P1/UF

**COMPANY: BHP PETROLEUM**

**WELL: MINERVA-1**

**FIELD: WILDCAT**

**RIG NAME: BYFORD** **COUNTRY: AUSTRALIA**

DEPT. NAT. RES & ENV
PE602768

Rig Name: BYFORD
Field: WILDCAT
Location: SEISMIC LINE: OE81A-2028
Well: MINERVA-1
Company: BHP PETROLEUM

**Schlumberger**

## SUITE-2, RUN-2 1/200
## DLL-MSFL-AS-GR-AMS-SP
## (2024 - 1189 M)

| LOCATION | | | |
|---|---|---|---|
| SEISMIC LINE: OE81A-2028 | Elev.: | K.B. | 25.3 M |
| OTWAY BASIN | | G.L. | -57 M |
| VIC P31 | | D.F. | 25 M |
| Permanent Datum: MSL | Elev.: | 0 M | |
| Log Measured From: RT | 25.0 M | above Perm. Datum | |
| Drilling Measured From: RT | | | |

| STATE: | Well Deviation | Longitude | Latitude |
|---|---|---|---|
| VICTORIA | | 142 57' 12.34" E | 38 42' 12.23" S |

| | | | | |
|---|---|---|---|---|
| Logging Date | 21-MAR-1993 | | | |
| Run Number | SUITE-2, RUN-2 | | | |
| Depth Driller | 2031 M | | | |
| Schlumberger Depth | 2024 M | | | |
| Bottom Log Interval | 2018 M | | | |
| Top Log Interval | 1189 M | | | |
| Casing Driller Size @ Depth | 9.625 IN | @ | 1189 M | @ |
| Casing Schlumberger | 1189 M | | | |
| Bit Size | 8.500 IN | | | |
| Type Fluid In Hole | KCL-PHPA | | | |
| MUD Density / Viscosity | 1.15 G/C3 | 45 S | | |
| Fluid Loss / PH | 5.5 C3 | 9.5 | | |
| Source Of Sample | FLOW LINE | | | |
| RM @ Measured Temperature | 0.100 OHMM | @ | 21 DEGC | @ |
| RMF @ Measured Temperature | 0.084 OHMM | @ | 22 DEGC | @ |
| RMC @ Measured Temperature | 0.120 OHMM | @ | 22 DEGC | @ |
| Source RMF / RMC | MEAS | MEAS | | |
| RM @ BHT / RMF @ BHT | 0.041 @ 83 | 0.035 @ 83 | @ | @ |
| Maximum Recorded BHT | 83 DEGC | 83 | 83 | |
| Circulation Stopped Time | 21-MAR-1993 | 08:30 | | |
| Logger On Bottom Time | 21-MAR-1993 | 17:00 | | |
| Unit Number / Location | 41 | SALE (VEA) | | |
| Recorded By | HELWIG , JONSSON | | | |
| Witnessed By | PICKAVANCE , TABASSI | | | |

| | 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 @ BHT / RMF @ BHT | @ | @ | @ | @ |
| Maximum Recorded BHT | | | | |
| Circulation Stopped Time | | | | |
| Logger On Bottom Time | | | | |
| Unit Number / Location | | | | |
| Recorded By | | | | |
| Witnessed By | | | | |

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES FOR SUITE 2
DESCENT 1: DLL-MSFL-AS-GR-AMS
DESCENT 2: FMS-LDT-CNL-GR-AMS
DESCENT 3: CSI (VSP)
DESCENT 4: RFT-HP-GR-AMS
DESCENT 5:

DESCENT 1:
DESCENT 2:
DESCENT 3:
DESCENT 4:
DESCENT 5:

REMARKS:
TOOL STRING: DLTE-AH169-SRTC-SDTC(ARRAY)-SGTL-TCCB-AMSA-BSP

STANDOFFS AND CENTRALIZERS RUN AS SHOWN IN DIAGRAM.
HOLE FINDER RUN ON THE BOTTOM OF THE TOOL.

DEPTH CORRELATED TO SUITE-1, RUN-1 RESISTIVITY SONIC.

KCL - 34000 PPM, 4 POUNDS PER BARREL BARITE.

THANK YOU FOR CALLING SCHLUMBERGER!!!

