COMPANY: **NORTHWEST NATURAL GAS**

WELL **IW 14dH-23-65**

FIELD: **CALVIN CREEK-REICHHOLD POOL**

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

COUNTY: COLUMBIA
Field: CALVIN CREEK-REICHHOLD P
Location: SHL: 976.5' NORTH & 1256.3' E
Well: IW 14dH-23-65
Company: NORTHWEST NATURAL GAS

Schlumberger

FORMATION IMCRO IMAGER T
DIPS AND IMAGES
LQC / GAMMA RAY

LOCATION				
SHL: 976.5' NORTH & 1256.3' EAST FROM THE SW CORNER OF SEC 23		Elev.:	K.B. 923 ft G.L. 905 ft D.F. 921.5 ft	
Permanent Datum:	GROUND LEVEL	Elev.:	905 ft	
Log Measured From:	KELLY BUSHING	18.0 ft	above Perm. Datum	
Drilling Measured From:	KELLY BUSHING			

API Serial No.	SECTION	TOWNSHIP	RANGE
36-009-00353	23	6N	5W

Logging Date	28-Oct-2001			
Run Number	TWO			
Depth Driller	3033 ft			
Schlumberger Depth	3024 ft			
Bottom Log Interval	3024 ft			
Top Log Interval	2176 ft			
Casing Driller Size @ Depth	8.625 in	@ 2144 ft		@
Casing Schlumberger	2144 ft			
Bit Size	7.875 in			
Type Fluid In Hole	WATER BASED			
Density / Viscosity	8.9 lbm/gal	61 s		
Fluid Loss / PH	5.2 cm3	8.5		
Source Of Sample	MUD TANK			
RM @ Measured Temperature	0.254 ohm.m	@ 55 degF		@
RMF @ Measured Temperature	0.219 ohm.m	@ 56 degF		@
RMC @ Measured Temperature	0.322 ohm.m	@ 55 degF		@
Source RMF / RMC	MUD PRESS	MUD PRESS		
RM @ MRT / RMF @ MRT	2.352 @ 77	2.238 @ 77	@	@
Maximum Recorded Temperatures	77 degF			
Circulation Stopped / Time	26-Oct-2001	4:00		
Logger On Bottom / Time	28-Oct-2001	10:15		
Unit Number / Location	3152	SACRAMENTO		
Recorded By	Z.AHMED			
Witnessed By	ED VADER			

	Run 1	Run 2	Run 3

MUD				
Logging Date				
Run Number				
Depth Driller				
Schlumberger Depth				
Bottom Log Interval				
Top Log Interval				
Casing Driller Size @ Depth		@		@
Casing Schlumberger				
Bit Size				
Type Fluid In Hole				
Density / 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: USIT	OS1:
OS2: NEUTRON	OS2:
OS3: PEX/FMI/SONIC ON	OS3:
OS4: TLC	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
CORRELATED TO LOG RAN BY SCHLUMBERGER ON 21-OCT-2001	
RAN ON TLC	
LOG SECTIONS SHOWN, NOT SPLICED AND PRESENTED	
SEPARATELY, GEOQUEST FOR FURTHER PROCESSING	
FIELD DIPS AND IMAGES REQUESTED BY GEOLOGIST	
CREW:ROCKY BECK, BRAD TOMM	

RUN 1			RUN 2		
SERVICE ORDER #:			SERVICE ORDER #:		
PROGRAM VERSION:	9C2-303		PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

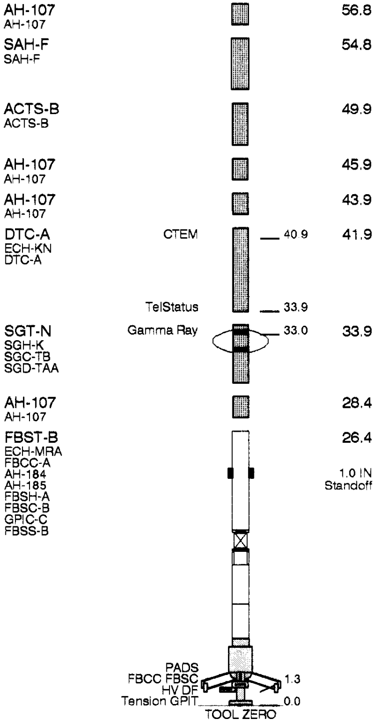
RUN 1	RUN 2

SURFACE EQUIPMENT

GSR-U/Y
WITM (DTS)-A

DOWNHOLE EQUIPMENT

AH-CSES AH-CSES	69.8
AH-XOVER	65.8
DWCH-A DWCH-A	64.8



MAXIMUM STRING DIAMETER 5.38 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

Schlumberger

IMAGES

Schlumberger

IMAGES

MAXIS 500 Field Log

Output DLIS Files

DEFAULT	FMI_073LUP	FN:68	PRODUCER	28-Oct-2001 10:22	2948.0 FT	2175.5 FT

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
XGMO	EmexManu_GainAutoHighRange	EmexManu_GainManu	2949.8 10:23:38
XVOL	180 V	0 V	2949.8 10:22:44

