|  |  |
|---|---|
| Company | CHESAPEAKE ENERGY |
| Well | WRD FEDERAL 4-23 |
| Field | WHITE RIVER DOME |
| County | RIO BLANCO State CO |

# ACOUSTIC CEMENT BOND LOG

|  |  |  |  |
|---|---|---|---|
| Company | CHESAPEAKE ENERGY |  |  |
| Well | WRD FEDERAL 4-23 |  |  |
| Field | WHITE RIVER DOME |  |  |
| County | RIO BLANCO | State | CO |

API No.: 0510310999 Serv #: 5313631

Location: SURFACE HOLE:
781' FSL & 903' FEL

Other Services
PERF

Sec: 23 Twp:2N Rge: 97W

|  |  |  |  |
|---|---|---|---|
| Permanent Datum | GROUND LEVEL | Elevation | 5960' |
| Log Measured From | K.B. , 17' Ft. above perm. datum |  |  |
| Drilling Measured From | K.B. |  |  |

Elevation
K.B. 5977'
D.F. 5960'
G.L. 5976'

|  |  |  |  |
|---|---|---|---|
| Date @ Time Logged | 21 AUG 2007 @ 1100 | Type Fluid in Hole | FRESH WATER |
| Run No. | ONE | Density of Fluid | 8.34 PPG |
| Depth - Driller | 7350' | Fluid Level | FULL |
| Depth - Logger | 7256' | Cement Top Est. Logged | 4300' |
| Bottom - Logged Interval | 7248' | Equipment / Location | 88022 / G.J. |
| Top - Log Interval | 3900' | Recorded by | RETZLAFF/SPARKS |
| Max. Recorded Temp. | 168 DEG F | Witnessed by | DOWHANIUK |

| CEMENTING DATA | Surface String | Protection String | Production String | Liner |
|---|---|---|---|---|
| Date / Time Cemented |  |  |  |  |
| Primary / Squeeze |  |  |  |  |
| Expected Compressive Strength | psi@ hrs | psi@ hrs | psi@ hrs | psi@ hrs |
| Cement Volume |  |  |  |  |
| Cement Type / Weight | / | / | / | / |
| Formulation |  |  |  |  |
| Mud Type / Mud Wgt. | / | / | / | / |

| Borehole Record |  |  |  | Casing & Tubing Record |  |  |  |
|---|---|---|---|---|---|---|---|
| Run Number | Bit | From | To | Size | Weight | From | To |
| ONE | N/A | SURFACE | 1157' | 8.625" | N/A | SURFACE | 1157' |
| TWO | 7.875" | 1157' | 7350' | 5.5" | 17# | SURFACE | 7352' |
|  |  |  |  |  |  |  |  |

<<< Fold Here >>>

HALLIBURTON DOES NOT GUARANTEE THE ACCURACY OF ANY INTERPRETATION OF THE LOG DATA, CONVERSION OF LOG DATA TO PHYSICAL ROCK PARAMETERS OR RECOMMENDATIONS WHICH MAY BE GIVEN BY HALLIBURTON PERSONNEL OR WHCIH APPEAR ON THE LOG OR IN ANY OTHER FORM. ANY USER OF SUCH DATA, INTERPRETATIONS, CONVERSIONS, OR RECOMMENDATIONS AGREES THAT HALLIBURTON IS NOT RESPONSIBLE EXCEPT WHERE DUE TO GROSS NEGLIGENCE OR WILLFUL MISCONDUCT, FOR ANY LOSS, DAMAGES, OR EXPENSES RESULTING FROM THE USE THEREOF.

## Comments

HES BOND LOG DATED 21 AUG 2007 WAS CORRELATED TO SCHLMBERGER ARRAY INDUCTION TLOG DATED 24 JULY 2007.

LOGGING INTERVALS PER CUSTOMER REQUEST.

NO SHORT JOINT PRESENT.

YOUR HES CREW: M. SHEA, P. KILPATRIC, & D. NALL.
***THANK YOU FOR USING HALLIBURTON ENERGY SERVICES***

| Service Ticket No. | 5313631 | API No. | 0510310999 | PGM Ver | WARRIOR 7.2 |
|---|---|---|---|---|---|

The Well Name, Location, Borehole Description, and / or Cementing Data Furnished by Client

## EQUIPMENT DATA

| CBL | | GR | | CCL | | | |
|---|---|---|---|---|---|---|---|
| Run No. | ONE | Run No. | ONE | Run No. | ONE | Run No. | |
| Serial No. | 142E1 | Serial No. | 142E1 | Serial No. | 142-E1 | Serial No. | |
| Model No. | CBT HA-CBT | Model No. | GR-UGR-HA | Model No. | CCLCBT-UCCL-UM | Model No. | |
| Diameter | 3.25" | Diameter | 3.38" | Diameter | 3.38" | Diameter | |

## LOGGING DATA

### General Data

| Pass | Depths | | Well Head | Speed | Logging Run Comments |
|---|---|---|---|---|---|
| No. | From | To | Pressure | Ft/Min | |
| ONE | 7260' | 3900' | 0 PSI | 60 | MAIN LOG SECTION |
| TWO | 7260' | 7000' | 0 PSI | 60 | REPEAT LOG ESCTION |

| | CBL | | GR | | CCL | | | |
|---|---|---|---|---|---|---|---|---|
| Pass | Scale | | Scale | | Scale | | Scale | |
| No. | L | R | L | R | L | R | L | L |
| ONE | 200 | 1200 | 0 | 200 | 90 | -10 | | |
| | | | | | | | | |

## DIRECTIONAL INFORMATION

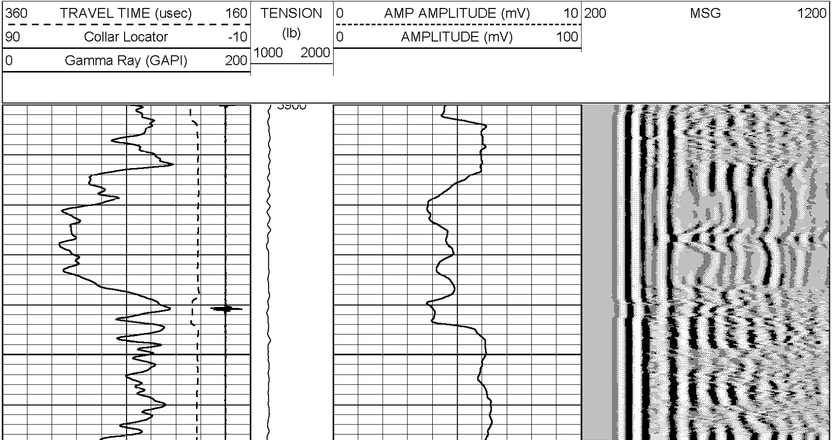
| Maximum Deviation | | deg. @ | | KOP | | |
|---|---|---|---|---|---|---|

