COMPANY: **NORTHWEST NATURAL GAS**

WELL: **IW-24BH-23-65**

FIELD: **MIST**

COUNTY: **COLUMBIA** **STATE:** **OREGON**

COUNTY:	COLUMBIA
Field:	MIST
Location:	976.5' NORTH, 1256.3' EAST
Well:	IW-24BH-23-65
Company:	NORTHWEST NATURAL GAS

Schlumberger

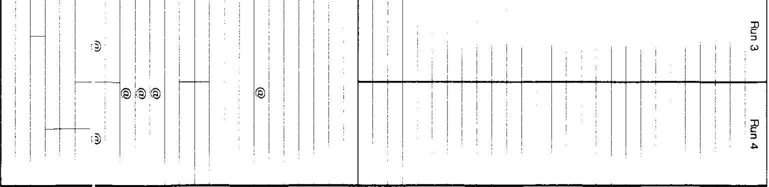
PLATFORM EXPRESS
BHC SONIC / SP/ GR
SCALE: 5" = 100'

LOCATION			
976.5' NORTH, 1256.3' EAST FROM THE SW SECTION CORNOR		Elev.:	K.B. 923 ft G.L. 905 ft D.F. 923 ft
Permanent Datum:	GROUND LEVEL	Elev.:	905 ft
Log Measured From:	KB	18.0 ft	above Perm. Datum
Drilling Measured From:	KB		

API Serial No.	SECTION	TOWNSHIP	RANGE
36-009-00351	23	6N	5W

Logging Date		14-JUN-2000		
Run Number		1		
Depth Driller		1838 ft		
Schlumberger Depth		1828 ft		
Bottom Log Interval		1818 ft		
Top Log Interval		429 ft		
Casing Driller Size @ Depth		13.375 in	@	429 ft
Casing Schlumberger		429 ft		
Bit Size		9.875 in		
Type Fluid In Hole		DMA		
MUD Density	Viscosity	8.8 lbm/gal	42 s	
Fluid Loss	PH	6.4 cm3	8.5	
Source Of Sample		FLOWLINE		
RM @ Measured Temperature		1.193 ohm.m	@	57 degF
RMF @ Measured Temperature		1.492 ohm.m	@	62 degF
RMC @ Measured Temperature		1.402 ohm.m	@	60 degF
Source RMF	RMC	PRESS	PRESS	
RM @ MRT	RMF @ MRT	1.017 @ 68	1.380 @ 68	
Maximum Recorded Temperatures		68 degF	68	68
Circulation Stopped	Time	14-JUN-2000		3:00
Logger On Bottom	Time	14-JUN-2000		7:00
Unit Number	Location	3152	SACRAMENTO	
Recorded By		M.KHAN		
Witnessed By		JACK MEYER		

	Run 1	Run 2
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		



DISCLAIMER
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE OF AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

OTHER SERVICES1	OTHER SERVICES2
OS1: FMI	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:

REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
Maximum Deviation: 72 Deg at 1828 ft	

RUN 1		RUN 2	
SERVICE ORDER #		SERVICE ORDER #:	
PROGRAM VERSION:	9C1-303	PROGRAM VERSION:	
FLUID LEVEL:	0 ft	FLUID LEVEL:	

LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1

RUN 2

SURFACE EQUIPMENT

GSR-U/Y
NCT-B
CNB-AB
NCS-VB
WITM (CTS)-A

DOWNHOLE EQUIPMENT

LEH-QT
LEH-QT

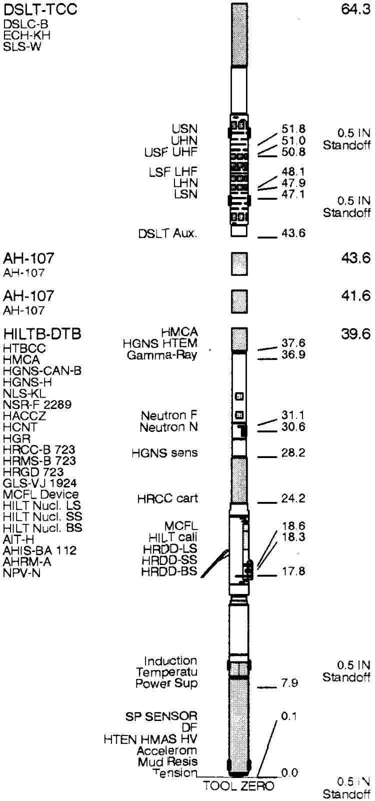
70.2

TCC-BF
ECH-KC
TCC-BF

TelStatus

67.3

64.3



MAXIMUM STRING DIAMETER 4.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Input DLIS Files

