**COMPANY:** **NORTHWEST NATURAL GAS**

**WELL:** **I.W. 24C-23-65**

**FIELD:** **CALVIN CREEK GAS STORAGE**

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

COUNTY: COLUMBIA
Field: CALVIN CREEK GAS STORAGE
Location: 985.3' N & 1258.4' E FROM THE
Well: I.W. 24C-23-65
Company: NORTHWEST NATURAL GAS

**Schlumberger**

# FORMATION MICRO IMAGER

## Images

## SCALE: 25" = 100'

| | | | |
|---|---|---|---|
| LOCATION | 985.3' N & 1258.4' E FROM THE<br>FROM THE SW CORNER OF 23 | Elev.: | K.B. 917.5 ft<br>G.L. 905 ft<br>D.F. 917.3 ft |
| | Permanent Datum: GROUND LEVEL | Elev.: 905 ft | |
| | Log Measured From: K.B | | above Perm. Datum |
| | Drilling Measured From: K.B | | |

| API Serial No. | SECTION | TOWNSHIP | RANGE |
|---|---|---|---|
| 36-009-00350 | 23 | 6N | 5W |

| | | | | | |
|---|---|---|---|---|---|
| Logging Date | | 7-MAY-2000 | | | |
| Run Number | | 1 | | | |
| Depth Driller | | 2591 ft | | | |
| Schlumberger Depth | | 2591 ft | | | |
| Bottom Log Interval | | 2581 ft | | | |
| Top Log Interval | | 1724 ft | | | |
| Casing Driller Size @ Depth | | 8.625 in | @ | 1727 ft | @ |
| Casing Schlumberger | | 1725 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 | 10.5 | | |
| Source Of Sample | | FLOWLINE | | | |
| RM @ Measured Temperature | | 0.914 ohm.m | @ | 68 degF | @ |
| RMF @ Measured Temperature | | 1.250 ohm.m | @ | 52 degF | @ |
| RMC @ Measured Temperature | | 1.325 ohm.m | @ | 52 degF | @ |
| Source RMF | RMC | PRESS | PRESS | | |
| RM @ MRT | RMF @ MRT | 0.692 @ 92 | 0.744 @ 92 | @ | @ |
| Maximum Recorded Temperatures | | 92 degF | 92 | 92 | |
| Circulation Stopped | Time | 7-MAY-2000 | | 0:30 | |
| Logger On Bottom | Time | 7-MAY-2000 | | | |
| Unit Number | Location | 3152 | SACRAMENTO | | |
| Recorded By | | M.KHAN | | | |
| Witnessed By | | JACK MEYER | | | |

Run

| | |
|---|---|
| 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 | |

@

@ @ @ @

@

1

Run 2

@

@ @ @ @

@

Run 3

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: FMI GR | OS1: |
| OS2: | OS2: |
| OS3: | OS3: |
| OS4: | OS4: |
| OS5: | OS5: |

| REMARKS: RUN NUMBER 1 | REMARKS: RUN NUMBER 2 |
|---|---|
| | |

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

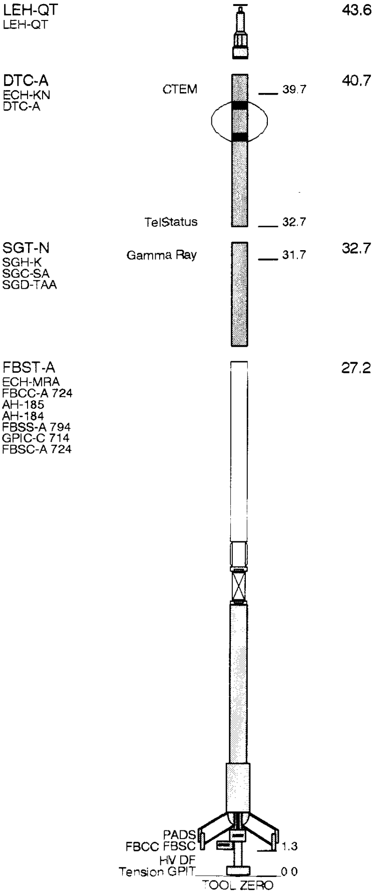
| LOGGED INTERVAL | START | STOP | LOGGED INTERVAL | START | STOP |
|---|---|---|---|---|---|
| | | | | | |