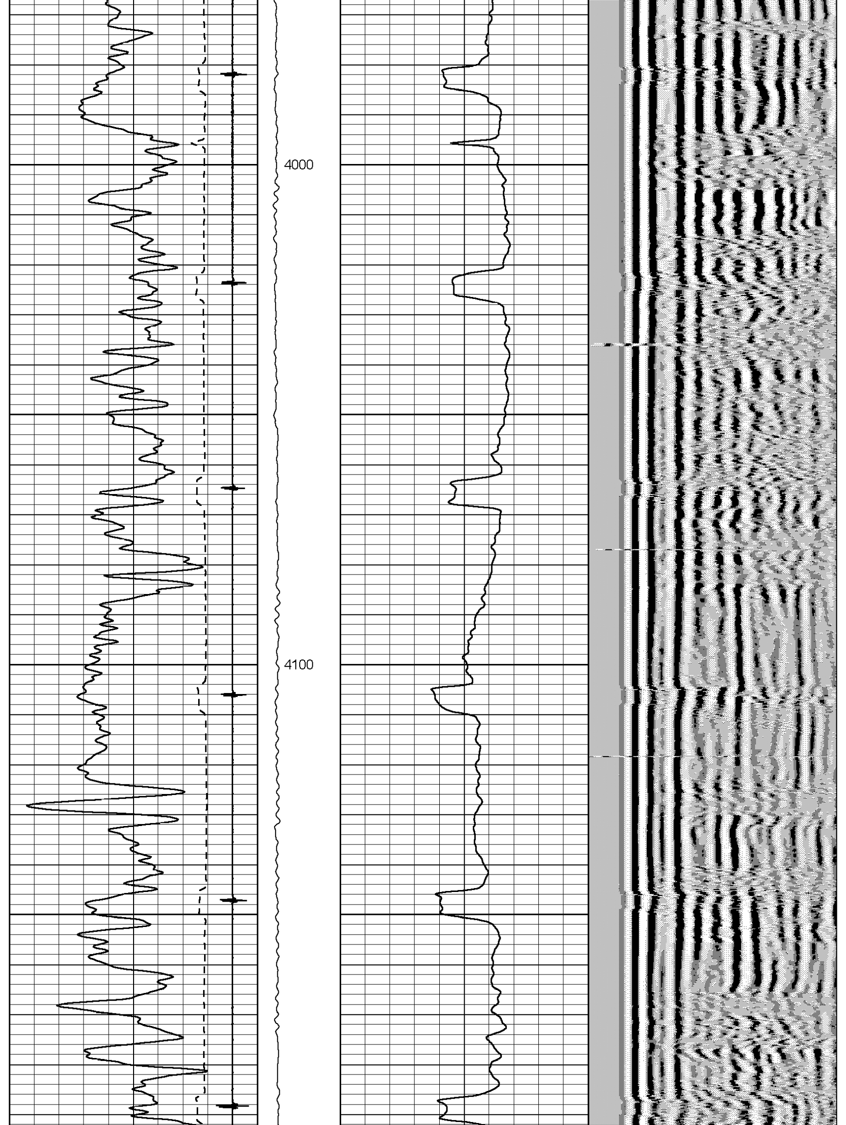
HALLIBURTON

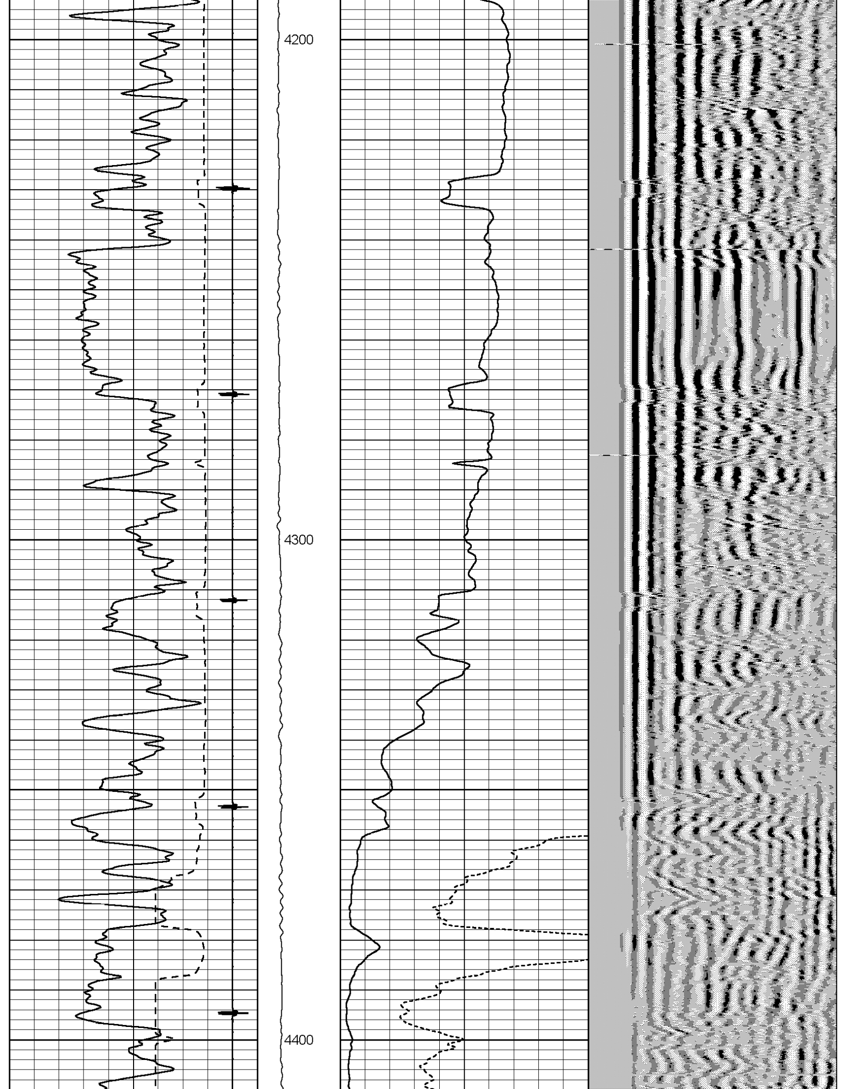
# ACOUSTIC CEMENT BOND LOG

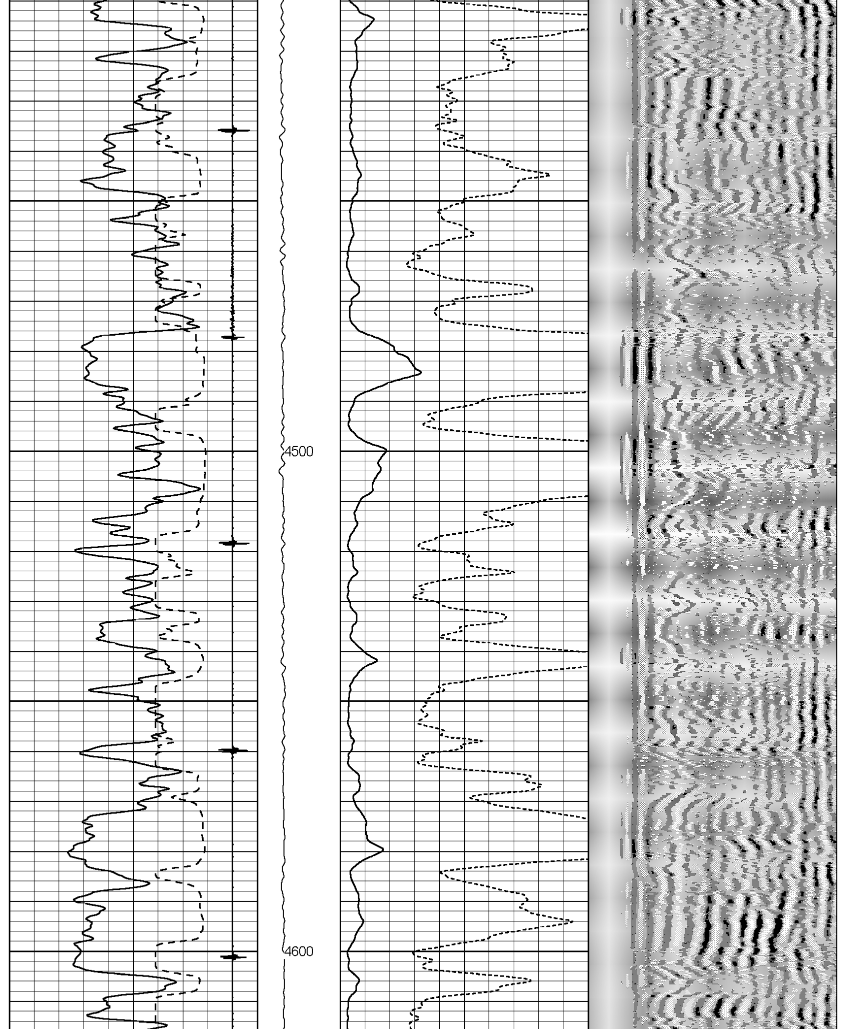
## MAIN LOG SECTION
## 5" = 100'

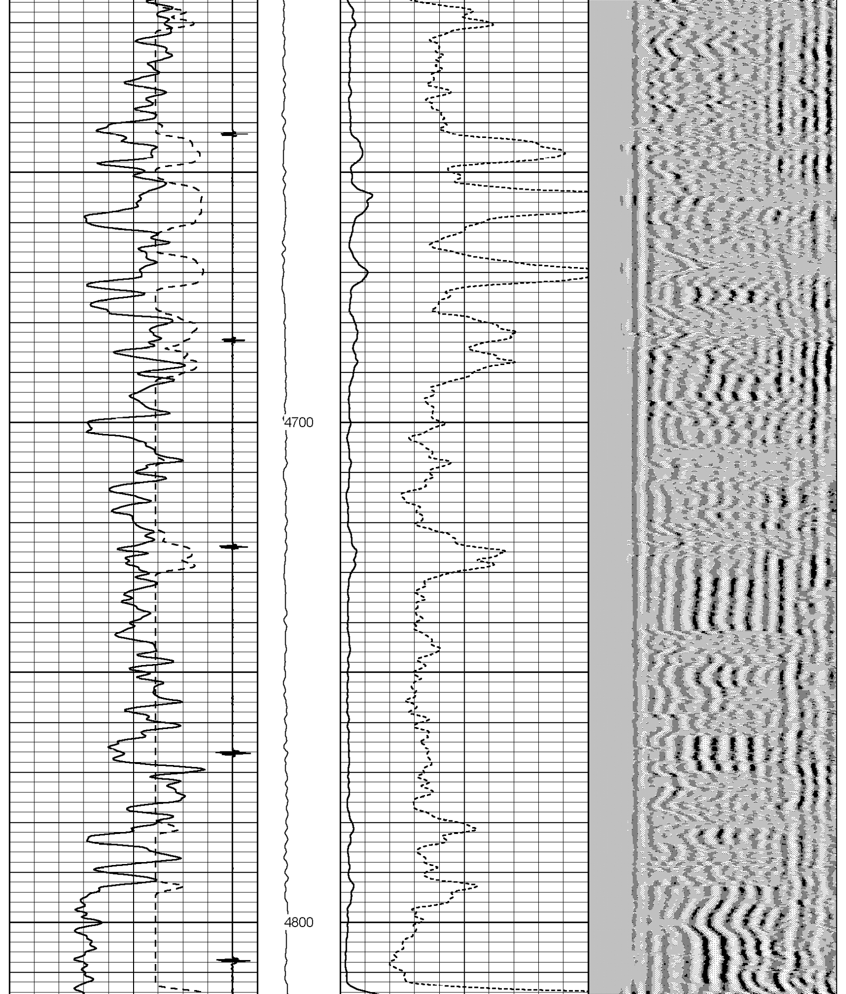
| | |
|---|---|
| Database File: | wrd_fed_4_23.db |
| Dataset Pathname: | whtrvrdme/wrd_fed_4/cbl/merge1 |
| Presentation Format: | cblmain |
| Dataset Creation: | Tue Aug 21 14:49:58 2007 |
| Charted by: | Depth in Feet scaled 1:240 |

