Schlumberger

COMPENSATED NEUTRON LITHO DENSITY LOG

COUNTY	COOS
FIELD	WILD CAT
LOCATION	511.9 N & 2151.7 W
WELL	"COOS COUNTY FOREST" #7-1
COMPANY	CARBON ENERGY INT.

COMPANY CARBON ENERGY INT.

WELL "COOS COUNTY FOREST" #7-1

FIELD WILD CAT

COUNTY COOS **STATE** OREGON

LOCATION				Other Services:
511.9'N & 2151.7'W FROM SE CORNER OF:				DITD/GR LDT/CNL/GR FMS MSCT
API SERIAL NO.	**SECT.**	**TWP.**	**RANGE**	
36-011-00027	7	27S	13W	

Permanent Datum	GL	**Elev.**	530.0 F	**Elev.: K.B.548.0 F**
Log Measured From	KB	18.0 F	**above Perm. Datum**	**D.F.547.0 F**
Drilling Measured From	KB			**G.L.530.0 F**

Date	15-OCT-1993				
Run No.	ONE				
Depth Driller	3804.0 F				
Depth Logger (Schl.)	3779.0 F				
Btm. Log Interval	3776.0 F				
Top Log Interval	380.0 F				
Casing-Driller	9 5/8	@ 380.0 F	@	@	
Casing-Logger	380.0 F				
Bit Size	8 3/4	@ 3804.0 F	@	@	
Type Fluid in Hole	FRESH				
Dens. / **Visc.**	9.10 LB/G	46.0 S			
pH / **Fld. Loss**		6.8 C3			
Source of Sample	FLOWLINE				
Rm @ Meas. Temp.	6.300 OHMM	@ 62.0 DEGF	@		
Rmf @ Meas. Temp.	7.250 OHMM	@ 60.0 DEGF	@		
Rmc @ Meas. Temp.	3.780 OHMM	@ 60.0 DEGF	@		
Source: Rmf / **Rmc**	MEASURED	MEASURED			
Rm @ BHT	4.025 OHMM	@ 101. DEGF	@		
TIME **Circulation Ended**	06:30 15-OCT-93				
TIME **Logger on Bottom**	16:30 15-OCT-93				
Max. Rec. Temp.	101. DEGF				
Equip. / **Location**	8504	SACRAMENTO			
Recorded By	M.DEMSKIE				
Witnessed By	S.PAPPAJOHN				

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

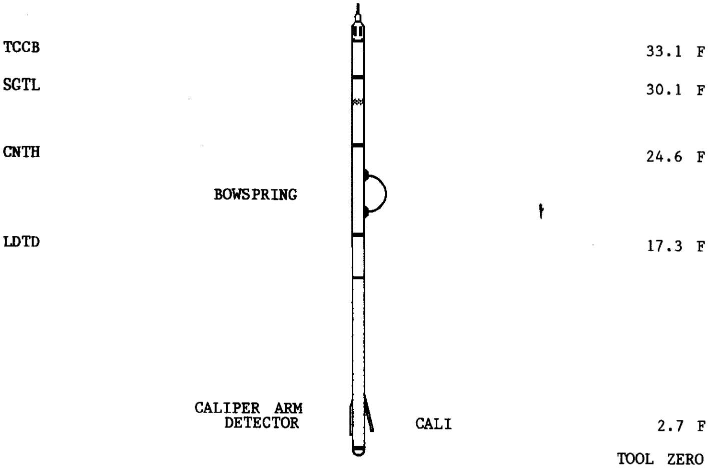
All interpretations are opinions based on inferences from electrical or other measurements and we cannot, and do not guarantee the accuracy or correctness of any interpretations, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, 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.	ONE	
Service Order No.	624380	
Drilling Fluid Level	100.0 F	
Salinity		
Rmf @ BHT	4.498 OHMM @ 101. DEGF	@
Rmc @ BHT	2.345 OHMM @ 101. DEGF	@
Logging Speed	1800.0 F/HR	
EQUIPMENT DATA		
Tool Number 1	DRS-C 3959	
Tool Number 2	NSC-E 2941	
Tool Number 3	CNC-HA 2524	
Tool Number 4	SGC-SA 544	
Tool Number 5	TCM-AB 1516	
Tool Number 6		
Tool Number 7		
Tool Number 8		
Tool Number 9		
Tool Number 10		
Tool Number 11		
Tool Number 12		

REMARKS:

HIGH RESOLUTION DATA TAKEN FROM 3779'-3480', AND 3000'-2900'
THANK YOU FOR CHOOSING SCHLUMBERGER
SOME WELLSITE INFORMATION NOT AVAILABLE AT WELL

LOGGING TOOL STRING SKETCH



TOTAL TOOL STRING LENGTH IS 36.6 F.
TOTAL TOOL STRING WEIGHT IS 658. LB IN AIR.