SERVICE ORDER #: 930321
PROGRAM VERSION: 5C0 433
FLUID LEVEL:

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

SERVICE ORDER #:
PROGRAM VERSION:
FLUID LEVEL:

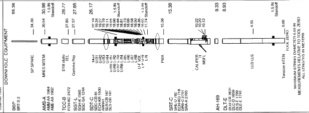
| LOGGED INTERVAL | START | STOP |
|---|---|---|
| | | |

## EQUIPMENT DESCRIPTION

### SURFACE EQUIPMENT

LCM-AA 949
STM-C 213
GSR-U/Y
TCM-AB 1333

### DOWNHOLE EQUIPMENT



MAXIMUM STRING DIAMETER 6.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

## Input DLIS Files

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| DEFAULT | DLTE .007 | FIELD | 21-MAR-1993 16:55 | 2033.9 M | 1133.4 M |

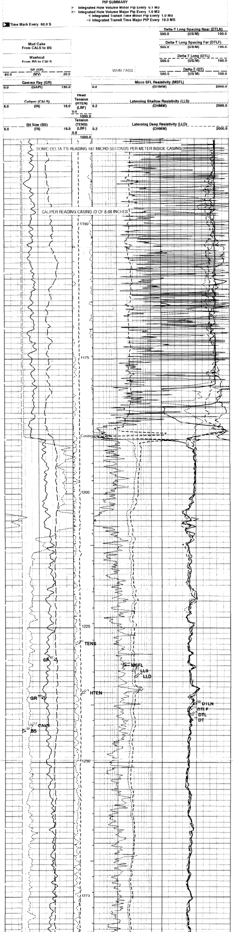
## Output DLIS Files

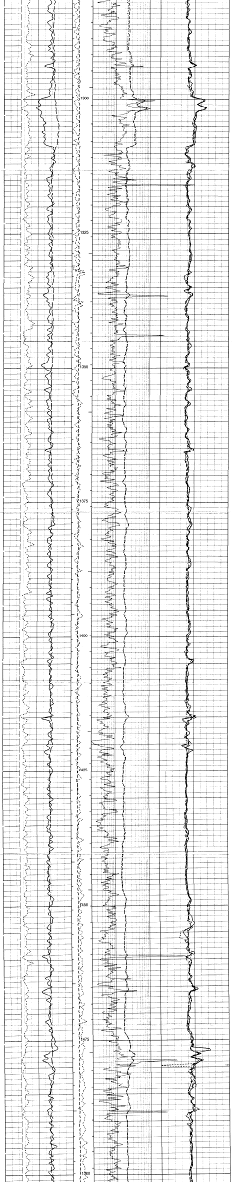
|  |  |  |  |  |  |
|---|---|---|---|---|---|
| TRANS2 | DLTE .012 | FIELD | 21-MAR-1993 18:46 | 2034.2 M | 1133.7 M |
| DEFAULT | DLTE .012 | FIELD | 21-MAR-1993 18:46 | 2034.2 M | 1133.7 M |

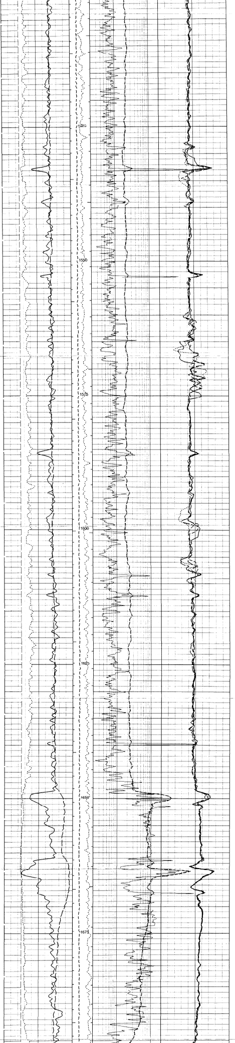
## Integrated Hole/Cement Volume Summary

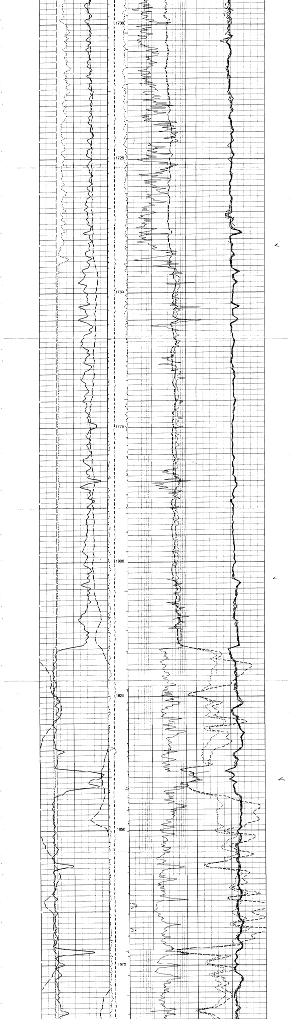
Hole Volume = 35.88 M3
Cement Volume = 15.15 M3 (assuming 7.00 IN casing O.D.)
Computed from 2023.9 M to 1189.0 M using data channel(s) CALS