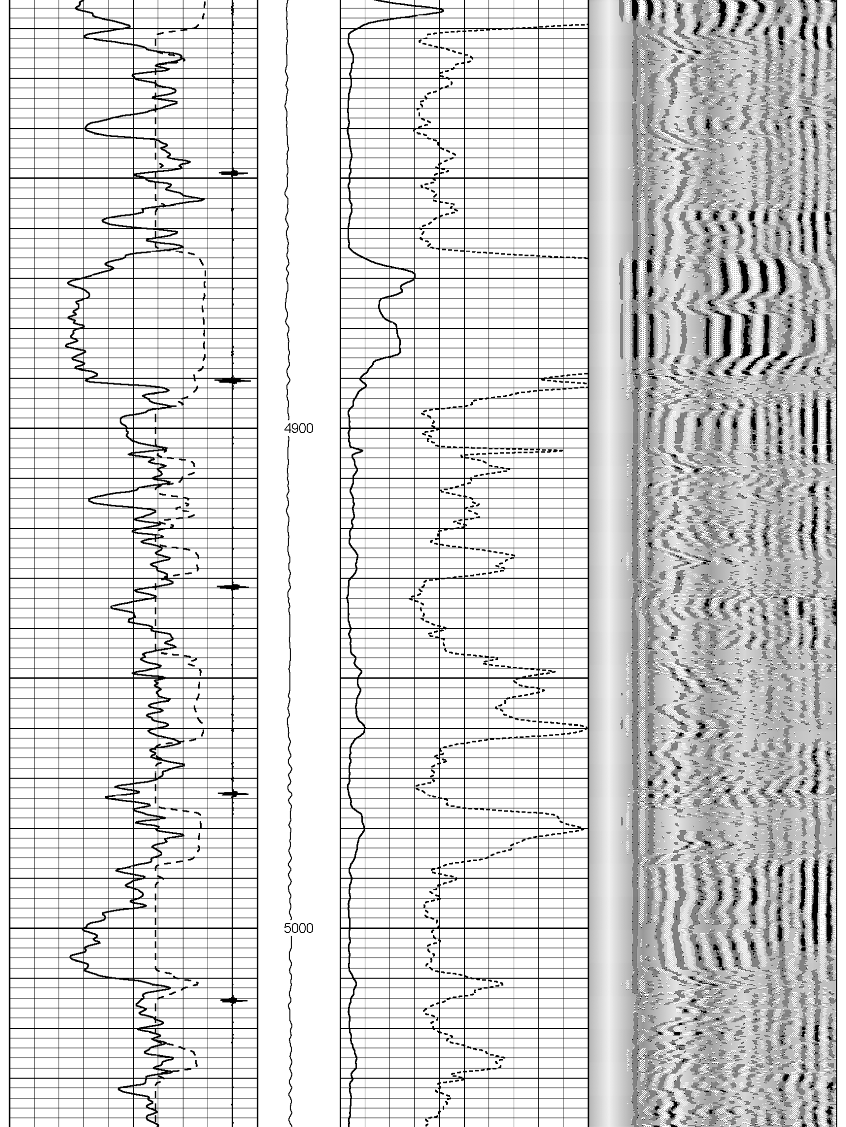


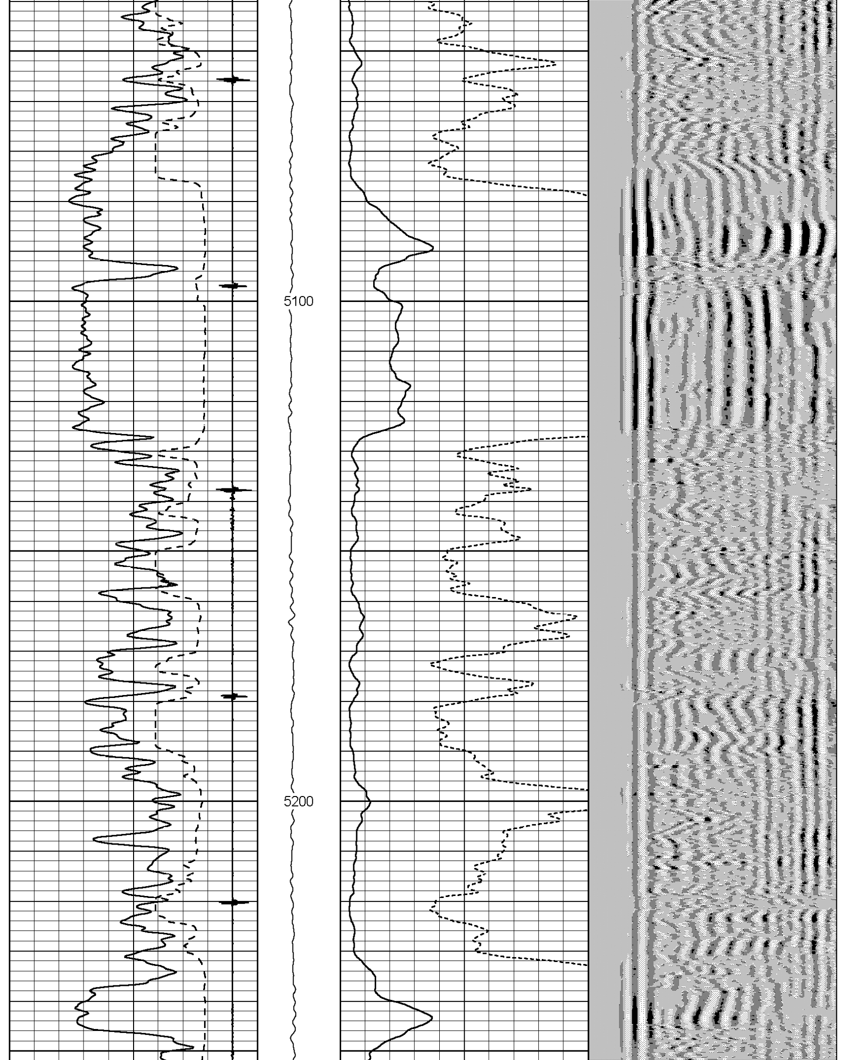


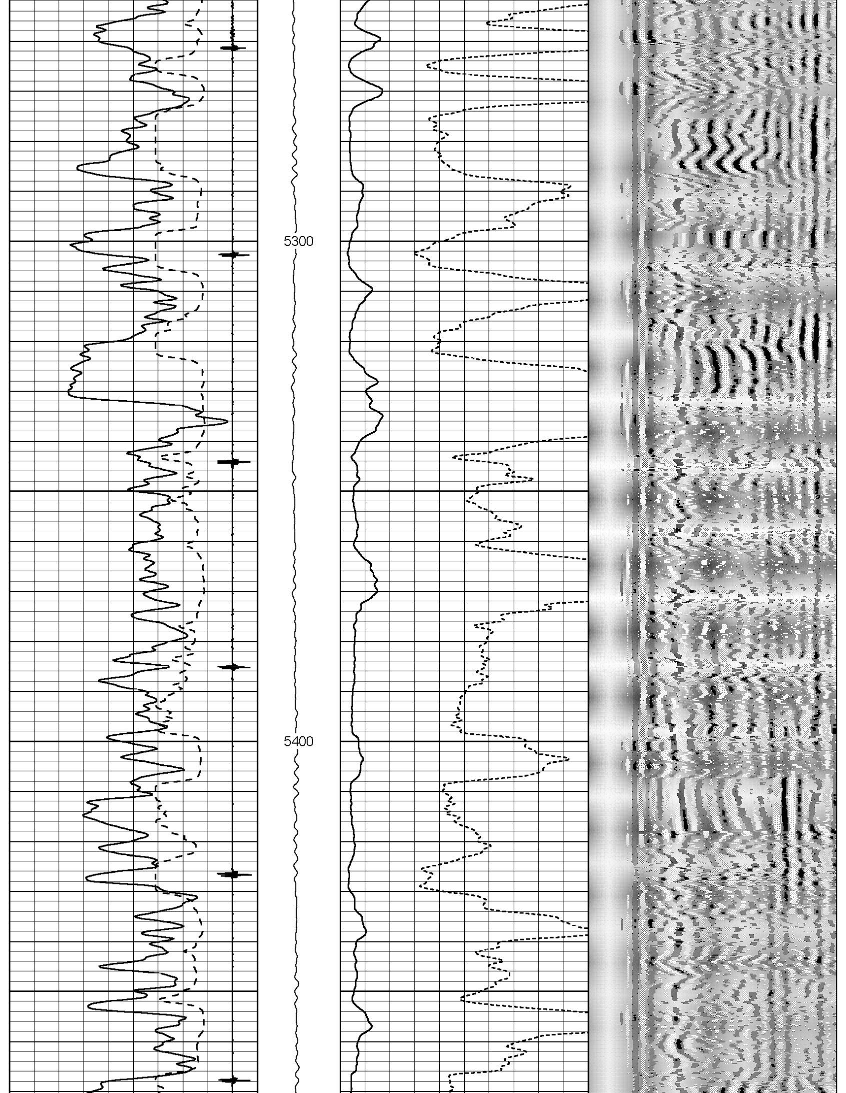