MAIN LOG - 5 INCH/100 FEET

```
ACCUMULATED INTEGRATION VALUES SUMMARY:

Integrated Hole Volume:   1756.19 F3   FROM 3779.00 F    TO 380.000 F
Integrated Cement Volume: 848.666 F3   FROM 3779.00 F    TO 380.000 F
  (ASSUMING 7.00000 IN   O.D. CASING)
```

```
EVENT MARK SUMMARY:

OUTPUT                        INTERVAL       DEPTH TRACK
                              BETWEEN PIPS   EDGE

Integrated Hole Volume        10.0000 F3     LEFT EDGE
Integrated Cement Volume      10.0000 F3     RIGHT EDGE
```

BDQC
10.000 0.0

DRHO(G/C3)
-.2500 .25000

TENS(LBF)
10000. 0.0

RHOB(G/C3)
.65000 1.6500

PEF
0.0 10.000

GR(GAPI)
0.0 150.00

NPOR(V/V)
.60000 0.0

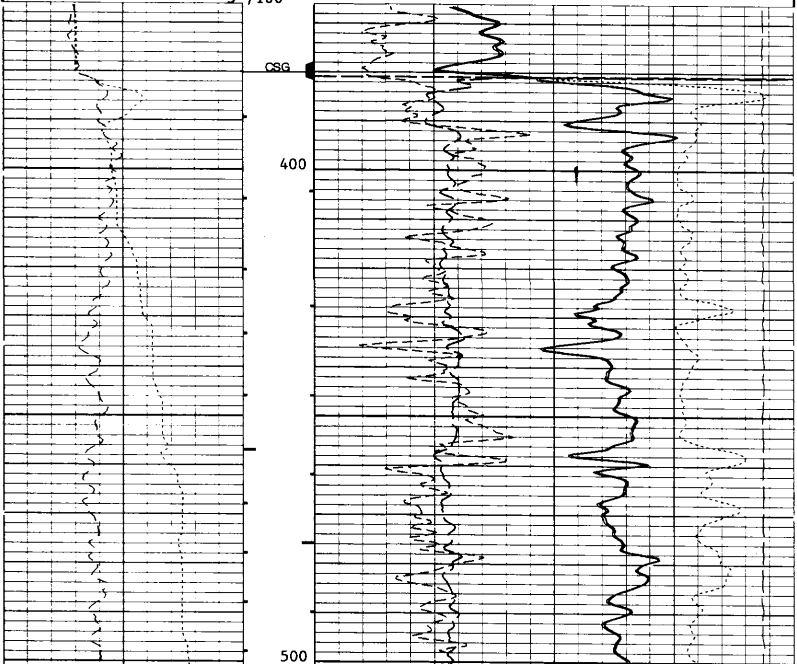
CALI(IN)
6.0000 16.000

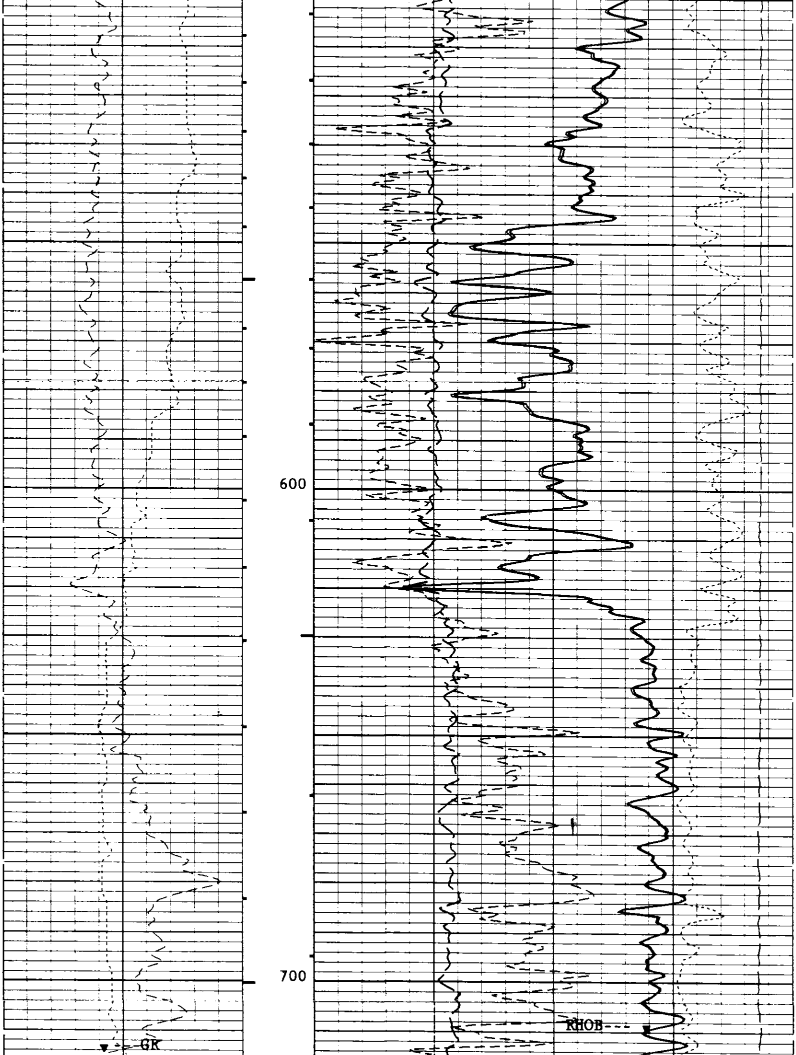
DPHI(V/V)
.60000 0.0

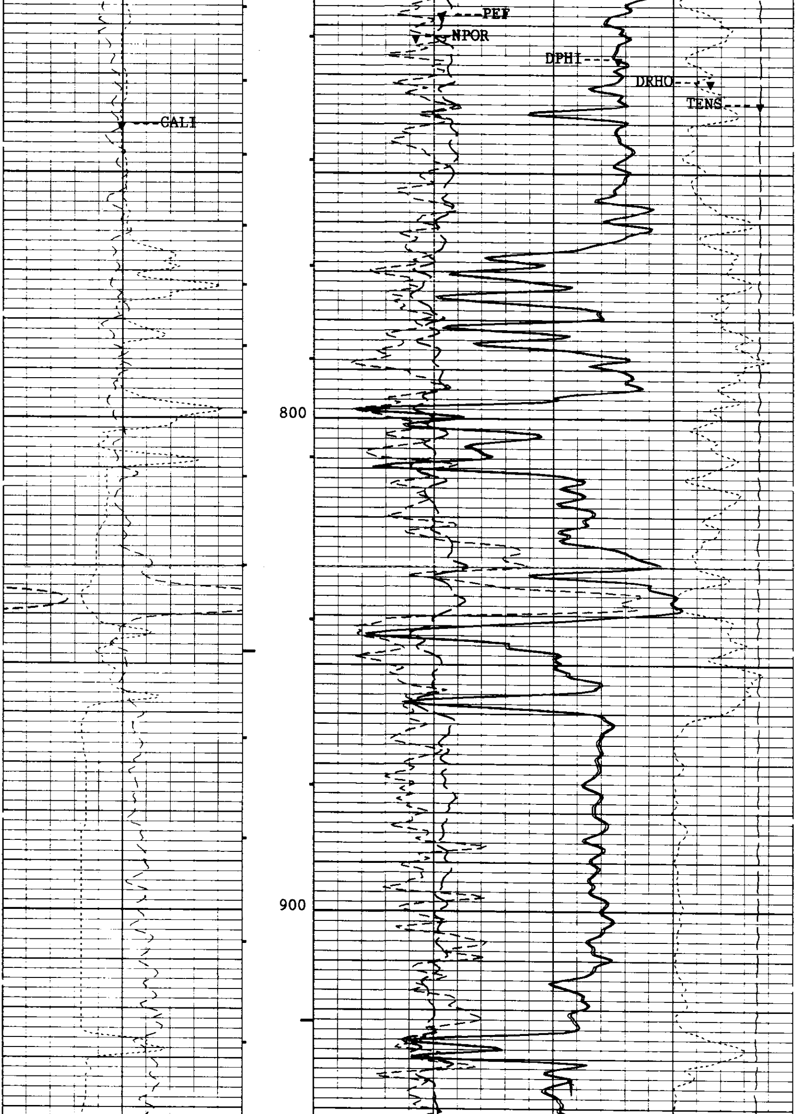
BDQC -- Z2

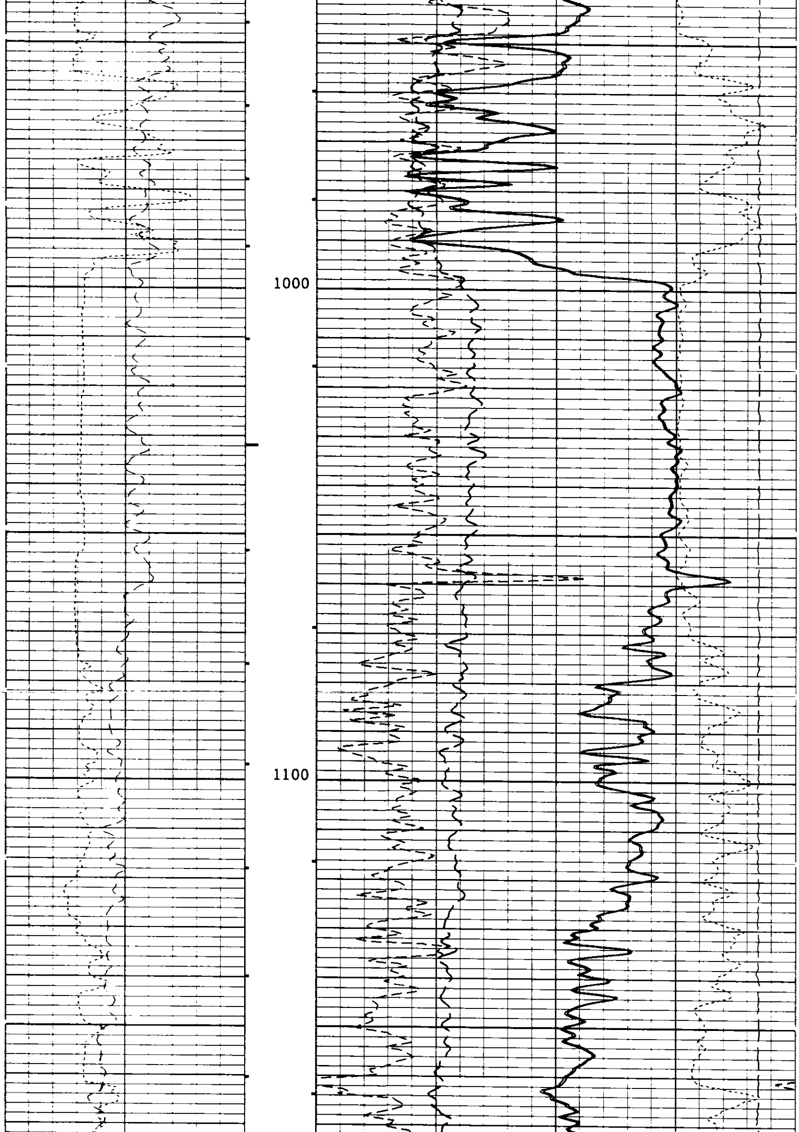
CP 38.2 FILE 4 15-OCT-1993 19:13 (UP)

