SCANNED

COMPANY: NORTHWEST NATURAL GAS

WELL: OM 43A-22-65

FIELD: MIST

COUNTY: COLUMBIA **STATE:** OREGON

COUNTY: COLUMBIA
Field: MIST
Location: 2441.82' North, 122.17' West
Well: OM 43A-22-65
Company: NORTHWEST NATURAL GAS

Schlumberger

ARRAY INDUCTION
BHC SONIC/ GR /SP
SCALE: 5" = 100'

LOCATION	2441.82' North, 122.17' West From the SW Section 23	Elev.:	K.B. 872.23 ft G.L. 862.23 ft D.F. 871.23 ft
Permanent Datum:	GROUND LEVEL	Elev.:	621 ft
Log Measured From:	K.B	10.0 ft	above Perm. Datum
Drilling Measured From:	K.B		

API Serial No.	SECTION	TOWNSHIP	RANGE
36-009-00352	22	6N	5W

Logging Date		3-JUN-2000			
Run Number		1			
Depth Driller		2317 ft			
Schlumberger Depth		2317 ft			
Bottom Log Interval		2309 ft			
Top Log Interval		444 ft			
Casing Driller Size @ Depth		8.625 in	@ 444 ft	@	
Casing Schlumberger		444 ft			
Bit Size		7.875 in			
Type Fluid In Hole		DMA			
MUD Density	Viscosity	8.8 lbm/gal	38 s		
Fluid Loss	PH	6.6 cm3	8		
Source Of Sample		FLOWLINE			
RM @ Measured Temperature		1.175 ohm.m	@ 99 degF	@	
RMF @ Measured Temperature		0.869 ohm.m	@ 90 degF	@	
RMC @ Measured Temperature		0.904 ohm.m	@ 92 degF	@	
Source RMF	RMC	PRESS	PRESS		
RM @ MRT	RMF @ MRT	1.221 @ 95	0.826 @ 95	@	@
Maximum Recorded Temperatures		95 degF	95	95	
Circulation Stopped	Time	3-JUN-2000	16:10		
Logger On Bottom	Time	3-JUN-2000	23:00		
Unit Number	Location	3152	SACRAMENTO		
Recorded By		M.KHAN			
Witnessed By		JACK MEYER			

		Run 1	Run 2	Run 3
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				

Run 4

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: FMS GR	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
CASING 8 5/8" 32 LB/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

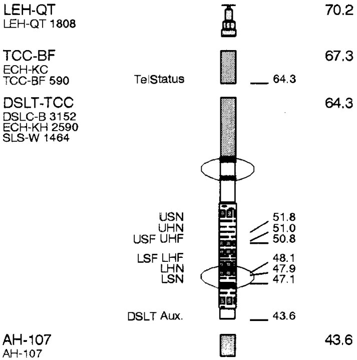
RUN 1	RUN 2

SURFACE EQUIPMENT

GSR-U/Y
NCT-B
CNB-AB
NCS-VB

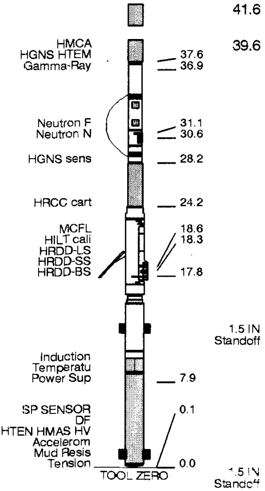
WITM (CTS)-A

DOWNHOLE EQUIPMENT



AH-107
AH-107

HILTB-DTB
HTBCC
HMCA 756
HGNS-CAN-B
HGNS-H 828
NLS-KL
NSR-F
HACCZ
HCNT
HGR
HRCC-B 723
HRMS-B 723
HRGD 723
GLS-VJ 1924
MCFL Device
HILT Nucl. LS
HILT Nucl. SS
HILT Nucl. BS
AIT-H
AHIS-BA 112
AHRM-A
BOW-SPR
NPV-N



MAXIMUM STRING DIAMETER 6.88 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Input DLIS Files

DEFAULT	HILTB .011	FN:1	PRODUCER	03-Jun-2000 20:59	2328.0 FT	305.0 FT

Output DLIS Files

DEFAULT	HILTB .013	FN:10	PRODUCER	03-Jun-2000 21:06	2336.0 FT	313.5 FT

OP System Version: 9C1-303

MCM

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

PIP SUMMARY

⊣ Integrated Transit Time Minor Pip Every 1 MS
⊣ Integrated Transit Time Major Pip Every 10 MS

■ Time Mark Every 60 S

AIT-H 60 Inch Investigation (AHO60)
0.2 (OHMM) 20

AIT-H 30 Inch Investigation (AHO30)
0.2 (OHMM) 20

Gamma Ray (GR)
0 (GAPI) 150

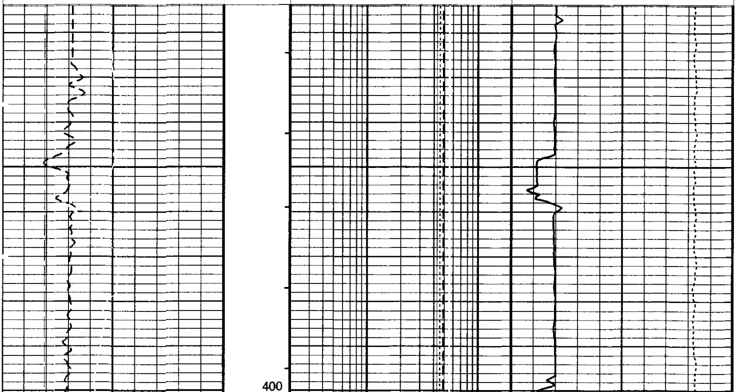
AIT-H 20 Inch Investigation (AHO20)
0.2 (OHMM) 20