DEFAULT	HILTB .003	FN:2	PRODUCER	14-Jun-2000 04:22	1824.0 FT	307.5 FT

Output DLIS Files

DEFAULT	HILTB .004	FN:3	PRODUCER	14-Jun-2000 05:27	1829.0 FT	312.5 FT

OP System Version: 9C1-303

MCM

HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

MAIN LOG

Tension (TENS)
12000 (LBF) 2000

Sonic Porosity (SPHI)
0.6 (V/V) 0

Crossover

Caliper (HCAL)
6 (IN) 16

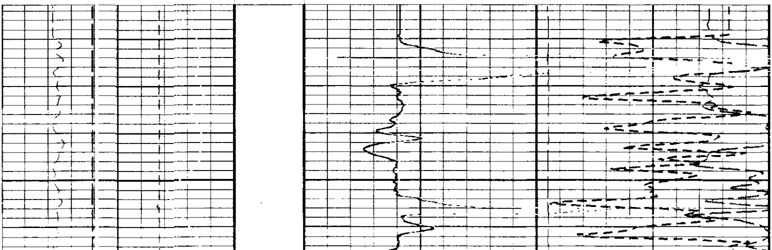
Formation Pe (PEFZ)
0 (----) 10

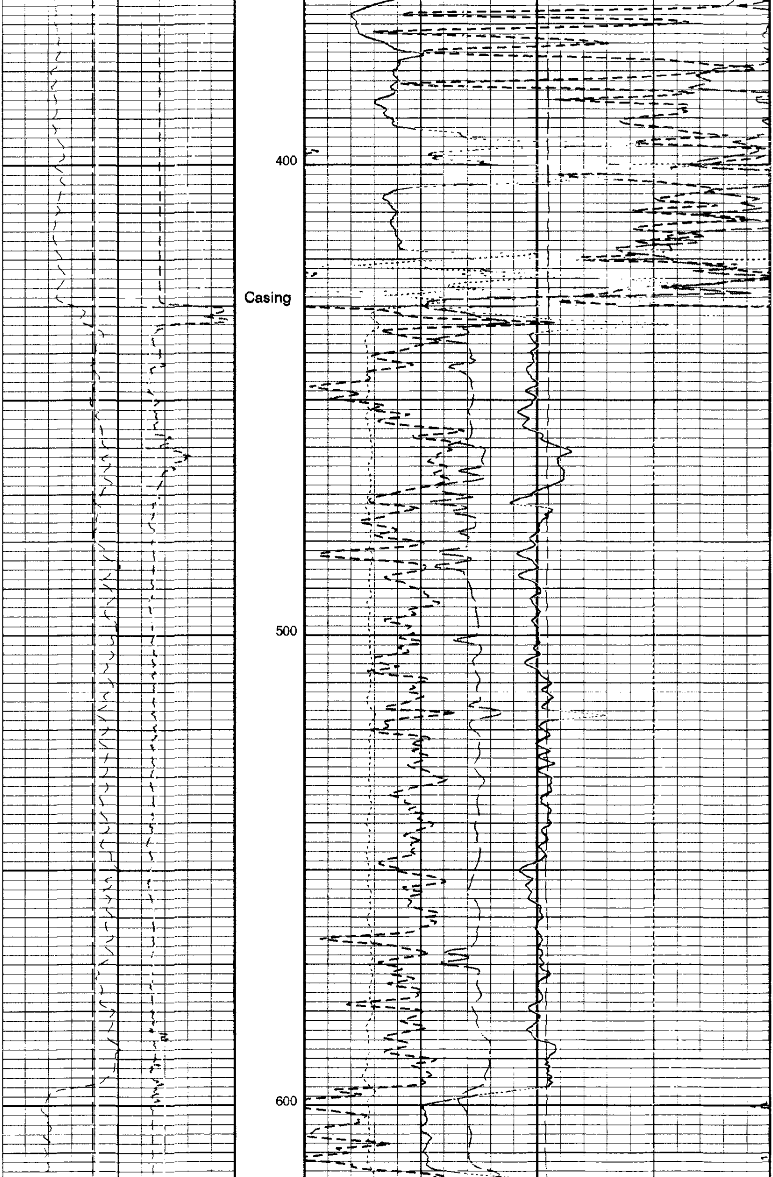
Bit Size (BS)
6 (IN) 16

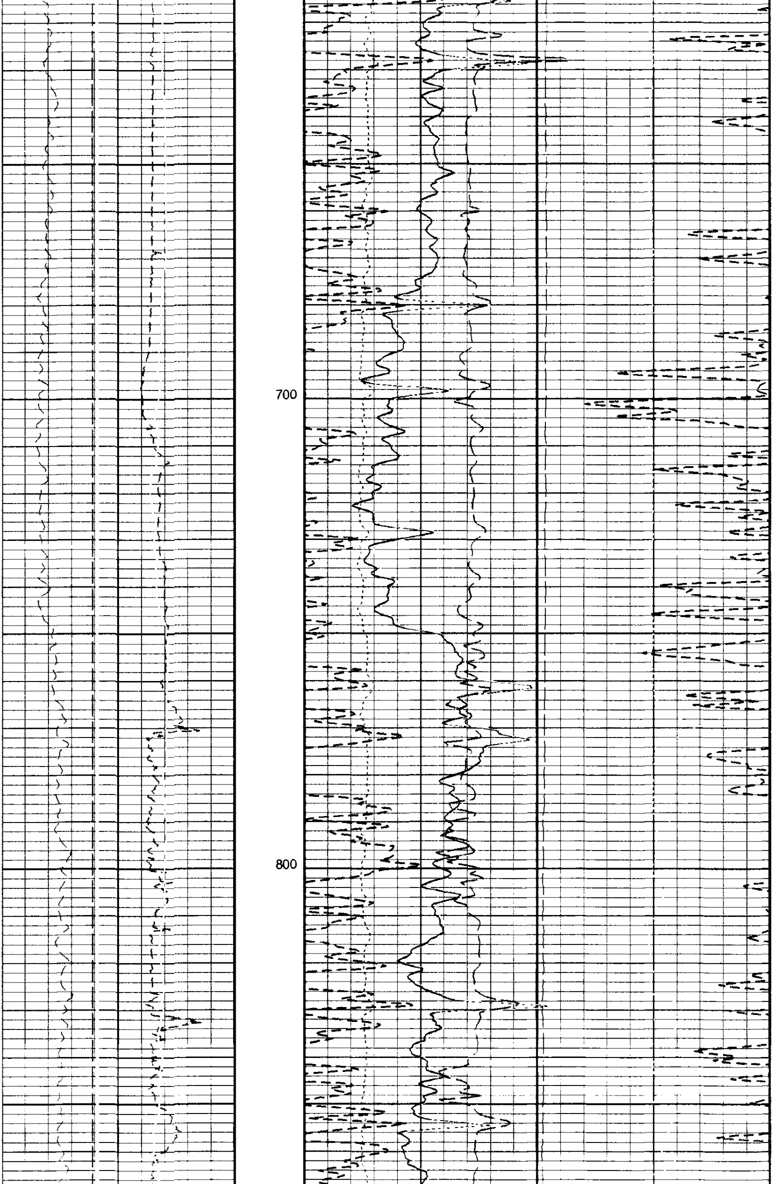
Alpha Processed Neutron Porosity (NPOR)
0.6 (V/V) 0