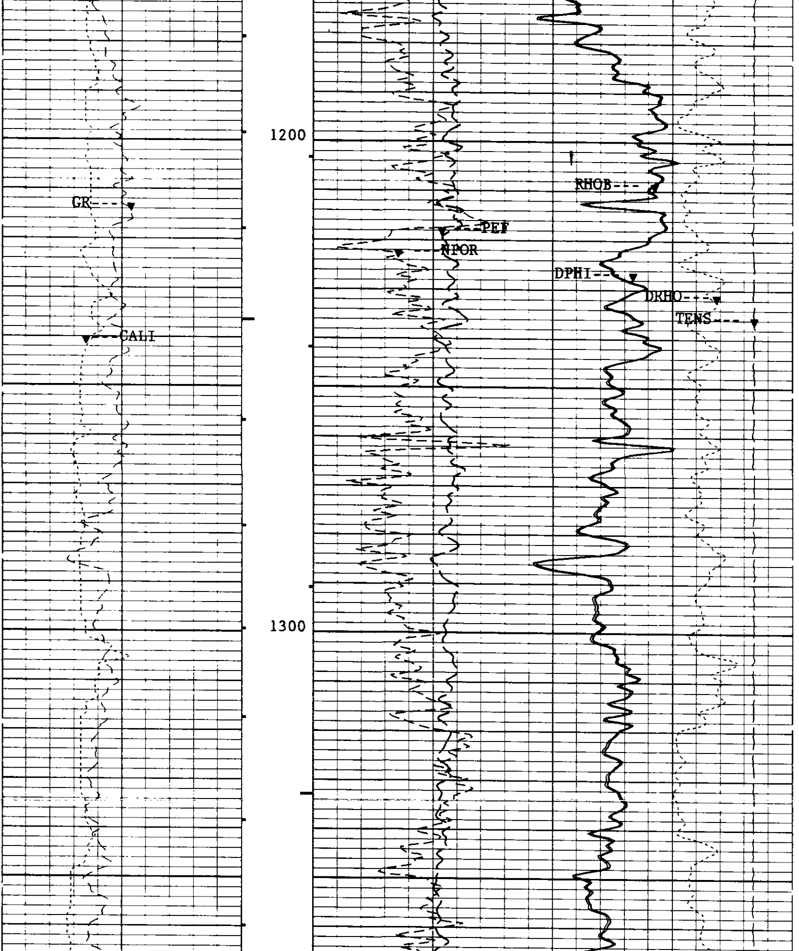
5"/100'