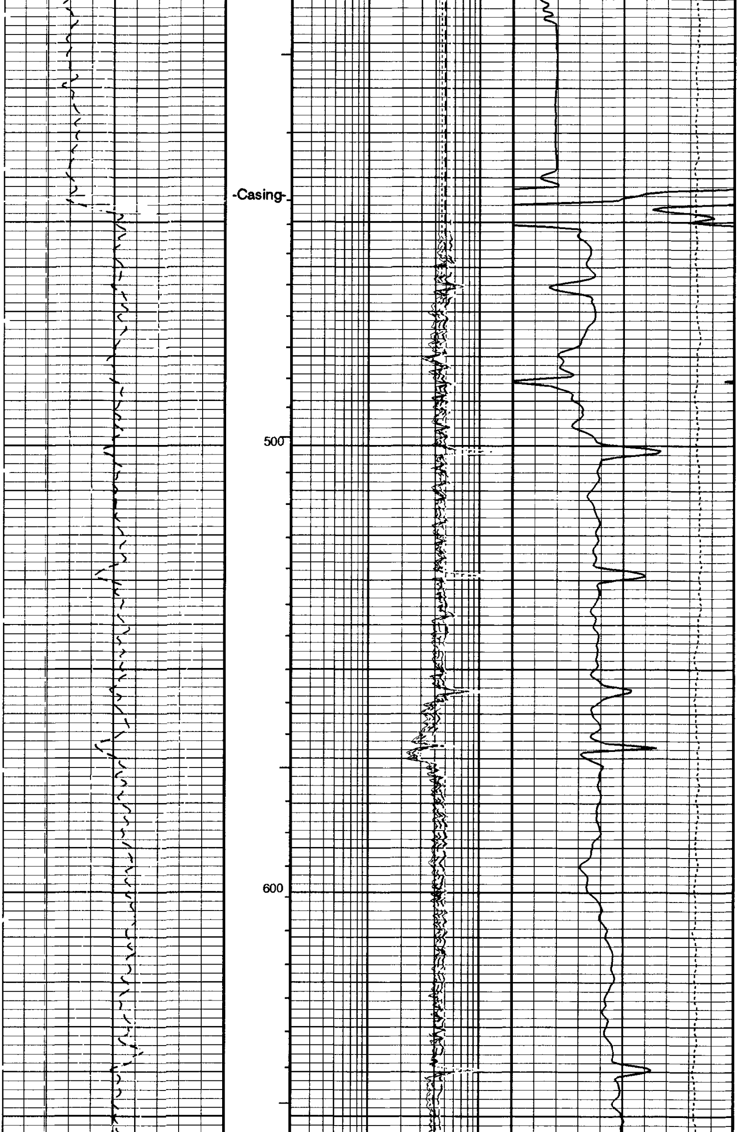
Tension (TENS)
10000 (LBF) 0

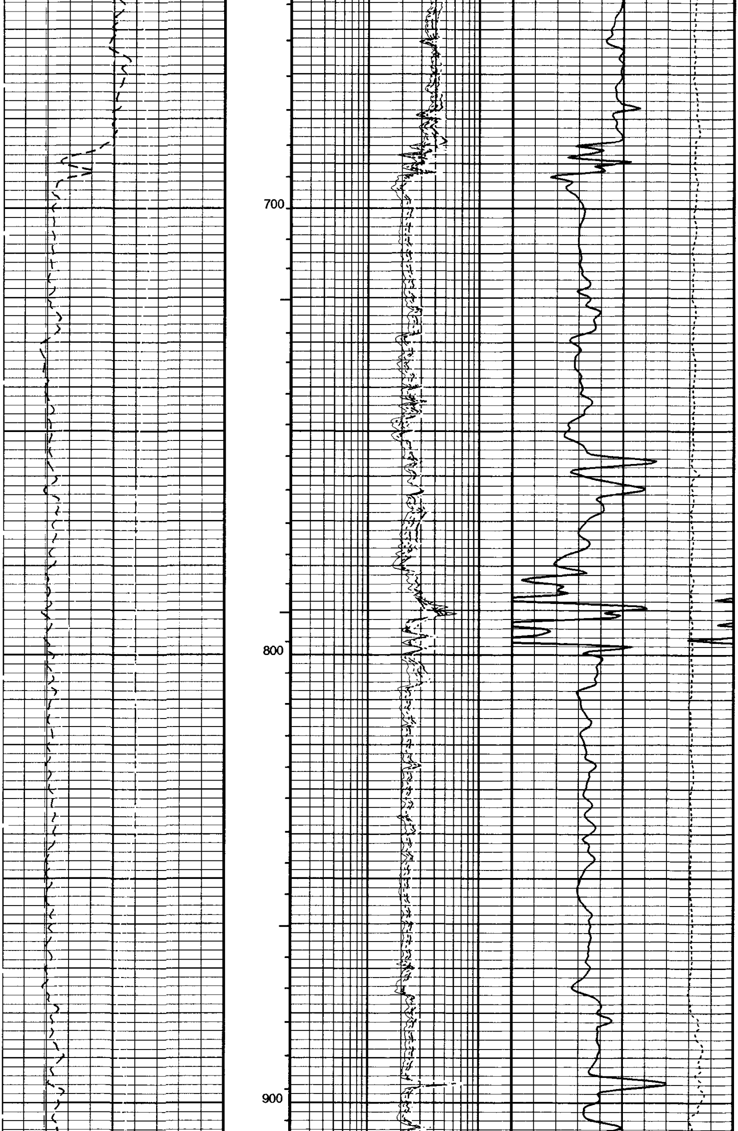