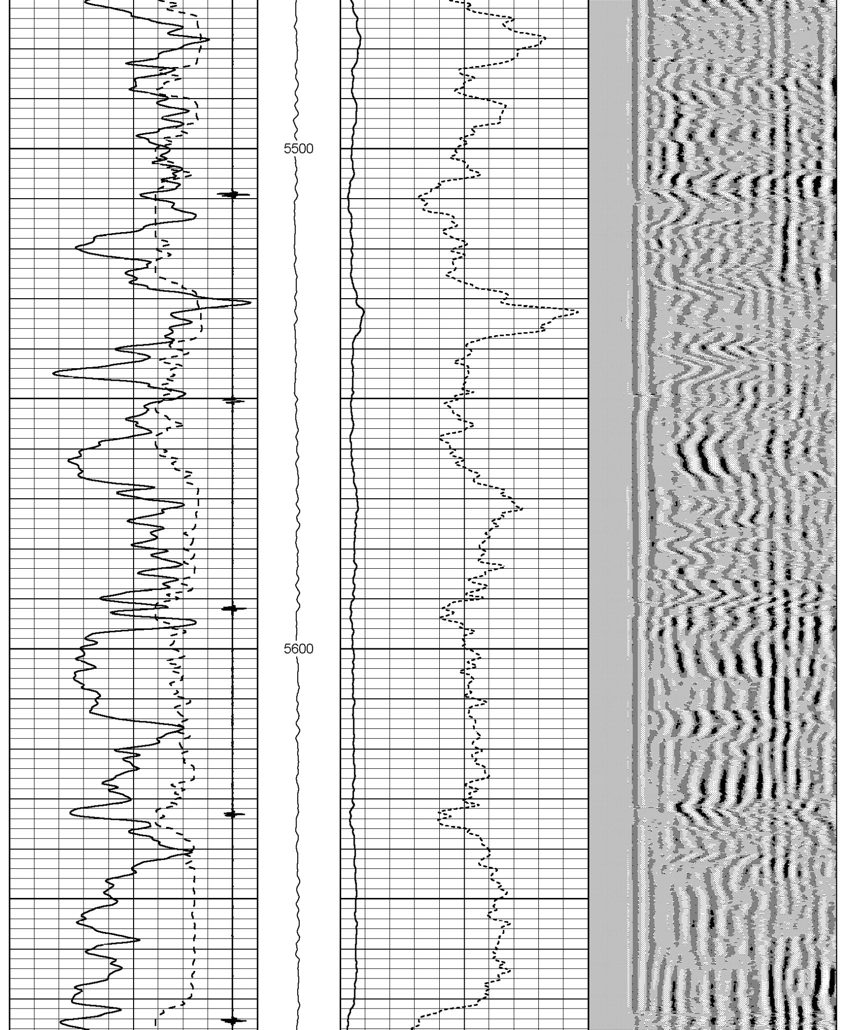


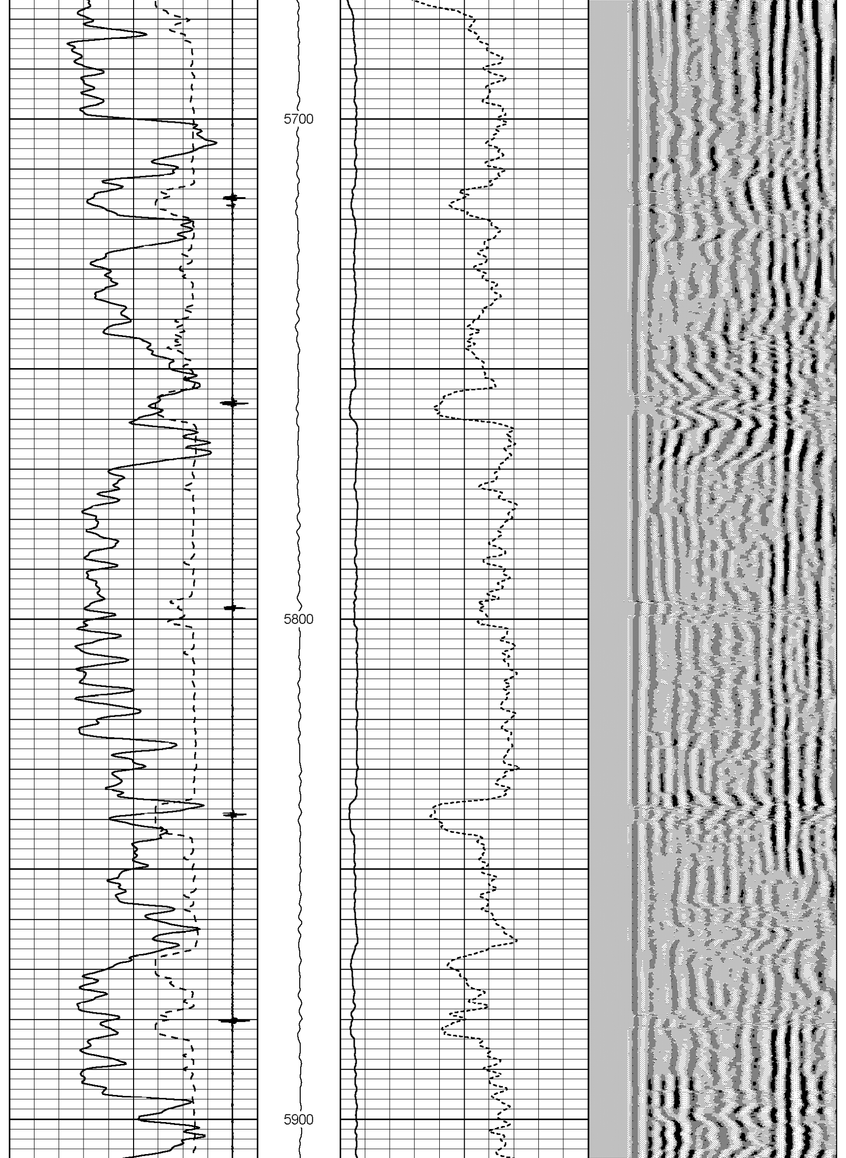


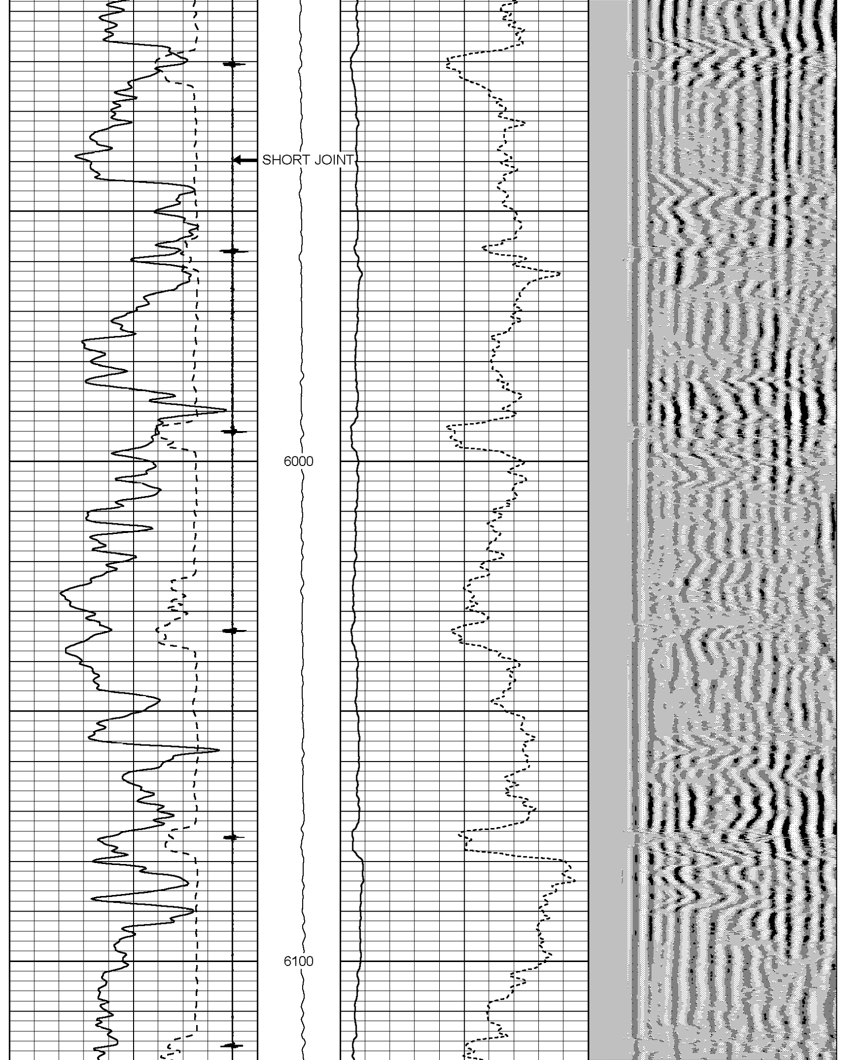


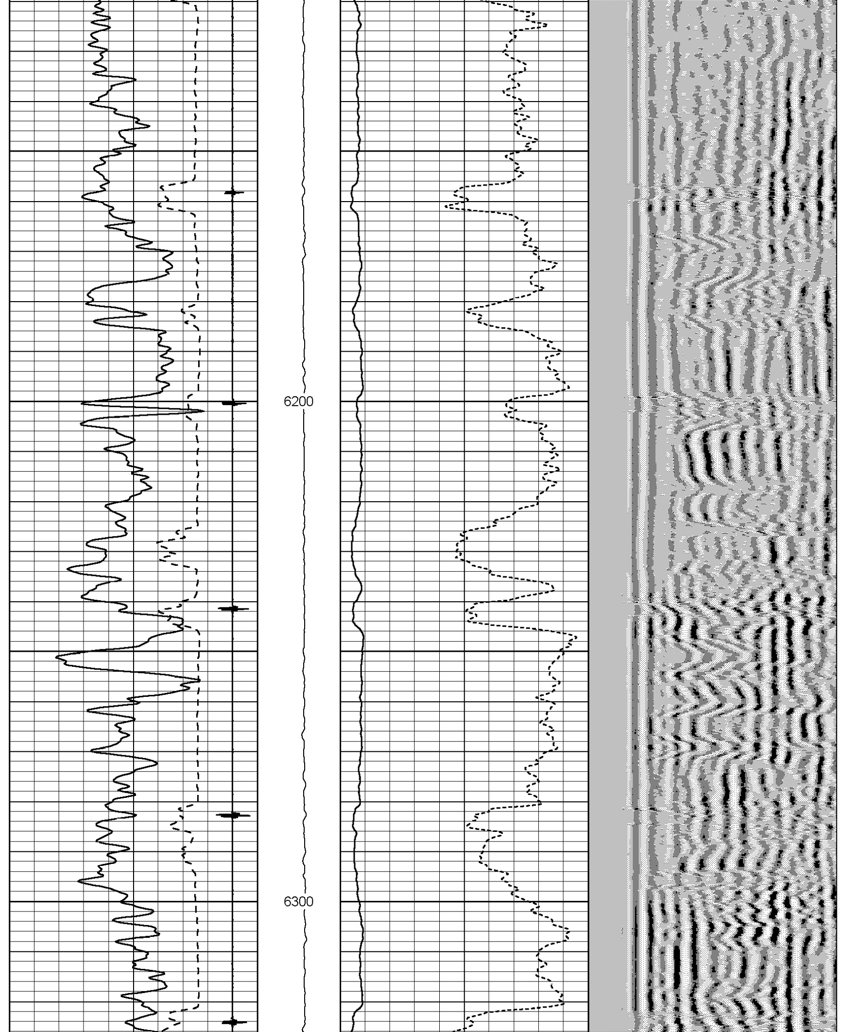