# EQUIPMENT DESCRIPTION

| RUN 1 | RUN 2 |
|---|---|
| SURFACE EQUIPMENT | |

GSR-U/Y
WITM (DTS)-A

## DOWNHOLE EQUIPMENT



MAXIMUM STRING DIAMETER 5.00 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN FEET

# Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | FBSTA .017 | FN:16 PRODUCER | 07-May-2000 08:55 | 2000.5 FT | 1708.1 FT |

# Output DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | FBSTA .019 | FN:18 PRODUCER | 07-May-2000 09:15 | 2000.5 FT | 1708.5 FT |

# OP System Version: 9C1-303

MCM

| | | | |
|---|---|---|---|
| FBST-A | 9C1-303 | SGT-N | OP91-KP1a |
| DTC-A | OP91-KP1a | | |

PIP SUMMARY

Time Mark Every 60 S

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

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

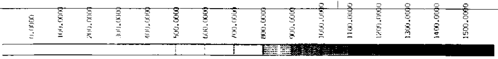
Hole Azimuth (HAZIM)
-40 (DEG) 360

Gamma Ray (GR)
0 (GAPI) 150

Deviation (DEVIM)
0 (DEG) 10

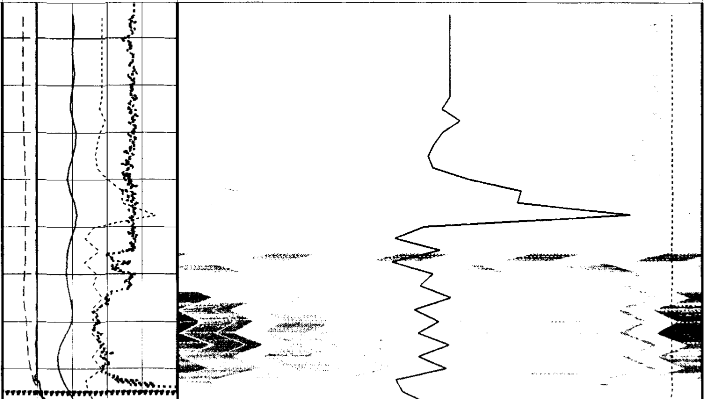
Tension (TENS)
10000 (LBF) 0

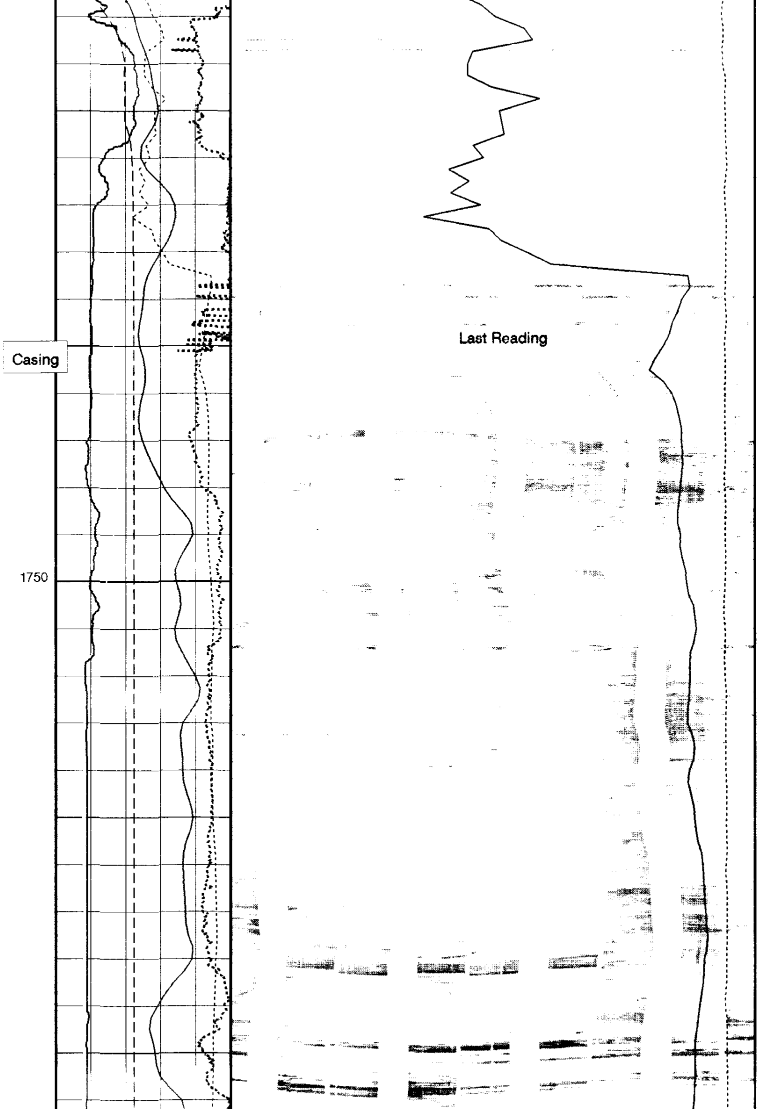
Caliper 2 (C2)
6 (IN) 16

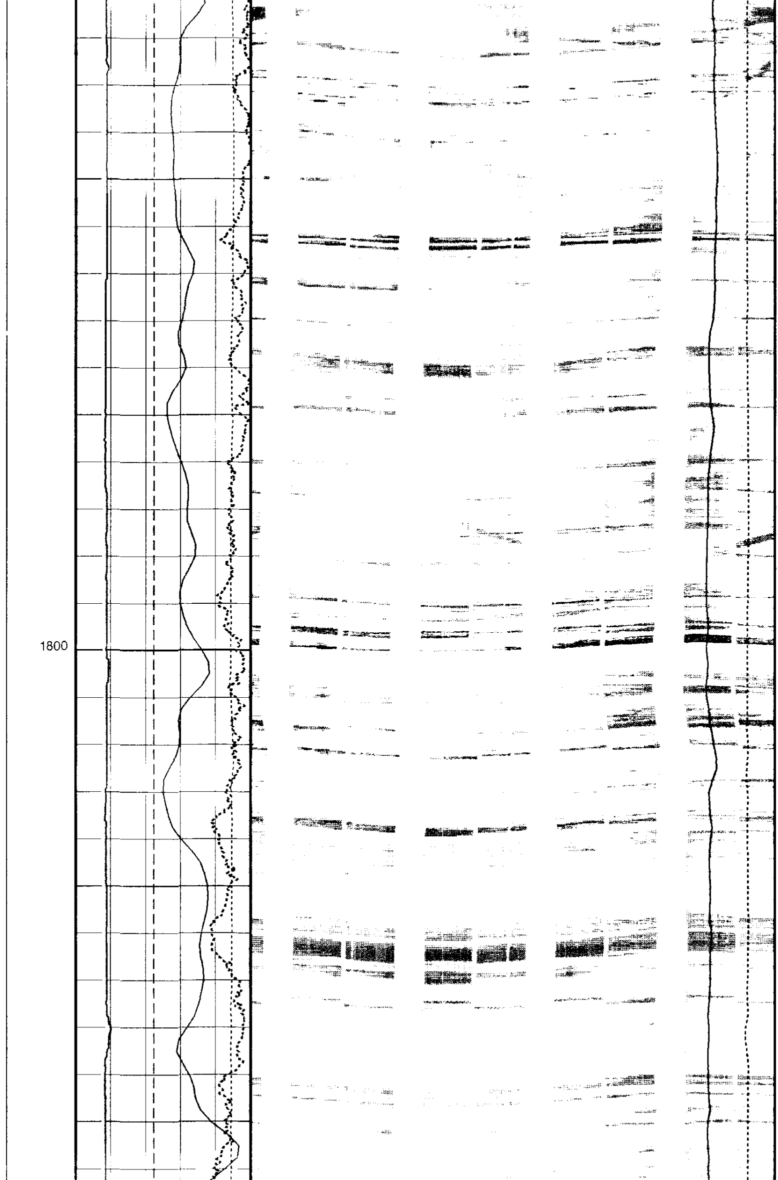


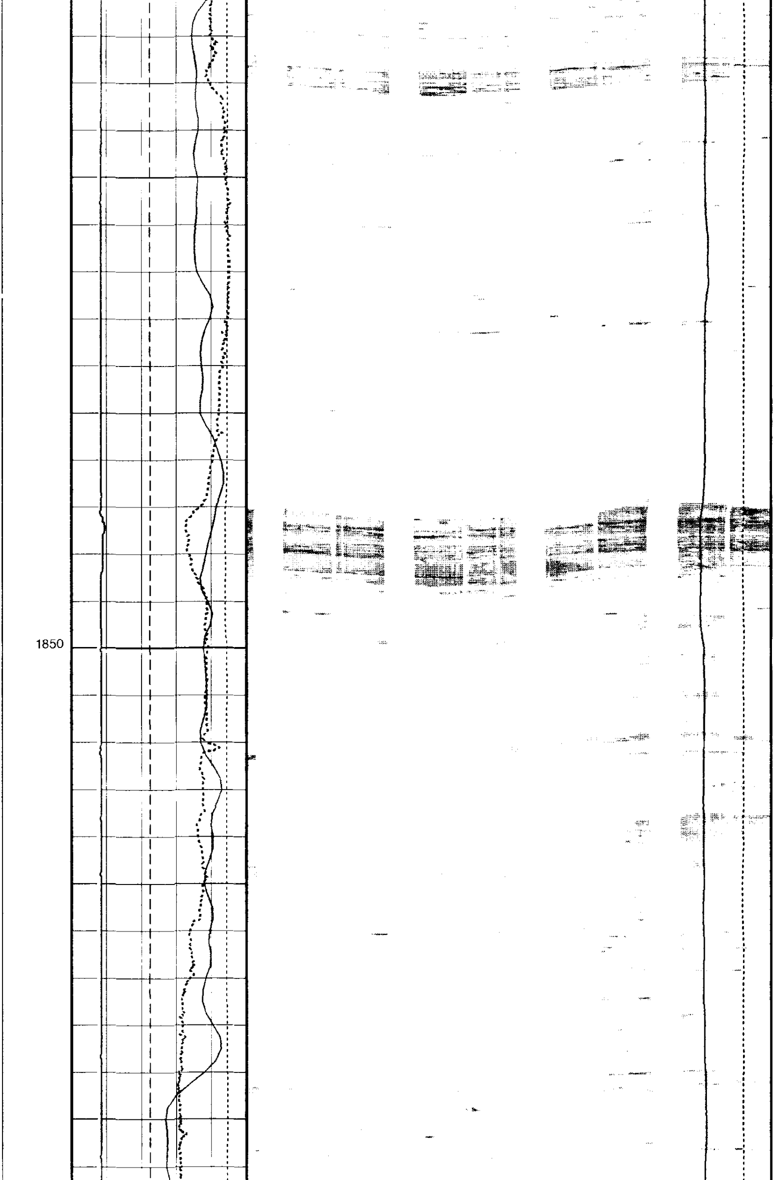
FBST/PADA (FBAA_A)
(----)

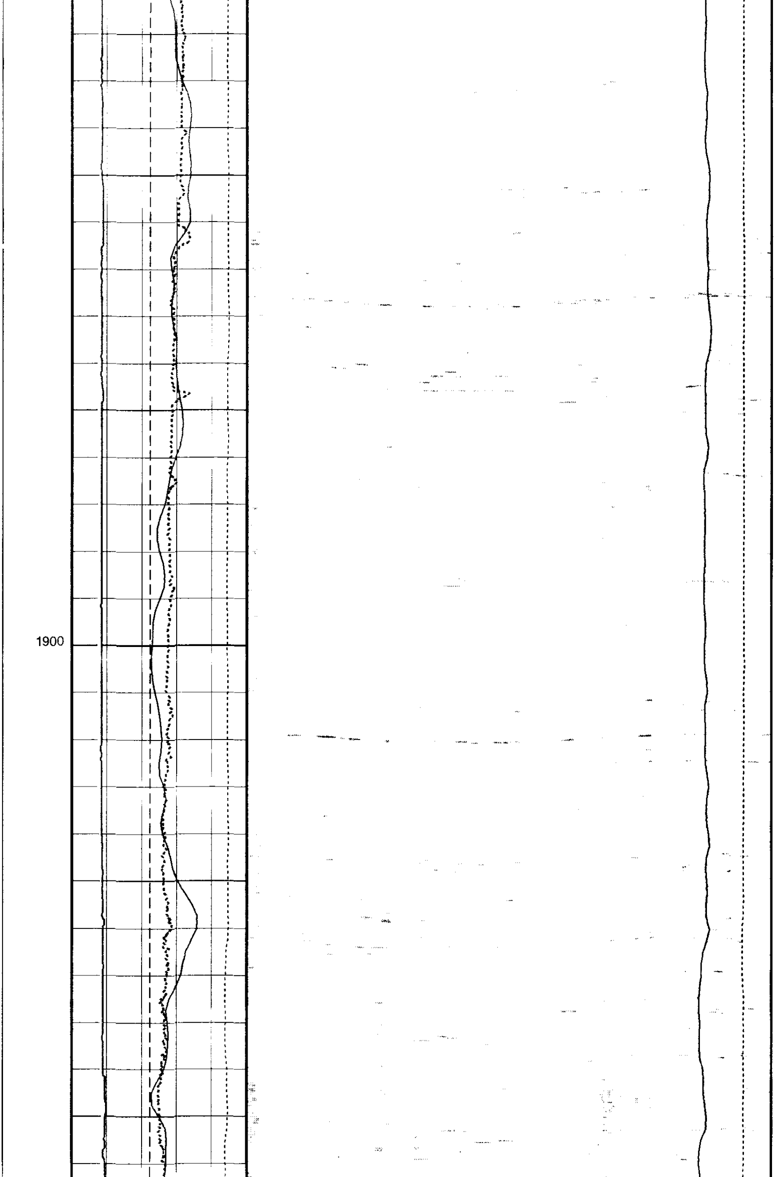
Image Orientation (P1AZ_FBST)
0 (DEG) 360