Bit Size (BS)
6 (IN) 16

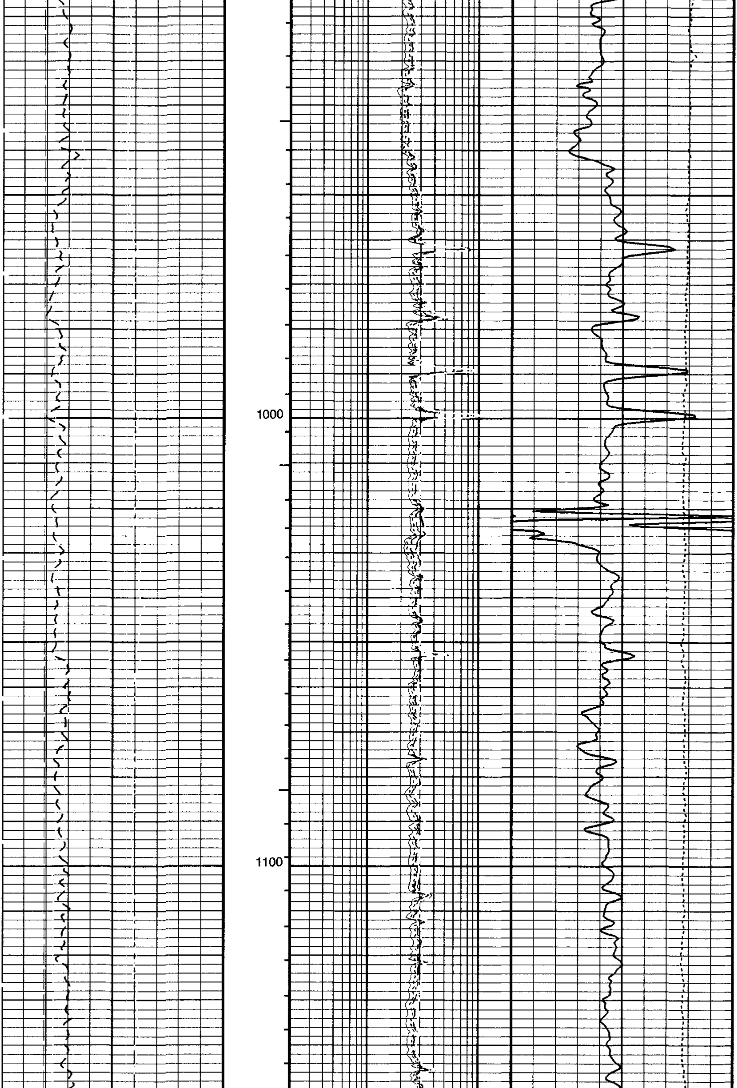
AIT-H 10 Inch Investigation (AHO10)
0.2 (OHMM) 20