PIP SUMMARY

▶ Time Mark Every 60 S

FMI Correlation Resistance (LOG) (FBCR)
2 (KOHM) 2000

Pad One Azimuth (P1AZ_FBST)
-40 (DEG) 360

Hole Azimuth (HAZIM)
-40 (DEG) 360

Gamma Ray (GR)
0 (GAPI) 150

Deviation (DEVIM)
0 (DEG) 10

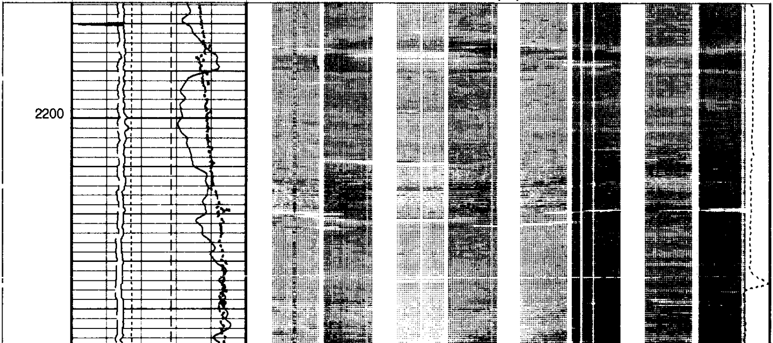
Caliper 2 (C2)
6 (IN) 16

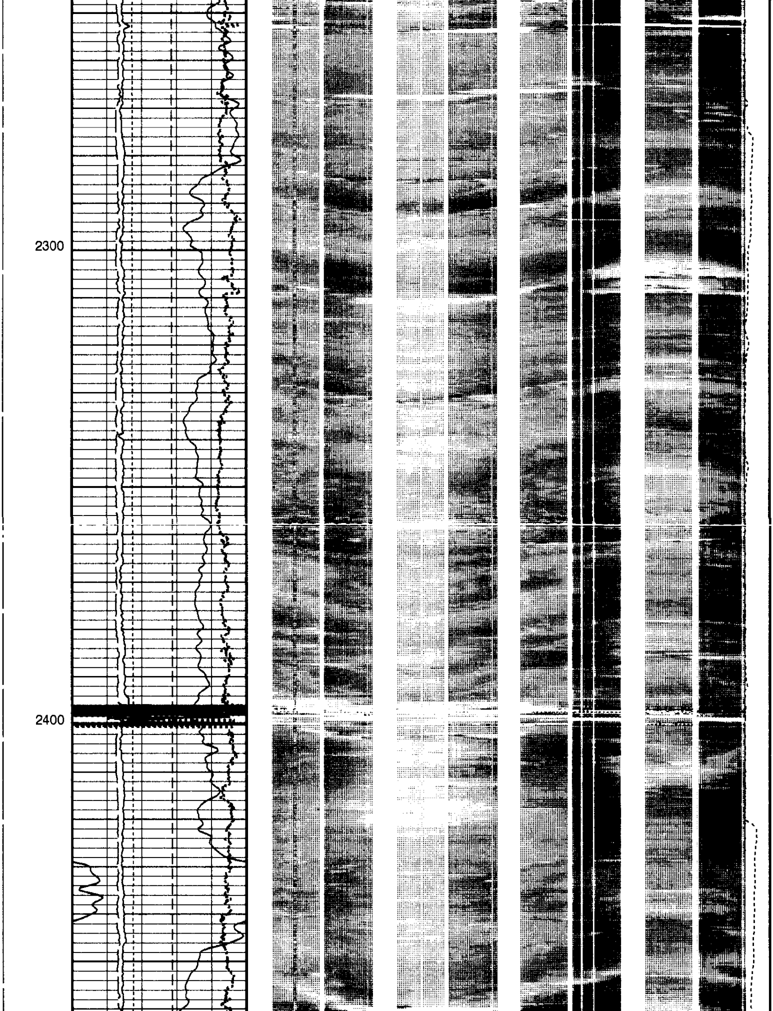
Caliper 1 (C1)
6 (IN) 16

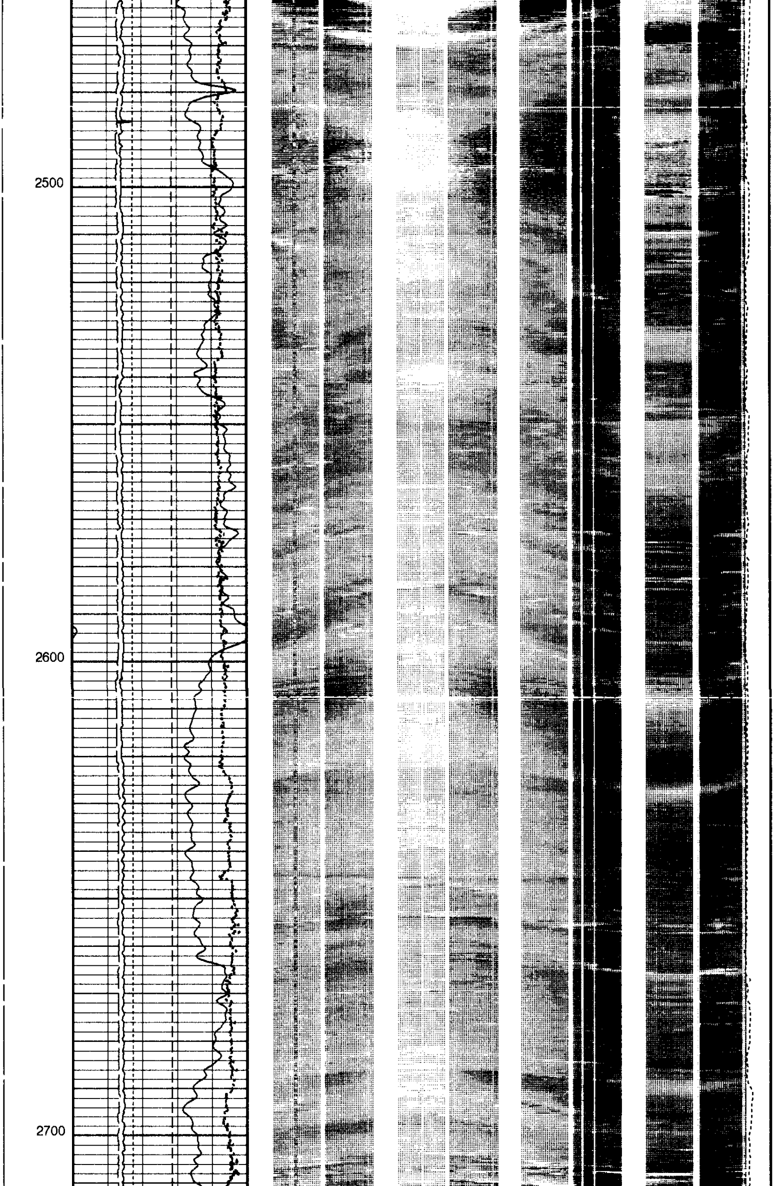
Tension (TENS)
10000 (LBF) 0

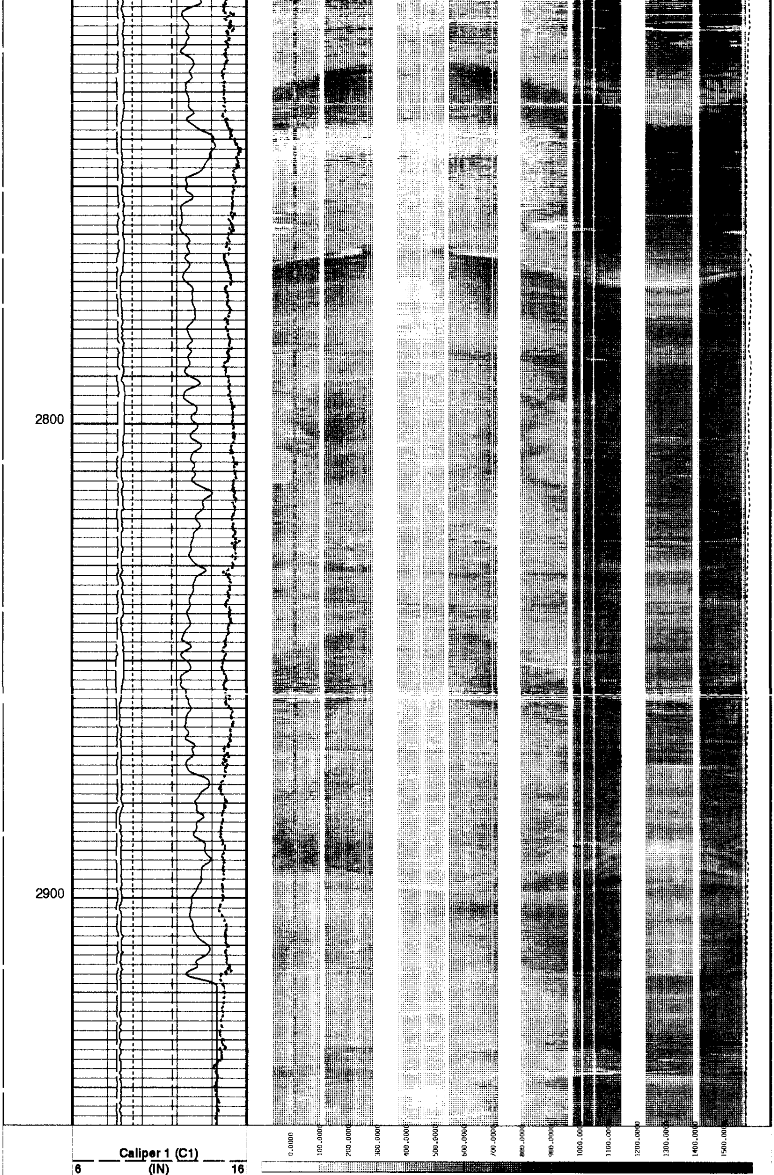
0.0000 100.0000 200.0000 300.0000 400.0000 500.0000 600.0000 700.0000 800.0000 900.0000 1000.0000 1100.0000 1200.0000 1300.0000 1400.0000 1500.0000

FBST/PADA (FBAA_A)
(----)









FBST/PADA (FBAA_A)
(----)

Caliper 2 (C2)		
6	(IN)	16
Deviation (DEVIM)		
0	(DEG)	10
Gamma Ray (GR)		
0	(GAPI)	150
Hole Azimuth (HAZIM)		
-40	(DEG)	360
Pad One Azimuth (P1AZ_FBST)		
-40	(DEG)	360
FMI Correlation Resistance (LOG) (FBCR)		
2	(KOHM)	2000

Tension (TENS)		
10000	(LBF)	0

PIP SUMMARY

Time Mark Every 60 S

FMI Image.

Resistive (White) to Conductive (Black)

Format: FMI_IMAGE Vertical Scale: 5" per 100' Graphics File Created: 28-Oct-2001 10:22

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Parameters

DLIS Name	Description	Value	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
ALTDPCHAN	Name of alternate depth channel	MeasuredDepth	
EGCO	FMI EMEX and GAIN Correction	NO	
FDBD	FMI Dead Buttons detection	OFF	
FDBP	FMI Dead Buttons Patching	OFF	
FIEQ	FMI Image Equalisation	OFF	
FLM	FMI Logging Mode	8PAD	
