COUNTY	MORROW
FIELD	WILDCAT
LOCATION	1755'S AND 1414'W
WELL	"ARCO HANNA" #1
COMPANY	ARCO OIL AND GAS

Schlumberger

FOUR ARM

HIGH RESOLUTION

CONTINUOUS DIPMETER

COMPANY	ARCO OIL AND GAS		
WELL	"ARCO HANNA" #1		
FIELD	WILDCAT		
COUNTY	MORROW	**STATE**	OREGON

LOCATION
1755'S AND 1414'W
FROM NE CORNER

Other Services:
DIL-BHC-GR
FDC-CNL-GR
SHDT

API SERIAL NO.	SECT.	TWP.	RANGE
	23	2S	27E

Permanent Datum	GL	Elev.	3199.5 F	Elev.: K.B.3225.5 F
Log Measured From	KB	26.0 F	above Perm. Datum	D.F.3224.5 F
Drilling Measured From	KB			G.L.3199.5 F

Date	05-AUG-88			
Run No.	1			
Depth Driller	7331.0 F			
Depth Logger (Schl.)	7250.0 F			
Btm. Log Interval	7249.0 F			
Top Log Interval	3100.0 F			
Casing-Driller	16	@1598.0 F	@	@
Casing-Logger	1598.0 F			
Bit Size	14 3/4			
Type Fluid in Hole	DRISPAC			
Dens. | Visc.	9.40 LB/G	48.0 S		
pH | Fld. Loss	10.0	6.1 C3		
Source of Sample	CIRCULATED			
Rm @ Meas. Temp.	7.490 OHMM	@ 79.0 DEGF	@	
Rmf @ Meas. Temp.	4.010 OHMM	@ 73.0 DEGF	@	
Rmc @ Meas. Temp.	3.030 OHMM	@ 72.0 DEGF	@	
Source: Rmf | Rmc	MEASURED	MEASURED		
Rm @ BHT	3.904 OHMM	@ 158. DEGF	@	
TIME Circulation Ended	07:00 5 AUG			
TIME Logger on Bottom	14:26 5 AUG			
Max. Rec. Temp.	158. DEGF			
Equip. | Location	8504	SACRAMENTO		
Recorded By	DAVID ROTHERS			
Witnessed By	FRANK MARTIN JR.			

The well name, location and borehole reference data were furnished by the customer.

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 interpretations 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.

Run No.		
Service Order No.	527488	
Magnetic Declination		
Drilling Fluid Level	0.0 F	
Salinity	300.0 PPM	
Rmf @ BHT	1.944 OHMM @ 158. DEGF	@
Rmc @ BHT	1.451 OHMM @ 158. DEGF	@
Logging Speed	3000.0 F/HR	
EQUIPMENT DATA		
Tool Number 1	SHDB-B 813	
Tool Number 2	SHDC-A 964	
Tool Number 3	SHDI-BB 972	
Tool Number 4	SHDS-B 946	
Tool Number 5	CCSM-AB 596	
Tool Number 6		
Tool Number 7		
Tool Number 8		
Tool Number 9		
Tool Number 10		
Tool Number 11		
Tool Number 12		

REMARKS:

EVENT MARK SUMMARY:

```
OUTPUT  INTERVAL        DEPTH TRACK
        BETWEEN PIPS    EDGE

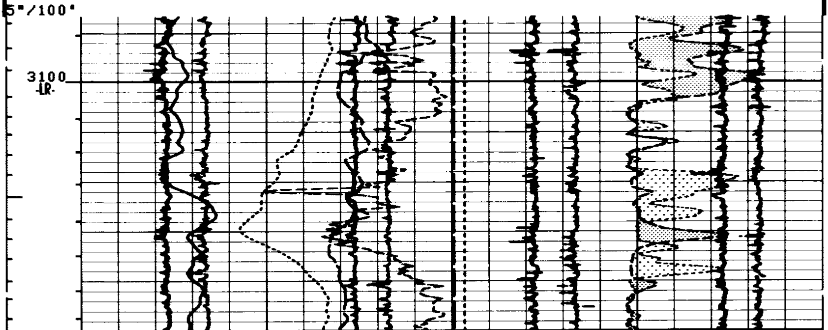
IHV     10.0000 F3      LEFT EDGE
ICV     10.0000 F3      RIGHT EDGE
```

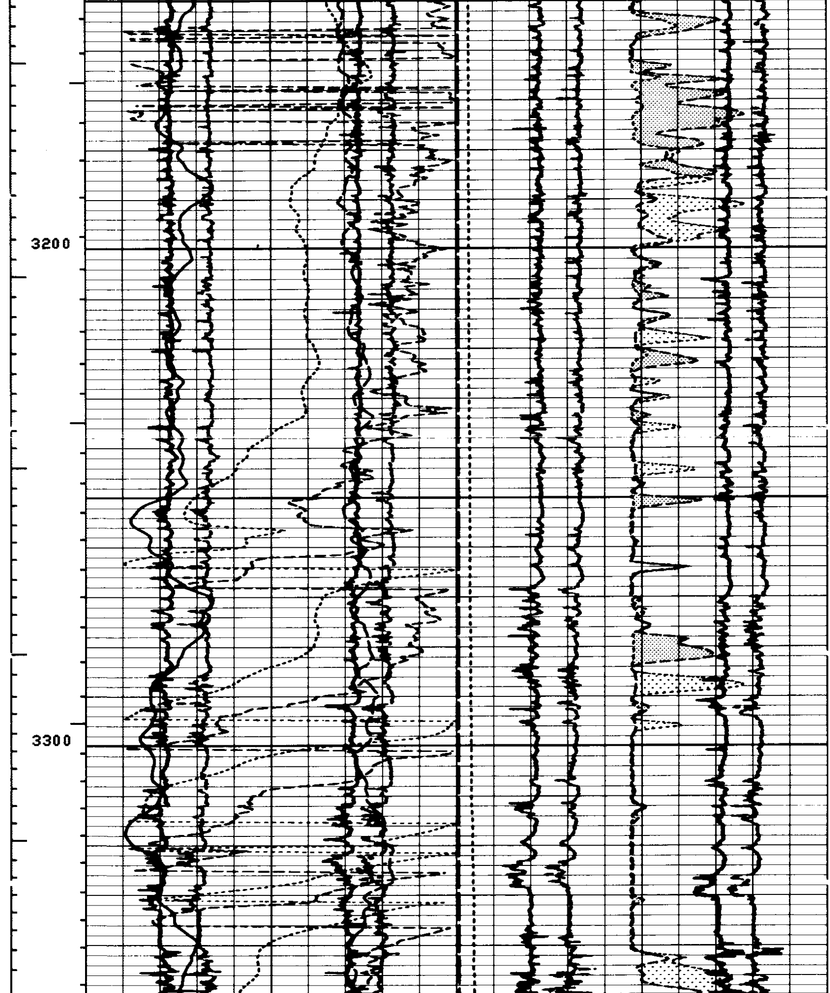
CEMENT VOLUME = 2415.09 F3
HOLE VOLUME =   6484.67 F3
FROM 7272.5 TO 3086.0 FEET

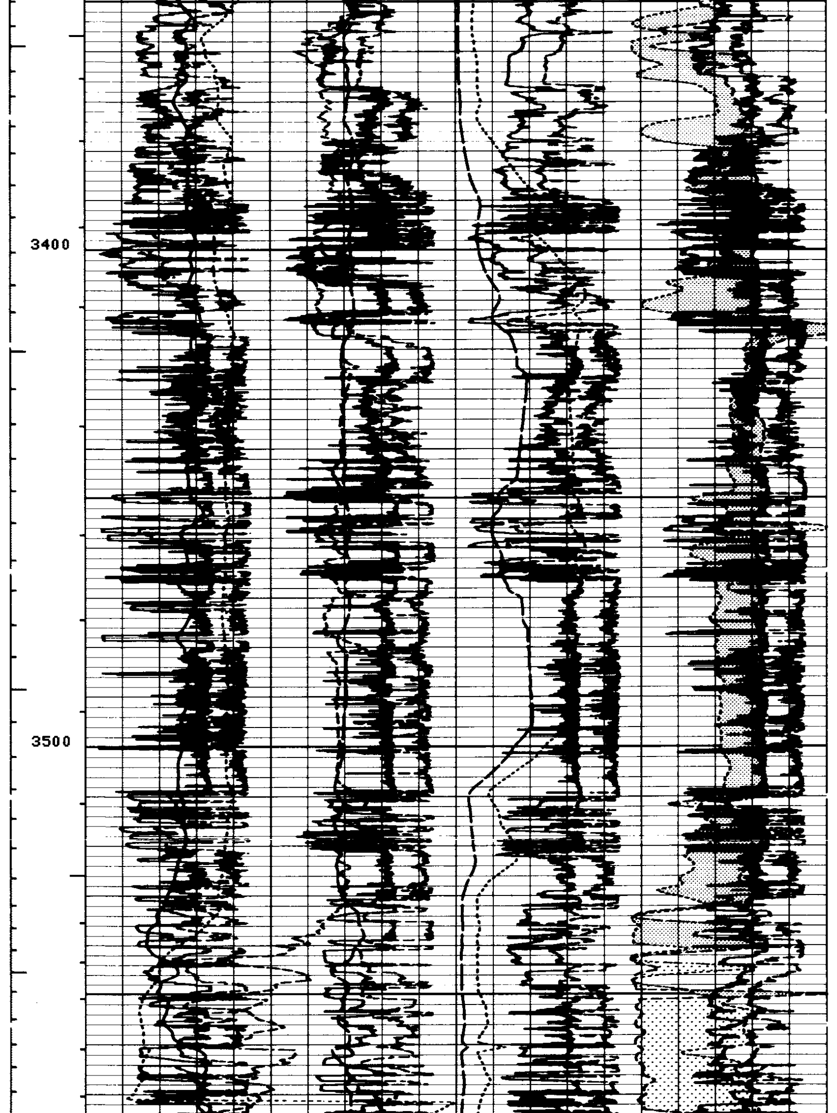
HAZI AND RB CURVES DISALLOWED WHEN DEV LESS THAN 0.5 DEG
NO KNUCKLE JOINT IS USED (SOFF = -1)