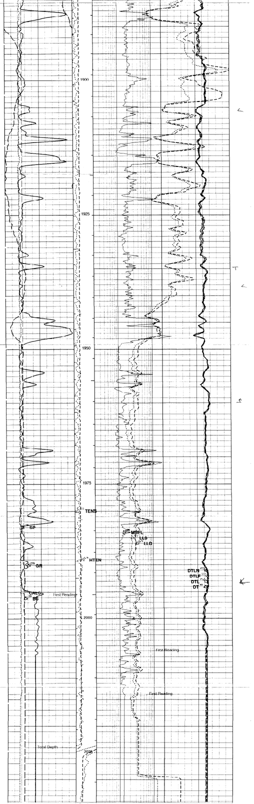
## OP System Version: 5C0-423











Tension (TENS) (LBF) 0.0 1000.0

Head Tension (HTEN) (LBF) 0.0 1000.0

| | | |
|---|---|---|
| | Bit Size (BS) | |
| 6.0 | (IN) | 16.0 |
| | Caliper (CALS) | |
| 6.0 | (IN) | 16.0 |
| | Gamma Ray (GR) | |
| 0.0 | (GAPI) | 150.0 |
| | SP (SP) | |
| -80.0 | (MV) | 20.0 |

| | | |
|---|---|---|
| | Laterolog Deep Resistivity (LLD) | |
| 0.2 | (OHMM) | 2000.0 |
| | Laterolog Shallow Resistivity (LLS) | |
| 0.2 | (OHMM) | 2000.0 |
| | Micro SFL Resistivity (MSFL) | |
| 0.2 | (OHMM) | 2000.0 |

Washout
From BS to CALS

Mud Cake
From CALS to BS

MAIN PASS

| | | |
|---|---|---|
| | Delta-T (DT) | |
| 500.0 | (US/M) | 100.0 |
| | Delta-T Long (DTL) | |
| 500.0 | (US/M) | 100.0 |
| | Delta-T Long Spacing Far (DTLF) | |
| 500.0 | (US/M) | 100.0 |
| | Delta-T Long Spacing Near (DTLN) | |
| 500.0 | (US/M) | 100.0 |

PIP SUMMARY

⊢ Integrated Hole Volume Minor Pip Every 0.1 M3
⊢ Integrated Hole Volume Major Pip Every 1.0 M3
⊣ Integrated Transit Time Minor Pip Every 1.0 MS
⊣ Integrated Transit Time Major PIP Every 10.0 MS

▶ Time Mark Every 60.0 S

Format: DLT_D2 Vertical Scale: 1:200.0 Graphics File Created: 21-MAR-1993 18:46

**OP System Version: 5C0-423**

## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | DLTE .007 | FIELD | 21-MAR-1993 16:55 | 2033.9 M | 1133.4 M |

## Output DLIS Files

| | | | |
|---|---|---|---|
| TRANS2 | DLTE .012 | FIELD | 21-MAR-1993 18:46 |
| DEFAULT | DLTE .012 | FIELD | 21-MAR-1993 18:46 |