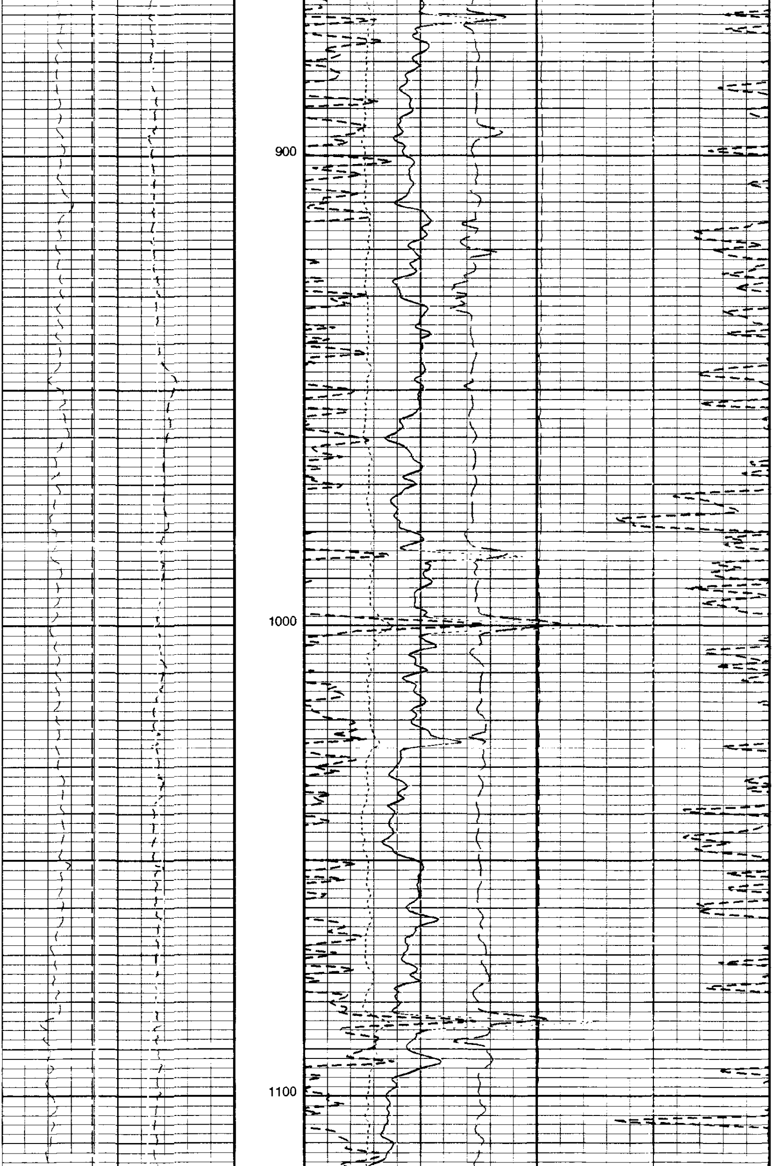
Gamma Ray (GR)
0 (GAPI) 150

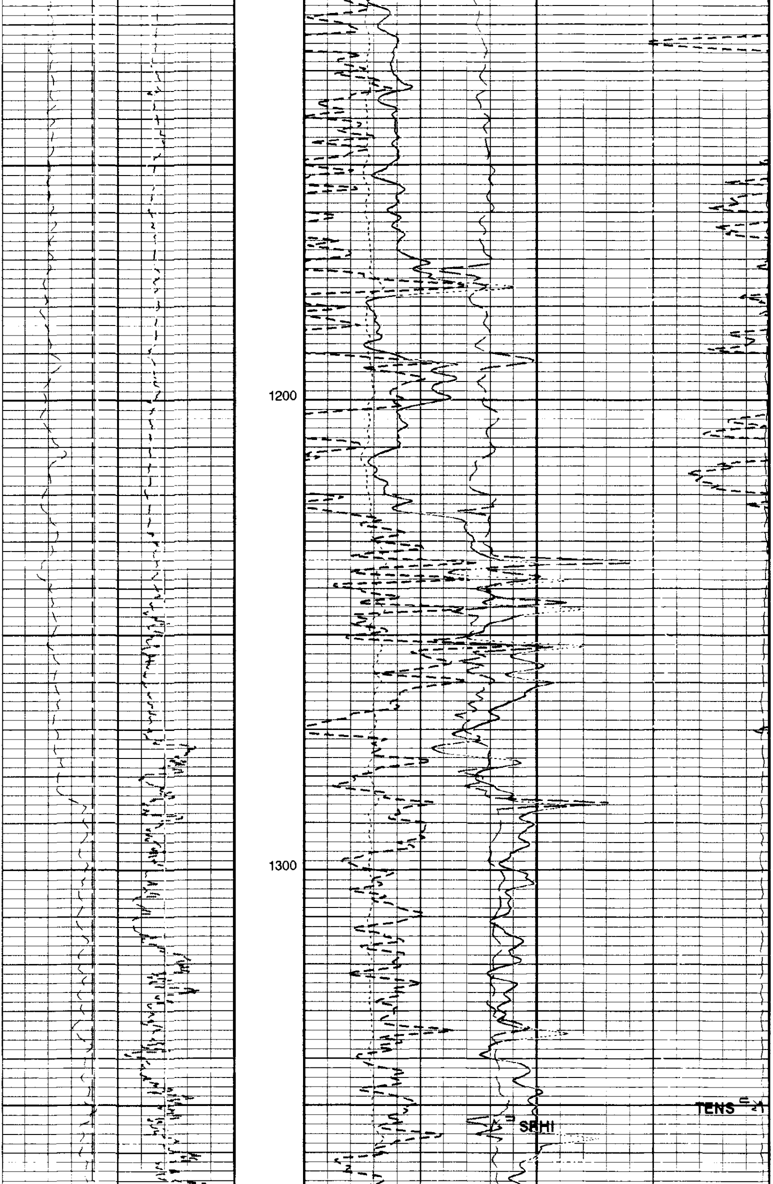
Std Res Density Porosity (DPHZ)
0.6 (V/V) 0