FPSA	~~FMI Peak Signal Amplitude for Required Servo Level~~	ON	
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
MDEC	Magnetic Field Declination	18.051	DEG
PBVSADP	Use alternate depth channel for playback	YES	
SOFF	Stand-Off	0	IN
XGAI_FBST	Gain Value(When manu)	0_dB	
XGMO	Emex & Gain Modes	EmexManu_GainManu	
XVOL	Emex Voltage	0	V

Output DLIS Files

DEFAULT	FMI_073LUP	FN:68	PRODUCER	28-Oct-2001 10:22

Output DLIS Files

DEFAULT	FMI_072LUP	FN:67	PRODUCER	28-Oct-2001 10:13	3026.0 FT	2950.0 FT

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
XGAI_FBST	0_dB	0_dB	3027.5 10:15:10
XGMO	EmexManu_GainManu	EmexManu_GainManu	3027.5 10:14:57
XVOL	0 V	0 V	3027.5 10:15:03

PIP SUMMARY

Time Mark Every 60 S

FMI Correlation Resistance (LOG) (FBCR)
2 (KOHM) 2000

Pad One Azimuth (P1AZ_FBST)
-40 (DEG) 360

Hole Azimuth (HAZIM)
-40 (DEG) 360

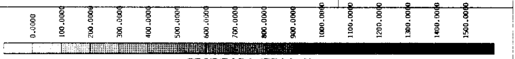
Gamma Ray (GR)
0 (GAPI) 150

Deviation (DEVIM)
0 (DEG) 10

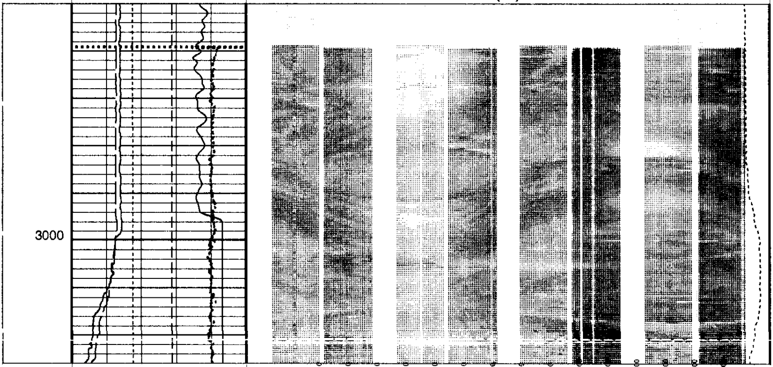
Caliper 2 (C2)
6 (IN) 16

Tension (TENS)
10000 (LBF) 0

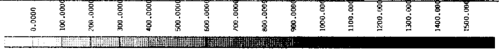
Caliper 1 (C1)
6 (IN) 16



FBST/PADA (FBAA_A)
(----)



Caliper 1 (C1)
6 (IN) 16



FBST/PADA (FBAA_A)
(----)

Caliper 2 (C2)
6 (IN) 16

Tension (TENS)
10000 (LBF) 0

Deviation (DEVIM)
0 (DEG) 10

Gamma Ray (GR)
0 (GAPI) 150

Hole Azimuth (HAZIM)
-40 (DEG) 360

Pad One Azimuth (P1AZ_FBST)
-40 (DEG) 360

FMI Correlation Resistance (LOG) (FBCR)
2 (KOHM) 2000

PIP SUMMARY

Time Mark Every 60 S

FMI Image.