## Parameters

| DLIS Name | Description | Value | |
|---|---|---|---|
| | SDT Bore-hole Status (BST) | OPEN | |
| AGC | Automatic Gain Control (AGC) | ON | |
| AMSG | Auxiliary Minimum Sliding Gate (AMSG) | 180 | US |
| BHS | Bore Hole Status | OPEN | |
| BHT | Bottom Hole Temperature (used in calculations) | 85 | DEGC |
| BILI | Bond Index Level for Zone Isolation | 0.8 | |
| BS | Bit Size | 8.500 | IN |
| BSAL | Borehole Salinity | 45000.0 | PPM |
| CBLG | CBL Gate Width (CBLG) | 45 | US |
| CDTS | C-Delta-T Shale | 100 | US/F |
| CREF | Current Reference | AUTO | |
| CSTR | Compressive Strength of Cement | 0 | KPA |
| DDE0 | Digitizing Delay 0 (DDE0) | 0 | US |
| DDEL | Digitizing Delay (DDEL) | 0 | US |
| DDMG | Downhole Differential Multi-Gain (DDMG) | 10 | |
| DETE | Detection (DETE) | E2 | |
| DO | Depth Offset | 0.3 | M |
| DPPM | Density Porosity Processing Mode | STAN | |
| DPRF | DEEP REFERENCE POWER | 550 | NW |
| DSI0 | Digitizer Sample Interval 0 (DSI0) | 10 | US |
| DSIN | Digitizer Sample Interval (DSIN) | DS10 | |
| DTCM | Delta-T Computation Mode (DTCM) | FULL | |
| DTF | Delta-T Fluid | 189 | US/F |
| DTM | Delta-T Matrix | 56 | US/F |
| DWC0 | Digitizer Word Count 0 (DWC0) | 500 | |
| DWCO | Digitizer Word Count (DWCO) | 500 | |
| EDMD | Effective Distance Mud (EDMD) | 6 | IN |
| FCD | Future Casing (Outer) Diameter | 7 | IN |
| FCF | CBL Fluid Compensation Factor | 1 | |
| GAI | Manual Gain (GAI) | 40 | |
| GCSE | Generalized Caliper Selection | CALIPER_CALS | |
| GDEV | Average Angular Deviation of Borehole from Normal | 0 | DEG |
| GOBO | Good Bond | 2 | MV |
| GRSE | Generalized Mud Resistivity Selection | AMS_RESIST | |
| GTSE | Generalized Temperature Selection | AMS_TEMP | |
| ITMD | Intrinsic Time Mud (ITMD) | 0 | US |
| ITTS | Integrated Transit Time Source | DT | |
| KFAC | K FACTOR | SOND | |
| LLOO | LATEROLOG LOOP | OFF | |
| MAGC | Mud AGC (MAGC) | ON | |
| MATR | Rock Matrix Type | LIMESTONE | |
| MCI | Minimum Cemented Interval | 4.51523 | M |
| MGAI | Maximum Gain (MGAI) | 2000 | |
| MMOD | Mud Firing Mode (MMOD) | OFF | |
| MMSG | Mud Minimum Sliding Gate (MMSG) | 80 | US |
| MODE | Firing Mode (MODE) | DDBH | |
| MSA | Minimum Sonic Amplitude | 19.7824 | MV |
| MSGA | Mud Sliding Gate (NSGA) | ON | |
| MSGL | Mud Sliding Gate Length (MSGL) | 35 | US |
| MSGW | Mud Sliding Gate Width (MSGW) | 20 | US |
| MUDG | Mud Manual Gain (MUDG) | 20 | |
| NMSG | Near Minimum Sliding Gate (NMSG) | 180 | US |
| OMR | Origin of Mud Resistivity | AMS | |
| PLRM | POWER LOOP REFERENCE MODE | DEEP | |
| RATE | Firing Rate (RATE) | R15 | |
| RMOD | Receiver Mode (RMOD) | AUTO | |
| RMUD | Resistivity of Mud Sample | 1 | OHMM |
| RTCO | RTCO - Rt Invasion Correction | YES | |
| RW | Resistivity of Connate Water | 1.0000 | OHMM |
| SFAF | Sonic Formation Attenuation Factor (SFAF) | 0 | DB/M |
| SGAD | Sliding Gate (SGAD) | ON | |
| SGDT | Sliding Gate Delta-T (SGDT) | 50 | US/F |
| SGW | Sliding Gate Width (SGW) | 80 | US |
| SHT | Surface Hole Temperature | 20 | DEGC |
| SLEV | Signal Level for AGC (SLEV) | 5000 | MV |
| SPDR | SP Drift | 0 | MV/M |
| SPFS | Sonic Porosity Formula | RAYMER_HUNT | |
| SPNV | SP Next Value | -55 | MV |
| SPRF | SHALLOW REFERENCE POWER | 550 | NW |
| SPSO | Sonic Porosity Source | DT | |
| SPT | SRT Pad Type | STANDARD | |
| T0CA | T0 Correction (T0CA) | ON | |
| TD | Total Depth | 2024 | M |
| TLCK | TLC Kit | OFF | |
| TSIG | Test Signal (TSIG) | OFF | |
| TWS | Temperature of Connate Water Sample | 37.8 | DEGC |
| VDLG | VDL Manual Gain (VDLG) | 40 | |
| VDLM | VDL Firing Mode (VDLM) | NONE | |
| WAGC | Waveform AGC (WAGC) | ON | |
| WGAI | Waveform Manual Gain WGAI | 20 | |
| WGDT | Waveform Gain Delta-T (WGDT) | 240 | US/F |
| WGIN | Waveform Gain Interval (WGIN) | 4800 | US |
| WMOD | Waveform Firing Mode (WMOD) | NONE | |

## Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | DLTE .007 | FIELD | 21-MAR-1993 16:55 | 2033.9 M | 1133.4 M |
| DEFAULT | DLTE .005 | FIELD | 21-MAR-1993 16:27 | 1982.4 M | 1794.4 M |

## Output DLIS Files

| | | | |
|---|---|---|---|
| TRANS2 | DLTE .012 | FIELD | 21-MAR-1993 18:46 |
| DEFAULT | DLTE .012 | FIELD | 21-MAR-1993 18:46 |