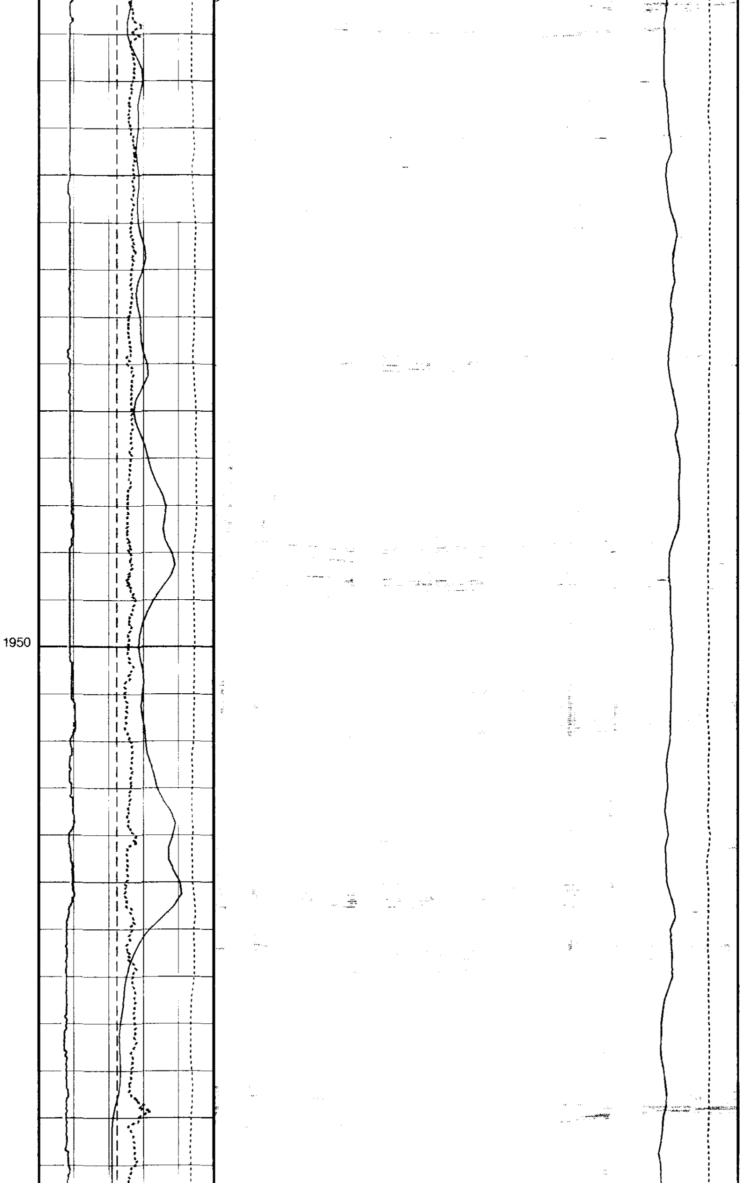












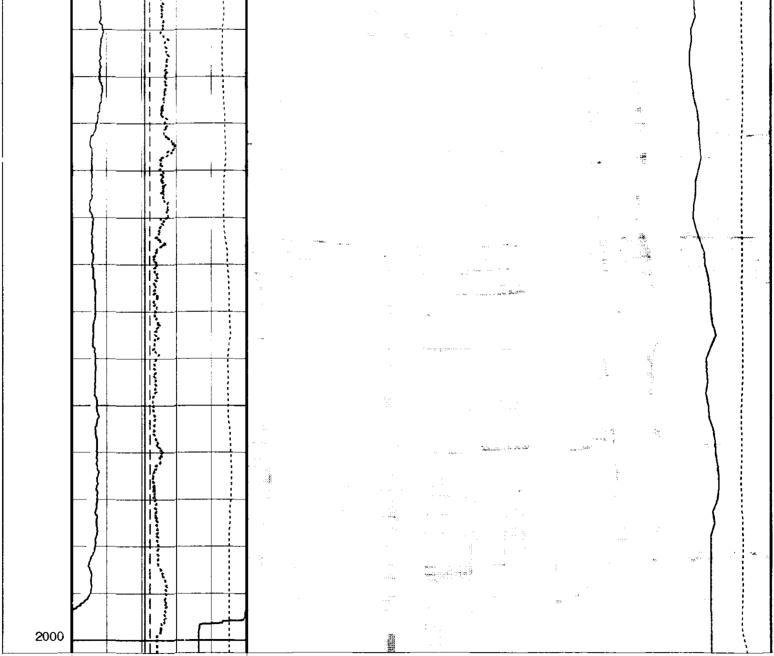
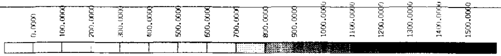


**Image Orientation (P1AZ_FBST)**
0 (DEG) 360



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

**Caliper 2 (C2)**
6 (IN) 16

**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

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

## PIP SUMMARY

Time Mark Every 60 S

## FMI Image.

## Resistive (White) to Conductive (Black)

Format: FMI_WRAP_BY_P1AZ Vertical Scale: 25" per 100' Graphics File Created: 07-May-2000 09:16

## OP System Version: 9C1-303

MCM

| | | | |
|---|---|---|---|
| FBST-A | 9C1-303 | SGT-N | OP91-KP1a |
| DTC-A | OP91-KP1a | | |

## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| AFMO | Accelerometer Filtering Mode | MOVING_AVERAGE | |
| ALTDPCHAN | Name of alternate depth channel | SpeedCorrectedDepth | |
| DO | Depth Offset for Logical Unit 1 | 0.0 | FT |
| 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 | |
| ICMO | Inclinometry Computation Mode | AUTOMATIC_SELECTION | |
