. 252.1 m
G.L. 245.9 m
D.F. 251.8 m

Permanent Datum: GROUND LEVEL Elev.: 245.9 m
Log Measured From: KELLY BUSHING 6.2 m above Perm. Datum
Drilling Measured From: KELLY BUSHING

LOCATION

API Serial No. 1165

Province: NORTHWEST TERRITORIES
Field: KWIJIKA
Location: LSD: M-59
Well: PETRO-CANADA BLACKWATER KWIJIKA M
Company: PETRO-CANADA

Logging Date	5-Mar-2008			
Run Number	TWO			
Depth Driller	1640 m			
Schlumberger Depth	1641 m			
Bottom Log Interval	1616.4 m			
Top Log Interval	1198 m			
Casing Driller Size @ Depth	177.800 mm @ 1198 m		@	
Casing Schlumberger	1198 m			
Bit Size	156.000 mm			
Type Fluid In Hole	KCL POLYMER			
MUD Density / Viscosity	1315 kg/m3	58 s		
Fluid Loss / PH	6.5 cm3	11.5		
Source Of Sample	FLOWLINE			
RM @ Measured Temperature	0.048 ohm.m @ 15 degC		@	
RMF @ Measured Temperature	0.044 ohm.m @ 15 degC		@	
RMC @ Measured Temperature	0.103 ohm.m @ 17 degC		@	
Source RMF / RMC	PRESSED	PRESSED		
RM @ MRT / RMF @ MRT	0.032 @ 34	0.029 @ 34	@	@
Maximum Recorded Temperatures	34 degC			
Circulation Stopped / Time	4-Mar-2008	12:15		
Logger On Bottom / Time	5-Mar-2008	10:56		
Unit Number / Location	4301	NORMAN WELLS		
Recorded By	J.ROLLINGS / R. JACOBS			
Witnessed By	G. TIMMONS / G. DEON			

	Run 1	Run 2	Run 3	Run 4
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				
MUD Density / Viscosity				
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				

DEPTH SUMMARY LISTING

Date Created: 5-MAR-2008 11:43:21

Depth System Equipment

Depth Measuring Device		Tension Device		Logging Cable	
Type:	IDW-B	Type:	CMTD-B/A	Type:	7-46A XXS
Serial Number:	6423	Serial Number:	2565	Serial Number:	6199
Calibration Date:	15-FEB-2008	Calibration Date:	15-FEB-2008	Length:	7800.14 M
Calibrator Serial Number:	4	Calibrator Serial Number:	-999	Conveyance Method:	Wireline
Calibration Cable Type:	7-46P	Calibration Gain:	0.88	Rig Type:	LAND
Wheel Correction 1:	-4	Calibration Offset:	336.00		
Wheel Correction 2:	-5				

Depth Control Parameters

Log Sequence:	Subsequent Trip To the Well
Reference Log Name:	PLATFORM EXPRESS COMPENSATED NEUTRON DUAL LITHOLOGY DENSITY LOG
Reference Log Run Number:	ONE
Reference Log Date:	23-FEB-2008
Subsequent Trip Down Log Correction:	1.40 M

Depth Control Remarks

1. IDW IS PRIMARY DEPTH MEASUREMENT
2. Z-CHART USED AS A SECONDARY DEPTH MEASUREMENTS
3. MAIN PASS TIED INTO PREVIOUS RUN AS PER SLB DEPTH CONTROL PROCEDURES
4.
5.
6.

OTHER SERVICES1	OTHER SERVICES2
OS1: PEX-HRLA-TLD2-CMR-ML	OS1:
OS2: MSCT	OS2:
OS3: FMI-DSI-HNGS-EMS	OS3:
OS4: MDT	OS4:
OS5: VSP	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
ALL PRESENTATIONS AS PER LOGGING PROGRAM DATED FEB 6, 2008	
INTERVALS CONFIRMED ON LOCATION BY WELLSITE GEOLOGIST	
MAXIMUM TEMPERATURE TAKEN FROM HEAD THERMOMETER	
ALL INTERVALS FROM TD-ICS	
FMI GPIT MAGNETIC FIELD INCLINATION AFFECTED FROM IRON IN BASEMENT ROCK	
P&S MODE, LOWER & UPPER DIPOLE MODES LOGGED FOR DSI	
PRESENTED BEST OF DIPOLE DATA FOR FINAL PRINT	
MLT RAN AGAIN FOR OPTIMAL RESULTS	
FMI LOG STOPPED BEFORE CASING TO PREVENT DAMAGE TO TOOL	
SONIC RELABELLED IN FIELD FOR FINAL PRINTS	
EMS CALIPERS USED FOR CEMENT & HOLE VOLUMES	
RIG: AKITA 51	
CREW: BILLY LIM, LARRY DUDUS	

RUN 1		RUN 2	
SERVICE ORDER #:	11958996	SERVICE ORDER #:	
PROGRAM VERSION:	15C0-309	PROGRAM VERSION:	
FLUID LEVEL:		FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

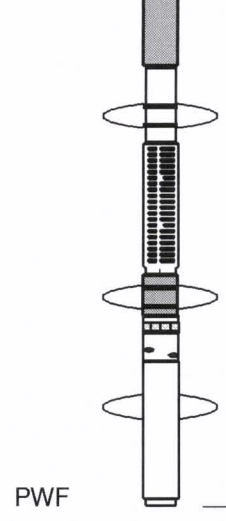
EQUIPMENT DESCRIPTION

RUN 1	RUN 2
SURFACE EQUIPMENT	
GSR-U 1237 GSR-U/Y 11 WITM (DTS)-A	

DOWNHOLE EQUIPMENT

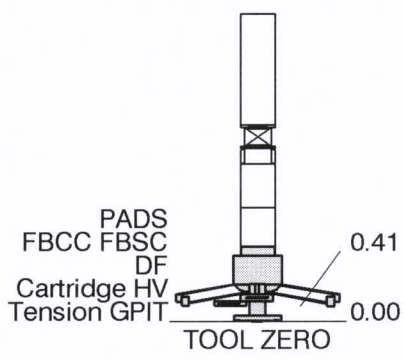
Tool	Measurement	Measure Point	Length
LEH-QT 2657			39.38
DTC-H	CTEM TelStatus ToolStatu	38.21 37.58	38.49
SAH-F 1874 SAH-F 1874			37.58
SGT-N SGH-K 3169 SGC-TB 10388	Gamma Ray	35.81	36.09
MLT-B MLT-B 109	BMNO BMIN MCAL MLT Statu	33.37 32.10	34.41
HNGS-BA HNGS-BA 163 HNSH-BA 160	Upper_1 Lower_2	31.40 31.19	32.10
HNGC-B HNGH-A 346	HNGC Stat	29.07	29.60
AH-184 2713			28.54
EMS-B EMA-B 8018 RES EMC-B 8035 ECH-KH 8045 EMM-B 8052	Mud Resis Mud Tempe Calipers	27.75 27.50 24.61	27.93
DSST-B SPAC-B 8321 ECH-SD 8303			23.59