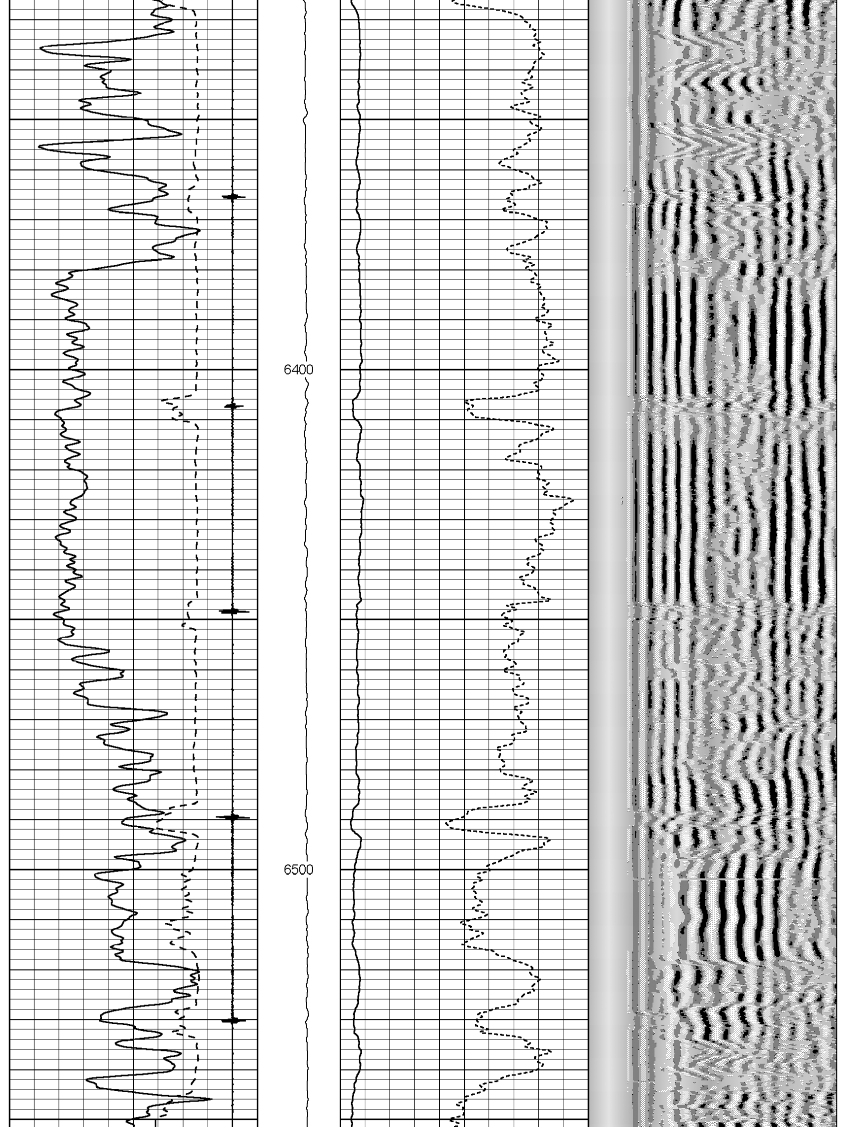


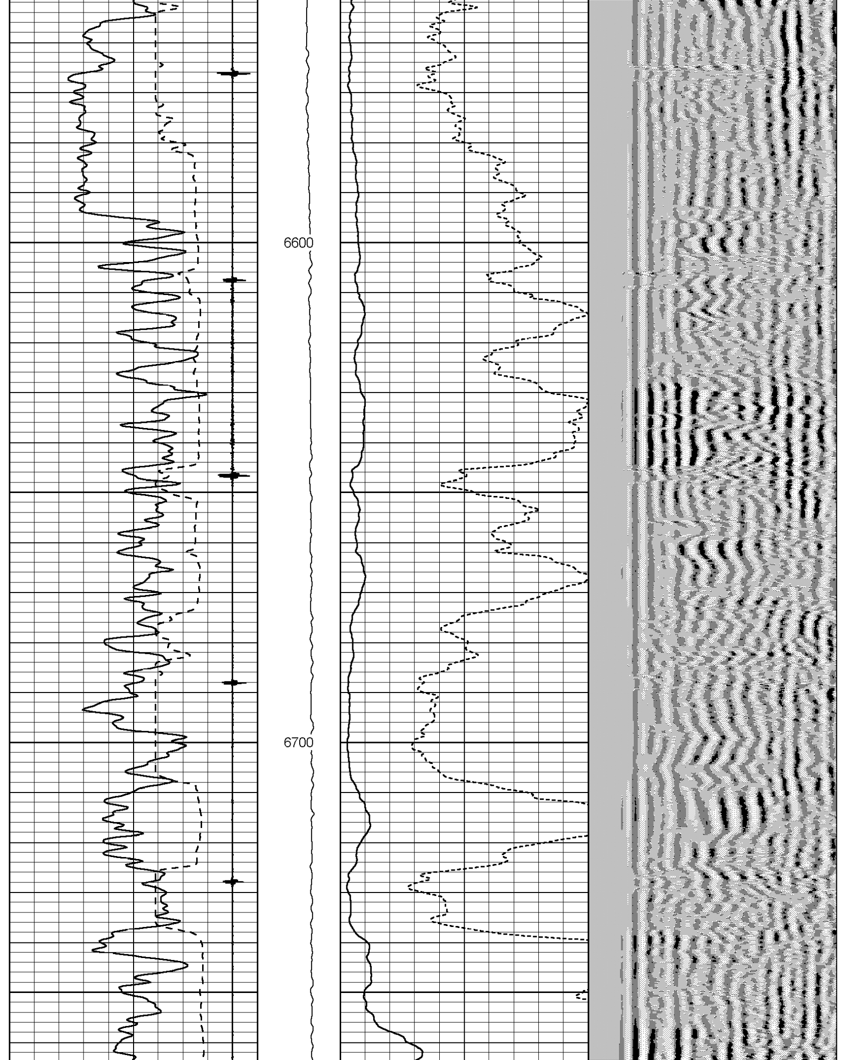


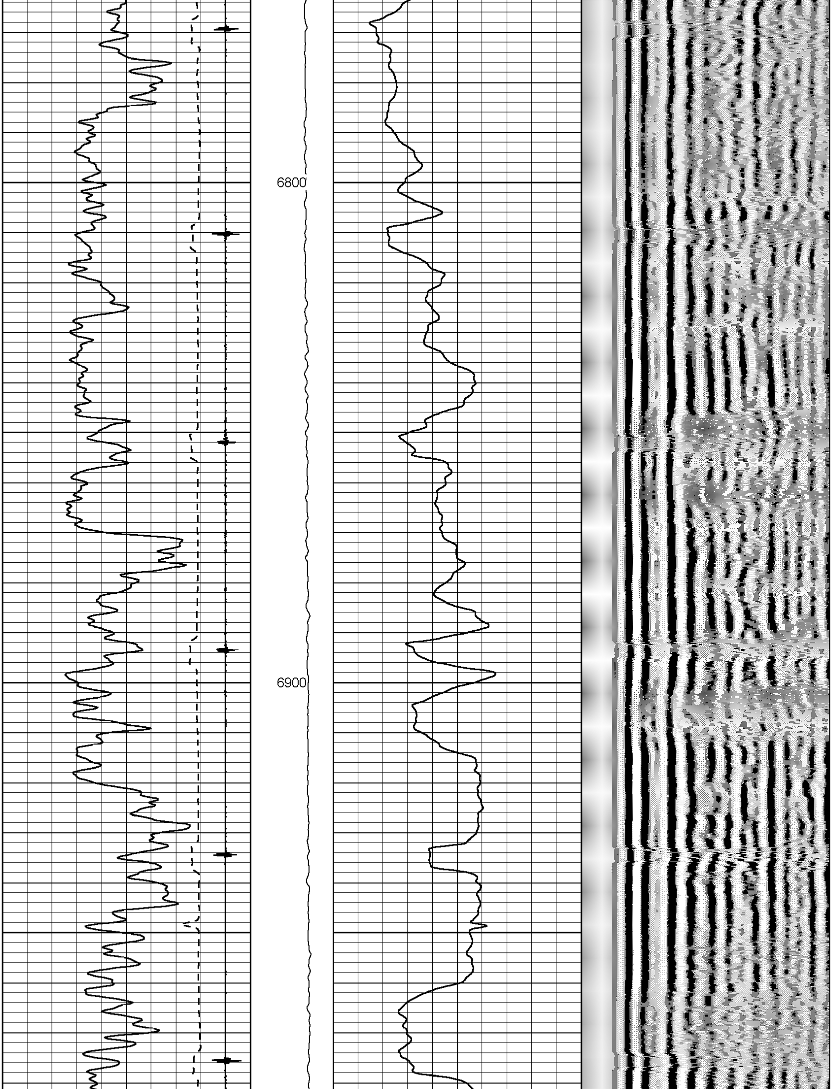