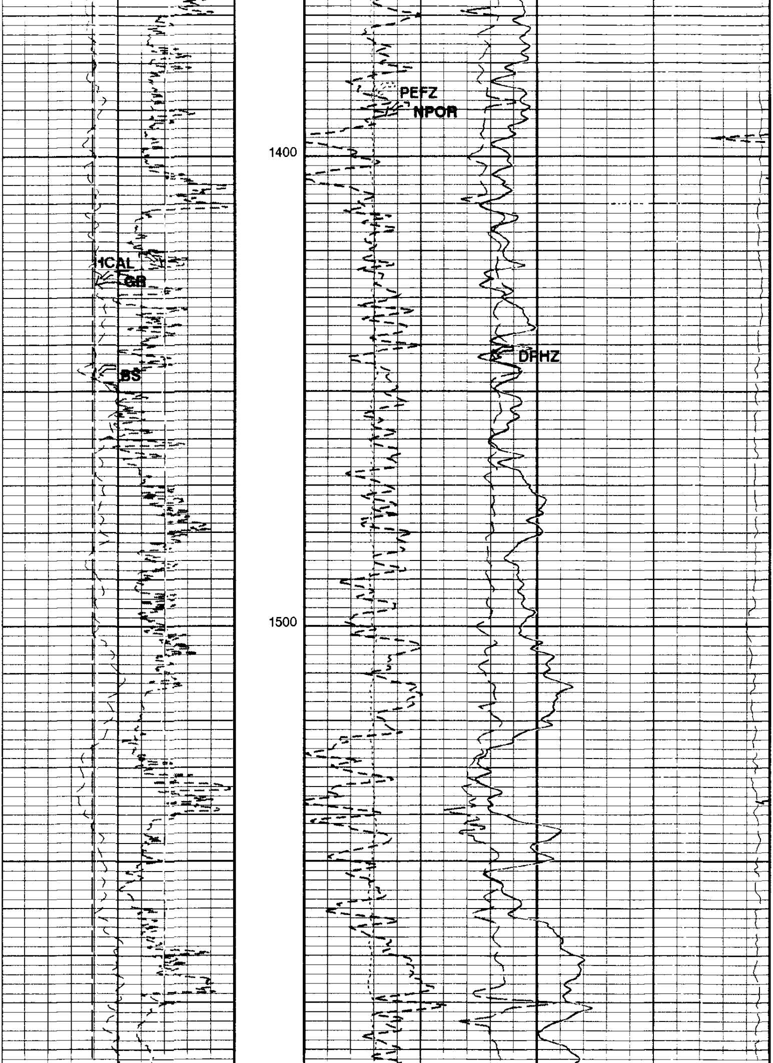


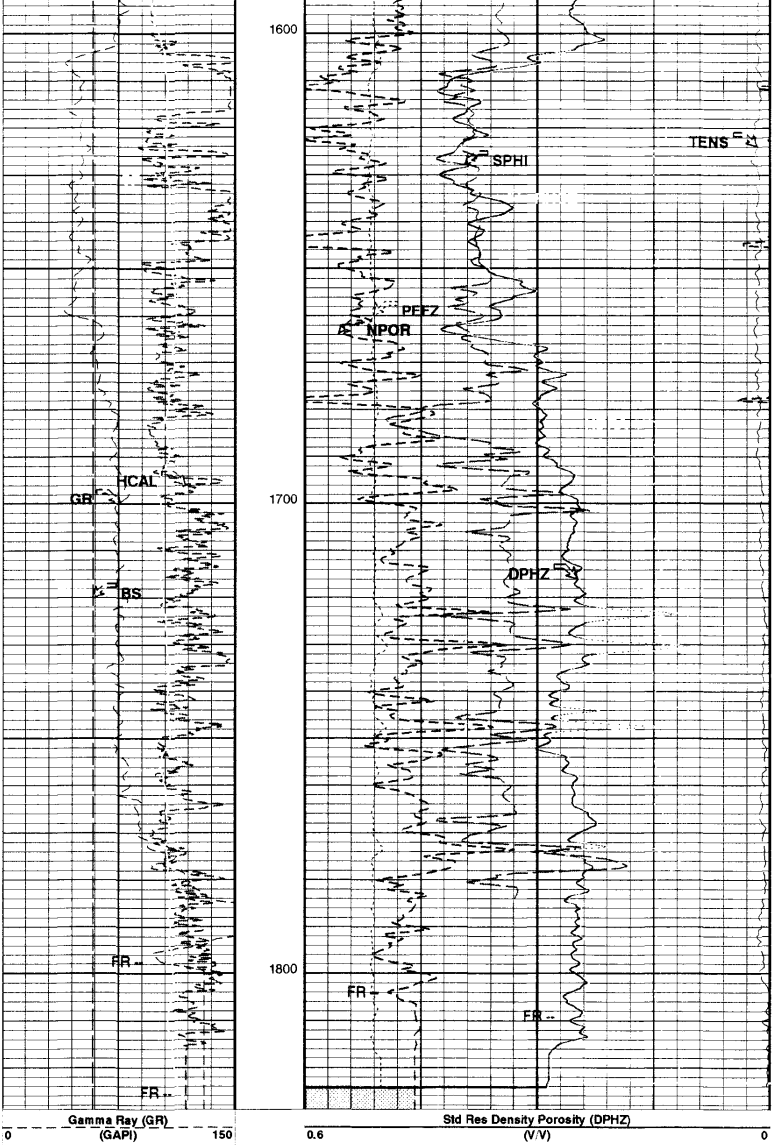












Bit Size (BS)
6 (IN) 16

Caliper (HCAL)
6 (IN) 16

Alpha Processed Neutron Porosity (NPOR)
0.6 (V/V) 0

Formation Pe (PEFZ)
0 (----) 10

Crossover

Sonic Porosity (SPHI)
0.6 (V/V) 0

Tension (TENS)
12000 (LBF) 2000

AIT-H Answer Product Processing Summary. Data taken with Tool # 112 (AHTNO)

...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 0.50 IN. Bit Size is 9.88 IN.

***** Input Selections to AIT-H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other Parameters used by AIT-H Answer Product Processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	212.000 DEGF
Total Depth (TD)	1838.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	1.492 OHMM	Mud Filtrate Sample Temperature (MFST)	62.400 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

***** AIT-H Answer Product Processing Control Parameters *****

Playback Mode: NORMAL

Parameters

DLIS Name	Description	Value	
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	1900.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CDTS	C-Delta-T Shale	100	US/F
CSIZ	Current Casing Size	13.375	IN
CWEI	Casing Weight	43.00	LB/F
DFD	Drilling Fluid Density	8.80	LB/G
DHC	Density Hole Correction	BS	
DO	Depth Offset for Logical Unit 1	5.0	FT
DTF	Delta-T Fluid	189	US/F
DTM	Delta-T Matrix	56	US/F
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HSCM	HILT Speed Correction Mode	NO_SC	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.65	G/C3
MST	Mud Sample Temperature	57.00	DEGF
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PP	Playback Processing	NORMAL	
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	1.4920	OHMM
SDAT	Standoff Data Source	SOCN	
SHT	Surface Hole Temperature	68	DEGF
SOCN	Standoff Distance	0.125	IN
SOCO	Standoff Correction Option	NO	
SPFS	Sonic Porosity Formula	RAYMER_HUNT	
SPNV	SP Next Value	0	MV

SPSO	Sonic Porosity Source	DT	
TDL	Total Depth - Logger	1838.00	FT

Format: PORO Vertical Scale: 5" per 100' Graphics File Created: 14-Jun-2000 05:27