## OP System Version: 5C0-423

PIP SUMMARY

Time Mark Every 60.0 S

Repeat Delta-T Long Spacing Near (DTLN_REP) 500.0 (US/M) 100.0

Repeat Delta-T Long Spacing Far (DTLF_REP) 500.0 (US/M) 100.0

Delta-T Long Spacing Near (DTLN) 500.0 (US/M) 100.0

Delta-T Long Spacing Far (DTLF) 500.0 (US/M) 100.0

Delta-T Long (DTL) 500.0 (US/M) 100.0

Delta-T (DT) 500.0 (US/M) 100.0

Repeat Delta-T Long (DTL_REP) 500.0 (US/M) 100.0

Repeat Delta-T (DT_REP) 500.0 (US/M) 100.0

MSFL > MSFL_REP
From MSFL_REP to MSFL

MSFL < MSFL_REP
From MSFL to MSFL_REP

LLS > LLS_REP
From LLS_REP to LLS

LLS < LLS_REP
From LLS to LLS_REP

LLD > LLD_REP
From LLD_REP to LLD

LLD < LLD_REP
From LLD to LLD_REP

Micro SFL Resistivity (MSFL) 0.2 (OHMM) 2000.0

REPEAT OVERLAY

Repeat Micro SFL Resistivity (MSFL_REP) 0.2 (OHMM) 2000.0

GR < GR_REP
From GR to GR_REP

Repeat Laterolog Deep Resistivity (LLD_REP) 0.2 (OHMM) 2000.0

GR > GR_REP
From GR_REP to GR

Repeat Laterolog Shallow Resistivity (LLS_REP) 0.2 (OHMM) 2000.0

Gamma Ray (GR) 0.0 (GAPI) 150.0

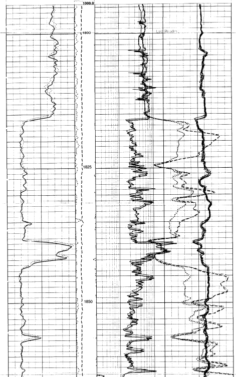
Head Tension (HTEN) (LBF) 0.0 1000.0

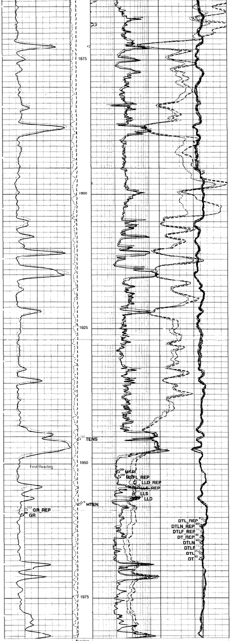
Laterolog Shallow Resistivity (LLS) 0.2 (OHMM) 2000.0

Repeat Gamma Ray (GR_REP) 0.0 (GAPI) 150.0

Tension (TENS) (LBF) 0.0 1000.0

Laterolog Deep Resistivity (LLD) 0.2 (OHMM) 2000.0





Repeat Gamma Ray (GR_REP)
0.0 (GAPI) 150.0

Tension (TENS) (LBF)
0.0 1000.0

Laterolog Deep Resistivity (LLD)
0.2 (OHMM) 2000.0

Gamma Ray (GR)
0.0 (GAPI) 150.0

Head Tension (HTEN) (LBF)
0.0 1000.0

Laterolog Shallow Resistivity (LLS)
0.2 (OHMM) 2000.0

GR > GR_REP
From GR_REP to GR

GR < GR_REP
From GR to GR_REP

REPEAT OVERLAY

Repeat Laterolog Shallow Resistivity (LLS_REP)
0.2 (OHMM) 2000.0

Repeat Laterolog Deep Resistivity (LLD_REP)
0.2 (OHMM) 2000.0

Repeat Micro SFL Resistivity (MSFL_REP)
0.2 (OHMM) 2000.0

Micro SFL Resistivity (MSFL)
0.2 (OHMM) 2000.0

LLD < LLD_REP
From LLD to LLD_REP

LLD > LLD_REP
From LLD_REP to LLD

LLS < LLS_REP
From LLS to LLS_REP

LLS > LLS_REP
From LLS_REP to LLS

MSFL < MSFL_REP
From MSFL to MSFL_REP

MSFL > MSFL_REP
From MSFL_REP to MSFL

Repeat Delta-T (DT_REP)
500.0 (US/M) 100.0

Repeat Delta-T Long (DTL_REP)
500.0 (US/M) 100.0

Delta-T (DT)
500.0 (US/M) 100.0

Delta-T Long (DTL)
500.0 (US/M) 100.0

Delta-T Long Spacing Far (DTLF)
500.0 (US/M) 100.0

Delta-T Long Spacing Near (DTLN)
500.0 (US/M) 100.0

Repeat Delta-T Long Spacing Far (DTLF_REP)
500.0 (US/M) 100.0

Repeat Delta-T Long Spacing Near (DTLN_REP)
500.0 (US/M) 100.0

PIP SUMMARY

▶ Time Mark Every 60.0 S

Format: DLT_REP Vertical Scale: 1:200.0 Graphics File Created: 21-MAR-1993 18:46

## OP System Version: 5C0-423

### Input DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | DLTE .007 | FIELD | 21-MAR-1993 16:55 | 2033.9 M | 1133.4 M |
| DEFAULT | DLTE .005 | FIELD | 21-MAR-1993 16:27 | 1982.4 M | 1794.4 M |