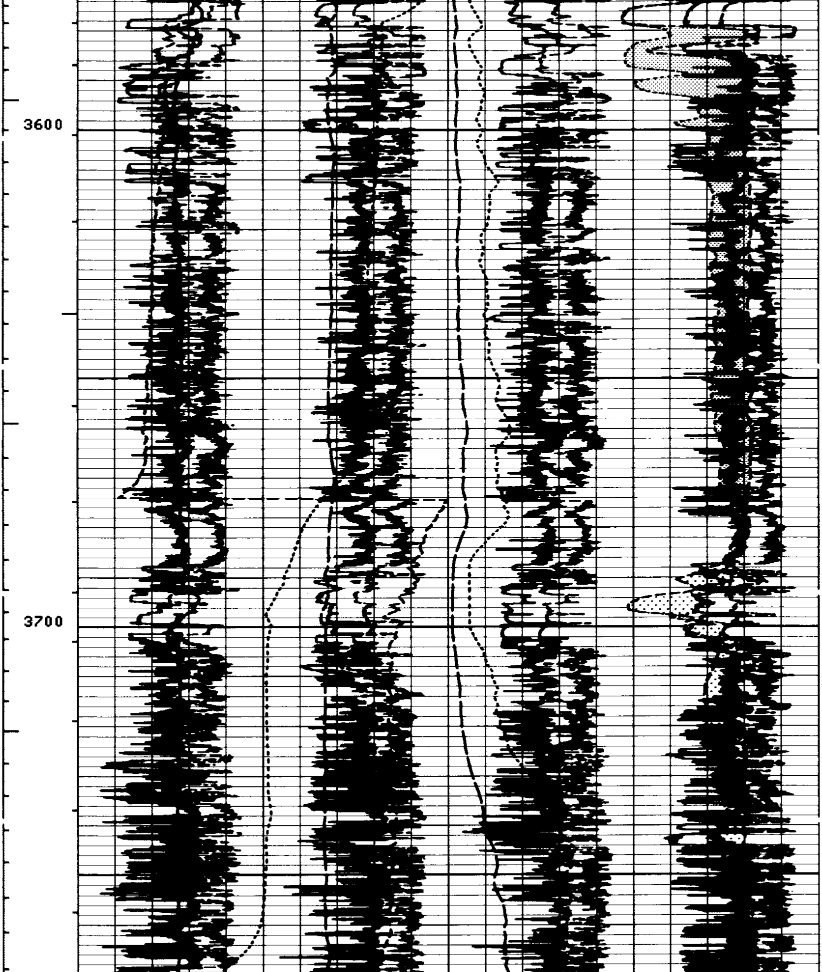
DB1A -1000. 4000.0	DB2A -1000. 4000.0	EV (VOLT) 0.0 50.000	
DB1 0.0 5000.0	DB2 0.0 5000.0	EI (AMPS) 0.0 10.000	
RB (DEG) -40.00 360.00		DB3A -1000. 4000.0	DB4A -1000. 4000.0
P1AZ(DEG) -40.00 360.00		DB3 0.0 5000.0	DB4 0.0 5000.0
HAZI(DEG) -40.00 360.00		C1 (IN) 32.000 12.000	
DEVI(DEG) 0.0 10.000		C2 (IN) 32.000 12.000	