SMDR-BD 8400
SSIJ-BA 8317
SMDX-AA 8315



FBST-B
ECH-MRA 6700
FBCC-A 1729
AH-184 1994
AH-185 904
FBSH-A 1724
GPIC-C 1923
FBSC-B 1719
FBSS-B 1728

8.04



MAXIMUM STRING DIAMETER 148 MM
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

Input DLIS Files

DEFAULT	FMI_DSI_EMS_NGS_040LUP	FN:62	PRODUCER	05-Mar-2008 11:09	1643.6 M	1123.9 M

Integrated Hole/Cement Volume Summary

Hole Volume = 9.61 M3

Cement Volume = 5.06 M3 (assuming 114.30 MM casing O.D.)

Computed from 1640.9 M to 1198.0 M using data channel(s) RD1 RD2 RD3 RD4 RD5 RD6

OP System Version: 15C0-309

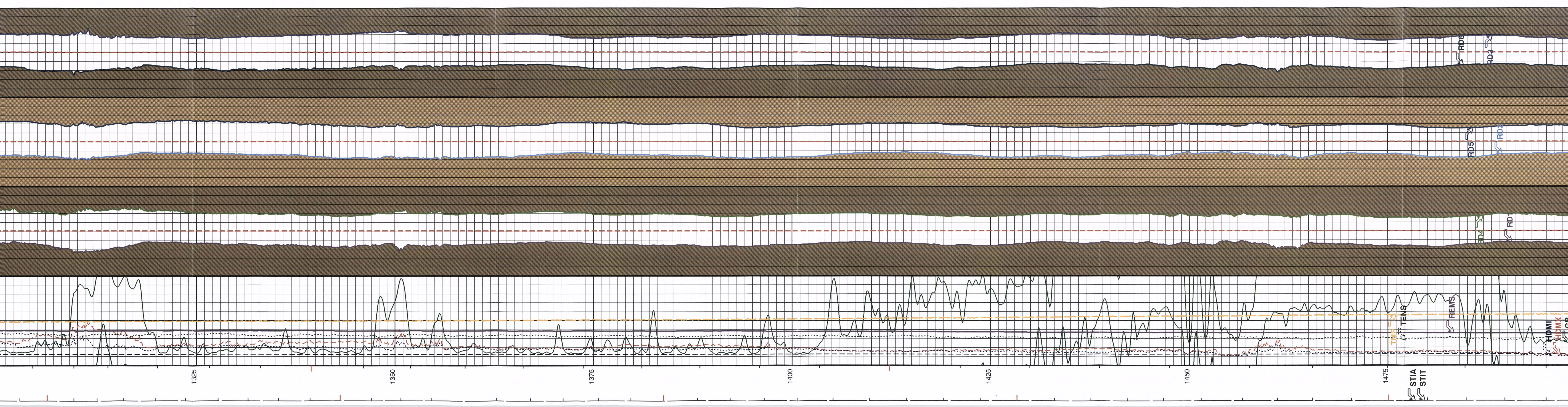
MCM

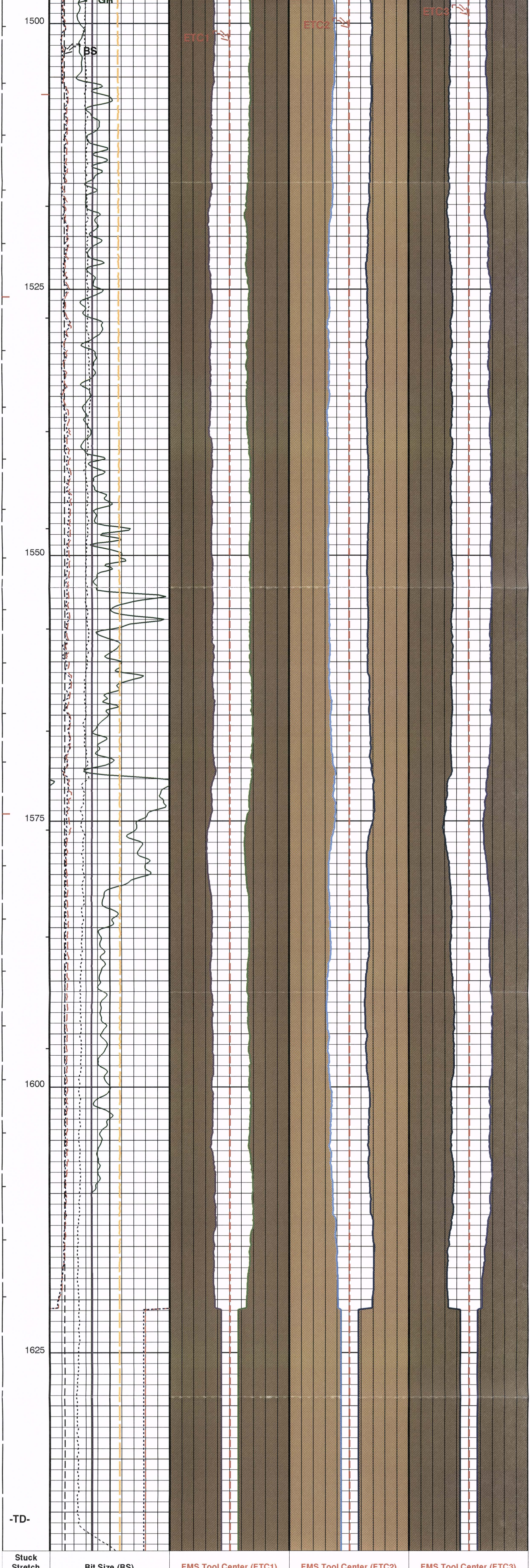
FBST-B	15C0-309	DSST-B	15C0-309
EMS-B	15C0-309	HNGC-B	15C0-309
HNGS-BA	15C0-309	MLT-B	15C0-309
SGT-N	15C0-309	DTC-H	15C0-309