### Output DLIS Files

| | | | |
|---|---|---|---|
| TRANS2 | DLTE .012 | FIELD | 21-MAR-1993 18:46 |
| DEFAULT | DLTE .012 | FIELD | 21-MAR-1993 18:46 |

### Input DLIS Files

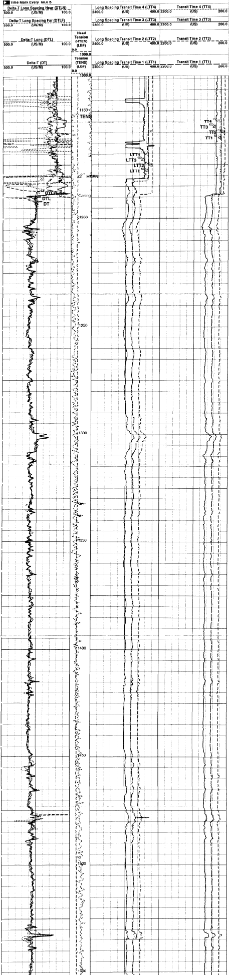
| | | | | | |
|---|---|---|---|---|---|
| DEFAULT | DLTE .007 | FIELD | 21-MAR-1993 16:55 | 2033.9 M | 1133.4 M |

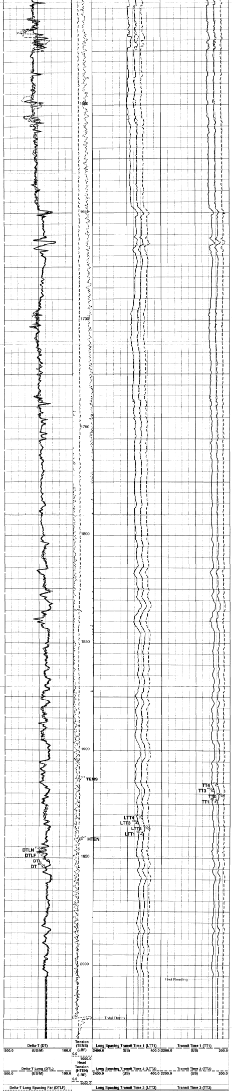
### Output DLIS Files

| | | | | | |
|---|---|---|---|---|---|
| TRANS2 | DLTE .012 | FIELD | 21-MAR-1993 18:46 | 2034.2 M | 1133.7 M |
| DEFAULT | DLTE .012 | FIELD | 21-MAR-1993 18:46 | 2034.2 M | 1133.7 M |

## OP System Version: 5C0-423

SONIC QUALITY LOG





| Delta-T (DT) 500.0 (US/M) 100.0 | Tension (TENS) (LBF) 0.0 1000.0 | Long Spacing Transit Time 1 (LTT1) 2400.0 (US) 400.0 | Transit Time 1 (TT1) 2200.0 (US) 200.0 |
|---|---|---|---|
| Delta-T Long (DTL) 500.0 (US/M) 100.0 | Head Tension (HTEN) (LBF) 0.0 1000.0 | Long Spacing Transit Time 2 (LTT2) 2400.0 (US) 400.0 | Transit Time 2 (TT2) 2200.0 (US) 200.0 |
| Delta-T Long Spacing Far (DTLF) 500.0 (US/M) 100.0 | | Long Spacing Transit Time 3 (LTT3) 2400.0 (US) 400.0 | Transit Time 3 (TT3) 2200.0 (US) 200.0 |
| Delta-T Long Spacing Near (DTLN) 500.0 (US/M) 100.0 | | Long Spacing Transit Time 4 (LTT4) 2400.0 (US) 400.0 | Transit Time 4 (TT4) 2200.0 (US) 200.0 |

SONIC QUALITY LOG

Time Mark Every 60.0 S

Format: SDT_QUAL Vertical Scale: 1:500.0 Graphics File Created: 21-MAR-1993 16:40

## OP System Version: 5C0-423

## Input DLIS Files

| DEFAULT | DLTE .007 | FIELD | 21-MAR-1993 16:55 | 2033.9 M | 1133.4 M |
|---|---|---|---|---|---|

## Output DLIS Files

| | | | |
|---|---|---|---|
| TRANS2 | DLTE .012 | FIELD | 21-MAR-1993 18:46 |
| DEFAULT | DLTE .012 | FIELD | 21-MAR-1993 18:46 |