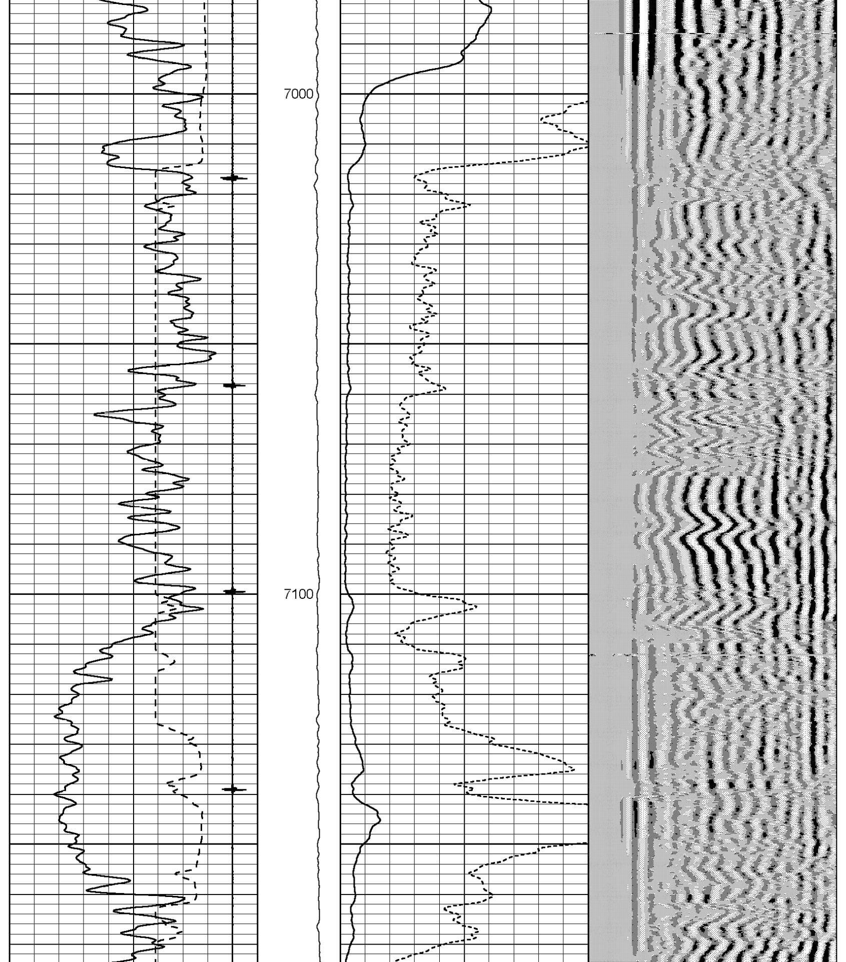


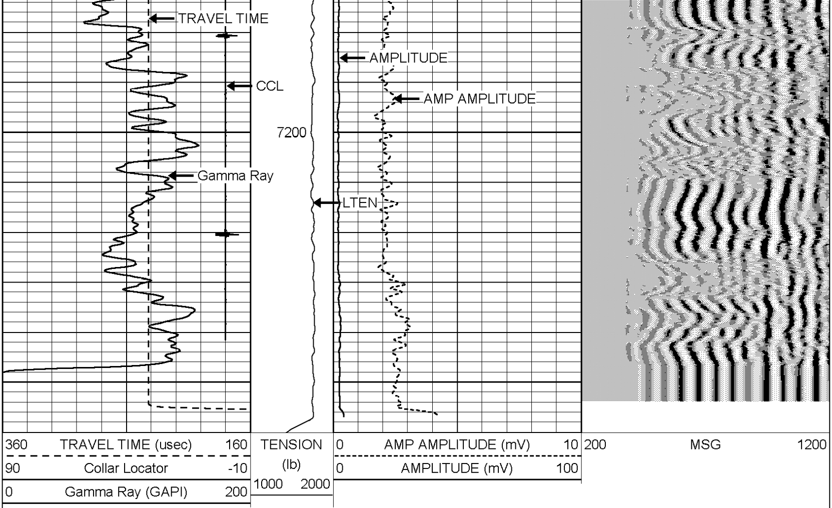












HALLIBURTON

# ACOUSTIC CEMENT BOND LOG

## MAIN LOG SECTION

5" = 100'