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3
- Time Mark Every 60 S

Hole Diameter Minimum (HDMI): 125 (MM) 375
Hole Diameter Maximum (HDMX): 125 (MM) 375
Mud Temperature (TMP): 0 (DEGC) 50
Mud Resistivity (REMS): 0 (OHMM) 0.1
Tension (TENS): 25000 (N) 0
Gamma Ray (GR): 0 (GAPI) 150
Stuck Stretch (STIT): 0 (M) 20
Bit Size (BS): 125 (MM) 375
Radius 4 (RD4): -250 (MM) 250
Radius 5 (RD5): -250 (MM) 250
Radius 6 (RD6): 250 (MM) -250
Radius 1 (RD1): 250 (MM) -250
Radius 2 (RD2): 250 (MM) -250
Radius 3 (RD3): -250 (MM) 250
EMS Tool Center (ETC1): 250 (MM) -250
EMS Tool Center (ETC2): 250 (MM) -250
EMS Tool Center (ETC3): 250 (MM) -250


RD6
RD5
RD5
RD2
RD4
RD1
TMS
TENS
REMS
HDMI
KLMX
STIA
STIT
1325
1350
1375
1400
1425
1450
1475



Stuck Stretch (STIT)	Bit Size (BS)	EMS Tool Center (ETC1)	EMS Tool Center (ETC2)	EMS Tool Center (ETC3)
0 (M) 20	125 (MM) 375	250 (MM) -250	250 (MM) -250	250 (MM) -250
	Gamma Ray (GR)	Radius 1 (RD1)	Radius 2 (RD2)	Radius 3 (RD3)
	0 (GAPI) 150	250 (MM) -250	250 (MM) -250	-250 (MM) 250
	Tension (TENS)	Radius 4 (RD4)	Radius 5 (RD5)	Radius 6 (RD6)
	25000 (N) 0	-250 (MM) 250	-250 (MM) 250	250 (MM) -250
	Mud Resistivity (REMS)			
	0 (OHMM) 0.1			
	Mud Temperature (TMP)			
	0 (DEGC) 50			
	Hole Diameter Maximum (HDMX)			
	125 (MM) 375			
	Hole Diameter Minimum (HDMI)			
	125 (MM) 375			

PIP SUMMARY

- Integrated Hole Volume Minor Pip Every 0.1 M3
- Integrated Hole Volume Major Pip Every 1 M3
- Integrated Cement Volume Minor Pip Every 0.1 M3
- Integrated Cement Volume Major Pip Every 1 M3
- Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	FBST-B: Full-Bore Scanner - B		
ACPP	Accelerometer PROM Presence	PRESENT	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
ART	Accelerometer Reference Temperature	20	DEGC
EGCO	FMI EMEX and GAIN Correction	NO	
FBCD	Correct Dip Buttons Values by EMEX and Gain	OFF	
FBEF	FMI EMEX filtering activation	OFF	
FBMV	FMI EMEX maximum voltage calculation	OFF	
FDBD	FMI Dead Buttons detection	OFF	
FDBP	FMI Dead Buttons Patching	OFF	
FDFL	FMI DSP Filter Length	1	
FIEQ	FMI Image Equalisation	OFF	
FIGA	FMI Image Gain	1	
FIOF	FMI Image Offset	0	
FLM	FMI Logging Mode	8PAD	
FPSA	FMI Peak Signal Amplitude for Required Servo Level	ON	
GLM	GPIT Logging Mode	DIPM	
GMOD	Gain Mode	MANU	
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
MAPP	Magnetometer PROM Presence	PRESENT	
MDEC	Magnetic Field Declination	24.9123	DEG
MRTE	Magneto Reference Temperature	20	DEGC