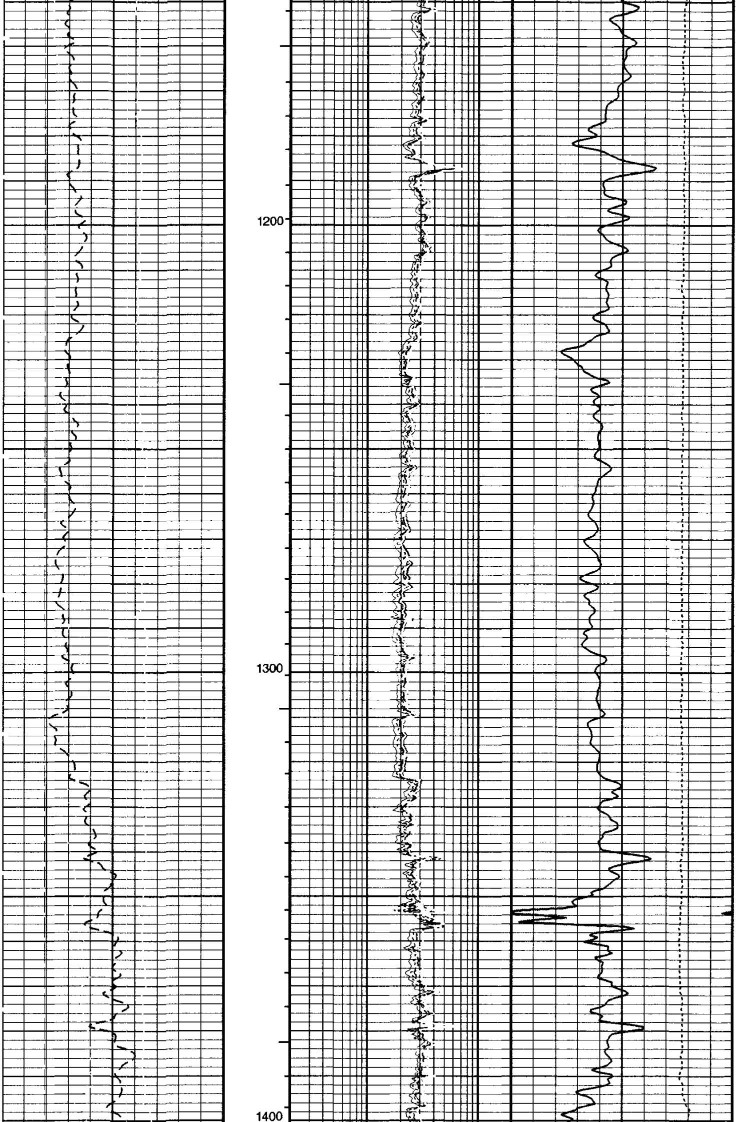
Delta-T (DT)
175 (US/F) 75

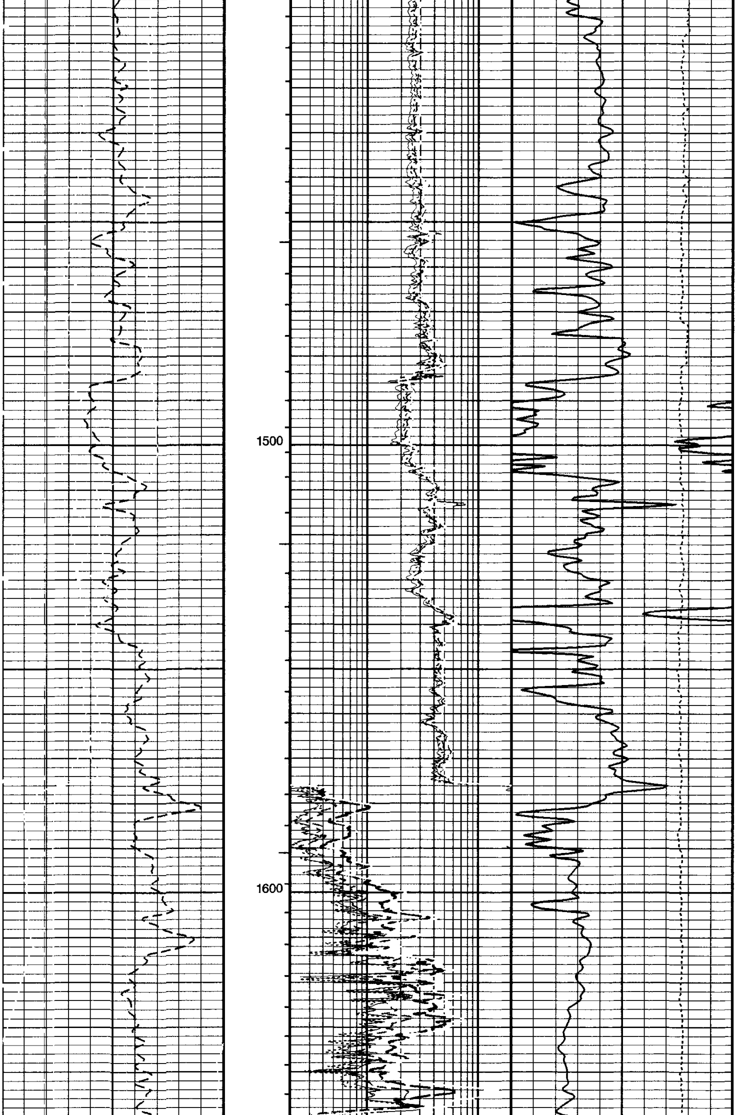


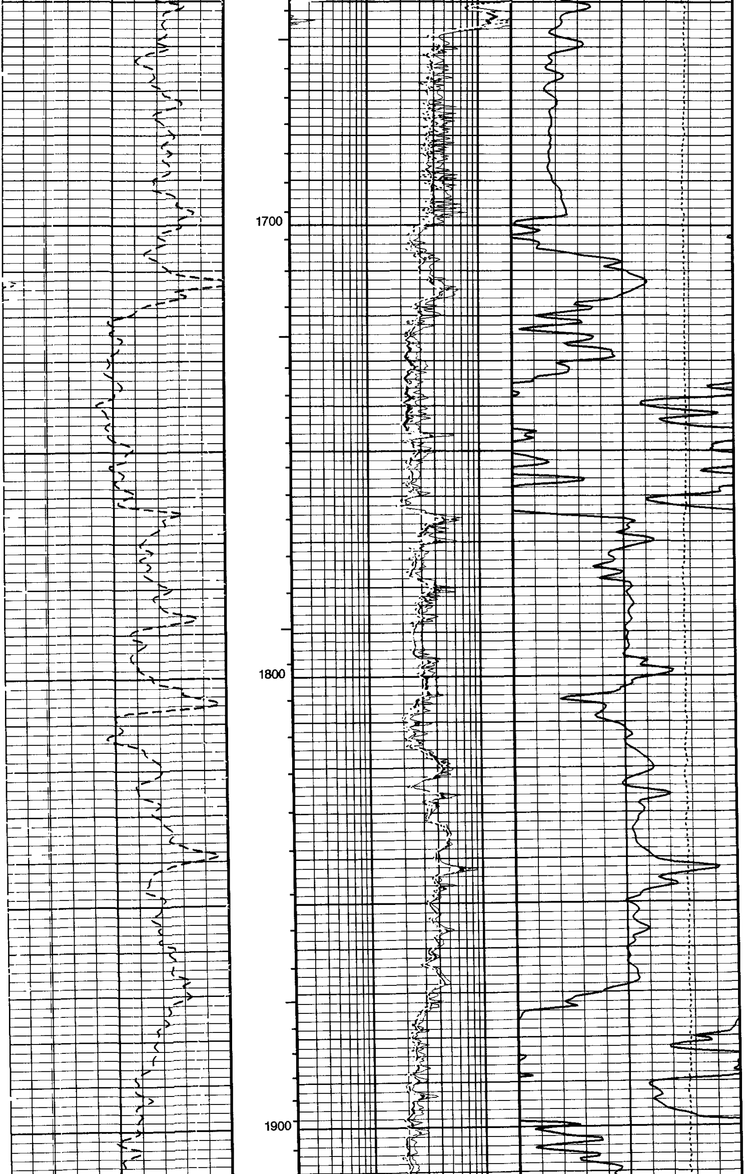


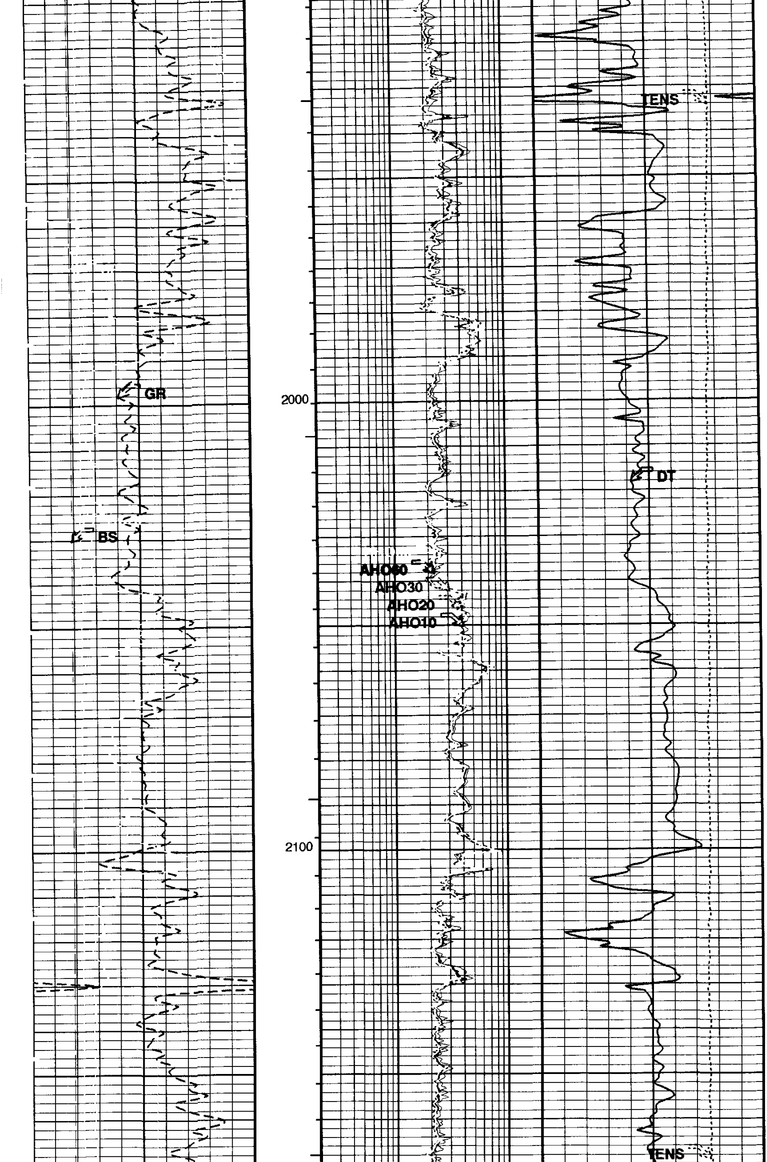


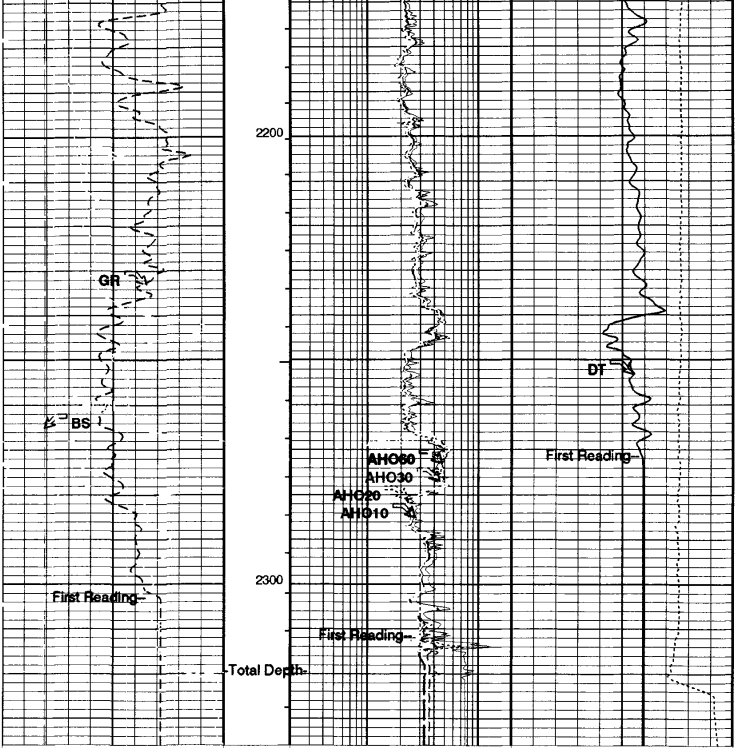












Bit Size (BS) 6 (IN) 16	AIT-H 10 Inch Investigation (AHO10) 0.2 (OHMM) 20	Delta-T (DT) 175 (US/F) 75
	AIT-H 20 Inch Investigation (AHO20) 0.2 (OHMM) 20	Tension (TENS) 10000 (LBF) 0
Gamma Ray (GR) 0 (GAPI) 150	AIT-H 30 Inch Investigation (AHO30) 0.2 (OHMM) 20	
	AIT-H 60 Inch Investigation (AHO60) 0.2 (OHMM) 20	

PIP SUMMARY

⊣ Integrated Transit Time Minor Pip Every 1 MS
⊣ Integrated Transit Time Major Pip Every 10 MS

■ Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	870	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	973	
AHBPO	Array Induction Basic Logs Processing Option	Standard_Processing	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHCSED	Array Induction Casing Shoe Estimated Depth	-50000	FT
AHFRSV	Array Induction Response Set Version for Four ft Resolution	30.66.23.11	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	30.66.23.11	
AHRFV	Array Induction Radial Profiling Code Version Number	700	
AHRPV	Array Induction Radial Parametrization Code Version Number	710	
AHSTA	Array Induction Tool Standoff	1.5	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	30.66.23.11	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.80	LB/G
DO	Depth Offset for Logical Unit 1	8.0	FT
DORL	Depth Offset Repeat Analysis	8.0	FT
DTCM	Delta-T Computation Mode	FULL	
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	NO_SC	
HSTI	STI Uses HILT Acceleration	NO	
MODE	Sonic Firing Mode	BHC	
MST	Mud Sample Temperature	99.00	DEGF
PP	Playback Processing	NORMAL	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
TD	Total Depth	2317	FT

Format: AITSON_1FT   Vertical Scale: 5" per 100'   Graphics File Created: 03-Jun-2000 21:06

OP System Version: 9C1-303

MCM

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

Input DLIS Files

DEFAULT	HILTB .011	FN:1	PRODUCER	03-Jun-2000 20:59	2328.0 FT	305.0 FT

Output DLIS Files

DEFAULT	HILTB .013	FN:10	PRODUCER	03-Jun-2000 21:06

Schlumberger

REPEAT ANALYSIS

MAXIS 500 Field Log

Input DLIS Files

DEFAULT	HILTB .011	FN:1	PRODUCER	03-Jun-2000 20:59	2328.0 FT	305.0 FT
DEFAULT	HILTB .005	FN:4	PRODUCER	03-Jun-2000 18:31	2316.0 FT	1980.0 FT

Output DLIS Files

DEFAULT	HILTB .013	FN:10	PRODUCER	03-Jun-2000 21:06	2336.0 FT	313.6 FT

OP System Version: 9C1-303

MCM

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

PIP SUMMARY

┤ Integrated Transit Time Minor Pip Every 1 MS
─┤ Integrated Transit Time Major Pip Every 10 MS

Time Mark Every 60 S

GR_REP Curve (GR_REP)
0 (GAPI) 150

Bit Size (BS)
6 (IN) 16

AHO60_REP Curve (AHO60_REP)
0.2 (OHMM) 20

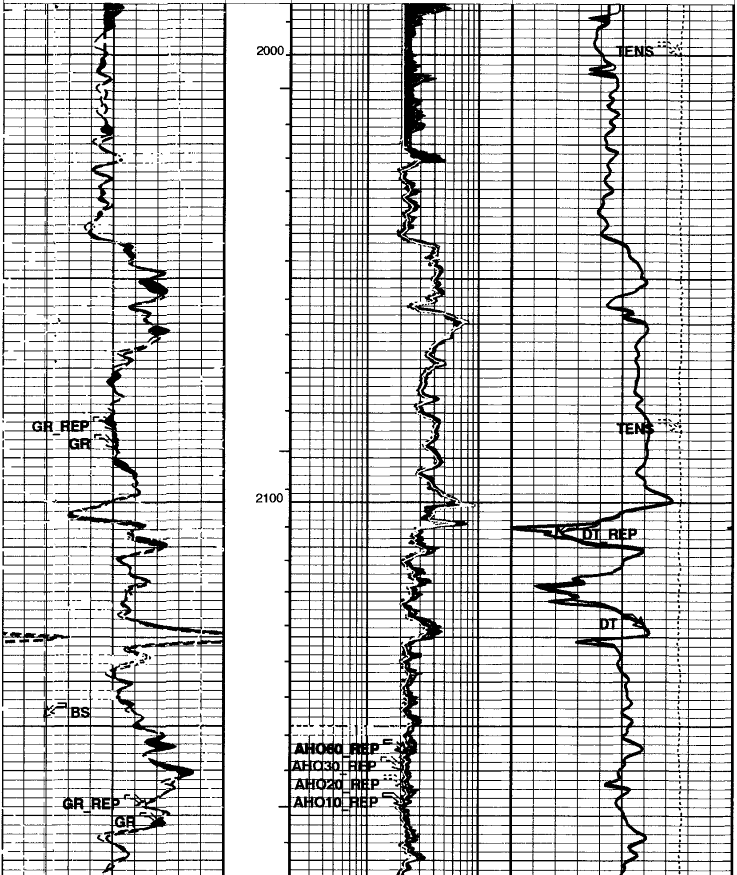
AHO30_REP Curve (AHO30_REP)
0.2 (OHMM) 20

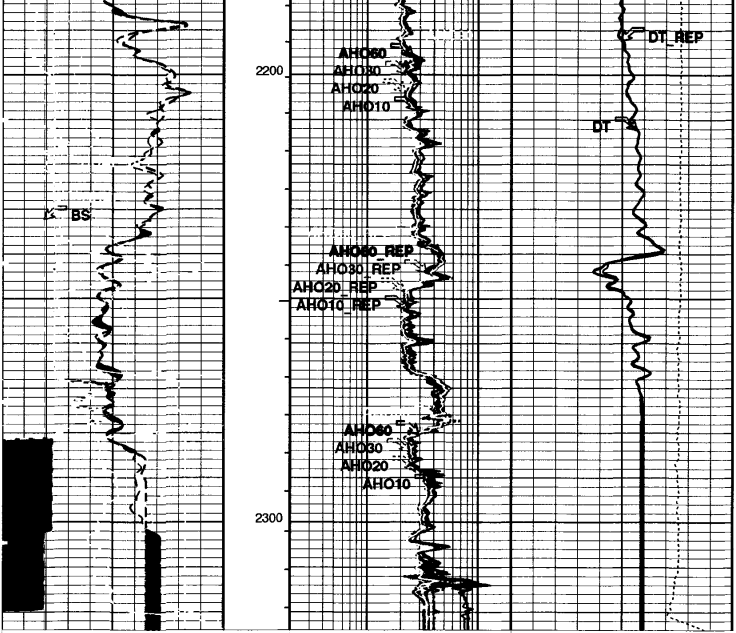
AHO20_REP Curve (AHO20_REP)
0.2 (OHMM) 20