OP System Version: 9C1-303

MCM

HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

Input DLIS Files

DEFAULT	HILTB .003	FN:2	PRODUCER	14-Jun-2000 04:22	1824.0 FT	307.5 FT

Output DLIS Files

DEFAULT	HILTB .004	FN:3	PRODUCER	14-Jun-2000 05:27

Schlumberger

REPEAT SECTION

MAXIS 500 Field Log

Output DLIS Files

DEFAULT	HILTB .010	FN:9	PRODUCER	14-Jun-2000 06:20	594.0 FT	340.0 FT

OP System Version: 9C1-303

MCM

HILTB-DTB	OP91-KP1a	DSLT-TCC	OP91-KP1a
TCC-BF	OP91-KP1a		

Tension (TENS)
12000 (LBF) 2000

Sonic Porosity (SPHI)
0.6 (V/V) 0

Crossover

Caliper (HCAL)
6 (IN) 16

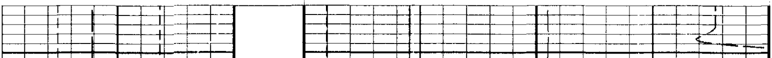
Formation Pe (PEFZ)
0 (----) 10

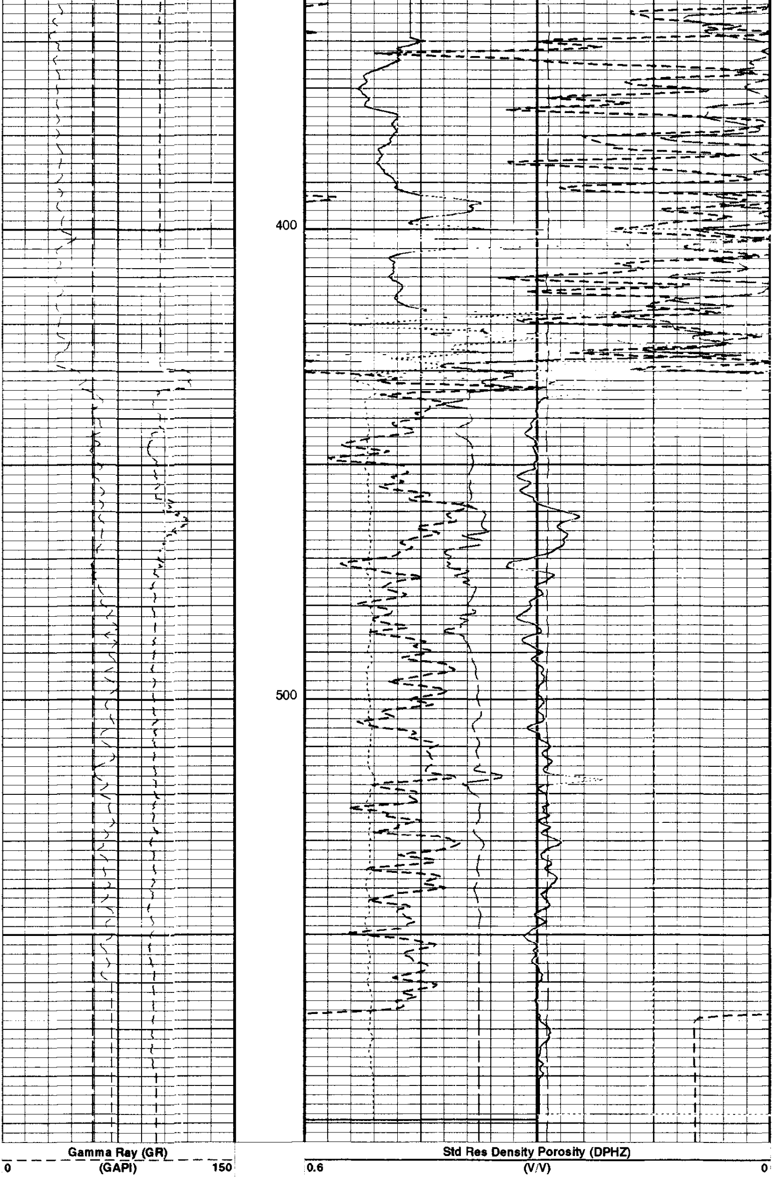
Bit Size (BS)
6 (IN) 16

Alpha Processed Neutron Porosity (NPOR)
0.6 (V/V) 0

Gamma Ray (GR)
0 (GAPI) 150

Std Res Density Porosity (DPHZ)
0.6 (V/V) 0





Bit Size (BS)
6 (IN) 16

Caliper (HCAL)
6 (IN) 16

Alpha Processed Neutron Porosity (NPOR)
0.6 (V/V) 0

Formation Pe (PEFZ)
0 (----) 10

Crossover

Sonic Porosity (SPHI)
0.6 (V/V) 0

Tension (TENS)
12000 (LBF) 2000

AIT-H Answer Product Processing Summary. Data taken with Tool # 112 (AHTNO)
...Acquired data from HILT/HAIT

***** Borehole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECCENTERED mode with a tool stand-off of 0.50 IN. Bit Size is 9.88 IN.

***** Input Selections to AIT-H Answer Product Processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other Parameters used by AIT-H Answer Product Processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	212.000 DEGF
Total Depth (TD)	1838.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	1.492 OHMM	Mud Filtrate Sample Temperature (MFST)	62.400 DEGF
Resitivity Connate Water (RW)	1.000 OHMM		