Resistive (White) to Conductive (Black)

Format: FMI_IMAGE Vertical Scale: 5" per 100' Graphics File Created: 28-Oct-2001 10:13

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Parameters

DLIS Name	Description	Value	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
ALTDPCHAN	Name of alternate depth channel	MeasuredDepth	
EGCO	FMI EMEX and GAIN Correction	NO	
FDBD	FMI Dead Buttons detection	OFF	
FDBP	FMI Dead Buttons Patching	OFF	
FIEQ	FMI Image Equalisation	OFF	
FLM	FMI Logging Mode	8PAD	
FPSA	FMI Peak Signal Amplitude for Required Servo Level	ON	
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
MDEC	Magnetic Field Declination	18.051	DEG
PBVSADP	Use alternate depth channel for playback	YES	
SOFF	Stand-Off	0	IN
XGAI_FBST	Gain Value(When manu)	0_dB	
XGMO	Emex & Gain Modes	EmexManu_GainManu	
XVOL	Emex Voltage	0	V

Output DLIS Files

DEFAULT	FMI_072LUP	FN:67	PRODUCER	28-Oct-2001 10:13

Schlumberger

DIPS

MAXIS 500 Field Log

Output DLIS Files

DEFAULT	FMI_072LUP	FN:67	PRODUCER	28-Oct-2001 10:13	3026.0 FT	2950.0 FT

OP System Version: 9C2-303

MCM

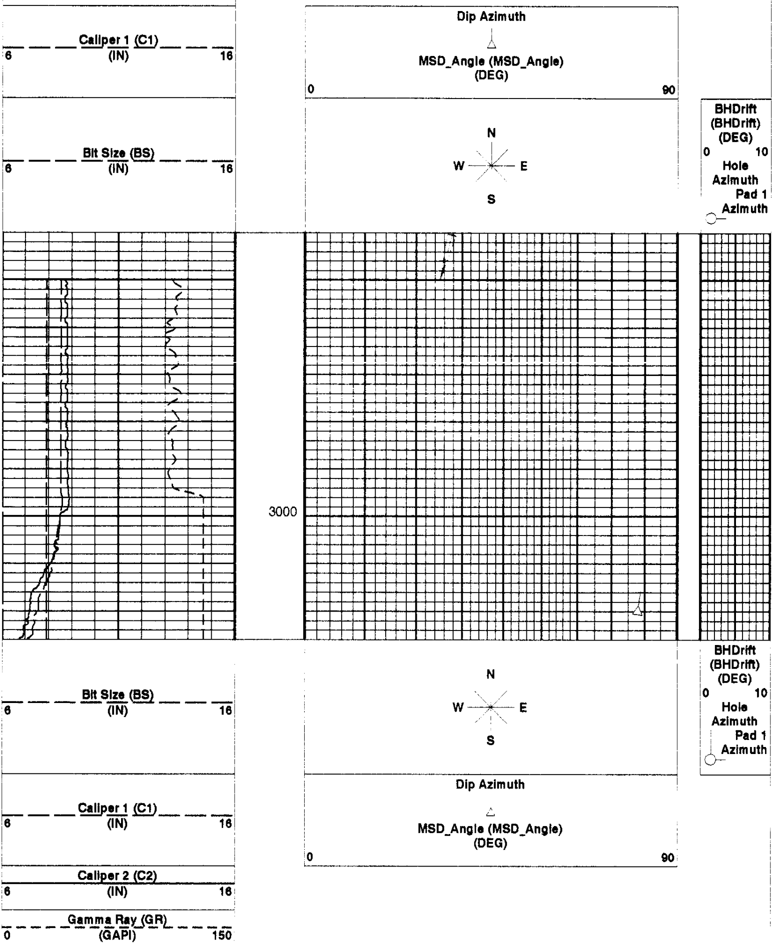
FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

PIP SUMMARY

Time Mark Every 60 S

	Gamma Ray (GR)	
0	(GAPI)	150

	Caliper 2 (C2)	
6	(IN)	16



PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
	DIP Tool	FBST	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
BS	Bit Size	7.875	IN
CSBL	CSB DIP Number of Levels	2L	
DPAD	Disabled Pad	NONE	
ELRA	Electrical Radius	0.5	IN
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
INT	Correlation Interval	4	FT
MDEC	Magnetic Field Declination	18.051	DEG
SANG	Correlation Search Angle	35	DEG
SBUT	DIP Set of Buttons	MSD	
SDFA	Side-by-Side Distance Factor	0.9	IN
SOFF	Stand-Off	0	IN
SPAN	DIP Spanning	1/4	
STDA	Structural DIP Azimuth	0	DEG
STDI	Structural DIP Angle	0	DEG
STEP	Correlation Step	2	FT

Format: CYBERDip Vertical Scale: 5" per 100' Graphics File Created: 28-Oct-2001 10:13