AHO10_REP Curve (AHO10_REP)
0.2 (OHMM) 20

Tension (TENS)
10000 (LBF) 0

DT_REP Curve (DT_REP)
175 (US/F) 75





Bit Size (BS)	AHO10_REP Curve (AHO10_REP)	DT_REP Curve (DT_REP)
6 (IN) 16	0.2 (OHMM) 20	175 (US/F) 75
	AHO20_REP Curve (AHO20_REP)	Tension (TENS)
	0.2 (OHMM) 20	10000 (LBF) 0
GR_REP Curve (GR_REP)	AHO30_REP Curve (AHO30_REP)	
0 (GAPI) 150	0.2 (OHMM) 20	
	AHO60_REP Curve (AHO60_REP)	
	0.2 (OHMM) 20	

PIP SUMMARY

⊣ Integrated Transit Time Minor Pip Every 1 MS

⊣ Integrated Transit Time Major Pip Every 10 MS

▶ Time Mark Every 60 S

Parameters

DLIS Name	Description	Value

AHBHM	Array Induction Borehole Correction Mode	2_ComputeStandoff	
AHBHV	Array Induction Borehole Correction Code Version Number	870	
AHBLM	Array Induction Basic Logs Mode	6_One_Two_and_Four	
AHBLV	Array Induction Basic Logs Code Version Number	973	
AHBPO	Array Induction Basic Logs Processing Option	Standard_Processing	
AHCDE	Array Induction Casing Detection Enable	Yes	
AHCEN	Array Induction Tool Centering Flag (in Borehole)	Eccentered	
AHCSED	Array Induction Casing Shoe Estimated Depth	-50000	FT
AHFRSV	Array Induction Response Set Version for Four ft Resolution	30.66.23.11	
AHMRF	Array Induction Mud Resistivity Factor	1	
AHORSV	Array Induction Response Set Version for One ft Resolution	30.66.23.11	
AHRFV	Array Induction Radial Profiling Code Version Number	700	
AHRPV	Array Induction Radial Parametrization Code Version Number	710	
AHSTA	Array Induction Tool Standoff	1.5	IN
AHTRSV	Array Induction Response Set Version for Two ft Resolution	30.66.23.11	
BHT	Bottom Hole Temperature (used in calculations)	212	DEGF
BS	Bit Size	7.875	IN
DFD	Drilling Fluid Density	8.80	LB/G
DO	Depth Offset for Logical Unit 1	8.0	FT
DORL	Depth Offset Repeat Analysis	8.0	FT
DTCM	Delta-T Computation Mode	FULL	
FEXP	Form Factor Exponent	2	
FNUM	Form Factor Numerator	1	
GCSE	Generalized Caliper Selection	HCAL	
GDEV	Average Angular Deviation of Borehole from Normal	0	DEG
GGRD	Geothermal Gradient	0.01	DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST	
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE	
HSCM	HILT Speed Correction Mode	NO_SC	
HSTI	STI Uses HILT Acceleration	NO	
MODE	Sonic Firing Mode	BHC	
MST	Mud Sample Temperature	99.00	DEGF
PP	Playback Processing	NORMAL	
SHT	Surface Hole Temperature	68	DEGF
SPNV	SP Next Value	0	MV
TD	Total Depth	2317	FT

Format: AITSON_1FT_REP **Vertical Scale: 5" per 100'** **Graphics File Created: 03-Jun-2000 21:06**

OP System Version: 9C1-303

MCM

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

Input DLIS Files

DEFAULT	HILTB .011	FN:1	PRODUCER	03-Jun-2000 20:59	2328.0 FT	305.0 FT
DEFAULT	HILTB .005	FN:4	PRODUCER	03-Jun-2000 18:31	2316.0 FT	1980.0 FT

Output DLIS Files

DEFAULT	HILTB .013	FN:10	PRODUCER	03-Jun-2000 21:06

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: 3-JUN-2000 17:59							
Thru Cal Magnitude - 0	0	0.6214	0.6302	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.274	1.292	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6329	0.6419	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.7152	0.7254	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.335	1.354	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.943	1.971	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.947	1.975	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.371	1.392	N/A	N/A	N/A	V
Phase - 0	0	64.91	65.43	N/A	N/A	N/A	DEG
Phase - 1	0	63.80	64.32	N/A	N/A	N/A	DEG
Phase - 2	0	60.03	60.55	N/A	N/A	N/A	DEG
Phase - 3	0	59.25	59.77	N/A	N/A	N/A	DEG
Phase - 4	0	52.91	53.44	N/A	N/A	N/A	DEG
Phase - 5	0	50.96	51.50	N/A	N/A	N/A	DEG
Phase - 6	0	50.92	51.46	N/A	N/A	N/A	DEG
Phase - 7	0	47.08	47.66	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: 3-JUN-2000 17:59