RBS	Resistivity Button Selection	AUTO	
RBSI	Auto RBS Change Interval	10	
SOFF	Standoff	0	MM
TEMS	GPIT Temperature Sensor Used	BOTH	
U-GPOF	Playback OLD VERSION GPIT FILE (BEFORE OP14 + SRPC-3098-FEB_2006_C) ?	NO	
XGAI_FBST	Gain Value in Manual Mode	0_dB	
XGMO	EMEX & Gain Modes	EmexManu_GainManu	
XMOD	EMEX Voltage Regulation Mode	MANU	
XVOL	EMEX Voltage	0	V
	DSST-B: Dipole Shear Imager - B		
AGC1	Automatic Gain Control 1	ON	
AGC2	Automatic Gain Control 2	ON	
AGC3	Automatic Gain Control 3	ON	
AGC4	Automatic Gain Control 4	ON	
AGC5	Automatic Gain Control 5	ON	
AGCX	Automatic Gain Control X	ON	
BARS_MTR1	Length for Monopole Transmitter to Receiver 1	2.7432	M
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
CASF	Label Casing Function - Monopole P&S	50	
CDTS	C-Delta-T Shale	328.084	US/M
COLL	Label Slowness Lower Limit - Monopole P&S Compressional	131.234	US/M
COUL	Label Slowness Upper Limit - Monopole P&S Compressional	590.551	US/M
DDE1	Digitizing Delay 1	0	US
DDE2	Digitizing Delay 2	0	US
DDE3	Digitizing Delay 3	0	US
DDE4	Digitizing Delay 4	0	US
DDE5	Digitizing Delay 5	0	US
DDEX	Digitizing Delay X	0	US
DLCS	Label Compressional Source - Dipole Shear	DONT_USE	
DLHS	Label Hole Diameter Source for SOBS Channel	AUTO	
DSHL	Label Slowness Lower Limit - Dipole Shear	246.063	US/M
DSHU	Label Slowness Upper Limit - Dipole Shear	2542.65	US/M
DSI1	Digitizer Sample Interval 1	40	US
DSI2	Digitizer Sample Interval 2	40	US
DSI3	Digitizer Sample Interval 3	40	US
DSI4	Digitizer Sample Interval 4	10	US
DSI5	Digitizer Sample Interval 5	10	US
DSIX	Digitizer Sample Interval X	40	US
DTCS	Compressional Delta-T Source for DTCO Channel	PS_COMP	
DTF	Delta-T Fluid	620.079	US/M
DTM	Delta-T Matrix	183.727	US/M
DTSS	Shear Delta-T Source for DTSM Channel	LOWER_DIPOLE	
DWC1	Digitizer Word Count 1	512	
DWC2	Digitizer Word Count 2	512	
DWC3	Digitizer Word Count 3	512	
DWC4	Digitizer Word Count 4	512	
DWC5	Digitizer Word Count 5	512	
DWCX	Digitizer Word Count X	512	
FDE1	Firing Delay 1	0	
FDE2	Firing Delay 2	0	
FDE3	Firing Delay 3	0	
FDE4	Firing Delay 4	0	
FDE5	Firing Delay 5	0	
FDEX	Firing Delay X	0	
FGM5	First Motion Gate Moveout 5	131	US/M
FGMX	First Motion Gate Moveout X	131	US/M
FILG	Label Fill Gap Control - Monopole P&S	COMP_SHEAR	
FMG5	First Motion Minimum Gate 5	500	US
FMGX	First Motion Minimum Gate X	500	US
FMLL	Slowness Lower Limit - FMD	131.234	US/M
FMRC	Restart Control - FMD	CONTINUE	
FMT5	First Motion Threshold 5	UP	
FMTX	First Motion Threshold X	NONE	
FMUL	Slowness Upper Limit - FMD	590.551	US/M
FNC5	First Motion Noise Counter Input 5	ALO	
FNCX	First Motion Noise Counter Input X	ALO	
FPM	Processing Mode - FMD	NONE	
FTD5	First Motion Threshold Direction 5	UP	
FTDX	First Motion Threshold Direction X	UP	
GAI1	Manual Gain 1	10	
GAI2	Manual Gain 2	10	
GAI3	Manual Gain 3	6	
GAI4	Manual Gain 4	16	
GAI5	Manual Gain 5	16	
GAIX	Manual Gain X	10	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GDT1	Gain Delta-T 1	2625	US/M
GDT2	Gain Delta-T 2	2625	US/M
GDT3	Gain Delta-T 3	2625	US/M
GDT4	Gain Delta-T 4	525	US/M
GDT5	Gain Delta-T 5	525	US/M
GDTX	Gain Delta-T X	2625	US/M
GGRD	Geothermal Gradient	0.018227	DC/M
GIN1	Gain Interval 1	15360	US
GIN2	Gain Interval 2	15360	US
GIN3	Gain Interval 3	15360	US
GIN4	Gain Interval 4	2560	US
GIN5	Gain Interval 5	1600	US
GINX	Gain Interval X	15360	US
GRSE	Generalized Mud Resistivity Selection	EMS_RESIST	
GTSE	Generalized Temperature Selection	EMS_TEMP	
HPF1	High Pass Filter 1	F80	
HPF2	High Pass Filter 2	F80	
HPF3	High Pass Filter 3	F80	
HPF4	High Pass Filter 4	F8K	
HPF5	High Pass Filter 5	F8K	
HPFX	High Pass Filter X	F80	
ISSBAR	Barite Mud Switch	NOBARITE	
ITTS	Integrated Transit Time Source	DTCO	
LFC	Label Formation Character - Monopole P&S	COMP_FIRST	
LPF1	Low Pass Filter 1	F5K	
LPF2	Low Pass Filter 2	F5K	
LPF3	Low Pass Filter 3	F5K	
LPF4	Low Pass Filter 4	F30K	
LPF5	Low Pass Filter 5	F30K	
LPFX	Low Pass Filter X	F5K	
LTXG	Lower Dipole Transmitter Geometry	3962	MM
MAI5	Slowness Averaging Interval - FMD	1067	MM
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCS	Mean Casing Slowness	187.008	US/M
MDS5	Multishot Delta-T Scatter - FMD	20	US
MTXG	Monopole Transmitter Geometry	4724	MM
MUX1	Sum Difference Multiplexor Input 1	RR	
MUX2	Sum Difference Multiplexor Input 2	RR	
MUX3	Sum Difference Multiplexor Input 3	RR	
MUX4	Sum Difference Multiplexor Input 4	RR	
MUX5	Sum Difference Multiplexor Input 5	RR	
MUXX	Sum Difference Multiplexor Input X	RR	
NTI5	Number Threshold Items 5	0	
NTIX	Number Threshold Items X	0	
NWI1	Number Waveform Items 1	8	
NWI2	Number Waveform Items 2	8	
NWI3	Number Waveform Items 3	0	
NWI4	Number Waveform Items 4	8	
NWI5	Number Waveform Items 5	0	
NWIX	Number Waveform Items X	0	
NWS1	Number Waveforms Stacked 1	1	
NWS2	Number Waveforms Stacked 2	1	
NWS3	Number Waveforms Stacked 3	1	
NWS4	Number Waveforms Stacked 4	1	
NWS5	Number Waveforms Stacked 5	1	
NWSX	Number Waveforms Stacked X	1	
RATE	Firing Rate	R7	
RSMN	Label Shear/Compressional Minimum Ratio - Monopole P&S	1.4	
RSMX	Label Shear/Compressional Maximum Ratio - Monopole P&S	2.12	
RX1G	Receiver 1 Geometry	7468	MM
RX2G	Receiver 2 Geometry	7620	MM
RX3G	Receiver 3 Geometry	7772	MM
RX4G	Receiver 4 Geometry	7925	MM