HALLIBURTON

# ACOUSTIC CEMENT BOND LOG

## REPEAT LOG SECTION

5" = 100'

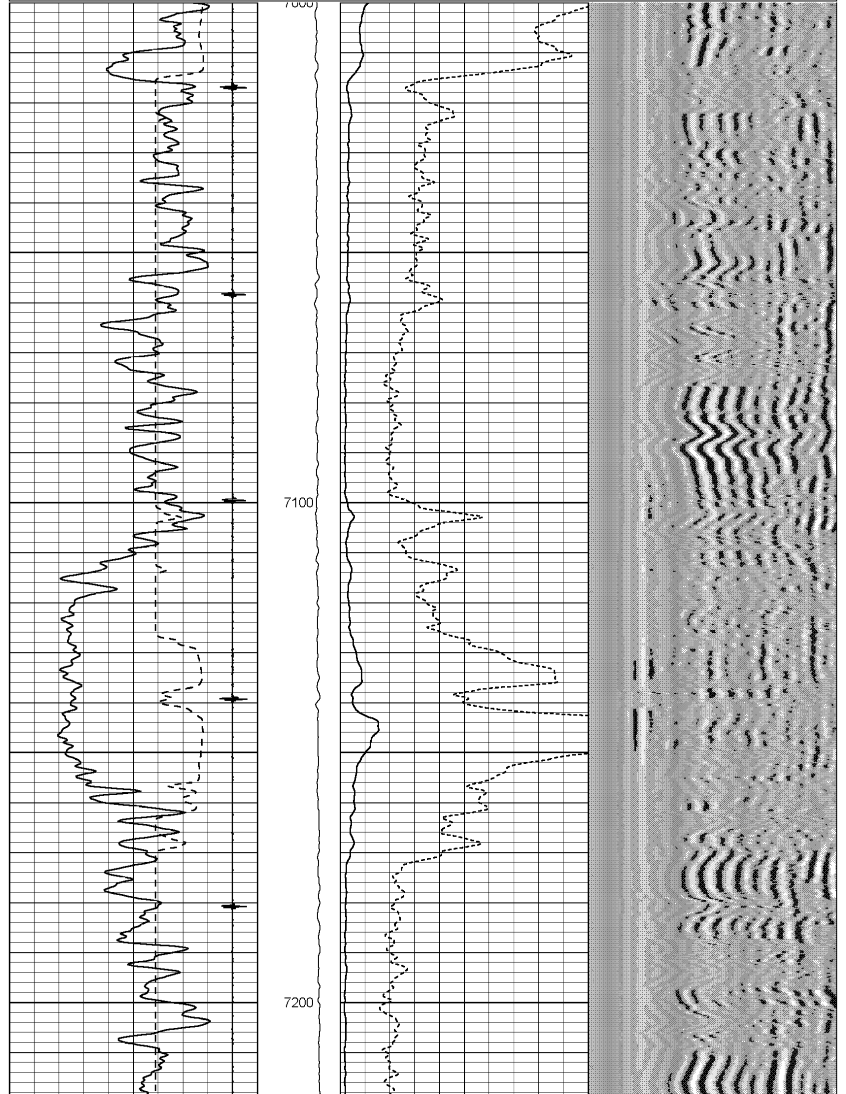
| | |
|---|---|
| Database File: | wrd_fed_4_23.db |
| Dataset Pathname: | whtrvrdme/wrd_fed_4/cbl/repeat |
| Presentation Format: | cblmain |
| Dataset Creation: | Tue Aug 21 12:45:06 2007 by Log Halliburton Casedho |
| Charted by: | Depth in Feet scaled 1:240 |

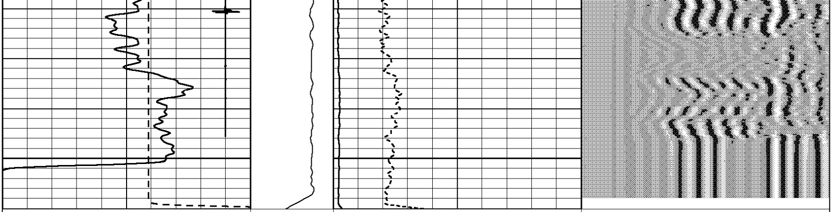
360 TRAVEL TIME (usec) 160
90 Collar Locator -10
0 Gamma Ray (GAPI) 200

LTEN (lb)
1000 2000

0 AMP AMPLITUDE (mV) 10
0 AMPLITUDE (mV) 100

200 MSG 1200





| 360 TRAVEL TIME (usec) 160 | LTEN (lb) | 0 AMP AMPLITUDE (mV) 10 | 200 MSG 1200 |
|---|---|---|---|
| 90 Collar Locator -10 | 1000 2000 | 0 AMPLITUDE (mV) 100 | |
| 0 Gamma Ray (GAPI) 200 | | | |

HALLIBURTON

# ACOUSTIC CEMENT BOND LOG

REPEAT LOG SECTION
5" = 100'