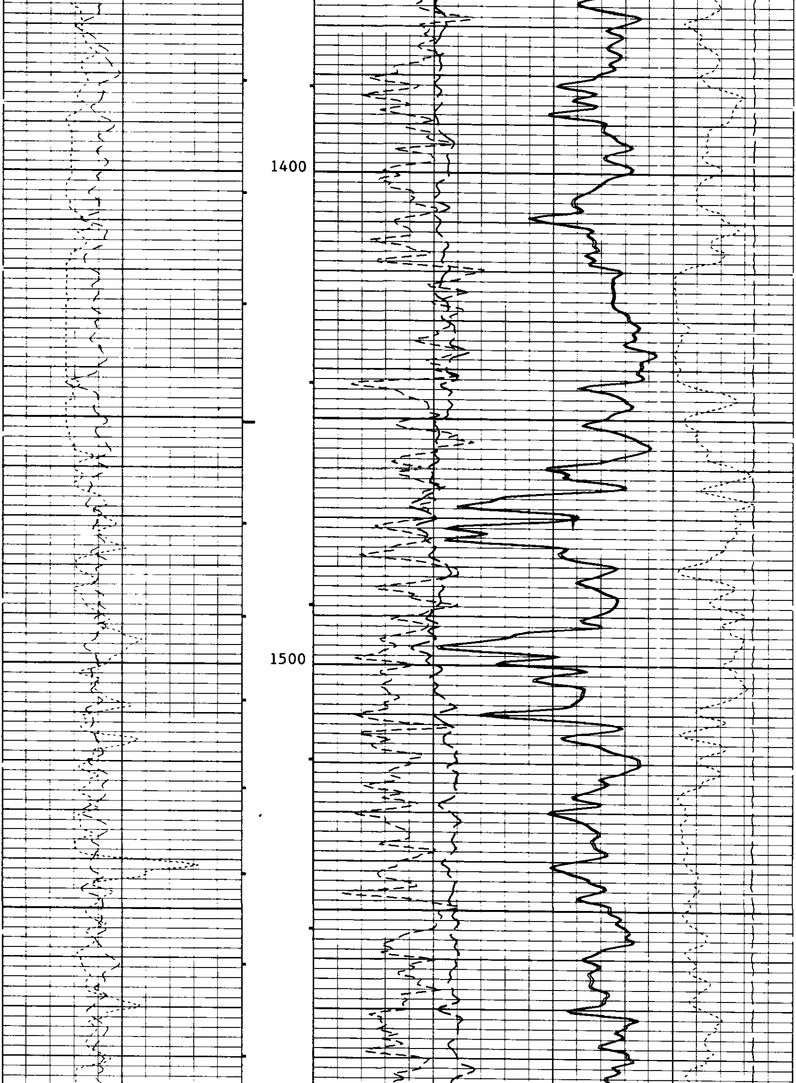


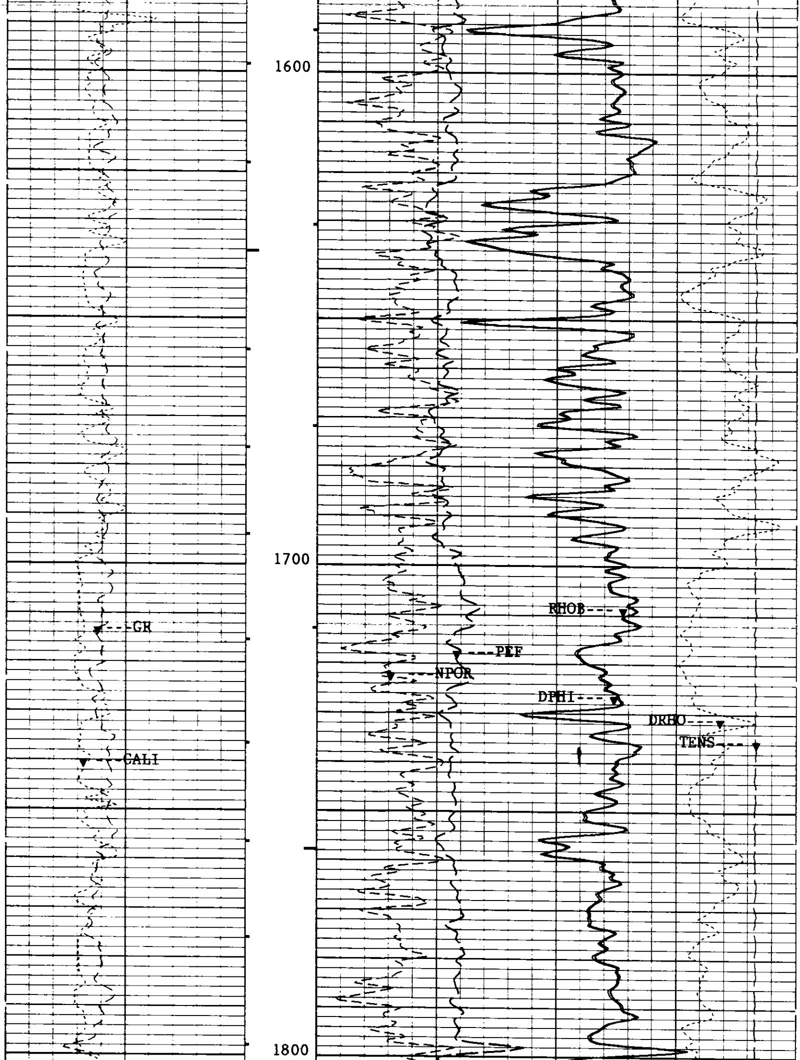