RX5G	Receiver 5 Geometry	8077	MM
RX6G	Receiver 6 Geometry	8230	MM
RX7G	Receiver 7 Geometry	8382	MM
RX8G	Receiver 8 Geometry	8534	MM
SAM1	DSST Sonic Acquisition Mode 1 - Lower Dipole Mode	EVEN	
SAM2	DSST Sonic Acquisition Mode 2 - Upper Dipole Mode	ODD	
SAM3	DSST Sonic Acquisition Mode 3 - Low Frequency Monopole Mode for Stoneley	OFF	
SAM4	DSST Sonic Acquisition Mode 4 - High Frequency Monopole Mode for P&S	EVEN	
SAM5	DSST Sonic Acquisition Mode 5 - High Frequency Monopole Mode for FMD	OFF	
SAMX	DSST Sonic Acquisition Mode X - Both Dipoles or Monopole Mode for Expert	OFF	
SAS1	STC Sonic Array Status - Lower Dipole	255	
SAS2	STC Sonic Array Status - Upper Dipole	255	
SAS3	STC Sonic Array Status - Monopole Stoneley	255	
SAS4	STC Sonic Array Status - Monopole P&S	255	
SAS5	Sonic Array Status - FMD	255	
SBO1	STC Search Band Offset - Lower Dipole	3000	US
SBO2	STC Search Band Offset - Upper Dipole	3000	US
SBO3	STC Search Band Offset - Monopole Stoneley	3000	US
SBO4	STC Search Band Offset - Monopole P&S	500	US
SBR4	STC Baseline Removal - Monopole P&S	ON	
SBW1	STC Search Bandwidth - Lower Dipole	8000	US
SBW2	STC Search Bandwidth - Upper Dipole	8000	US
SBW3	STC Search Bandwidth - Monopole Stoneley	8000	US
SBW4	STC Search Bandwidth - Monopole P&S	2000	US
SFC1	STC Formation Character - Lower Dipole	SELECTABLE	
SFC2	STC Formation Character - Upper Dipole	SELECTABLE	
SFC3	STC Formation Character - Monopole Stoneley	SELECTABLE	
SFC4	STC Formation Character - Monopole P&S	SELECTABLE	
SFM1	STC Filter - Lower Dipole	B1-3K	
SFM2	STC Filter - Upper Dipole	B1-3K	
SFM3	STC Filter - Monopole Stoneley	B.5-1.5K	
SFM4	STC Filter - Monopole P&S	B3-20K	
SHLL	Label Slowness Lower Limit - Monopole P&S Shear	246.063	US/M
SHT	Surface Hole Temperature	20	DEGC
SHUL	Label Slowness Upper Limit - Monopole P&S Shear	590.551	US/M
SLL1	STC Slowness Lower Limit - Lower Dipole	246.063	US/M
SLL2	STC Slowness Lower Limit - Upper Dipole	246.063	US/M
SLL3	STC Slowness Lower Limit - Monopole Stoneley	590.551	US/M
SLL4	STC Slowness Lower Limit - Monopole P&S	131.234	US/M
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPSO	Sonic Porosity Source	DTCO	
SST1	STC Slowness Step - Lower Dipole	13.1234	US/M
SST2	STC Slowness Step - Upper Dipole	13.1234	US/M
SST3	STC Slowness Step - Monopole Stoneley	13.1234	US/M
SST4	STC Slowness Step - Monopole P&S	6.56168	US/M
SSW1	STC Source Waveform - Lower Dipole	WF_SAM1	
SSW2	STC Source Waveform - Upper Dipole	WF_SAM2	
SSW3	STC Source Waveform - Monopole Stoneley	WF_SAM3	
SSW4	STC Source Waveform - Monopole P&S	WF_SAM4	
STLL	Label Slowness Lower Limit - Monopole Stoneley	590.551	US/M
STUL	Label Slowness Upper Limit - Monopole Stoneley	2559.06	US/M
SUL1	STC Slowness Upper Limit - Lower Dipole	2542.65	US/M
SUL2	STC Slowness Upper Limit - Upper Dipole	2542.65	US/M
SUL3	STC Slowness Upper Limit - Monopole Stoneley	2559.06	US/M
SUL4	STC Slowness Upper Limit - Monopole P&S	787.402	US/M
SWD1	STC Slowness Width - Lower Dipole	131.234	US/M
SWD2	STC Slowness Width - Upper Dipole	131.234	US/M
SWD3	STC Slowness Width - Monopole Stoneley	131.234	US/M
SWD4	STC Slowness Width - Monopole P&S	32.8084	US/M
TBDB	Tool String Bottom to DSST Bottom	8044.18	MM
TBF1	STC Time for Baseline Fill - Lower Dipole	0	US
TBF2	STC Time for Baseline Fill - Upper Dipole	0	US
TBF3	STC Time for Baseline Fill - Monopole Stoneley	0	US
TBF4	STC Time for Baseline Fill - Monopole P&S	300	US
TLL1	STC Time Lower Limit - Lower Dipole	600	US
TLL2	STC Time Lower Limit - Upper Dipole	600	US
TLL3	STC Time Lower Limit - Monopole Stoneley	600	US
TLL4	STC Time Lower Limit - Monopole P&S	150	US
TST1	STC Time Step - Lower Dipole	200	US
TST2	STC Time Step - Upper Dipole	200	US
TST3	STC Time Step - Monopole Stoneley	200	US
TST4	STC Time Step - Monopole P&S	50	US
TTDB	Tool String Top to DSST Bottom	31336	MM
TUL1	STC Time Upper Limit - Lower Dipole	15912.5	US
TUL2	STC Time Upper Limit - Upper Dipole	15525	US
TUL3	STC Time Upper Limit - Monopole Stoneley	12000	US
TUL4	STC Time Upper Limit - Monopole P&S	3660	US
TWA1	Transmitter Waveform Amplitude 1	179	
TWA2	Transmitter Waveform Amplitude 2	179	
TWA3	Transmitter Waveform Amplitude 3	166	
TWA4	Transmitter Waveform Amplitude 4	150	
TWA5	Transmitter Waveform Amplitude 5	150	
TWAX	Transmitter Waveform Amplitude X	179	
TWD1	STC Time Width - Lower Dipole	2000	US
TWD2	STC Time Width - Upper Dipole	2000	US
TWD3	STC Time Width - Monopole Stoneley	2000	US
TWD4	STC Time Width - Monopole P&S	1000	US
TWI1	STC Integration Time Window - Lower Dipole	1600	US
TWI2	STC Integration Time Window - Upper Dipole	1600	US
TWI3	STC Integration Time Window - Monopole Stoneley	2400	US
TWI4	STC Integration Time Window - Monopole P&S	500	US
TWR1	Transmitter Waveform Sample Rate 1	5	US
TWR2	Transmitter Waveform Sample Rate 2	5	US
TWR3	Transmitter Waveform Sample Rate 3	5	US
TWR4	Transmitter Waveform Sample Rate 4	5	US
TWR5	Transmitter Waveform Sample Rate 5	5	US
TWRX	Transmitter Waveform Sample Rate X	5	US
TWS1	Transmitter Waveform Select 1	0	
TWS2	Transmitter Waveform Select 2	0	
TWS3	Transmitter Waveform Select 3	4	
TWS4	Transmitter Waveform Select 4	6	
TWS5	Transmitter Waveform Select 5	6	
TWSX	Transmitter Waveform Select X	0	