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Output DLIS Files

DEFAULT	FMI_072LUP	FN:67	PRODUCER	28-Oct-2001 10:13

Output DLIS Files

DEFAULT	FMI_073LUP	FN:68	PRODUCER	28-Oct-2001 10:22	2948.0 FT	2175.5 FT

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

PIP SUMMARY

Time Mark Every 60 S

Gamma Ray (GR)
0 (GAPI) 150

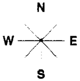
Caliper 2 (C2)
6 (IN) 16

Caliper 1 (C1)
6 (IN) 16

Bit Size (BS)
6 (IN) 16

Dip Azimuth

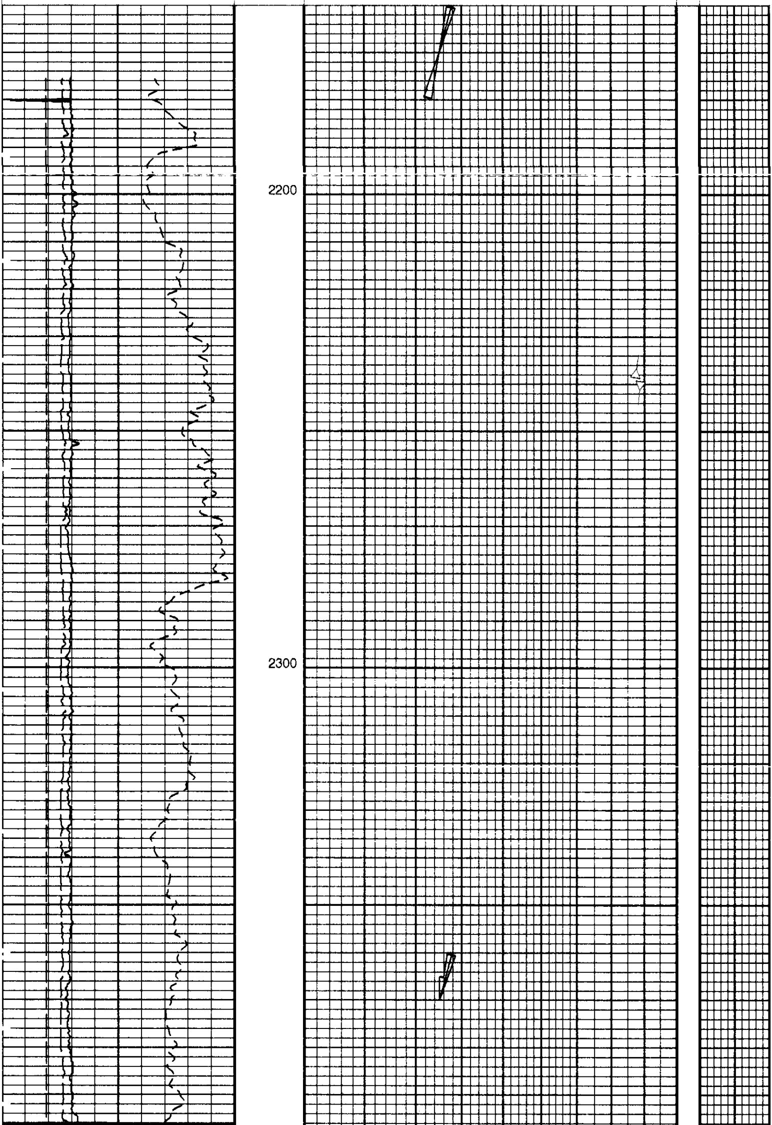
MSD_Angle (MSD_Angle)
(DEG)
0 90

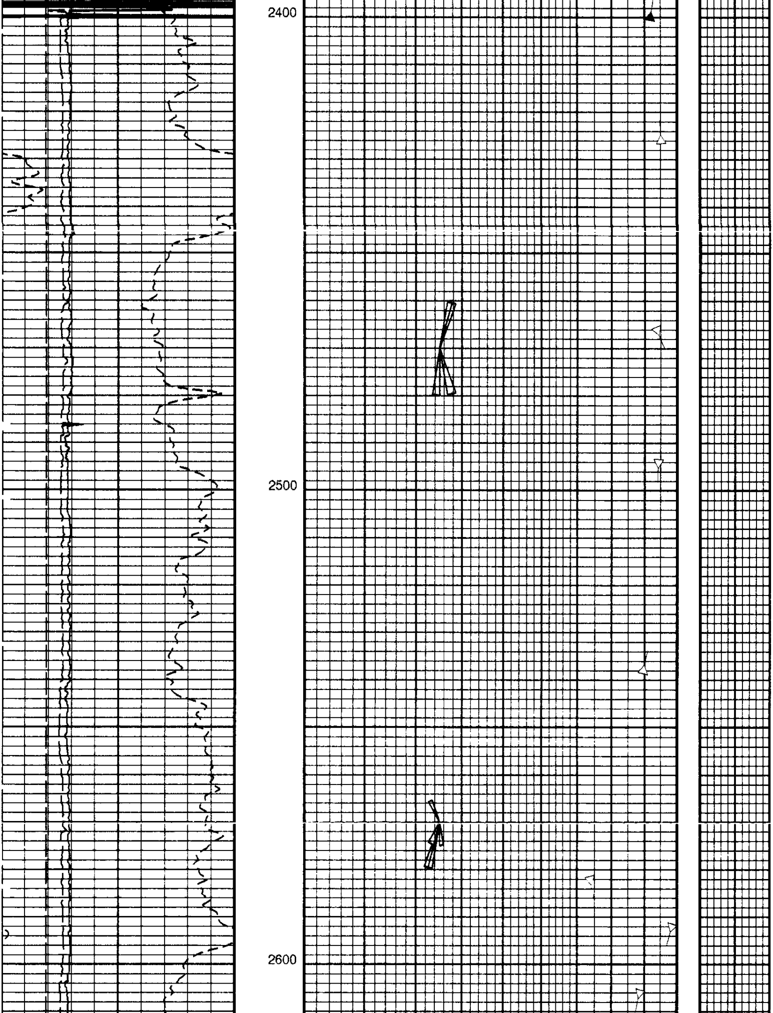


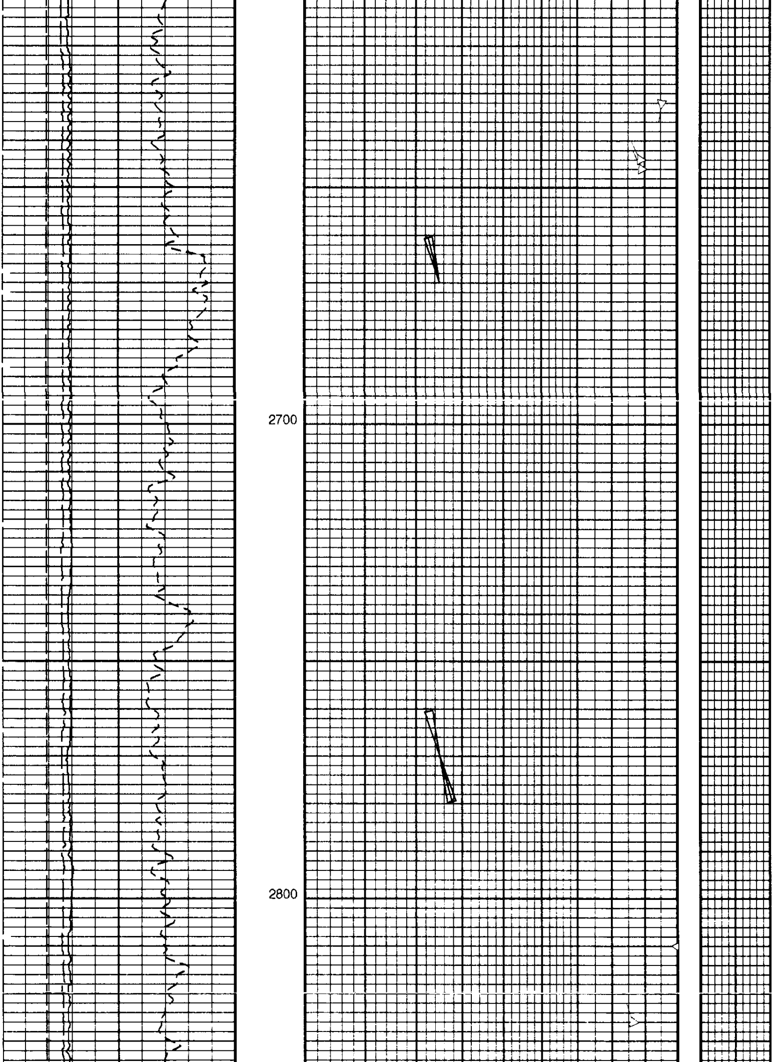
BHDrift
(BHDrift)
(DEG)
0 10

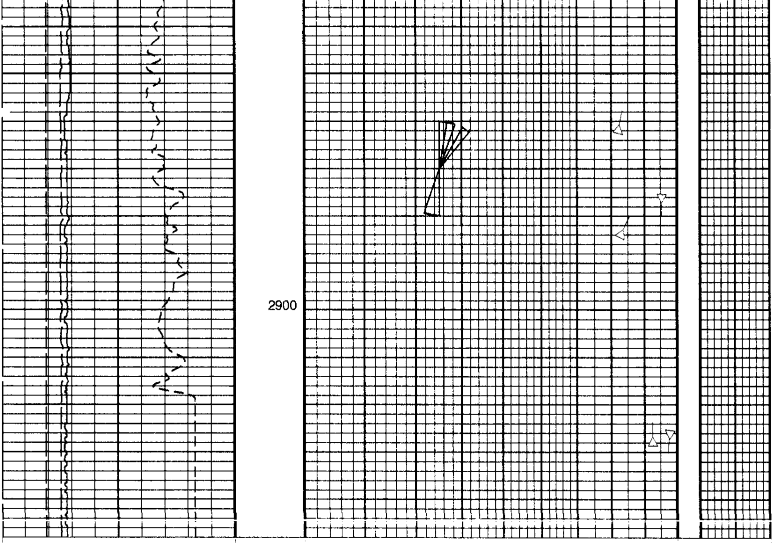
Hole
Azimuth

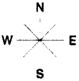
Pad 1
Azimuth











Bit Size (BS)
(IN)
6 16

Caliper 1 (C1)
(IN)
6 16

Caliper 2 (C2)
(IN)
6 16

Gamma Ray (GR)
(GAPI)
0 150

Dip Azimuth

△
MSD_Angle (MSD_Angle)
(DEG)
0 90

BHDrift
(BHDrift)
(DEG)
0 10
Hole
Azimuth
Pad 1
Azimuth

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value

	DIP Tool	FBST	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