***** AIT-H Answer Product Processing Control Parameters *****

(AHAPL): 3_BholeCorr_BasicLogs_Radial_Processing

(AHBHM): 2_ComputeStandoff (AHBLM): 6_One_Two_and_Four (AHRPM): 1_Two

(AHBPO): Standard_Processing

Parameters

DLIS Name	Description	Value	
BHFL	Borehole Fluid Type	WATER	
BHS	Borehole Status	OPEN	
BS	Bit Size	9.875	IN
BSAL	Borehole Salinity	1900.00	PPM
BSCO	Borehole Salinity Correction Option	NO	
CCCO	Casing & Cement Thickness Correction Option	NO	
CDTS	C-Delta-T Shale	100	US/F
CSIZ	Current Casing Size	13.375	IN
CWEI	Casing Weight	43.00	LB/F
DFD	Drilling Fluid Density	8.80	LB/G
DHC	Density Hole Correction	BS	
DTF	Delta-T Fluid	189	US/F
DTM	Delta-T Matrix	56	US/F
FD	Fluid Density	1	G/C3
FSAL	Formation Salinity	-50000	PPM
FSCO	Formation Salinity Correction Option	NO	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
HSCM	HILT Speed Correction Mode	NO_SC	
HSCO	Hole Size Correction Option	YES	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix for Neutron Porosity Corrections	SANDSTONE	
MCCO	Mud Cake Correction Option	NO	
MCOR	Mud Correction	NATU	
MDEN	Matrix Density	2.65	G/C3
MST	Mud Sample Temperature	57.00	DEGF
MWCO	Mud Weight Correction Option	NO	
NAAC	HRDD APS Activation Correction	OFF	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PTCO	Pressure/Temperature Correction Option	NO	
RMFS	Resistivity of Mud Filtrate Sample	1.4920	OHMM

SDAT	**Standoff Data Source**	**SOCN**	
SHT	**Surface Hole Temperature**	**68**	**DEGF**
SOCN	**Standoff Distance**	**0.125**	**IN**
SOCO	**Standoff Correction Option**	**NO**	
SPFS	**Sonic Porosity Formula**	**RAYMER_HUNT**	
SPNV	**SP Next Value**	**0**	**MV**
SPSO	**Sonic Porosity Source**	**DT**	
TDL	**Total Depth - Logger**	**1838.00**	**FT**

Format: PORO **Vertical Scale: 5" per 100'** **Graphics File Created: 14-Jun-2000 06:20**