UTXG	Upper Dipole Transmitter Geometry	4115	MM
WFDTSP1	SAM1 Waveform Delta for Spectrum	0	US/M
WFDTSP2	SAM2 Waveform Delta for Spectrum	0	US/M
WFDTSP3	SAM3 Waveform Delta for Spectrum	0	US/M
WFDTSP4	SAM4 Waveform Delta for Spectrum	0	US/M
WFDTSPX	SAMX Waveform Delta for Spectrum	0	US/M
WFLLSP1	SAM1 Waveform Lower Limit for Spectrum	0	US
WFLLSP2	SAM2 Waveform Lower Limit for Spectrum	0	US
WFLLSP3	SAM3 Waveform Lower Limit for Spectrum	0	US
WFLLSP4	SAM4 Waveform Lower Limit for Spectrum	0	US
WFLLSPX	SAMX Waveform Lower Limit for Spectrum	0	US
WFM1	Waveform Mode 1	W1	
WFM2	Waveform Mode 2	W1	
WFM3	Waveform Mode 3	W1	
WFM4	Waveform Mode 4	W1	
WFM5	Waveform Mode 5	W1	
WFMX	Waveform Mode X	W1	
WFULSP1	SAM1 Waveform Upper Limit for Spectrum	20000	US
WFULSP2	SAM2 Waveform Upper Limit for Spectrum	20000	US
WFULSP3	SAM3 Waveform Upper Limit for Spectrum	20000	US
WFULSP4	SAM4 Waveform Upper Limit for Spectrum	5000	US
WFULSPX	SAMX Waveform Upper Limit for Spectrum	20000	US
XMT1	Transmitter Select 1	DLO	
XMT2	Transmitter Select 2	DUP	
XMT3	Transmitter Select 3	MONO	
XMT4	Transmitter Select 4	MONO	
XMT5	Transmitter Select 5	MONO	
XMTX	Transmitter Select X	DUP	
EMS-B: Environment Measurement Sonde			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
EAAB	EMS Accelerometer Coefficient:Ab	0	
EAAS	EMS Accelerometer Coefficient:As	0	
EABB	EMS Accelerometer Coefficient:Bb	0	
EABS	EMS Accelerometer Coefficient:Bs	0	
EACB	EMS Accelerometer Coefficient:Cb	0	
EACS	EMS Accelerometer Coefficient:Cs	0	
ECOF	EMS Caliper Offset	50.8	MM
EFC	EMS Fixed Caliper Operation	OFF	
EMPDFL	EMS Max Pipe Diameter filter length	120	
EMUD	EMS Mudcake Correction	OFF	
ESCL	EMS Synthetic Caliper Log	OFF	
FCD	Future Casing (Outer) Diameter	114.3	MM
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	EMS_RESIST	
GTSE	Generalized Temperature Selection	EMS_TEMP	
HVCS	Integrated Hole Volume Caliper Selection	EMS_Calipers	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	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	MM
CSD2	Outer Casing Outer Diameter	0	MM
CSW1	Inner Casing Weight	0	KG/M
CSW2	Outer Casing Weight	0	KG/M
DBCC	HNGS Barite Constant Correction Flag	NONE	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	EMS_RESIST	
GTSE	Generalized Temperature Selection	EMS_TEMP	
H1P	HNGS Detector 1 Allow/Disallow In Processing	ALLOW	
H2P	HNGS Detector 2 Allow/Disallow In Processing	ALLOW	
HABK	HNGS Borehole Potassium Running Average	0.0600966	
HALF	HNGS Alpha Filter Length	1524	MM
HCRB	HNGS Apply Borehole Potassium Correction	NONE	
HMWM	Mud Weighting Material	NATU	
HNPE	HNGS Processing Enable	YES	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
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	0.999413	
VBA2	HNGS Detector 2 Variable Barite Factor Running Average	1.00359	
SGT-N: Scintillation Gamma Ray Tool - N			
BHS	Borehole Status	OPEN	
BHT	Bottom Hole Temperature (used in calculations)	100	DEGC
DPPM	Density Porosity Processing Mode	STAN	
GCSE	Generalized Caliper Selection	BS	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.018227	DC/M
GRSE	Generalized Mud Resistivity Selection	EMS_RESIST	
GTSE	Generalized Temperature Selection	EMS_TEMP	
ISSBAR	Barite Mud Switch	NOBARITE	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
SHT	Surface Hole Temperature	20	DEGC
SOGR	SGT Standoff Distance	0	MM
HOLEV: Integrated Hole/Cement Volume			
FCD	Future Casing (Outer) Diameter	114.3	MM
HVCS	Integrated Hole Volume Caliper Selection	EMS_Calipers	
STI: Stuck Tool Indicator			
LBFR	Trigger for MAXIS First Reading Label	STI	
STKT	STI Stuck Threshold	1.524	M
TDD	Total Depth - Driller	1640.00	M
TDL	Total Depth - Logger	1641.00	M
DIR: Directional Survey Computation			
SPED	East Departure of Starting Point	0	M
SPND	North Departure of Starting Point	0	M
SPVD	TVD of Starting Point	0	M
TAZI	Vertical Section Azimuth	0	DEG
TIED	East Departure of Tie-in Point	0	M
TIMD	Along-hole depth of Tie-in Point	1198	M
TIND	North Departure of Tie-in Point	0	M
TIVD	TVD of Tie-in Point	1198	M
System and Miscellaneous			
ALTDPCHAN	Name of alternate depth channel	SpeedCorrectedDepth	
BS	Bit Size	156.000	MM
BSAL	Borehole Salinity	-50000.00	PPM
CSIZ	Current Casing Size	177.800	MM
CWEI	Casing Weight	34.20	KG/M
DFD	Drilling Fluid Density	1315.00	K/M3
DO	Depth Offset for Playback	0.0	M
FLEV	Fluid Level	-50000.00	M
MST	Mud Sample Temperature	15.40	DEGC
PBVSADP	Use alternate depth channel for playback	NO	
PP	Playback Processing	NORMAL	
RMFS	Resistivity of Mud Filtrate Sample	0.0440	OHMM
RW	Resistivity of Connate Water	1.0000	OHMM
TD	Total Depth	1641	M
TWS	Temperature of Connate Water Sample	37.78	DEGC