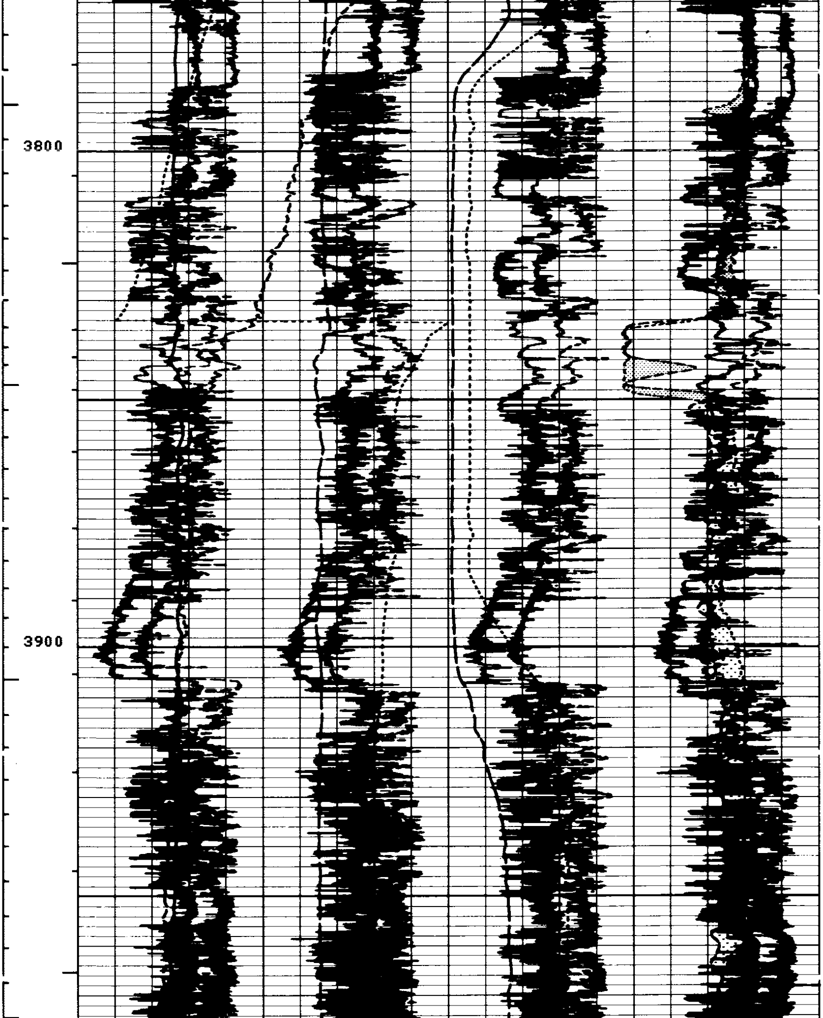
CP 30.4 FILE 2 05-AUG-88 16:00

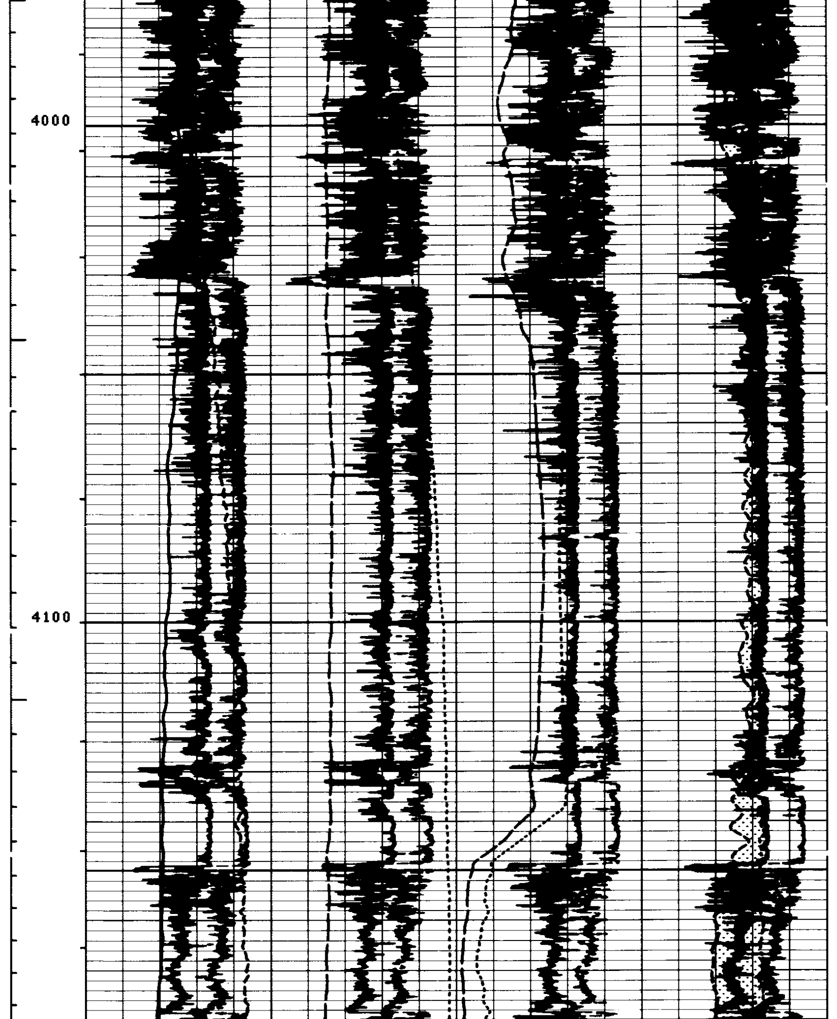


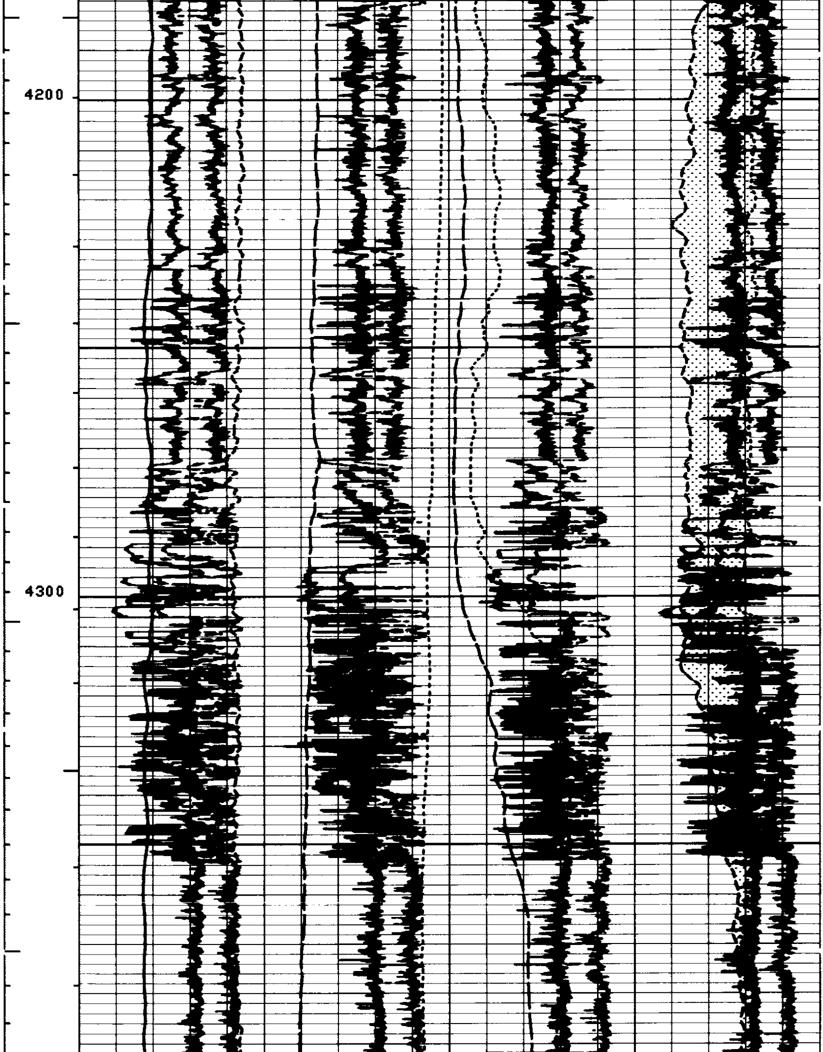


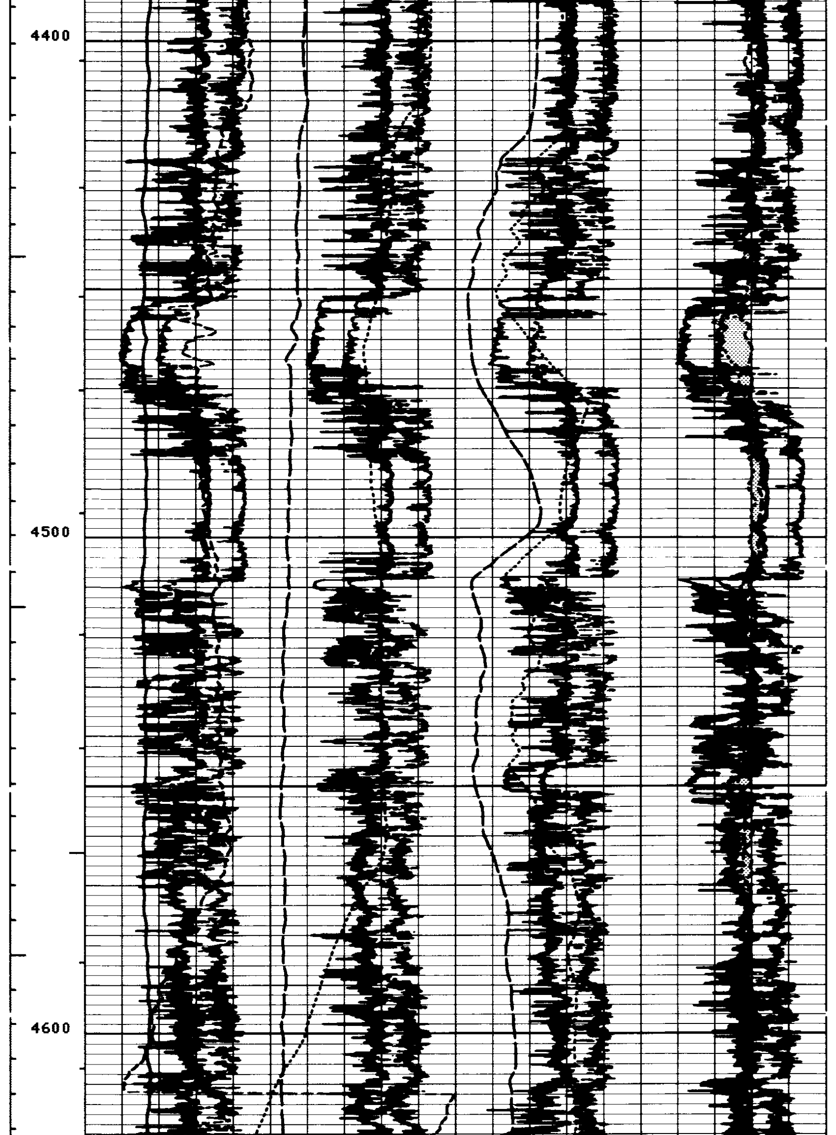


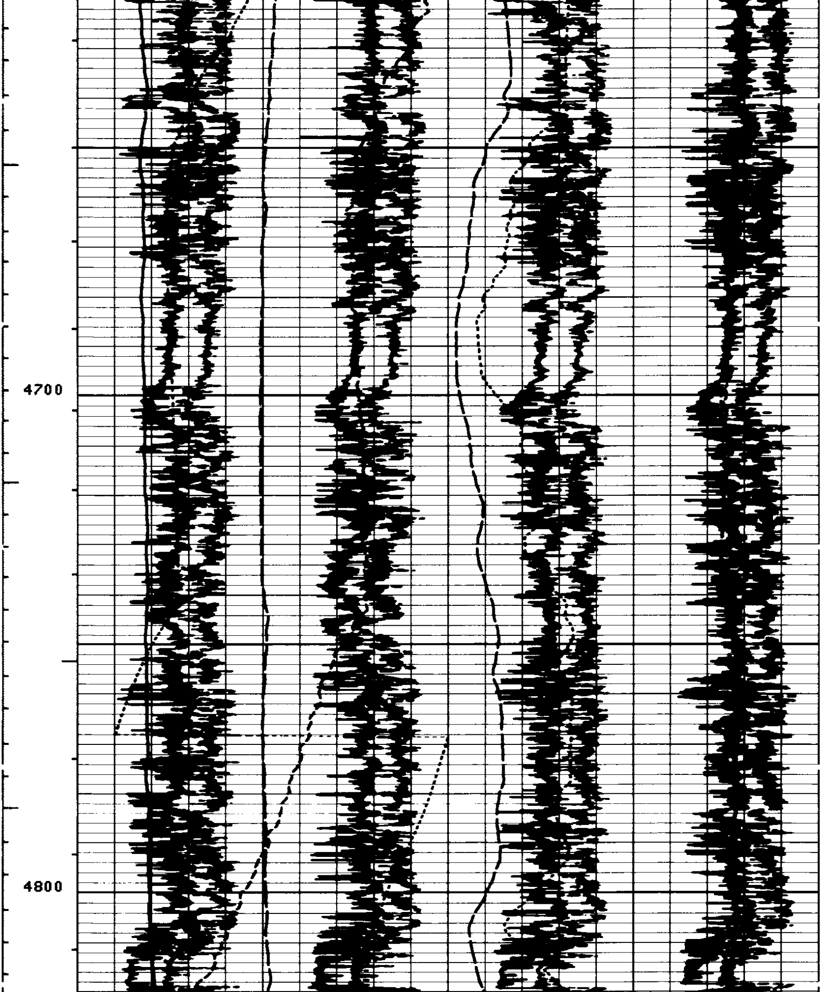


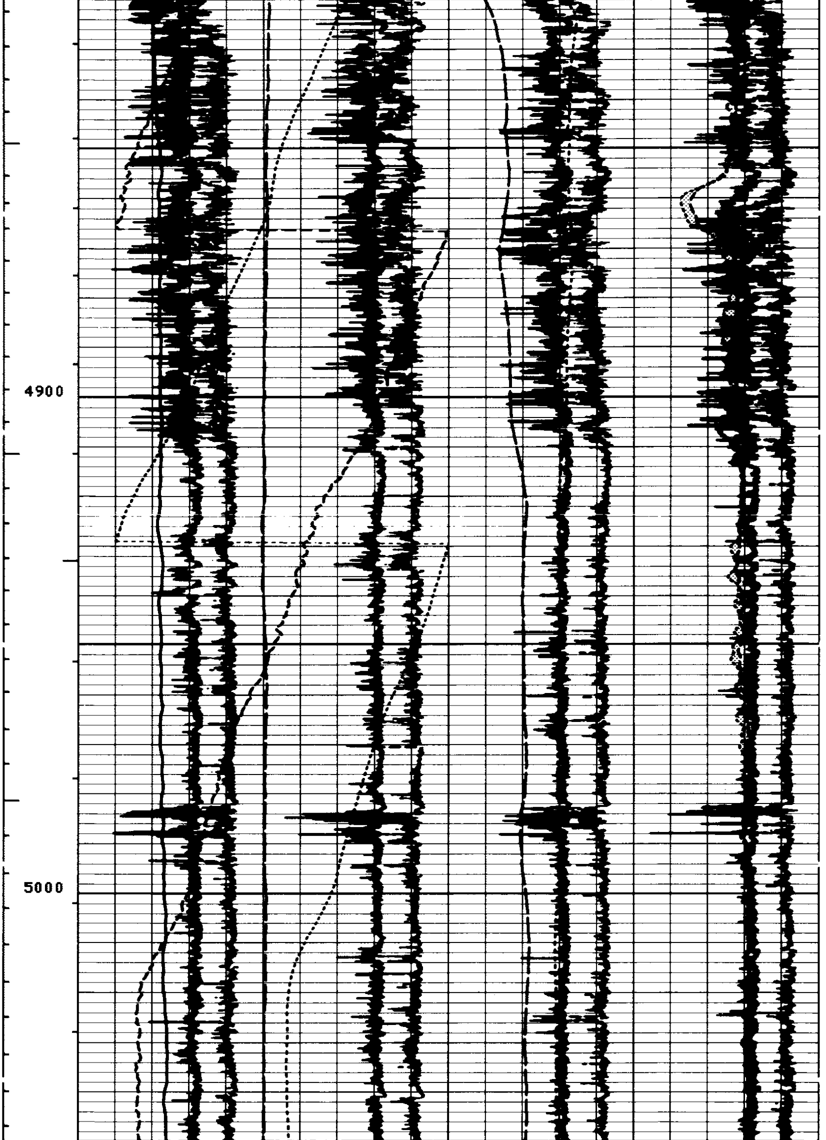


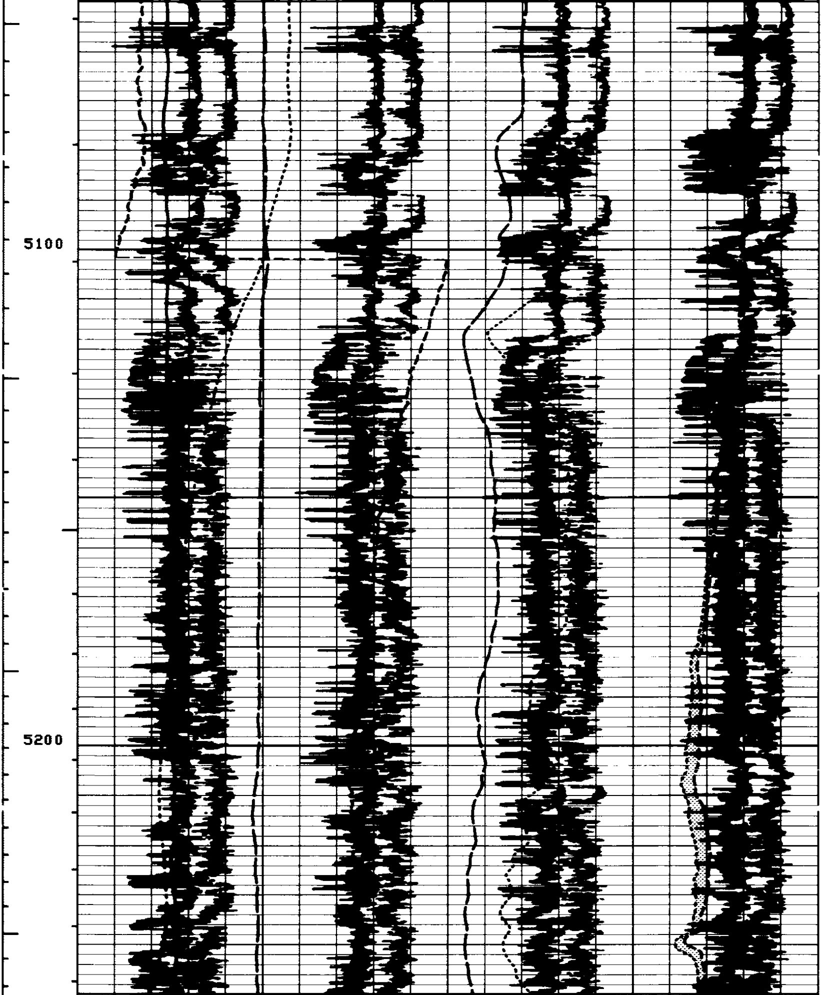