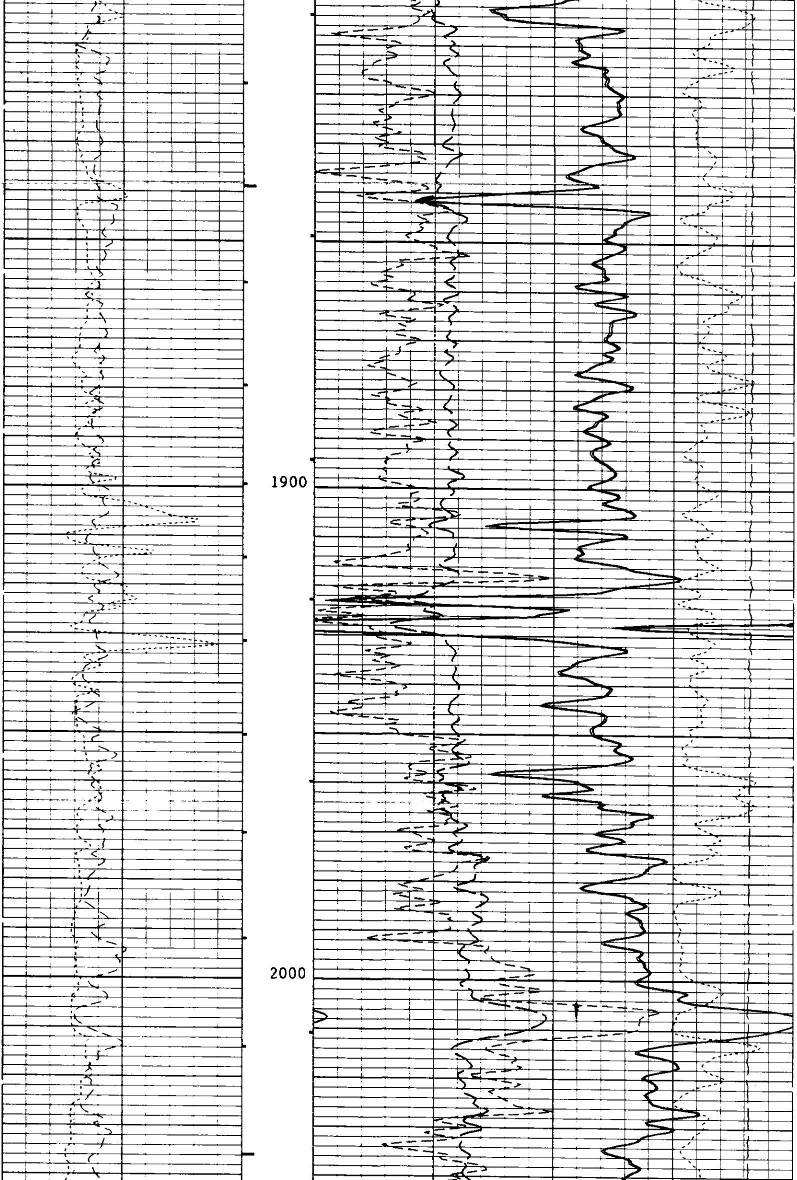


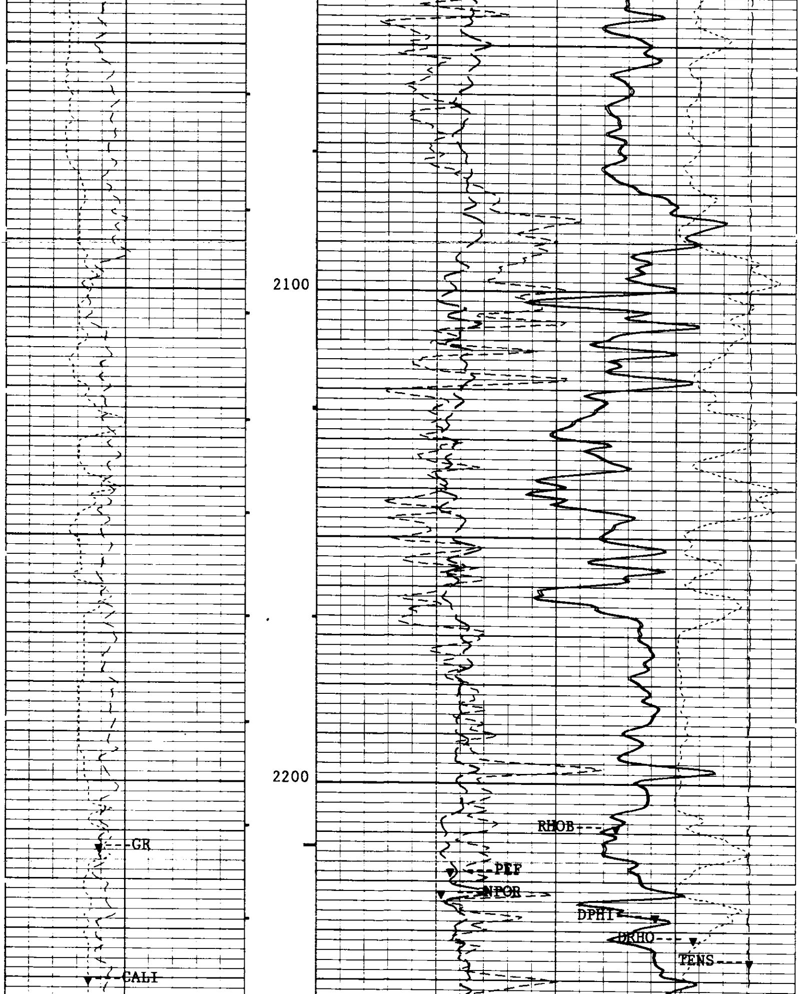


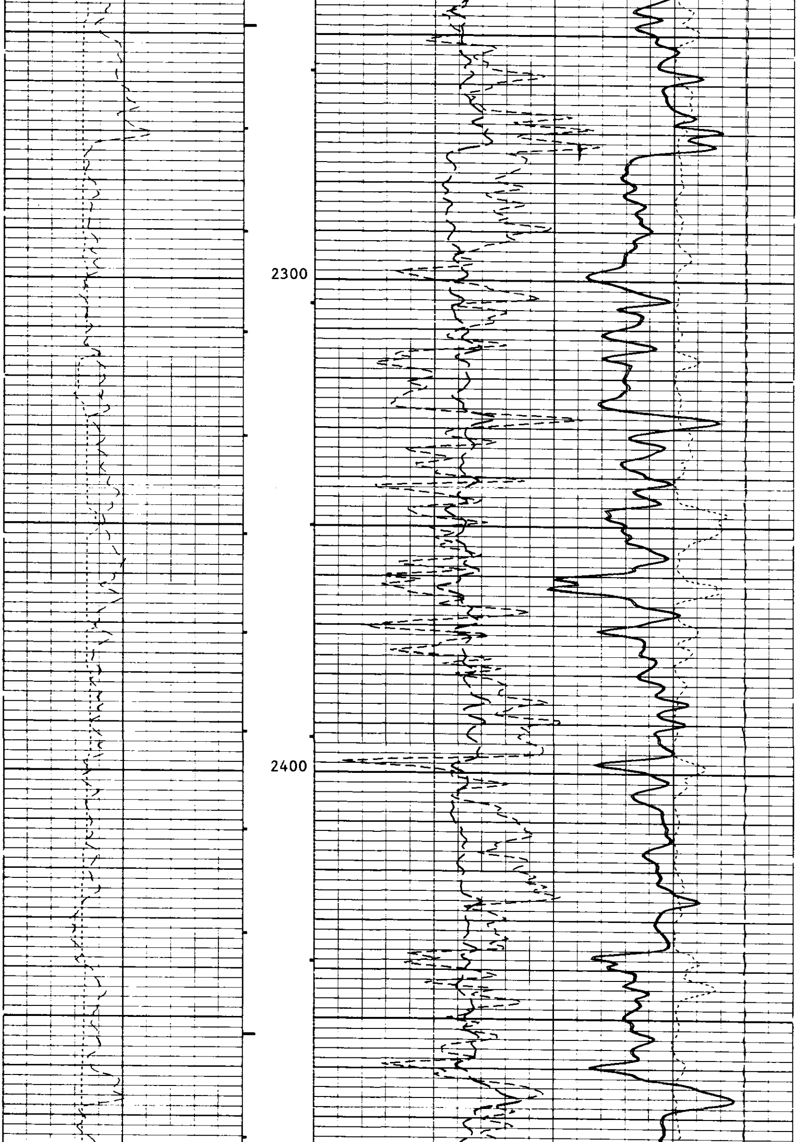