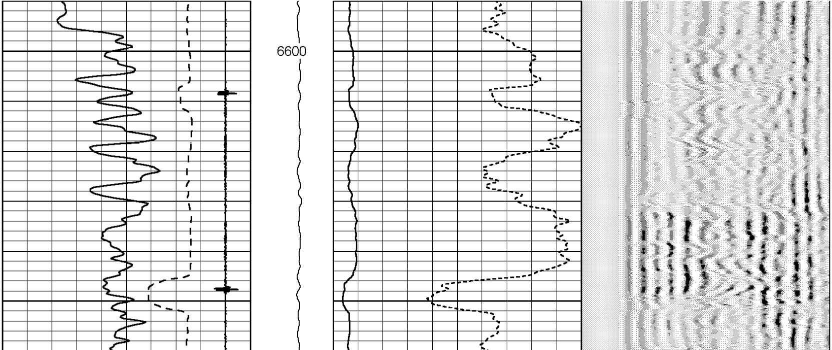
HALLIBURTON

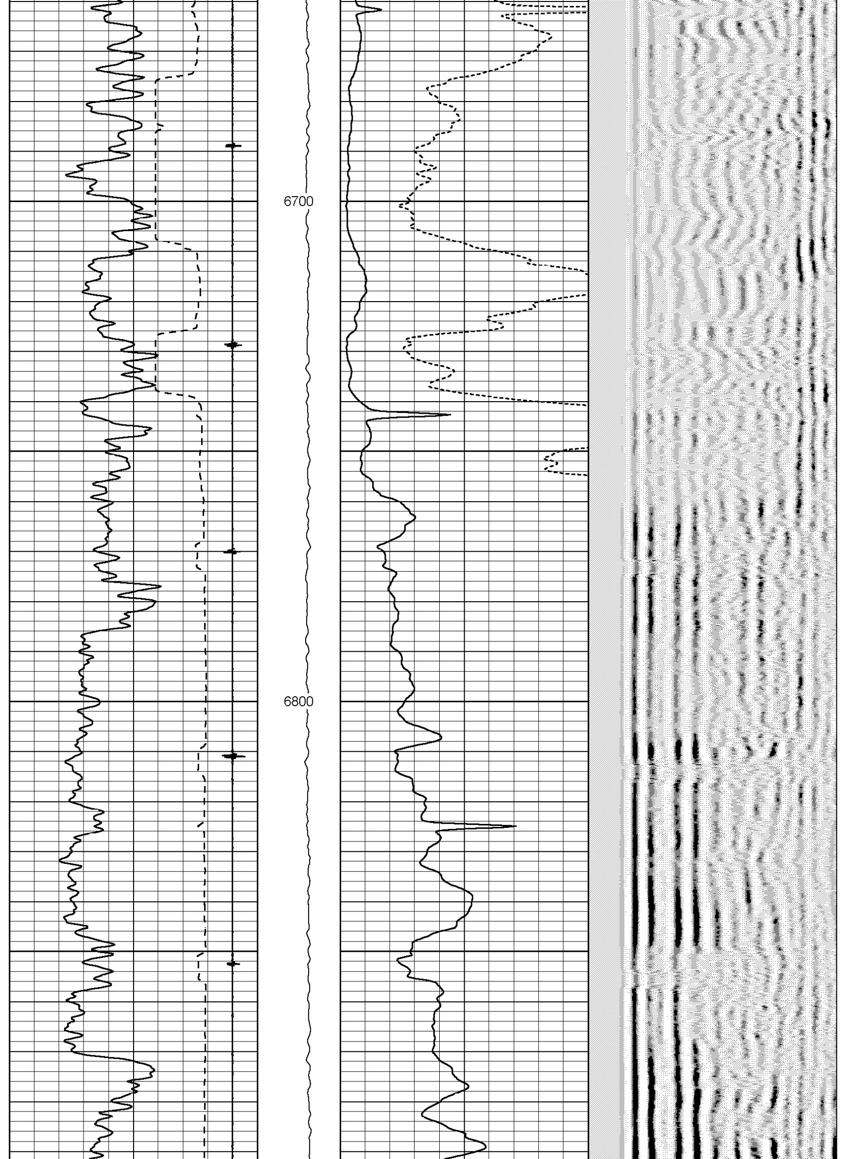
# ACOUSTIC CEMENT BOND LOG

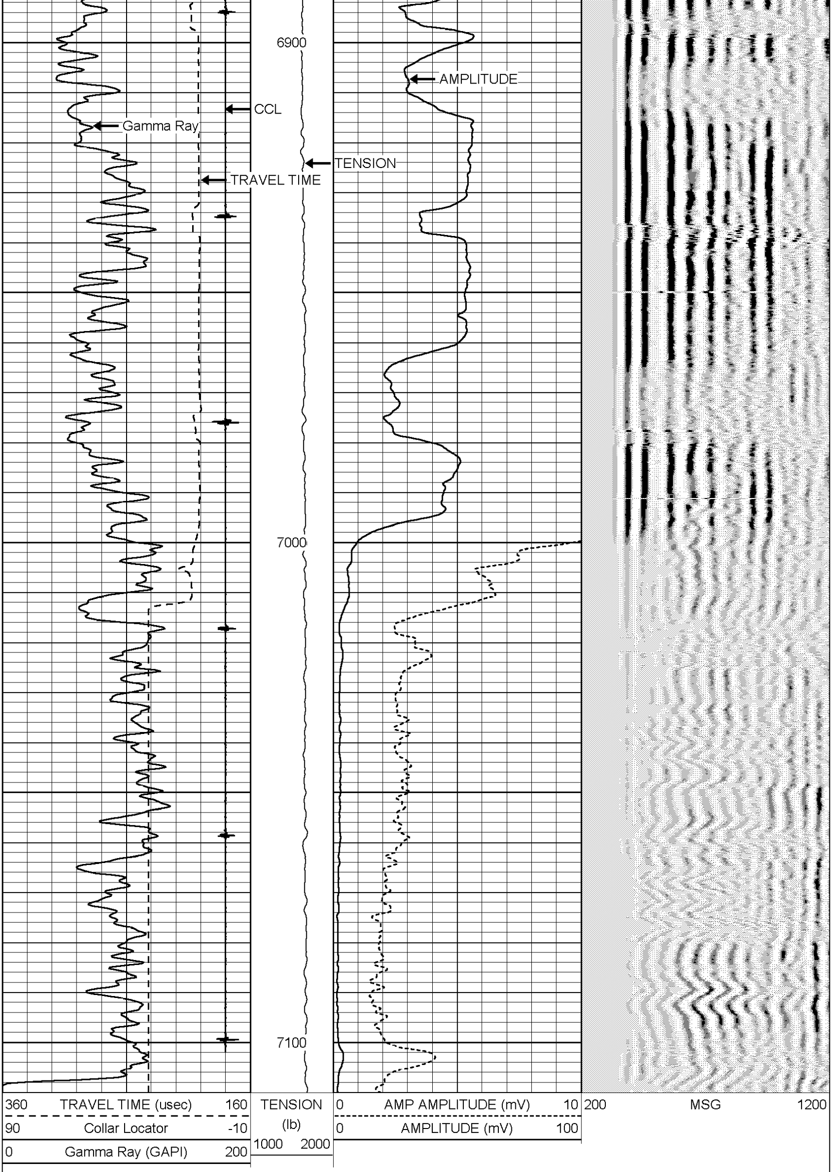
2000 PSI
5" =100'

| | |
|---|---|
| Database File: | wrd_fed_4_23.db |
| Dataset Pathname: | whtrvrdme/wrd_fed_4/cbl/pressure_ |
| Presentation Format: | cblmain |
| Dataset Creation: | Wed Aug 22 07:26:10 2007 by Log Halliburton Casedho |
| Charted by: | Depth in Feet scaled 1:240 |

| 360 TRAVEL TIME (usec) 160 | TENSION (lb) | 0 AMP AMPLITUDE (mV) 10 | 200 MSG 1200 |
|---|---|---|---|
| 90 Collar Locator -10 | 1000 2000 | 0 AMPLITUDE (mV) 100 | |
| 0 Gamma Ray (GAPI) 200 | | | |







HALLIBURTON

# ACOUSTIC CEMENT BOND LOG

2000 PSI
5" = 100'

## Calibration Report

Database File: wrd_fed_4_23.db
Dataset Pathname: whtrvrdme/wrd_fed_4/cbl/merge1
Dataset Creation: Tue Aug 21 14:49:58 2007

## Segmented Cement Bond Log Calibration Report

| | | |
|---|---|---|
| Serial Number: | 142E1 | |
| Tool Model: | CBT_HA | |
| Calibration Casing Diameter: | 5.500 | in |
| Calibration Depth: | 1061.973 | ft |

Master Calibration, performed Tue Aug 21 12:10:35 2007:

| | Raw (v) | | Calibrated (mv) | | Results | |
|---|---|---|---|---|---|---|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| 3' | -0.007 | 0.209 | 2.000 | 71.921 | 323.868 | 4.198 |
| CAL | | | | | | |
| 5' | -0.008 | 0.273 | 2.000 | 71.921 | 249.084 | 3.919 |

Internal Reference Calibration, performed Wed Dec 31 17:00:00 1969:

| | Raw (v) | | Calibrated (v) | | Results | |
|---|---|---|---|---|---|---|
| | Zero | Cal | Zero | Cal | Gain | Offset |
| CAL | | | | | | |

Air Zero Calibration, performed Wed Dec 31 17:00:00 1969:

| | Raw (v) | Calibrated (v) | Results |
|---|---|---|---|
| | Zero | Zero | Offset |
| 3' | 0.000 | 0.000 | 0.000 |
| 5' | 0.000 | 0.000 | 0.000 |

## Gamma Ray Calibration Report

Type / Serial: UGR-HA / 142E1

SHOP CALIBRATION Tue Aug 21 11:12:38 2007

| | Counts/Sec. | Gain | Offset | Jig | Units |
|---|---|---|---|---|---|
| Background | 144.1 | | | | cps |
| Calibrator | 597.4 | | | | cps |
| | | 0.5669 | | | GAPI/cps |

PRIMARY VERIFICATION Tue Aug 21 11:14:58 2007

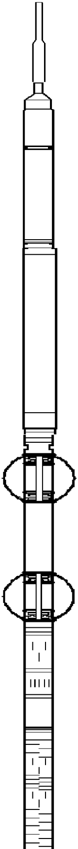
| | Counts/Sec. | Gain | Offset | Jig | Units |
|---|---|---|---|---|---|
| Background | 82.3 | | | | cps |
| Calibrator | 335.2 | | | | cps |
| Difference | | | | 252.9 | GAPI |

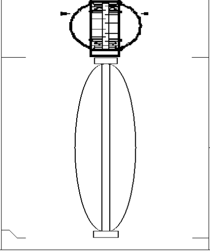
BEFORE SURVEY VERIFICATION

| | Counts/Sec. | Gain | Offset | Jig | Units |
|---|---|---|---|---|---|
| Background | 0.0 | | | | cps |
| Calibrator | 0.0 | | | | cps |
| Difference | | | | 0.0 | GAPI |

AFTER SURVEY VERIFICATION

| | | | |
|---|---|---|---|
| Background | 0.0 | | cps |
| Calibrator | 0.0 | | cps |
| Difference | | 0.0 | GAPI |

| Sensor | Offset (ft) | Schematic | Description | Len (ft) | OD (in) | Wt (lb) |
|---|---|---|---|---|---|---|
| | |  | HAL<br>HAL Cable Head | 1.92 | 1.44 | 10.00 |
| CCL | 22.63 | | CCLCBT-UCCL-UN (142E1)<br>Universal CCL - UCCL-UN | 3.96 | 3.38 | 10.00 |
| GR | 16.79 | | GR-UGR-HA (142E1)<br>Universal Gamma Ray UGR-HA | 4.42 | 3.38 | 80.00 |
| WVF3FT<br>WVF5FT | 8.54<br>7.54 | | CBT_CBT_HA-CBT_HA (142E1)<br>G-Type Modular 3 1/4" Cement Bond Tool (No Delay) | 11.25 | 3.25 | 215.00 |



| | | | | |
|---|---|---|---|---|
| WVFSYNC | 4.29 | | | |
| | | CBLINLINE | 4.29 | 3.25 |
| LLMTEN | 0.00 | | | |

Dataset: wrd_fed_4_23.db: whtrvrdme/wrd_fed_4/cbl/merge1
Total Length: 25.84 ft
Total Weight: 315.00 lb
O.D. 3.38 in

| | |
|---|---|
| Company | CHESAPEAKE ENERGY |
| Well | WRD FEDERAL 4-23 |
| Field | WHITE RIVER DOME |
| County | RIO BLANCO |
| State | CO |

HALLIBURTON

ACOUSTIC CEMENT
BOND LOG