OP System Version: 9C1-303

MCM

HILTB-DTB	**OP91-KP1a**	**DSLT-TCC**	**OP91-KP1a**
TCC-BF	**OP91-KP1a**		

Output DLIS Files

DEFAULT **HILTB .010** **FN:9** **PRODUCER** **14-Jun-2000 06:20**

Schlumberger

CALIBRATIONS

MAXIS 500 Field Log

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Calibration out of date 20-JAN-2000 11:39 Before: 14-JUN-2000 2:44							
Thru Cal Magnitude - 0	0	0.6214	0.6238	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.274	1.279	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6329	0.6353	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7152	0.7182	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.335	1.340	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.943	1.951	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.947	1.955	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.371	1.380	N/A	N/A	N/A	V
Phase - 0	0	64.91	65.49	N/A	N/A	N/A	DEG
Phase - 1	0	63.80	64.38	N/A	N/A	N/A	DEG
Phase - 2	0	60.03	60.64	N/A	N/A	N/A	DEG
Phase - 3	0	59.25	59.86	N/A	N/A	N/A	DEG
Phase - 4	0	52.91	53.56	N/A	N/A	N/A	DEG
Phase - 5	0	50.96	51.64	N/A	N/A	N/A	DEG
Phase - 6	0	50.92	51.60	N/A	N/A	N/A	DEG
Phase - 7	0	47.08	48.00	N/A	N/A	N/A	DEG
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxilliary							
Master: Calibration out of date 20-JAN-2000 11:39 Before: 14-JUN-2000 2:44							
Array Induction SPA Plus	990.5	989.8	990.9	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.1083	0.09257	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9169	0.9180	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0001095	0.00009801	N/A	N/A	N/A	V
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction							
Master: Calibration out of date 20-JAN-2000 11:39							
Test Loop Gain Magnitude - 0	0	1.042	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.011	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.010	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9940	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9835	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	0.9934	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	0.9945	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.3672	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	-0.6191	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.01578	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	0.1871	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.1325	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.1680	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.2889	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.2642	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction

Master: Calibration out of date 20-JAN-2000 11:39

R Sonde Error Correction - 0	0	-121.4	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	149.7	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	113.9	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	58.40	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	24.16	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	11.87	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	7.431	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-3.605	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	34.14	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-240.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	67.33	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	81.72	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-1.172	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	-10.09	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	10.78	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	0.3313	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction

Master: Calibration out of date 20-JAN-2000 11:39

Coarse - Mag, Real, Imag - 0	0	1.013	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.013	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.013	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.011	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.011	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.011	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary

Before: 14-JUN-2000 2:54

BS Window Ratio	1.033	N/A	1.026	N/A	N/A	N/A	
BS Window Sum	14310	N/A	14350	N/A	N/A	N/A	CPS
SS Window Ratio	0.5004	N/A	0.5047	N/A	N/A	N/A	
SS Window Sum	11490	N/A	11410	N/A	N/A	N/A	CPS
LS Window Ratio	0.2862	N/A	0.2832	N/A	N/A	N/A	
LS Window Sum	1163	N/A	1152	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations

Before: 14-JUN-2000 2:54

BS PM High Voltage (Command)	1614	N/A	1650	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1916	N/A	1959	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1966	N/A	1965	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration

Before: 14-JUN-2000 2:54

BS Crystal Resolution	12.26	N/A	12.47	N/A	N/A	N/A	%
SS Crystal Resolution	11.63	N/A	11.93	N/A	N/A	N/A	%
LS Crystal Resolution	10.59	N/A	10.92	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration

Before: 14-JUN-2000 2:55

Raw B0 Resistivity	3875	N/A	3844	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3809	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3822	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration

Before: 14-JUN-2000 2:45

HILT Caliper Zero Measurement	8.000	N/A	7.212	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	16.00	N/A	15.93	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration

Before: Calibration not done

Gamma Ray Background	30.00	N/A	N/A	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	N/A	N/A	N/A	N/A	N/A	N/A	GAPI
Gamma Ray (Calibrated)	165.0	N/A	N/A	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement

Master: 6-APR-2000 4:31 Before: 14-JUN-2000 2:51

CNTC Background	27.31	27.31	27.31	N/A	N/A	4.096	CPS
CFTC Background	28.31	28.31	29.65	N/A	N/A	4.247	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration

Before: 14-JUN-2000 2:52

Z-Axis Acceleration	32.19	N/A	32.16	N/A	N/A	N/A	F/S2

The GLS-VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT-B Water Temperature	90.0	DEGF.
Thermal Housing Size	3.375	IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:		
Array Induction Tool - H	AIT - H	
Rm/SP Bottom Nose	AHRM - A	
Array Induction Sonde	AHIS - BA	112
HILT high-Resolution Mechanical Sonde	HRMS - B	723
HILT Rxo Gamma-ray Device	HRGD -	723
HILT Nuclear Back-Scatter Detector	HILT -	
HILT Nuclear Short-Spacing Detector	HILT -	
HILT Nuclear Long-Spacing Detector	HILT -	
Auxiliary Equipment:		

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Thru Cal Mag. & Phase

Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6214		0.6050	64.91		71.00
	Before	0.6238			65.49		
1	Master	1.274		1.270	63.80		70.00
	Before	1.279			64.38		
2	Master	0.6329		0.6230	60.03		66.00
	Before	0.6353			60.64		
3	Master	0.7152		0.7040	59.25		65.00
	Before	0.7162			59.86		
4	Master	1.335		1.337	52.91		59.00
	Before	1.340			53.56		
5	Master	1.943		1.955	50.96		57.00
	Before	1.951			51.64		
6	Master	1.947		1.955	50.92		57.00
	Before	1.955			51.60		
7	Master	1.371		1.415	47.08		53.00
	Before	1.360			48.00		
			60.00 % (Minimum) (Nominal) 140.0 % (Maximum)			Nom -60.00 (Minimum) (Nominal) Nom + 60.00 (Maximum)	

Master: Calibration out of date 20-JAN-2000 11:39 Before: 14-JUN-2000 2:44

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Electronics Calibration Check - Auxilliary

Phase	Array Induction SPA Plus MV	Value	Phase	Array Induction SPA Zero MV	Value
Master		989.8	Master		0.1063
Before		990.9	Before		0.09257
	941.0 (Minimum) 990.5 (Nominal) 1040 (Maximum)			-50.00 (Minimum) 0 (Nominal) 50.00 (Maximum)	