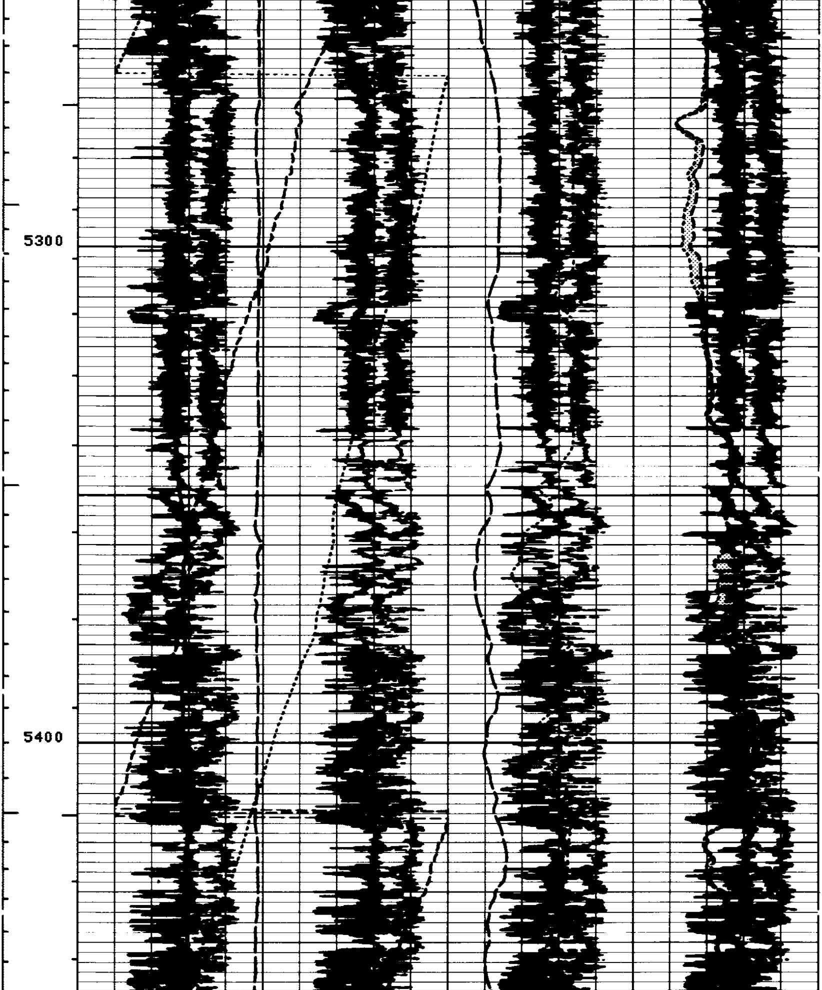


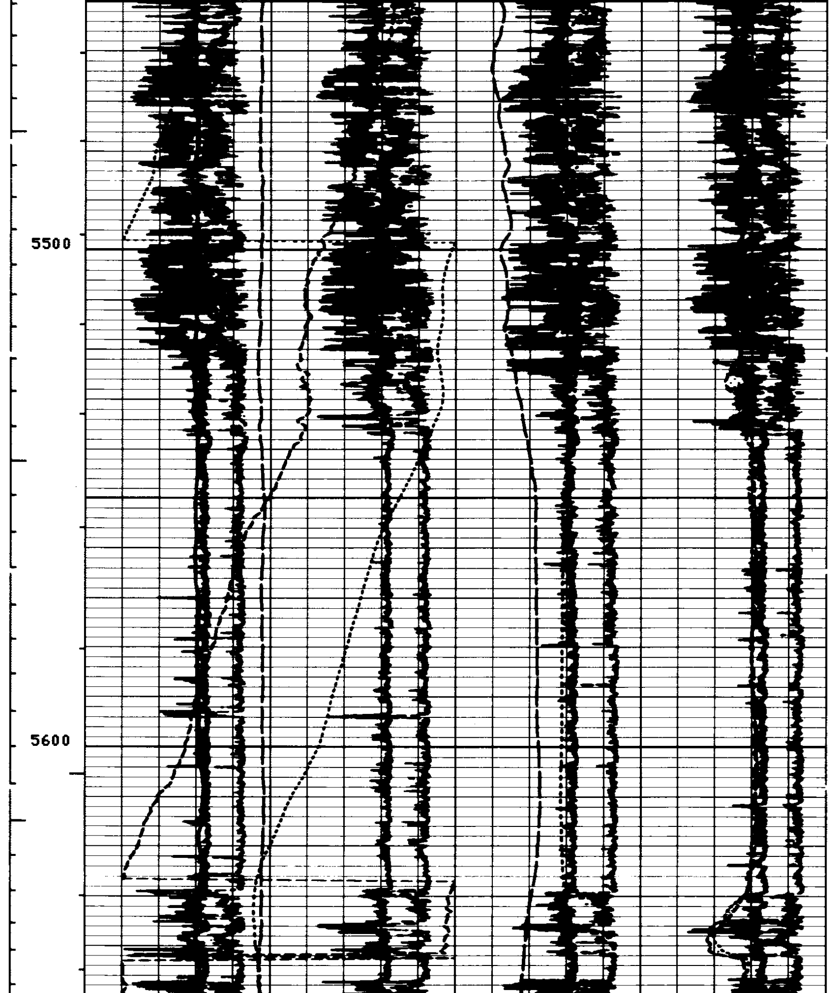


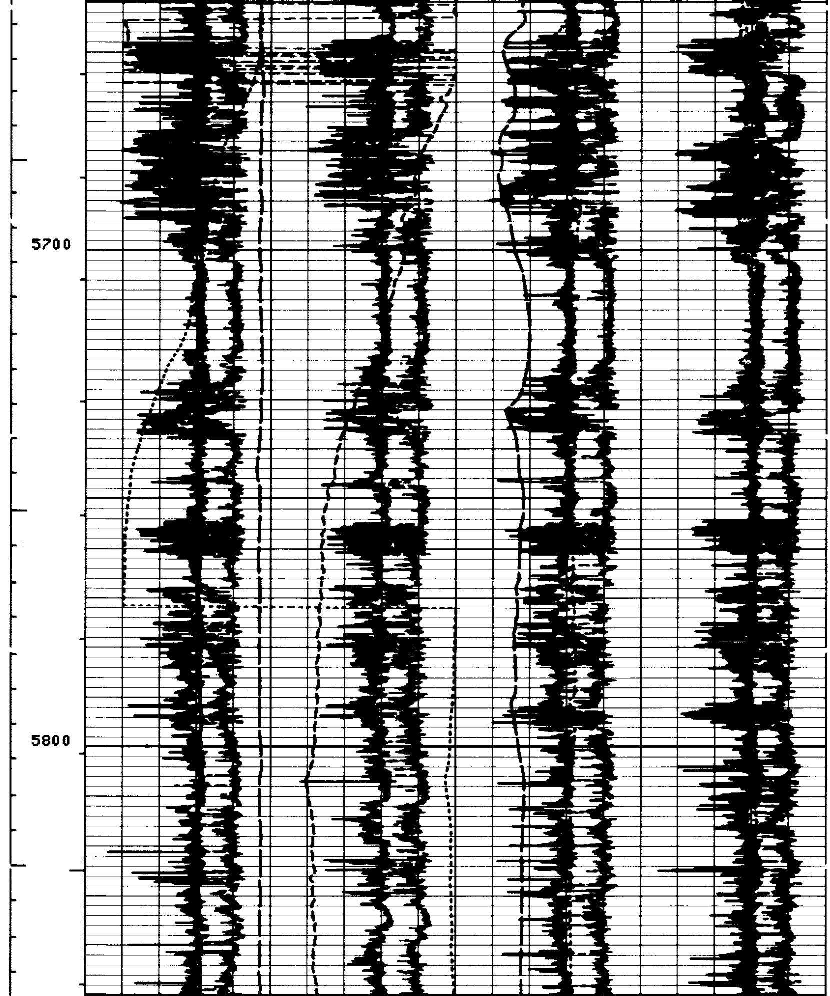


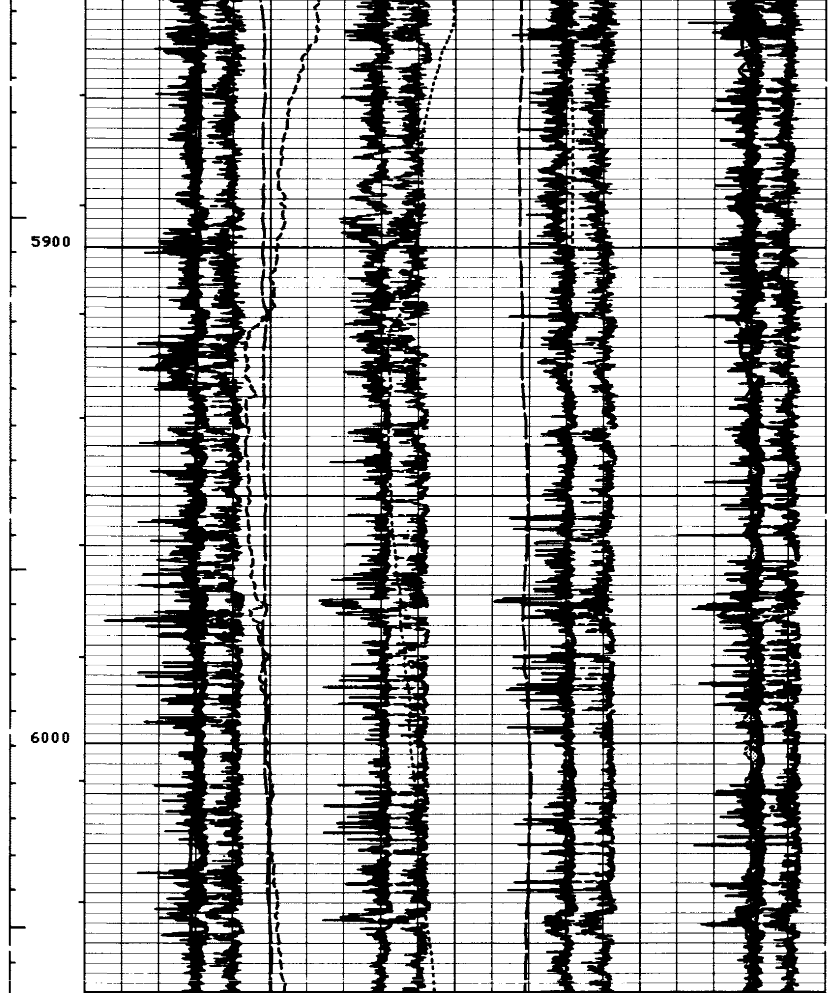


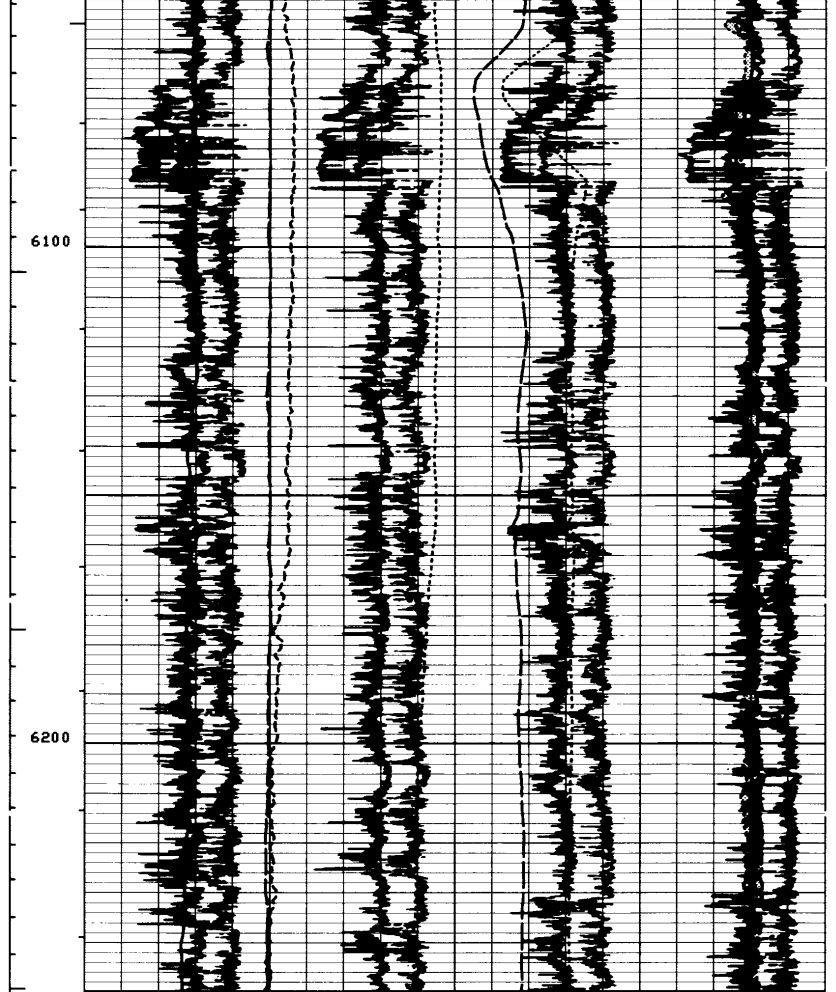


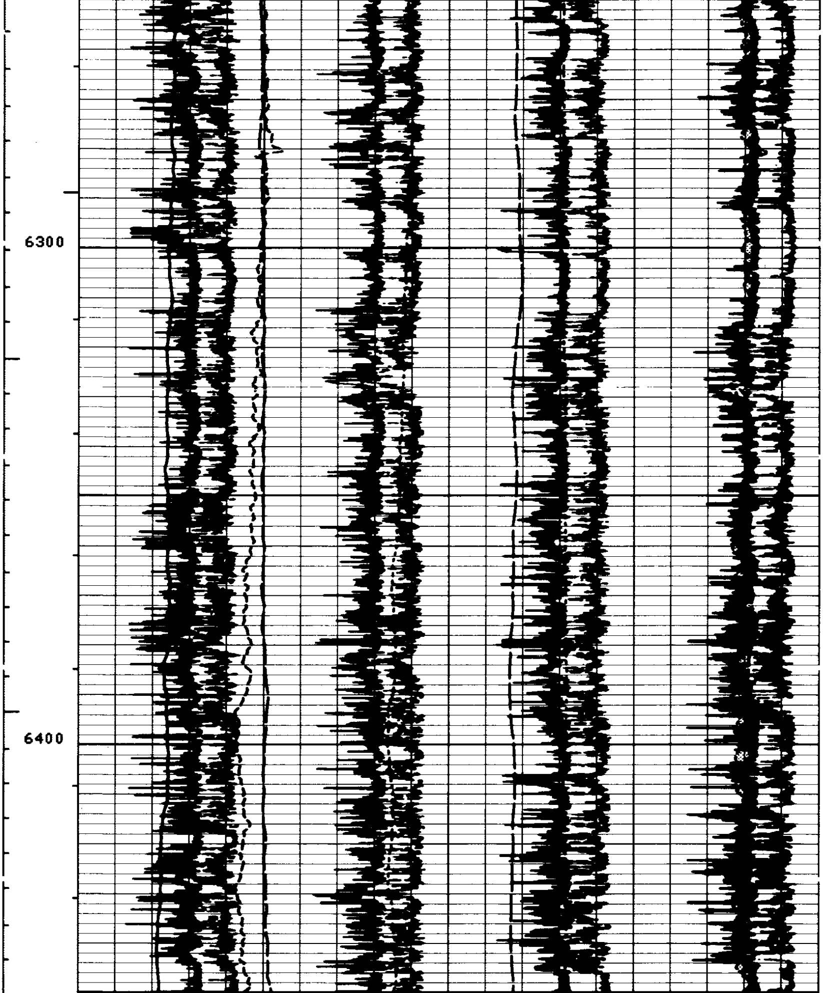


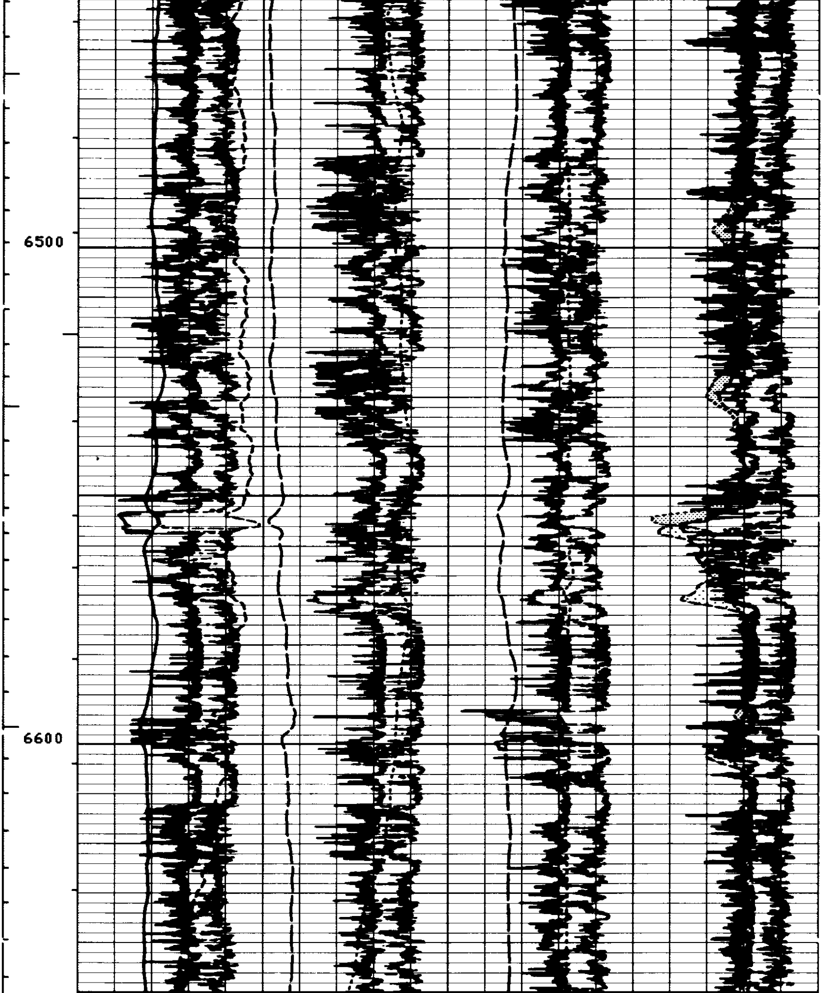


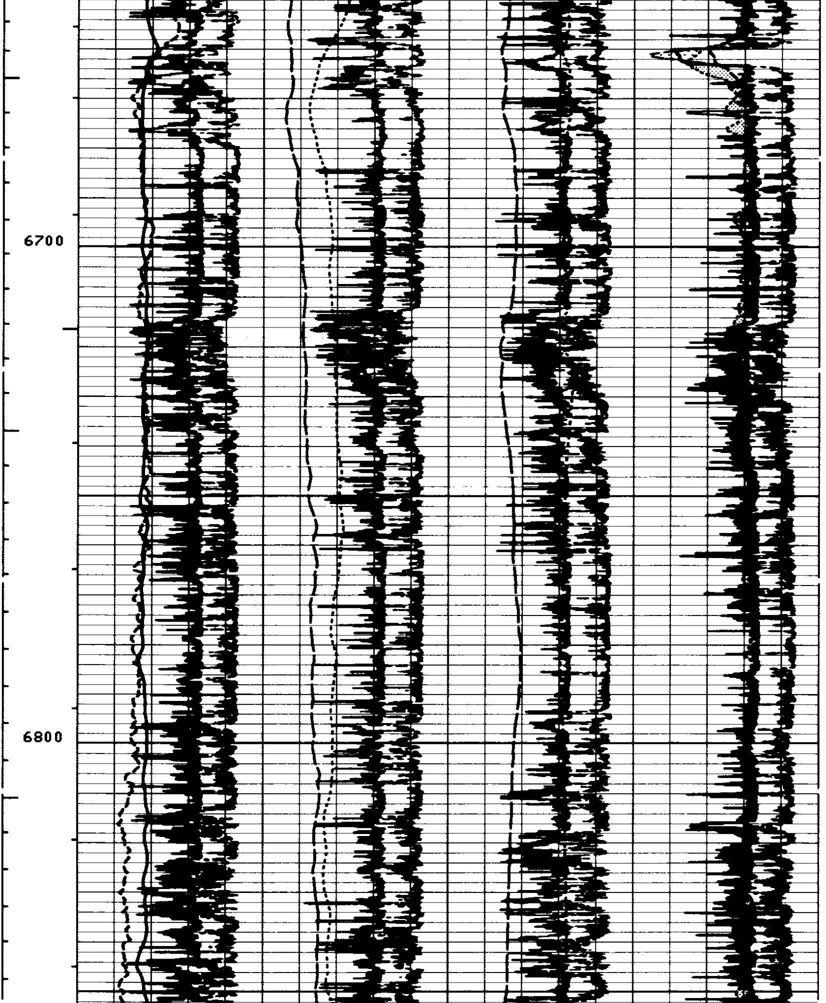