BS	Bit Size	7.875	IN
CSBL	CSB DIP Number of Levels	2L	
DPAD	Disabled Pad	NONE	
ELRA	Electrical Radius	0.5	IN
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
INT	Correlation Interval	4	FT
MDEC	Magnetic Field Declination	18.051	DEG
SANG	Correlation Search Angle	35	DEG
SBUT	DIP Set of Buttons	MSD	
SDFA	Side-by-Side Distance Factor	0.9	IN
SOFF	Stand-Off	0	IN
SPAN	DIP Spanning	1/4	
STDA	Structural DIP Azimuth	0	DEG
STDI	Structural DIP Angle	0	DEG
STEP	Correlation Step	2	FT

Format: CYBERDip Vertical Scale: 5" per 100' Graphics File Created: 28-Oct-2001 10:22

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Output DLIS Files

DEFAULT	FMI_073LUP	FN:68	PRODUCER	28-Oct-2001 10:22

Schlumberger

Log Quality Control

MAXIS 500 Field Log

Output DLIS Files

DEFAULT	FMI_073LUP	FN:68	PRODUCER	28-Oct-2001 10:22	2948.0 FT	2175.5 FT

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
XGMO	EmexManu_GainAutoHighRange	EmexManu_GainManu	2949.8 10:23:38
XVOL	180 V	0 V	2949.8 10:22:44

PIP SUMMARY

■ Time Mark Every 60 S

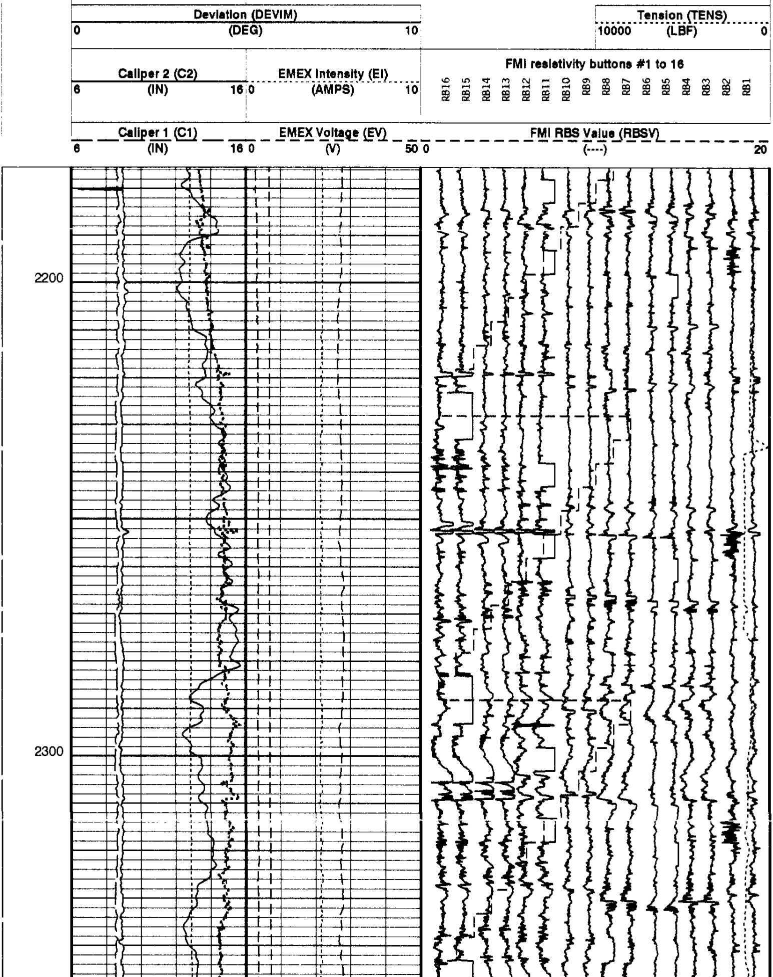
FMI Correlation Resistance (LOG) (FBCR)
2 (KOHM) 2000