Array Induction SPA Plus	990.5	989.8	990.1	N/A	N/A	N/A	MV
Array Induction SPA Zero	0	0.1083	0.1029	N/A	N/A	N/A	MV
Array Induction Temperature Pl	0.9150	0.9169	0.9172	N/A	N/A	N/A	V
Array Induction Temperature Ze	0	0.0001095	0.0001047	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: 3-JUN-2000 18:06

BS Window Ratio	1.033	N/A	1.036	N/A	N/A	N/A	
BS Window Sum	14310	N/A	14290	N/A	N/A	N/A	CPS
SS Window Ratio	0.5004	N/A	0.5048	N/A	N/A	N/A	
SS Window Sum	11490	N/A	11420	N/A	N/A	N/A	CPS
LS Window Ratio	0.2862	N/A	0.2861	N/A	N/A	N/A	
LS Window Sum	1163	N/A	1154	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations
Before: 3-JUN-2000 18:06

BS PM High Voltage (Command)	1614	N/A	1660	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1916	N/A	1964	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1966	N/A	1958	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration
Before: 3-JUN-2000 18:06

BS Crystal Resolution	12.26	N/A	12.35	N/A	N/A	N/A	%
SS Crystal Resolution	11.63	N/A	11.76	N/A	N/A	N/A	%
LS Crystal Resolution	10.59	N/A	10.72	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration
Before: 3-JUN-2000 18:01

Raw B0 Resistivity	3875	N/A	3846	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3802	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3817	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration
Before: 21-MAY-2000 12:17

HILT Caliper Zero Measurement	8.000	N/A	7.179	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	16.00	N/A	15.34	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration
Before: 7-MAY-2000 6:47

Gamma Ray Background	30.00	N/A	23.06	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	193.6	N/A	193.6	N/A	N/A	17.60	GAPI
Gamma Ray (Calibrated)	165.0	N/A	173.7	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement
Master: 6-APR-2000 4:31 Before: 3-JUN-2000 18:05

CNTC Background	27.31	27.31	27.34	N/A	N/A	4.096	CPS
CFTC Background	28.31	28.31	29.66	N/A	N/A	4.247	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration
Before: 3-JUN-2000 18:07

Z-Axis Acceleration	32.19	N/A	32.15	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	0.6302			65.43		
1	Master	1.274		1.270	63.80		70.00
	Before	1.292			64.32		
2	Master	0.6329		0.6230	60.03		66.00
	Before	0.6419			60.55		
3	Master	0.7152		0.7040	59.25		65.00
	Before	0.7254			59.77		
4	Master	1.335		1.337	52.91		59.00
	Before	1.354			53.44		
5	Master	1.943		1.955	50.96		57.00
	Before	1.971			51.50		
6	Master	1.947		1.955	50.92		57.00
	Before	1.975			51.46		
7	Master	1.371		1.415	47.08		53.00
	Before	1.392			47.66		
		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: 3-JUN-2000 17:59

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		0.1083
Before		990.1	Before		0.1029
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		0.9172	Before		0.0001047
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: 3-JUN-2000 17:59

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		1.036	Before		0.5048	Before		0.2861
	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		14290	Before		11420	Before		1154
	13590 (Minimum) 14310 (Nominal) 15020 (Maximum)			10920 (Minimum) 11490 (Nominal) 12070 (Maximum)			1105 (Minimum) 1163 (Nominal) 1221 (Maximum)	

Before: 3-JUN-2000 18:06

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		1660	Before		1964	Before		1958
	1514 (Minimum) 1614 (Nominal) 1714 (Maximum)			1816 (Minimum) 1916 (Nominal) 2016 (Maximum)			1866 (Minimum) 1966 (Nominal) 2066 (Maximum)	

Before: 3-JUN-2000 18:06

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		12.35	Before		11.76	Before		10.72
	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: 3-JUN-2000 18:06

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		3846	Before		3802	Before		3817
	3565 (Minimum) 3875 (Nominal) 4185 (Maximum)			3524 (Minimum) 3830 (Nominal) 4136 (Maximum)			3524 (Minimum) 3830 (Nominal) 4136 (Maximum)	

Before: 3-JUN-2000 18:01

High resolution Integrated Logging Tool-CTS Wellsite Calibration

HILT Caliper Calibration

Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value
Before		7.179	Before		15.34
	6.000 (Minimum) 8.000 (Nominal) 10.00 (Maximum)			12.00 (Minimum) 16.00 (Nominal) 20.00 (Maximum)	

Before: 21-MAY-2000 12:17

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		23.06	Before		193.6	Before		173.7
	0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)			176.0 (Minimum) 193.6 (Nominal) 211.2 (Maximum)			150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum)	

Before: 7-MAY-2000 6:47

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		27.34	Before		29.66
	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: 3-JUN-2000 18:05

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Accelerometer Calibration

Phase	Z-Axis Acceleration F/S2	Value
Before		32.15
	31.53 (Minimum) 32.19 (Nominal) 32.84 (Maximum)	

Before: 3-JUN-2000 18:07

COMPANY: **NORTHWEST NATURAL GAS**

WELL: **OM 43A-22-65**
FIELD: **MIST**
COUNTY: **COLUMBIA**
STATE: **OREGON**

BOTTOM LOG INTERVAL	2309 ft
SCHLUMBERGER DEPTH	2317 ft
DEPTH DRILLER	2317 ft
KELLY BUSHING	872.23 ft
DRILL FLOOR	871.23 ft
GROUND LEVEL	862.23 ft

Schlumberger

ARRAY INDUCTION
BHC SONIC/ GR /SP
SCALE: 2" = 100'