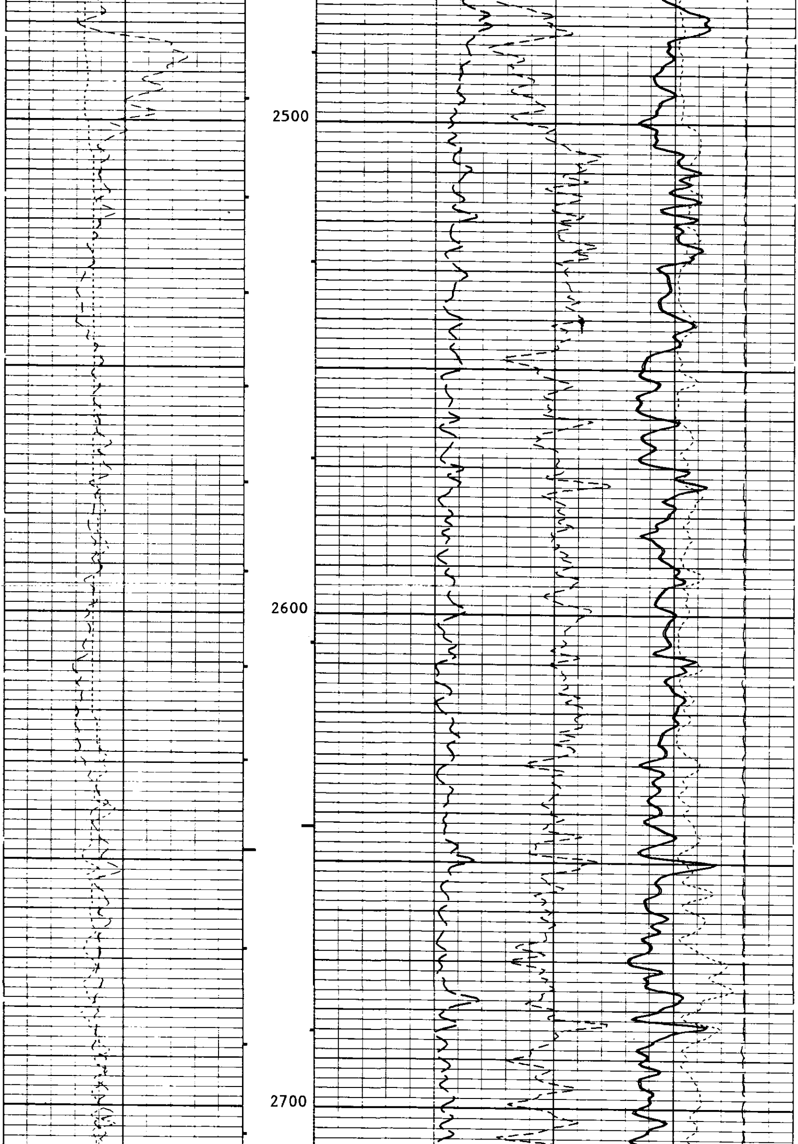


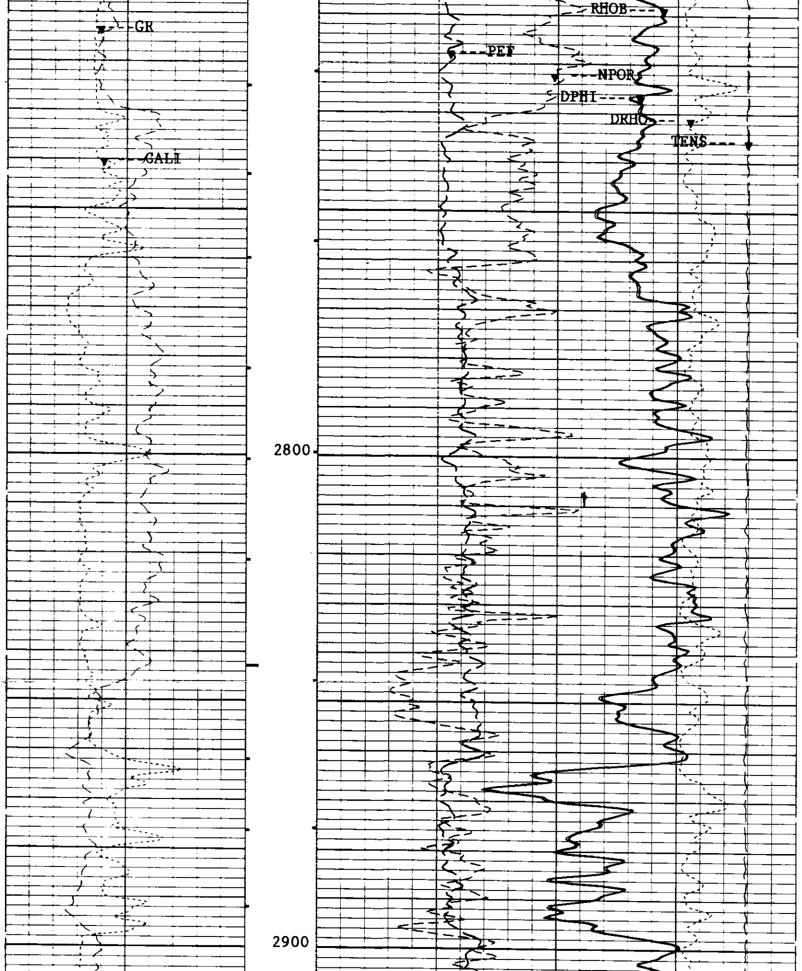