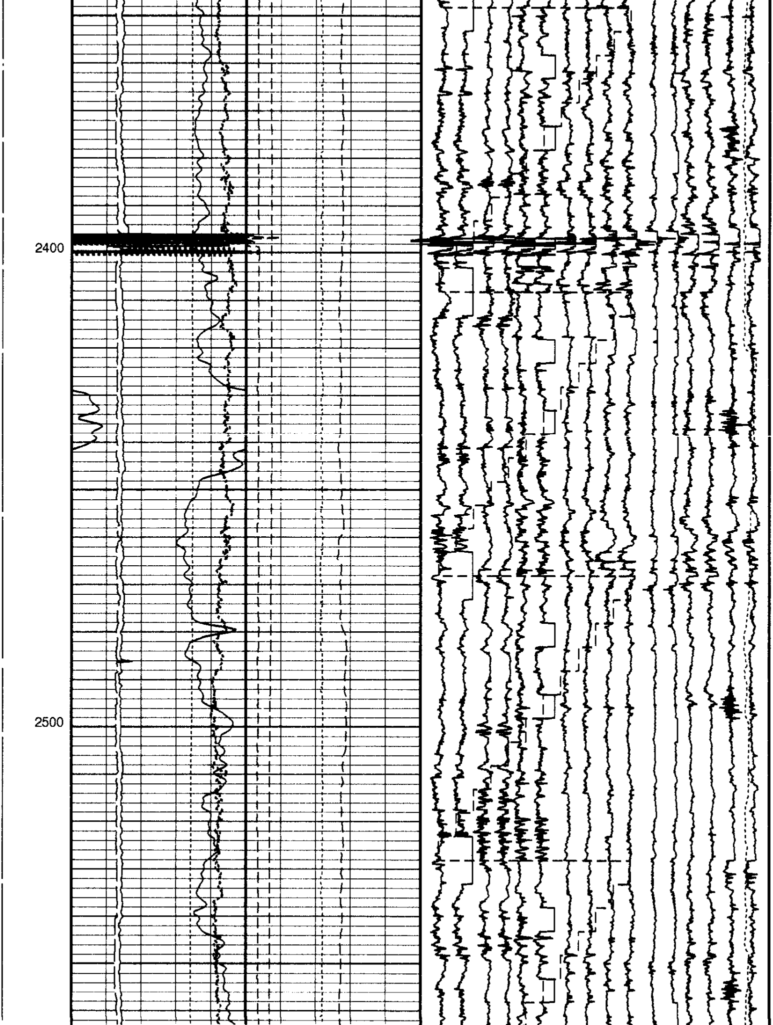
Relative Bearing (RB_FBST)
-40 (DEG) 360

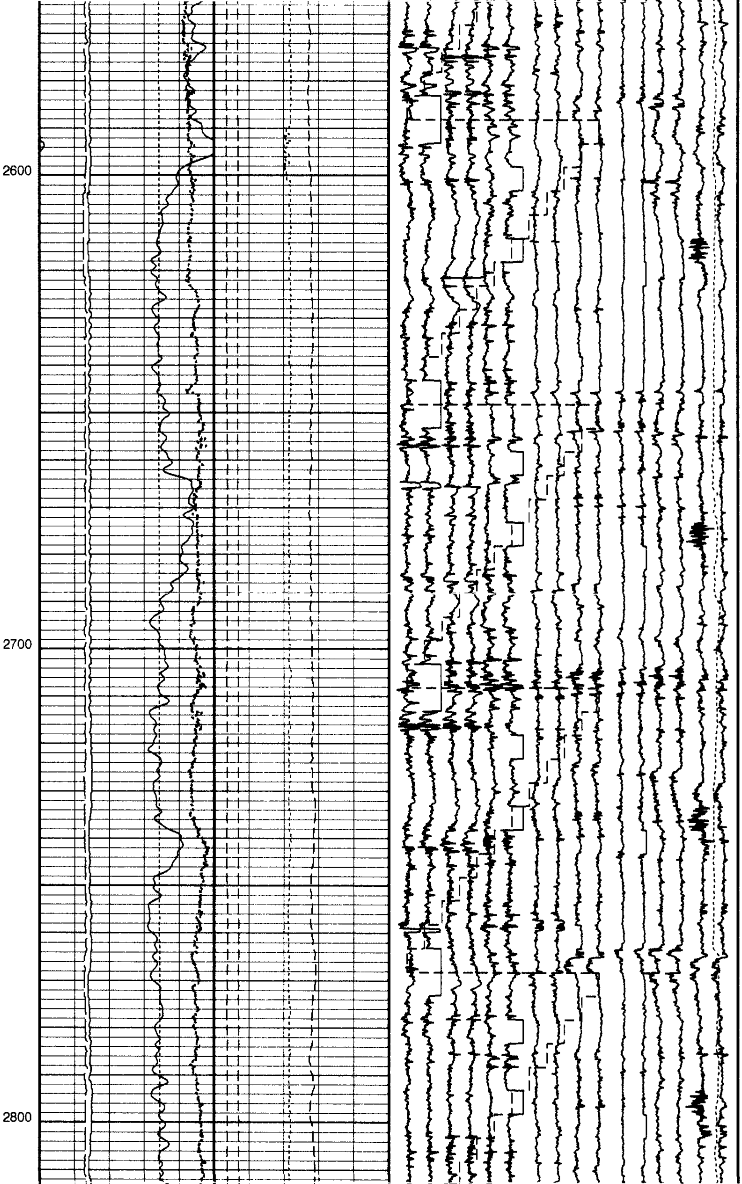
Pad One Azimuth (P1AZ_FBST)
-40 (DEG) 360

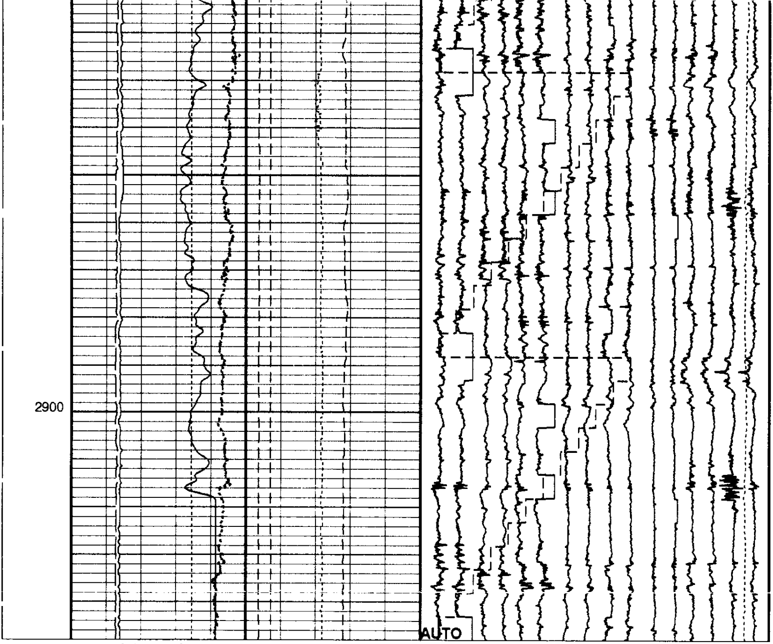
Hole Azimuth (HAZIM)
-40 (DEG) 360

Gamma Ray (GR)
0 (GAPI) 150









Caliper 1 (C1)
6 (IN) 16

EMEX Voltage (EV)
0 (V) 50

FMI RBS Value (RBSV)
0 (----) 20

Caliper 2 (C2)
6 (IN) 16

EMEX Intensity (EI)
0 (AMPS) 10

FMI resistivity buttons #1 to 16
RB16 RB15 RB14 RB13 RB12 RB11 RB10 RB9 RB8 RB7 RB6 RB5 RB4 RB3 RB2 RB1