Phase	Array Induction Temperature Plus V	Value	Phase	Array Induction Temperature Zero V	Value
Master		0.9169	Master		0.0001095
Before		0.9180	Before		9.801E-00
	0.8700 (Minimum) 0.9150 (Nominal) 0.9600 (Maximum)			-0.05000 (Minimum) 0 (Nominal) 0.05000 (Maximum)	

Master: Calibration out of date 20-JAN-2000 11:39 Before: 14-JUN-2000 2:44

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Test Loop Gain Correction

Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG		
		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
0	1.042	0.9500	1.000	1.050	0.3672	-3.000	0	3.000
1	1.011	0.9500	1.000	1.050	-0.6191	-3.000	0	3.000
2	1.012	0.9500	1.000	1.050	-0.01578	-3.000	0	3.000
3	1.010	0.9500	1.000	1.050	0.1871	-3.000	0	3.000
4	0.9940	0.9500	1.000	1.050	0.1325	-3.000	0	3.000
5	0.9835	0.9500	1.000	1.050	-0.1680	-3.000	0	3.000
6	0.9934	0.9500	1.000	1.050	0.2889	-3.000	0	3.000
7	0.9945	0.9500	1.000	1.050	-0.2642	-3.000	0	3.000

Master: Calibration out of date 20-JAN-2000 11:39

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M			Value	X Sonde Error Correction MM/M		
		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
0	-121.4	-231.0	-56.00	119.0	34.14	-2250	0	2250
1	149.7	114.0	159.0	204.0	-240.4	-625.0	0	625.0
2	113.9	66.00	111.0	156.0	67.33	-350.0	0	350.0
3	58.40	39.00	64.00	89.00	81.72	-250.0	0	250.0
4	24.16	15.00	25.00	35.00	-1.172	-63.00	0	63.00
5	11.87	4.000	14.00	24.00	-10.09	-50.00	0	50.00
6	7.431	5.000	10.00	15.00	10.78	-30.00	0	30.00
7	-3.605	-5.000	0	5.000	0.3313	-30.00	0	30.00

Master: Calibration out of date 20-JAN-2000 11:39

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Mud Gain Correction

Idx	Value	Coarse - Mag, Real, Imag			Value	Fine - Mag, Real, Imag		
		(Minimum)	(Nominal)	(Maximum)		(Minimum)	(Nominal)	(Maximum)
0	1.013	0.8000	1.000	1.200	1.011	0.8000	1.000	1.200
1	1.013	0.8000	1.000	1.200	1.011	0.8000	1.000	1.200
2	1.013	0.8000	1.000	1.200	1.011	0.8000	1.000	1.200

Master: Calibration out of date 20-JAN-2000 11:39

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		1.026	Before		0.5047	Before		0.2832
0.9818 (Minimum)	1.033 (Nominal)	1.085 (Maximum)	0.4754 (Minimum)	0.5004 (Nominal)	0.5255 (Maximum)	0.2719 (Minimum)	0.2862 (Nominal)	0.3005 (Maximum)
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		14350	Before		11410	Before		1152
13590 (Minimum)	14310 (Nominal)	15020 (Maximum)	10920 (Minimum)	11490 (Nominal)	12070 (Maximum)	1105 (Minimum)	1163 (Nominal)	1221 (Maximum)

Before: 14-JUN-2000 2:54

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Photo-multiplier High Voltages Calibrations

Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1650	Before		1959	Before		1965
1514 (Minimum)	1614 (Nominal)	1714 (Maximum)	1816 (Minimum)	1916 (Nominal)	2016 (Maximum)	1866 (Minimum)	1966 (Nominal)	2066 (Maximum)

Before: 14-JUN-2000 2:54

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Crystal Quality Resolutions Calibration

Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		12.47	Before		11.93	Before		10.92
11.26 (Minimum)	12.26 (Nominal)	13.26 (Maximum)	10.63 (Minimum)	11.63 (Nominal)	12.63 (Maximum)	9.591 (Minimum)	10.59 (Nominal)	11.59 (Maximum)

Before: 14-JUN-2000 2:54

High resolution Integrated Logging Tool-CTS Wellsite Calibration

MCFL Calibration

Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3844	Before		3809	Before		3822
3565 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: 14-JUN-2000 2:55

High resolution Integrated Logging Tool-CTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement N	Value
Before		7.212	Before		15.93
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	12.00 (Minimum)	16.00 (Nominal)	20.00 (Maximum)

Before: 14-JUN-2000 2:45

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before	NOT DONE	N/A	Before	NOT DONE	N/A	Before	NOT DONE	N/A
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	N/A (Minimum)	N/A (Nominal)	N/A (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: Calibration not done

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Zero Measurement

Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		27.31	Master		28.31
Before		27.31	Before		29.65
5.000 (Minimum)	27.31 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	28.31 (Nominal)	40.00 (Maximum)

Master: 6-APR-2000 4:31 Before. 14-JUN-2000 2:51

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		32.16
31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)

Before: 14-JUN-2000 2:52

COMPANY: **NORTHWEST NATURAL GAS**

WELL: **IW-24BH-23-65**
FIELD: **MIST**
COUNTY: **COLUMBIA**
STATE: **OREGON**

BOTTOM LOG INTERVAL	1818 ft
SCHLUMBERGER DEPTH	1828 ft
DEPTH DRILLER	1838 ft
KELLY BUSHING	923 ft
DRILL FLOOR	923 ft
GROUND LEVEL	905 ft

Schlumberger

PLATFORM EXPRESS
BHC SONIC / SP/ GR
SCALE: 5" = 100'