| MDEC | Magnetic Field Declination | -9.54999 | DEG |
| PBVSADP | Use alternate depth channel for playback | NO | |
| PP | Playback Processing | NORMAL | |
| SOFF | Stand-Off | 0 | IN |
| XGAI_FBST | Gain Value(When manu) | 25_dB | |
| XGMO | Emex & Gain Modes | EmexManu_GainManu | |
| XVOL | Emex Voltage | 0 | V |

## Input DLIS Files

| | | | | | | |
|---|---|---|---|---|---|---|
| DEFAULT | FBSTA .017 | FN:16 | PRODUCER | 07-May-2000 08:55 | 2000.5 FT | 1708.1 FT |

## Output DLIS Files

| | | | | |
|---|---|---|---|---|
| DEFAULT | FBSTA .019 | FN:18 | PRODUCER | 07-May-2000 09:15 |

| | | | |
|---|---|---|---|
| COMPANY: | NORTHWEST NATURAL GAS | BOTTOM LOG INTERVAL | 2581 ft |
| | | SCHLUMBERGER DEPTH | 2591 ft |
| WELL: | I.W. 24C-23-65 | DEPTH DRILLER | 2591 ft |
| FIELD: | CALVIN CREEK GAS STORAGE | KELLY BUSHING | 917.5 ft |
| COUNTY: | COLUMBIA | DRILL FLOOR | 917.3 ft |
| STATE: | OREGON | GROUND LEVEL | 905 ft |

**Schlumberger**

# FORMATION MICRO IMAGER
# LQC
# SCALE: 5" = 100'