Format: EMS_CAL **Vertical Scale: 1:240** **Graphics File Created: 06-Mar-2008 14:09**

OP System Version: 15C0-309

MCM

FBST-B	15C0-309	DSST-B	15C0-309
EMS-B	15C0-309	HNGC-B	15C0-309
HNGS-BA	15C0-309	MLT-B	15C0-309
SGT-N	15C0-309	DTC-H	15C0-309

Input DLIS Files

DEFAULT	FMI_DSI_EMS_NGS_040LUP	FN:62	PRODUCER	05-Mar-2008 11:09	1643.6 M	1123.9 M

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Full-Bore Scanner - B Wellsite Calibration - Caliper Calibration							
Before: 16-Feb-2008 15:30							
Caliper 1 Small Jig	203.2	N/A	195.0	N/A	N/A	N/A	MM
Caliper 2 Small Jig	203.2	N/A	193.4	N/A	N/A	N/A	MM
Caliper 1 Large Jig	304.8	N/A	289.7	N/A	N/A	N/A	MM
Caliper 2 Large Jig	304.8	N/A	289.1	N/A	N/A	N/A	MM
Full-Bore Scanner - B Wellsite Calibration - CROUZET ACCELEROMETER PROM HAS BEEN READ CORRECTLY							
Before: 5-Mar-2008 9:14							
TEMPERATURE REFERENCE :	N/A	N/A	20	N/A	N/A	N/A	DEGC
YEAR OF CALIBRATION :	N/A	N/A	6	N/A	N/A	N/A	
MONTH OF CALIBRATION :	N/A	N/A	12	N/A	N/A	N/A	
SERIAL NUMBER :	N/A	N/A	1076	N/A	N/A	N/A	
Full-Bore Scanner - B Wellsite Calibration - CROUZET MAGNETOMETER PROM HAS BEEN READ CORRECTLY							
Before: 5-Mar-2008 9:14							
TEMPERATURE REFERENCE :	N/A	N/A	20	N/A	N/A	N/A	DEGC
YEAR OF CALIBRATION :	N/A	N/A	6	N/A	N/A	N/A	
MONTH OF CALIBRATION :	N/A	N/A	5	N/A	N/A	N/A	
SERIAL NUMBER :	N/A	N/A	725	N/A	N/A	N/A	
Environment Measurement Sonde Wellsite Calibration - EMS Caliper Calibration							
Before: 16-Feb-2008 15:25							
Radius 1 Short Radius	101.6	N/A	81.34	N/A	N/A	5.080	MM
Radius 1 Long Radius	203.2	N/A	187.4	N/A	N/A	5.080	MM
Radius 2 Short Radius	101.6	N/A	79.42	N/A	N/A	5.080	MM
Radius 2 Long Radius	203.2	N/A	184.6	N/A	N/A	5.080	MM
Radius 3 Short Radius	101.6	N/A	79.37	N/A	N/A	5.080	MM
Radius 3 Long Radius	203.2	N/A	184.5	N/A	N/A	5.080	MM
Radius 4 Short Radius	101.6	N/A	87.87	N/A	N/A	5.080	MM
Radius 4 Long Radius	203.2	N/A	190.2	N/A	N/A	5.080	MM
Radius 5 Short Radius	101.6	N/A	83.27	N/A	N/A	5.080	MM
Radius 5 Long Radius	203.2	N/A	186.9	N/A	N/A	5.080	MM
Radius 6 Short Radius	101.6	N/A	78.00	N/A	N/A	5.080	MM
Radius 6 Long Radius	203.2	N/A	183.6	N/A	N/A	5.080	MM
Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 1 Check							
Master: 4-Jan-2008 9:55 Before: 3-Mar-2008 14:57							
Na 511 Peak Loc	40.00	39.78	39.64	N/A	N/A	1.000	
Na 511 Peak Res	15.50	15.38	14.71	N/A	N/A	2.000	%
High Voltage	1150	1258	1196	N/A	N/A	N/A	V
Na 1785 Peak Loc	142.6	143.7	144.3	N/A	N/A	7.000	
Na 1785 Peak Res	8.500	8.442	7.752	N/A	N/A	2.000	%
Temperature	15.50	22.14	-19.41	N/A	N/A	N/A	DEGC
Na Count Rate	45.00	35.30	35.42	N/A	N/A	8.000	CPS
Hostile Natural Gamma Ray Sonde Wellsite Calibration - Detector 2 Check							
Master: 4-Jan-2008 9:55 Before: 3-Mar-2008 14:57							
Na 511 Peak Loc	40.00	39.66	39.58	N/A	N/A	1.000	
Na 511 Peak Res	15.50	14.86	14.28	N/A	N/A	2.000	%
High Voltage	1150	1273	1211	N/A	N/A	N/A	V
Na 1785 Peak Loc	142.6	142.7	142.6	N/A	N/A	7.000	
Na 1785 Peak Res	8.500	8.234	8.033	N/A	N/A	2.000	%
Temperature	15.50	21.49	-20.13	N/A	N/A	N/A	DEGC
Na Count Rate	45.00	35.28	35.35	N/A	N/A	8.000	CPS
Hostile Natural Gamma Ray Sonde Wellsite Calibration - Ratio Of Detector 1 To Detector 2							
Master: 4-Jan-2008 9:55 Before: 3-Mar-2008 14:57							
Coincidence Count Rate Ratio	1.000	1.001	1.001	N/A	N/A	0.05000	
Hostile Natural Gamma Ray Sonde Master Calibration - Detector 1 Calibration							
Master: 4-Jan-2008 9:50							
Na 511 Peak Set Point	40.00	41.00	--	--	--	--	
Th Peak Loc	209.6	211.0	--	--	--	--	
Th Peak Res	7.000	6.765	--	--	--	--	%
Background Count Rate	142.5	82.05	--	--	--	--	CPS
Gain Ratio	1.000	1.009	--	--	--	--	
Hostile Natural Gamma Ray Sonde Master Calibration - Detector 2 Calibration							
Master: 4-Jan-2008 9:50							
Na 511 Peak Set Point	40.00	41.00	--	--	--	--	
Th Peak Loc	209.6	211.2	--	--	--	--	
Th Peak Res	7.000	7.094	--	--	--	--	%
Background Count Rate	142.5	80.00	--	--	--	--	CPS
Gain Ratio	1.000	1.013	--	--	--	--	
MicroLog - B Wellsite Calibration - MLT Caliper Calibration							
Before: 3-Mar-2008 13:47							
MLT Caliper Small Ring	203.2	N/A	162.1	N/A	N/A	N/A	MM
MLT Caliper Large Ring	304.8	N/A	265.8	N/A	N/A	N/A	MM
MicroLog - B Wellsite Calibration - MLT Micro Inverse Calibration							
Before: 3-Mar-2008 13:45							
Micro Inverse Zero	0	N/A	0.0006272	N/A	N/A	0.2000	OHMM
Micro Inverse Plus	5.000	N/A	4.872	N/A	N/A	0.2000	OHMM
MicroLog - B Wellsite Calibration - MLT Micro Normal Calibration							
Before: 3-Mar-2008 13:45							
Micro Normal Zero	0	N/A	0.002347	N/A	N/A	0.2000	OHMM

Micro Normal Plus	6.720	N/A	6.560	N/A	N/A	0.2000	OHMM
Scintillation Gamma Ray Tool - N Wellsite Calibration - Detector Calibration							
Before: 3-Mar-2008 13:04							
Gamma Ray (Jig - Bkg)	159.4	N/A	159.4	N/A	N/A	14.49	GAPI
Gamma Ray (Calibrated)	162.0	N/A	162.0	N/A	N/A	15.00	GAPI

Full-Bore Scanner - B / Equipment Identification

Primary Equipment:	
FullBore Scanner Sonde	FBSS - B
FullBore Scanner Sonde Upper part	FBSH - A
FullBore Scanner Sonde Cartridge	FBSC - B
GPIT Cartridge - C	GPIC - C
Insulating Sub	AH - 185
Flex Joint	AH - 184
FullBore Scanner Control Cartridge	FBCC - A
Auxiliary Equipment:	
Electronics Cartridge Housing	ECH - MRA

Full-Bore Scanner - B Wellsite Calibration

Caliper Calibration

Phase	Caliper 1 Small Jig MM	Value	Phase	Caliper 2 Small Jig MM	Value
Before		195.0	Before		193.4
	172.7 (Minimum) 203.2 (Nominal) 233.7 (Maximum)			172.7 (Minimum) 203.2 (Nominal) 233.7 (Maximum)	