Calibration and Check Summary

| Measurement | Nominal | Master | Before | After | Change | Limit | Units |
|---|---|---|---|---|---|---|---|
| DUAL LATEROLOG - E Wellsite Calibration - DLT ELECTRONICS CALIBRATION Laterolog Measurement | | | | | | | |
| Before: Mar 21 15:07 1993 After: Mar 21 18:34 1993 | | | | | | | |
| CALIBRATED LLD | 31.62 | N/A | 31.62 | 31.57 | -0.04749 | 0.7000 | UA |
| CALIBRATED LLS | 31.62 | N/A | 31.62 | 31.62 | -0.002405 | 0.7000 | UA |
| Spherical Resistivity - C Wellsite Calibration - Electronics Calibration | | | | | | | |
| Before: Mar 21 15:06 1993 After: Mar 21 18:32 1993 | | | | | | | |
| MSFL Conductivity Zero | 1.000 | N/A | 1.096 | 1.100 | 0.004755 | 2.000 | MM/M |
| MSFL Bucking Current Zero | 0.2000 | N/A | 0.2225 | 0.2245 | 0.002006 | 2.000 | MM/M |
| MSFL Conductivity Plus | 500.0 | N/A | 504.7 | 503.0 | -1.653 | 10.00 | MM/M |
| MSFL Bucking Current Plus | 100.0 | N/A | 95.71 | 94.80 | -0.9032 | 10.00 | MM/M |
| Spherical Resistivity - C Wellsite Calibration - Caliper Calibration | | | | | | | |
| Before: Mar 19 17:06 1993 | | | | | | | |
| CALIPER Downhole | 16.31 | N/A | 16.30 | N/A | N/A | 0.3261 | IN |
| Scintillation Gamma-Ray - L Wellsite Calibration - Detector Calibration | | | | | | | |
| Before: Mar 19 17:06 1993 | | | | | | | |
| Gamma Ray Background | 30.00 | N/A | 6.036 | N/A | N/A | N/A | GAPI |
| Gamma Ray (Jig - Bkg) | 156.7 | N/A | 156.7 | N/A | N/A | 14.25 | GAPI |
| Gamma Ray (Calibrated) | 165.0 | N/A | 166.0 | N/A | N/A | 15.00 | GAPI |

DUAL LATEROLOG - E / Equipment Identification

Primary Equipment:

Auxiliary Equipment:

| | | |
|---|---|---|
| DUAL LATEROLOG ELECTRODE | DLE - E | 1741 |
| Dual Laterolog Sonde | DLS - F | 1799 |
| Dual Laterolog Housing | DLH - CB | 3631 |
| Dual Laterolog Cartridge | DLC - D | 1659 |
| Laterolog Control Module | LCM - AA | 949 |

DUAL LATEROLOG - E Wellsite Calibration

DLT ELECTRONICS CALIBRATION Laterolog Measurement

| Phase | CALIBRATED LLD UA | Value |
|---|---|---|
| Before | | 31.62 |
| After | | 31.57 |
| | 30.82 (Minimum) 31.62 (Nominal) 32.32 (Maximum) | |

| Phase | CALIBRATED LLS UA | Value |
|---|---|---|
| Before | | 31.62 |
| After | | 31.62 |
| | 30.82 (Minimum) 31.62 (Nominal) 32.32 (Maximum) | |

Before: Mar 21 15:07 1993 After: Mar 21 18:34 1993

DUAL LATEROLOG - E Wellsite Calibration

DLT Electronics Calibration Plus Measurement

| Phase | Deep Current Plus UA | Value |
|---|---|---|
| Before | | 342.6 |
| After | | 342.8 |
| | 317.5 (Minimum) 342.5 (Nominal) 367.5 (Maximum) | |

| Phase | Deep Voltage Plus MV | Value |
|---|---|---|
| Before | | 10.82 |
| After | | 10.81 |
| | 9.830 (Minimum) 10.83 (Nominal) 11.83 (Maximum) | |

| Phase | Groningen Voltage Plus MV | Value |
|---|---|---|
| Before | | 11.03 |
| After | | 11.04 |
| | 9.830 (Minimum) 10.83 (Nominal) 11.83 (Maximum) | |

| Phase | Shallow Current Plus UA | Value |
|---|---|---|
| Before | | 339.6 |
| After | | 339.9 |
| | 317.5 (Minimum) 342.5 (Nominal) 367.5 (Maximum) | |

| Phase | Shallow Voltage Plus MV | Value |
|---|---|---|
| Before | | 11.02 |
| After | | 11.02 |
| | 9.830 (Minimum) 10.83 (Nominal) 11.83 (Maximum) | |

Before: Mar 21 15:07 1993 After: Mar 21 18:34 1993

DUAL LATEROLOG - E Wellsite Calibration

DLT Electronics Calibration Zero Measurement

| Phase | Deep Current Zero UA | Value |
|---|---|---|
| Before | | -0.06554 |
| After | | -0.09043 |
| | -1.000 (Minimum) 0 (Nominal) 1.000 (Maximum) | |

| Phase | Deep Voltage Zero MV | Value |
|---|---|---|
| Before | | -0.003566 |
| After | | -0.02666 |
| | -0.1000 (Minimum) 0 (Nominal) 0.1000 (Maximum) | |

| Phase | Groningen Voltage Zero MV | Value |
|---|---|---|
| Before | | -0.007107 |
| After | | -0.01055 |
| | -0.1000 (Minimum) 0 (Nominal) 0.1000 (Maximum) | |

| Phase | Shallow Current Zero UA | Value |
|---|---|---|
| Before | | -0.08213 |
| After | | -0.1136 |
| | -1.000 (Minimum) 0 (Nominal) 1.000 (Maximum) | |

| Phase | Shallow Voltage Zero MV | Value |
|---|---|---|
| Before | | -0.007261 |
| After | | -0.02648 |
| | -0.1000 (Minimum) 0 (Nominal) 0.1000 (Maximum) | |