Deviation (DEVIM)
0 (DEG) 10

Tension (TENS)
10000 (LBF) 0

Gamma Ray (GR)
0 (GAPI) 150

Hole Azimuth (HAZIM)
-40 (DEG) 360

Pad One Azimuth (P1AZ_FBST)
-40 (DEG) 360

Relative Bearing (RB_FBST)
-40 (DEG) 360

FMI Correlation Resistance (LOG) (FBCR)
2 (KOHM) 2000

PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
FBEF	Emex filtering activation	OFF	
FLM	FMI Logging Mode	8PAD	
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
MDEC	Magnetic Field Declination	18.051	DEG
RBS	Resistivity Button Selection	AUTO	
RBSI	Auto RBS change interval	10	
SOFF	Stand-Off	0	IN
XGMO	Emex & Gain Modes	EmexManu_GainManu	
XVOL	Emex Voltage	0	V

Format: FMI_LQC   Vertical Scale: 5" per 100'   Graphics File Created: 28-Oct-2001 10:22

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Output DLIS Files

DEFAULT   FMI_073LUP   FN:68   PRODUCER   28-Oct-2001 10:22

Output DLIS Files

DEFAULT   FMI_072LUP   FN:67   PRODUCER   28-Oct-2001 10:13   3026.0 FT   2950.0 FT

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Changed Parameter Summary

DLIS Name	New Value	Previous Value	Depth & Time
XGMO	EmexManu_GainManu	EmexManu_GainManu	3027.5 10:14:57
XVOL	0 V	0 V	3027.5 10:15:03

PIP SUMMARY

Time Mark Every 60 S

FMI Correlation Resistance (LOG) (FBCR)
2 (KOHM) 2000

Relative Bearing (RB_FBST)
-40 (DEG) 360

Pad One Azimuth (P1AZ_FBST)
-40 (DEG) 360

Hole Azimuth (HAZIM)
-40 (DEG) 360

Gamma Ray (GR)
0 (GAPI) 150

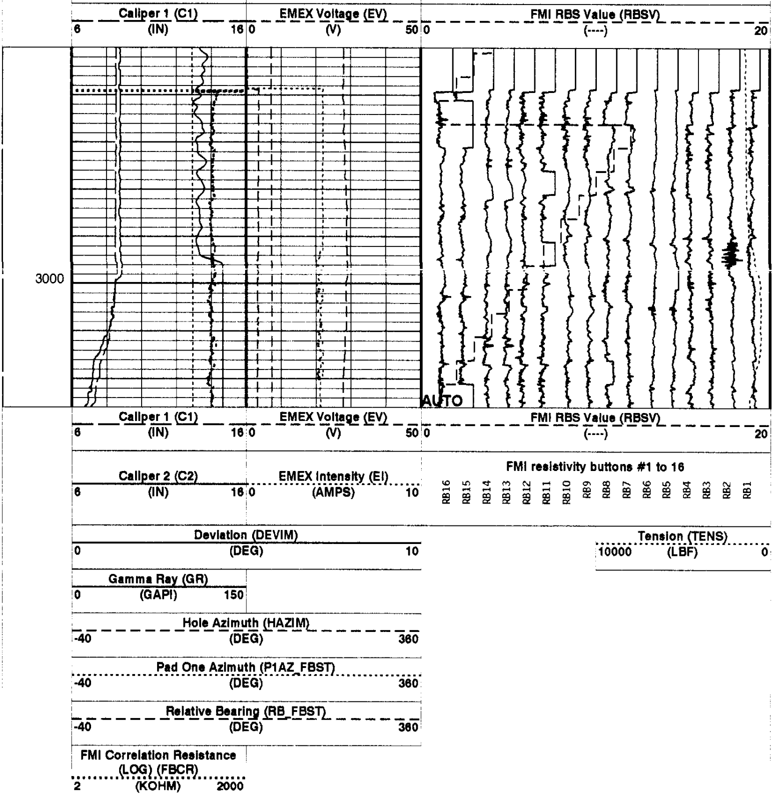
Deviation (DEVIM)
0 (DEG) 10

Tension (TENS)
10000 (LBF) 0

Caliper 2 (C2)
6 (IN) 16

EMEX Intensity (EI)
0 (AMPS) 10

FMI resistivity buttons #1 to 16
RB16 RB15 RB14 RB13 RB12 RB11 RB10 RB9 RB8 RB7 RB6 RB5 RB4 RB3 RB2 RB1



PIP SUMMARY

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value	
AFMO	Accelerometer Filtering Mode	MOVING_AVERAGE	
FBEF	Emex filtering activation	OFF	
FLM	FMI Logging Mode	8PAD	
ICMO	Inclinometry Computation Mode	AUTOMATIC_SELECTION	
MDEC	Magnetic Field Declination	18.051	DEG
RBS	Resistivity Button Selection	AUTO	
RBSI	Auto RBS change interval	10	
SOFF	Stand-Off	0	IN
XGMO	Emex & Gain Modes	EmexManu_GainManu	
XVOL	Emex Voltage	0	V

Format: FMI_LQC Vertical Scale: 5" per 100' Graphics File Created: 28-Oct-2001 10:13

OP System Version: 9C2-303

MCM

FBST-B	9C2-303	SGT-N	SPC-2072-NUCLEAR
DTC-A	9C2-303		

Output DLIS Files

DEFAULT	FMI_072LUP	FN:67	PRODUCER	28-Oct-2001 10:13

COMPANY:	NORTHWEST NATURAL GAS
WELL:	IW 14dH-23-65
FIELD:	CALVIN CREEK-REICHHOLD POOL
COUNTY:	COLUMBIA
STATE:	OREGON

BOTTOM LOG INTERVAL	3024 ft
SCHLUMBERGER DEPTH	3024 ft
DEPTH DRILLER	3033 ft
KELLY BUSHING	923 ft
DRILL FLOOR	921.5 ft
GROUND LEVEL	905 ft

Schlumberger

FORMATION IMCRO IMAGER TOOL
DIPS AND IMAGES
LQC / GAMMA RAY