Phase	Caliper 1 Large Jig MM	Value	Phase	Caliper 2 Large Jig MM	Value
Before		289.7	Before		289.1
	259.1 (Minimum) 304.8 (Nominal) 350.5 (Maximum)			259.1 (Minimum) 304.8 (Nominal) 350.5 (Maximum)	

Before: 16-Feb-2008 15:30

Environment Measurement Sonde / Equipment Identification

Primary Equipment:	
EMS Mechanical	EMM - B
EMS Cartridge	EMC - B
EMS Adaptor	EMA - B
Resistivity Meter	RES -
Auxiliary Equipment:	
Electronics Cartridge Housing	ECH - KH

Environment Measurement Sonde Wellsite Calibration

EMS Caliper Calibration

Phase	Radius 1 Short Radius MM	Value	Phase	Radius 1 Long Radius MM	Value
Before		81.34	Before		187.4
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)			177.8 (Minimum) 203.2 (Nominal) 228.6 (Maximum)	
Phase	Radius 2 Short Radius MM	Value	Phase	Radius 2 Long Radius MM	Value
Before		79.42	Before		184.6
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)			177.8 (Minimum) 203.2 (Nominal) 228.6 (Maximum)	
Phase	Radius 3 Short Radius MM	Value	Phase	Radius 3 Long Radius MM	Value
Before		79.37	Before		184.5
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)			177.8 (Minimum) 203.2 (Nominal) 228.6 (Maximum)	
Phase	Radius 4 Short Radius MM	Value	Phase	Radius 4 Long Radius MM	Value
Before		87.87	Before		190.2
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)			177.8 (Minimum) 203.2 (Nominal) 228.6 (Maximum)	
Phase	Radius 5 Short Radius MM	Value	Phase	Radius 5 Long Radius MM	Value
Before		83.27	Before		186.9
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)			177.8 (Minimum) 203.2 (Nominal) 228.6 (Maximum)	
Phase	Radius 6 Short Radius MM	Value	Phase	Radius 6 Long Radius MM	Value
Before		78.00	Before		183.6
	76.20 (Minimum) 101.6 (Nominal) 127.0 (Maximum)			177.8 (Minimum) 203.2 (Nominal) 228.6 (Maximum)	

Before: 16-Feb-2008 15:25

Hostile Natural Gamma Ray Cartridge - B / Equipment Identification

Primary Equipment:		
HNGC Cartridge	HNGC - B	405
Auxiliary Equipment:		
HNGC Housing	HNGH - A	346

Hostile Natural Gamma Ray Sonde / Equipment Identification

Primary Equipment:		
HNGS Sonde	HNGS - BA	163
Auxiliary Equipment:		
HNGS Sonde Housing	HNSH - BA	160
Gamma Source Radioactive	GSR - U	1237

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		39.78	Master		15.38	Master		1258
Before		39.64	Before		14.71	Before		1196
	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		143.7	Master		8.442	Master		22.14
Before		144.3	Before		7.752	Before		-19.41
	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		35.30						
Before		35.42						
	10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum)							

Master: 4-Jan-2008 9:55 Before: 3-Mar-2008 14:57

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		39.66	Master		14.86	Master		1273
Before		39.58	Before		14.28	Before		1211
	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		142.7	Master		8.234	Master		21.49
Before		142.6	Before		8.033	Before		-20.13
	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		35.28						
Before		35.35						
	10.00 (Minimum) 45.00 (Nominal) 100.0 (Maximum)							

Master: 4-Jan-2008 9:55 Before: 3-Mar-2008 14:57

Hostile Natural Gamma Ray Sonde Wellsite Calibration

Ratio Of Detector 1 To Detector 2

Phase	Coincidence Count Rate Ratio	Value
Master		1.001
Before		1.001
	0.9500 (Minimum) 1.000 (Nominal) 1.050 (Maximum)	

Master: 4-Jan-2008 9:55

Before: 3-Mar-2008 14:57

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		211.0	Master		6.765
	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		82.05	Master		1.009			
	10.00 (Minimum) 142.5 (Nominal) 265.0 (Maximum)			0.9400 (Minimum) 1.000 (Nominal) 1.060 (Maximum)				

Master: 4-Jan-2008 9:50

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		211.2	Master		7.094
	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		80.00	Master		1.013			
	10.00 (Minimum) 142.5 (Nominal) 265.0 (Maximum)			0.9400 (Minimum) 1.000 (Nominal) 1.060 (Maximum)				

Master: 4-Jan-2008 9:50

MicroLog - B / Equipment Identification

Primary Equipment:	
MicroLog - B (sonde)	MLT - B
Auxiliary Equipment:	

MicroLog - B Wellsite Calibration

MLT Micro Inverse Calibration

Phase	Micro Inverse Zero OHMM	Value	Phase	Micro Inverse Plus OHMM	Value
Before		0.0006272	Before		4.872
	-2.000 (Minimum) 0 (Nominal) 2.000 (Maximum)			1.000 (Minimum) 5.000 (Nominal) 9.000 (Maximum)	

Before: 3-Mar-2008 13:45

MicroLog - B Wellsite Calibration

MLT Micro Normal Calibration

Phase	Micro Normal Zero OHMM	Value	Phase	Micro Normal Plus OHMM	Value
Before		0.002347	Before		6.560
	-2.000 (Minimum) 0 (Nominal) 2.000 (Maximum)			2.720 (Minimum) 6.720 (Nominal) 10.72 (Maximum)	

Before: 3-Mar-2008 13:45

Scintillation Gamma Ray Tool - N / Equipment Identification

Primary Equipment:	
Scintillation Gamma Cartridge	SGC - TB
Scintillation Gamma Detector	SGD - TAB
Auxiliary Equipment:	
Scintillation Gamma Housing	SGH - K
Gamma Source Radioactive	GSR - U/Y

Scintillation Gamma Ray Tool - N Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		10.45	Before		159.4	Before		162.0
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			144.9 (Minimum) 159.4 (Nominal) 173.9 (Maximum)			147.0 (Minimum) 162.0 (Nominal) 177.0 (Maximum)	

Before: 3-Mar-2008 13:04

DTS Telemetry Tool / Equipment Identification

Primary Equipment:	
DTC-H Auxiliary Cartridge	DTCH - A
DTC-H Telemetry Cartridge	DTCH - A
Auxiliary Equipment:	
DTCH Telemetry Cartridge Housing	ECH - KC

Company: **PETRO-CANADA**

Schlumberger

Well: **PETRO-CANADA BLACKWATER KWIJIKA M-59**

Field: **KWIJIKA**

Province: **NORTHWEST TERRITORIES**

*****MD*****

***MD ***

ENVIRONMENTAL MEASUREMENT SONDE

BOREHOLE GRAPHICS LOG