Before: Mar 21 15:06 1993 After: Mar 21 18:33 1993

Spherical Resistivity - C / Equipment Identification

Primary Equipment:

| | | |
|---|---|---|
| Density Resistivity Sonde | DRS - C | 2701 |
| Spherical Resistivity Electronics | SRE - D | 782 |

Auxiliary Equipment:

| | | |
|---|---|---|
| Spherical Resistivity Adapter | SRA - A | 2765 |
| Electronics Cartridge Housing | ECH - KQ | 718 |

Spherical Resistivity - C Wellsite Calibration

Electronics Calibration

| Phase | MSFL Conductivity Zero MM/M | Value |
|---|---|---|
| Before | | 1.096 |
| After | | 1.100 |
| | -1.000 (Minimum) 1.000 (Nominal) 3.000 (Maximum) | |

| Phase | MSFL Bucking Current Zero MM/M | Value |
|---|---|---|
| Before | | 0.2225 |
| After | | 0.2245 |
| | -35.80 (Minimum) 0.2000 (Nominal) 36.20 (Maximum) | |

| Phase | MSFL Conductivity Plus MM/M | Value |
|---|---|---|
| Before | | 504.7 |
| After | | 503.0 |
| | 450.0 (Minimum) 500.0 (Nominal) 550.0 (Maximum) | |

| Phase | MSFL Bucking Current Plus MM/M | Value |
|---|---|---|
| Before | | 95.71 |
| After | | 94.80 |
| | 90.00 (Minimum) 100.0 (Nominal) 110.0 (Maximum) | |

Before: Mar 21 15:06 1993 After: Mar 21 18:32 1993

Spherical Resistivity - C Wellsite Calibration

Caliper Calibration

| Phase | CALIPER Small Ring IN | Value |
|---|---|---|
| Before | | 7.029 |
| | 4.000 (Minimum) 6.000 (Nominal) 9.000 (Maximum) | |

| Phase | CALIPER Large Ring IN | Value |
|---|---|---|
| Before | | 11.75 |
| | 9.600 (Minimum) 12.00 (Nominal) 18.00 (Maximum) | |

| Phase | CALIPER Downhole IN | Value |
|---|---|---|
| Before | | 16.30 |
| | 14.68 (Minimum) 16.31 (Nominal) 17.94 (Maximum) | |

Before: Mar 19 17:06 1993

Scintillation Gamma-Ray - L / Equipment Identification

Primary Equipment:

| | | |
|---|---|---|
| Scintillation Gamma Cartridge | SGC - SA | 1244 |
| Scintillation Gamma Detector | SGD - TAA | 4245 |

Auxiliary Equipment:

| | | |
|---|---|---|
| Scintillation Gamma Housing | SGH - K | 1565 |
| Gamma Source Radioactive | GSR - U/Y | |

Scintillation Gamma-Ray - L Wellsite Calibration

Detector Calibration

| Phase | Gamma Ray Background GAPI | Value |
|---|---|---|
| Before | | 6.036 |
| | 0 (Minimum) 30.00 (Nominal) 120.0 (Maximum) | |

| Phase | Gamma Ray (Jig - Bkg) GAPI | Value |
|---|---|---|
| Before | | 156.7 |
| | 142.5 (Minimum) 156.7 (Nominal) 171.0 (Maximum) | |

| Phase | Gamma Ray (Calibrated) GAPI | Value |
|---|---|---|
| Before | | 165.0 |
| | 150.0 (Minimum) 165.0 (Nominal) 180.0 (Maximum) | |

Before: Mar 19 17:06 1993

| | | | |
|---|---|---|---|
| COMPANY: | **BHP PETROLEUM** | BOTTOM LOG INTERVAL | 2019 M |
| | | SCHLUMBERGER DEPTH | 2024 M |
| WELL: | **MINERVA-1** | DEPTH DRILLER | 2031 M |
| FIELD: | **WILDCAT** | KELLY BUSHING | 25.3 M |
| RIG NAME: | **BYFORD** | DRILL FLOOR | 25 M |
| COUNTRY: | **AUSTRALIA** | GROUND LEVEL | -57 M |

**SUITE-2, RUN-2 1/200**
**DLL-MSFL-AS-GR-AMS-SP**