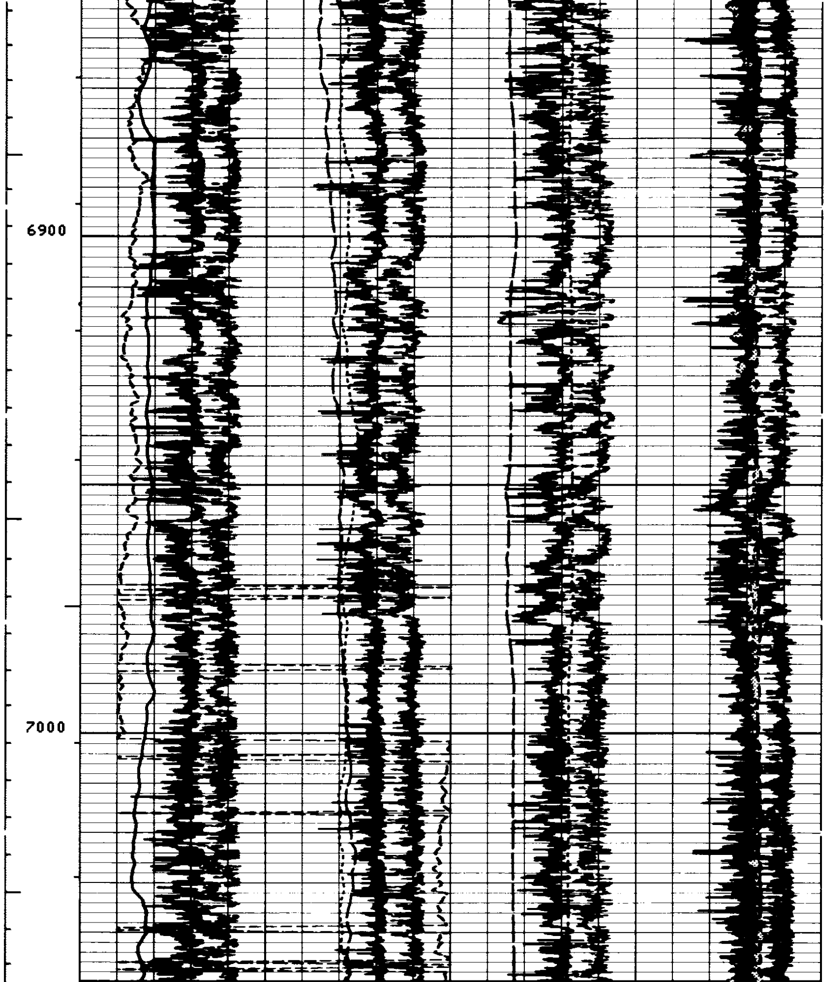


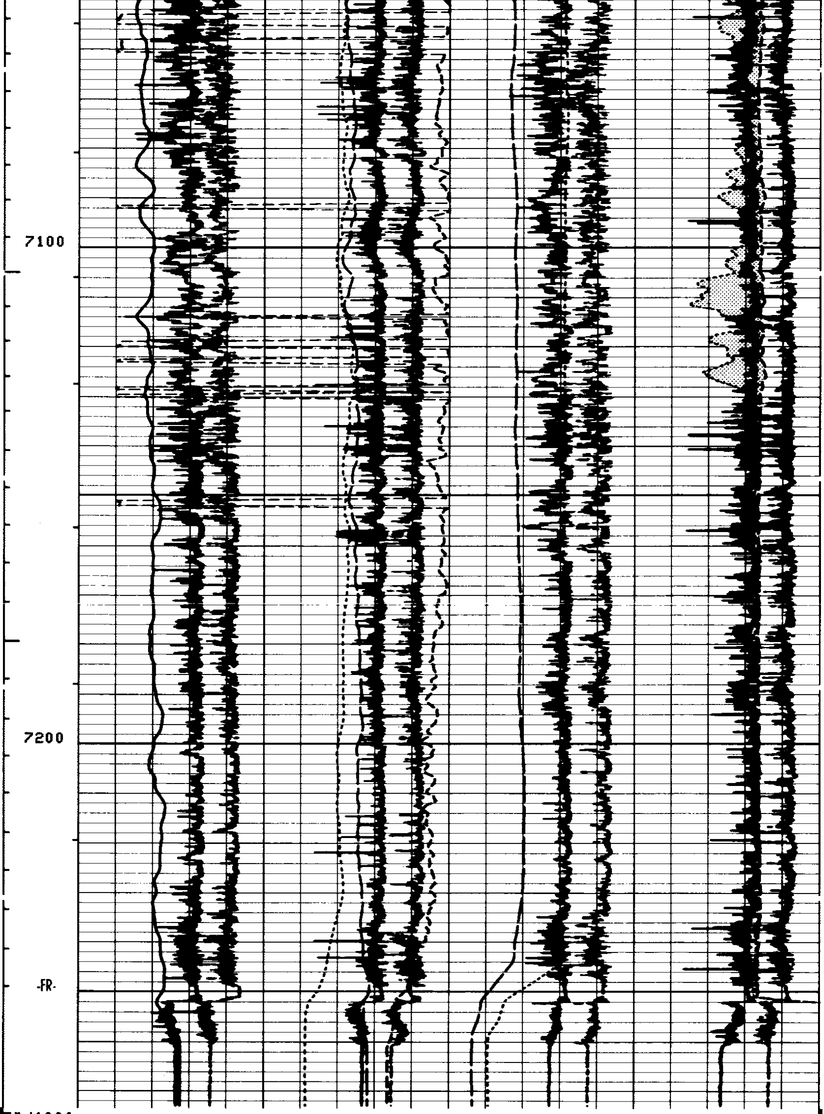












5"/100'

CP 30.4 FILE 2 05-AUG-88 14:24

			EV (VOLT) 0.0 50.000 EI (AMPS) 0.0 10.000	
	DB1A -1000. 4000.0	DB2A -1000. 4000.0	DB3A -1000. 4000.0	DB4A -1000. 4000.0
	DB1 0.0 5000.0	DB2 0.0 5000.0	DB3 0.0 5000.0	DB4 0.0 5000.0
	P1AZ(DEG) -40.00 360.00		C1 (IN) 32.000 12.000	
	DEVI(DEG) 0.0 10.000		C2 (IN) 32.000 12.000	

SENSOR MEASURE POINT TO TOOL ZERO

TENS	1.2	FEET	SHDW	1.2	FEET
DCHV	1.2	FEET	ADCR	1.2	FEET
C2	1.2	FEET	C1	1.2	FEET
EV	1.2	FEET	EI	1.2	FEET
FY	1.2	FEET	FX	1.2	FEET
PP	1.2	FEET	FZ	1.2	FEET
RAD2	1.2	FEET	RAD1	1.2	FEET
RAD4	1.2	FEET	RAD3	1.2	FEET
ATEM	1.2	FEET	ADCZ	1.2	FEET
VPR	1.2	FEET	VMR	1.2	FEET
AY	1.2	FEET	AX	1.2	FEET
AZ	1.2	FEET			

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
BS	14.7500	IN	BHS	OPEN	
XOFF	0		SOFF	-1.00000	IN
XMOD	AUTO		XGAI	2	
VREF	-5.00000	VDC	FCDD	1.	
SHDS	B		SHDI	BB	
MDEC	20.0000	DEG			

EVENT MARK SUMMARY:

OUTPUT	INTERVAL BETWEEN PIPS	DEPTH TRACK EDGE
IHV	10.0000 F3	LEFT EDGE
ICV	10.0000 F3	RIGHT EDGE

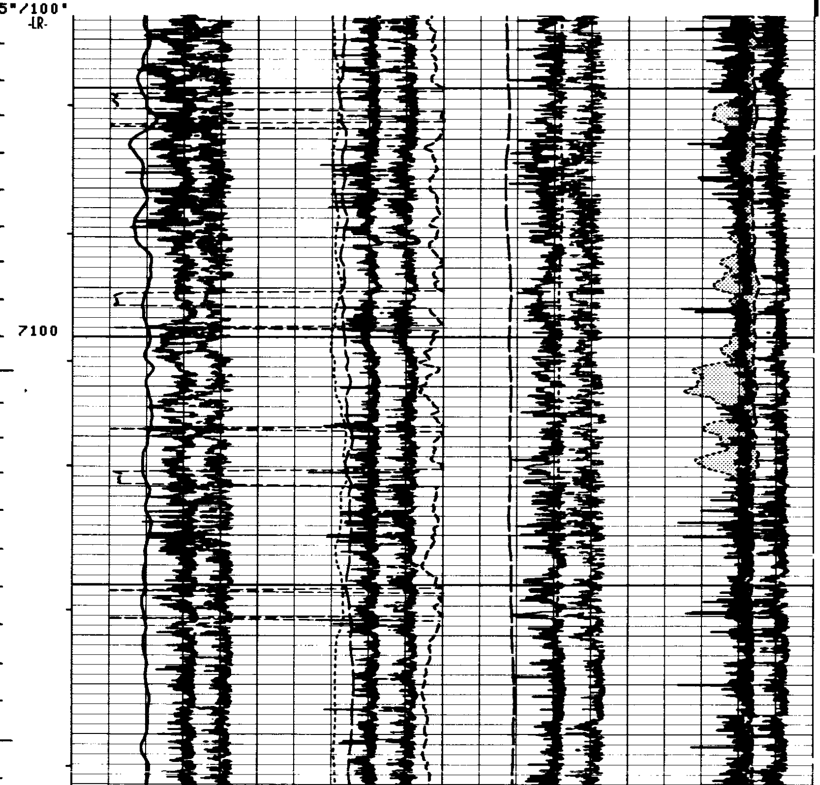
CEMENT VOLUME = 77.3746 F3
HOLE VOLUME = 299.302 F3
FROM 7267.5 TO 7034.5 FEET

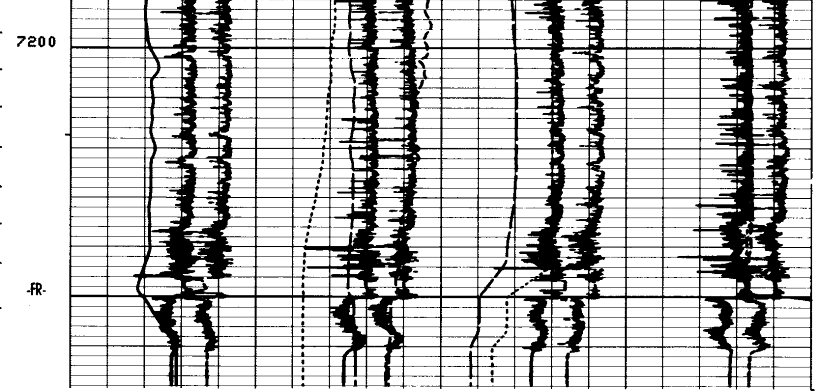
HAZI AND RB CURVES DISALLOWED WHEN DEV LESS THAN 0.5 DEG
NO KNUCKLE JOINT IS USED (SOFF = -1)

Curve	Left	Right
DB1A	-1000.	4000.0
DB2A	-1000.	4000.0
EV (VOLT)	0.0	50.000
DB1	0.0	5000.0
DB2	0.0	5000.0
EI (AMPS)	0.0	10.000
RB (DEG)	-40.00	360.00
DB3A	-1000.	4000.0
DB4A	-1000.	4000.0
P1AZ(DEG)	-40.00	360.00
DB3	0.0	5000.0
DB4	0.0	5000.0
HAZI(DEG)	-40.00	360.00
C1 (IN)	32.000	12.000
DEVI(DEG)	0.0	10.000
C2 (IN)	32.000	12.000

REPEAT SECTION

CP 30.4 FILE 1 05-AUG-88 14:22





5"/100'

CP 30.4 FILE 1 05-AUG-88 14:15

DB1A		DB2A		EV (VOLT)			
-1000.	4000.0	-1000.	4000.0	0.0	50.000		
DB1		DB2		EI (AMPS)			
0.0	5000.0	0.0	5000.0	0.0	10.000		
RB (DEG)				DB3A		DB4A	
-40.00			360.00	-1000.	4000.0	-1000.	4000.0
P1AZ(DEG)				DB3		DB4	
-40.00			360.00	0.0	5000.0	0.0	5000.0
HAZI(DEG)				C1 (IN)			
-40.00			360.00	32.000			12.000
DEVI(DEG)				C2 (IN)			
0.0			10.000	32.000			12.000

SENSOR MEASURE POINT TO TOOL ZERO

TENS	1.2	FEET	SHDW	1.2	FEET
DCHV	1.2	FEET	ADCR	1.2	FEET
C2	1.2	FEET	C1	1.2	FEET
EV	1.2	FEET	EI	1.2	FEET
FY	1.2	FEET	FX	1.2	FEET
PP	1.2	FEET	FZ	1.2	FEET
RAD2	1.2	FEET	RAD1	1.2	FEET
RAD4	1.2	FEET	RAD3	1.2	FEET
ATEM	1.2	FEET	ADCZ	1.2	FEET
VPR	1.2	FEET	VMR	1.2	FEET
AY	1.2	FEET	AX	1.2	FEET
AZ	1.2	FEET			

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
BS	14.7500	IN	BHS	OPEN	
XOFF	0		SOFF	-1.00000	IN
XMOD	AUTO		XGAI	2	
VREF	-5.00000	VDC	FCDD	1.	
SHDS	B		SHDI	BB	
MDEC	20.0000	DEG			

```
HAZI AND RB CURVES DISALLOWED WHEN DEV LESS THAN 0.5 DEG
NO KNUCKLE JOINT IS USED (SOFF = -1)
```

```
DB1A                       DB2A                      EV   (VOLT)
-1000.        4000.0      -1000.        4000.0      0.0          50.000
DB1                        DB2                       EI   (AMPS)
0.0           5000.0      0.0           5000.0      0.0          10.000
           RB   (DEG )                               DB3A                      DB4A
-40.00                                  360.00      -1000.        4000.0      -1000.        4000.0
           P1AZ(DEG )                                DB3                       DB4
-40.00                                  360.00      0.0           5000.0      0.0           5000.0
           HAZI(DEG )                                              C1   (IN  )
-40.00                                  360.00      24.000                                  4.0000
           DEVI(DEG )                                              C2   (IN  )
0.0                                     10.000      24.000                                  4.0000
```

check

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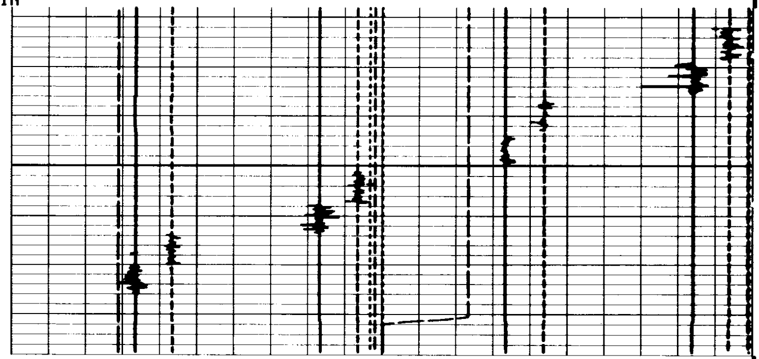
CP 30.4            FILE    2      03-AUG-88 13:27
```

.5"/MIN



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```
CP 30.4            FILE    2      03-AUG-88 13:25
```

```
DB1A                       DB2A                      EV   (VOLT)
-1000.        4000.0      -1000.        4000.0      0.0          50.000
DB1                        DB2                       EI   (AMPS)
0.0           5000.0      0.0           5000.0      0.0          10.000
           RB   (DEG )                               DB3A                      DB4A
-40.00                                  360.00      -1000.        4000.0      -1000.        4000.0
           P1AZ(DEG )                                DB3                       DB4
-40.00                                  360.00      0.0           5000.0      0.0           5000.0
           HAZI(DEG )                                              C1   (IN  )
-40.00                                  360.00      24.000                                  4.0000
           DEVI(DEG )                                              C2   (IN  )
0.0                                     10.000      24.000                                  4.0000
```

```
                    BEFORE SURVEY CALIBRATION SUMMARY


  PERFORMED:     03-AUG-88 13:24
  PROGRAM FILE:  SHDT   (VERSION    30.4    88/05/30   87/11/19)


SHDT                  CALIPER CALIBRATION SUMMARY

              MEASURED                        CALIBRATED
          SMALL     LARGE                 SMALL       LARGE         UNITS
    C1    6.50      10.5                  8.00        12.0           IN
    C2    6.97      11.0                  8.00        12.0           IN
```