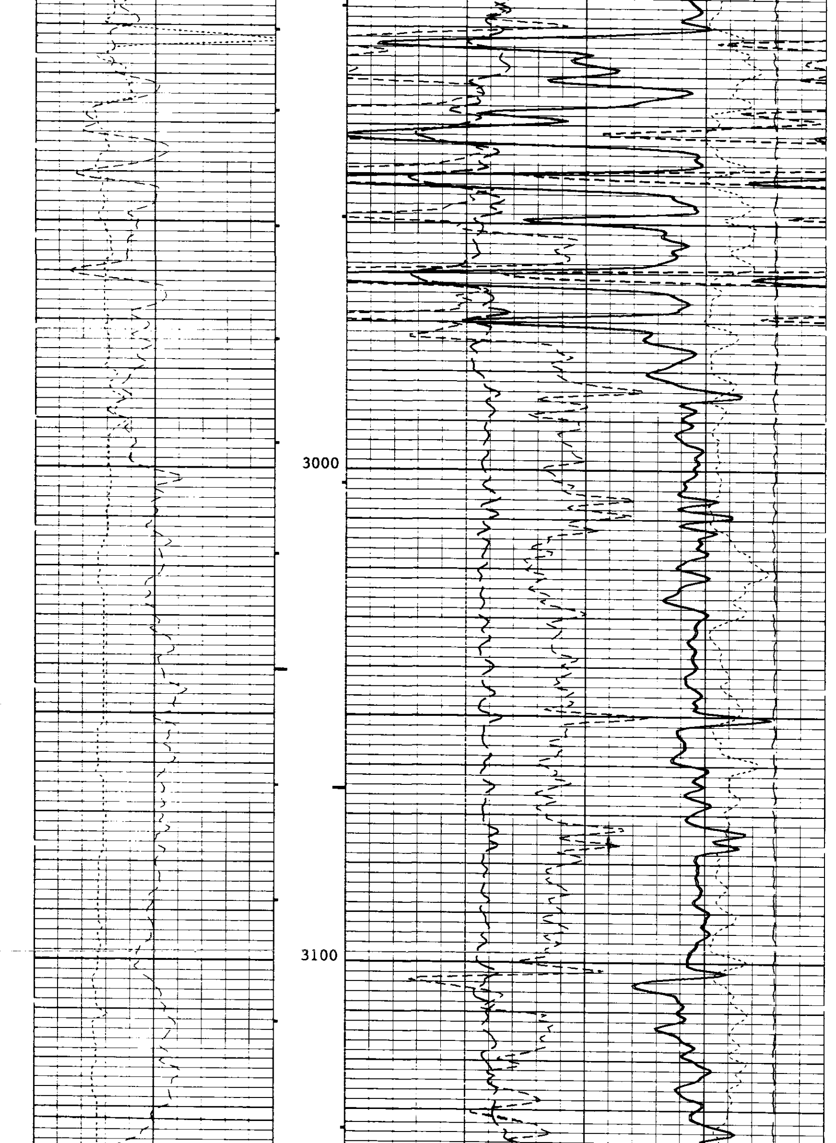


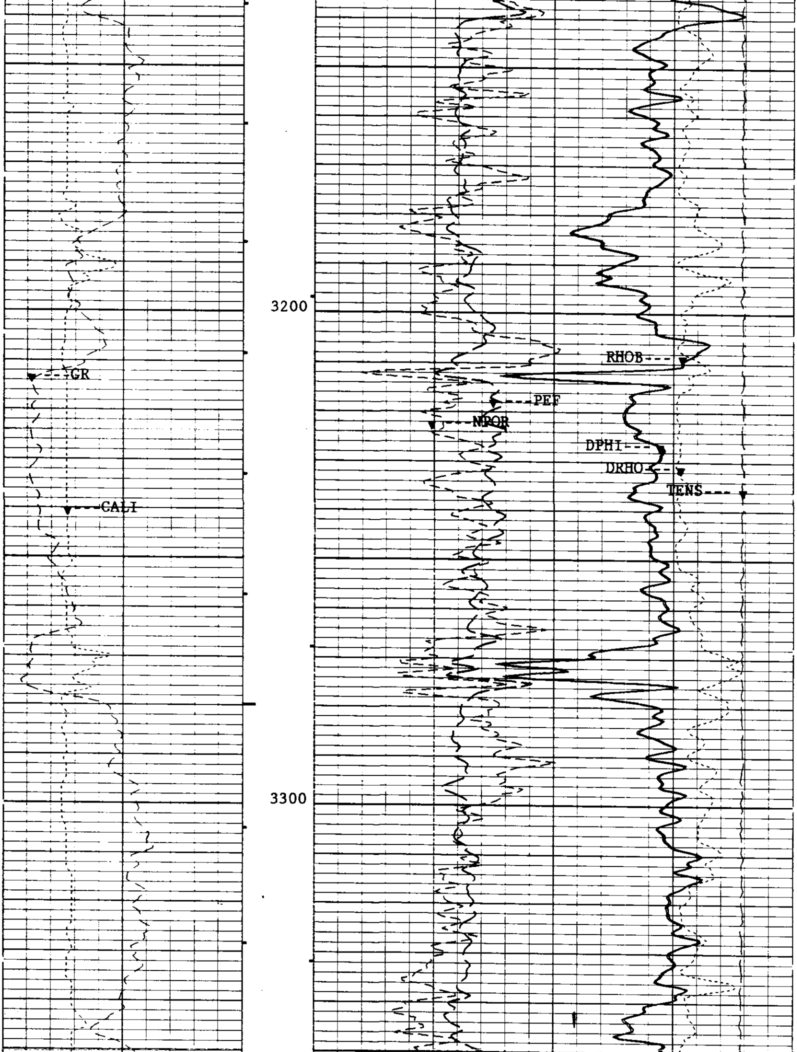


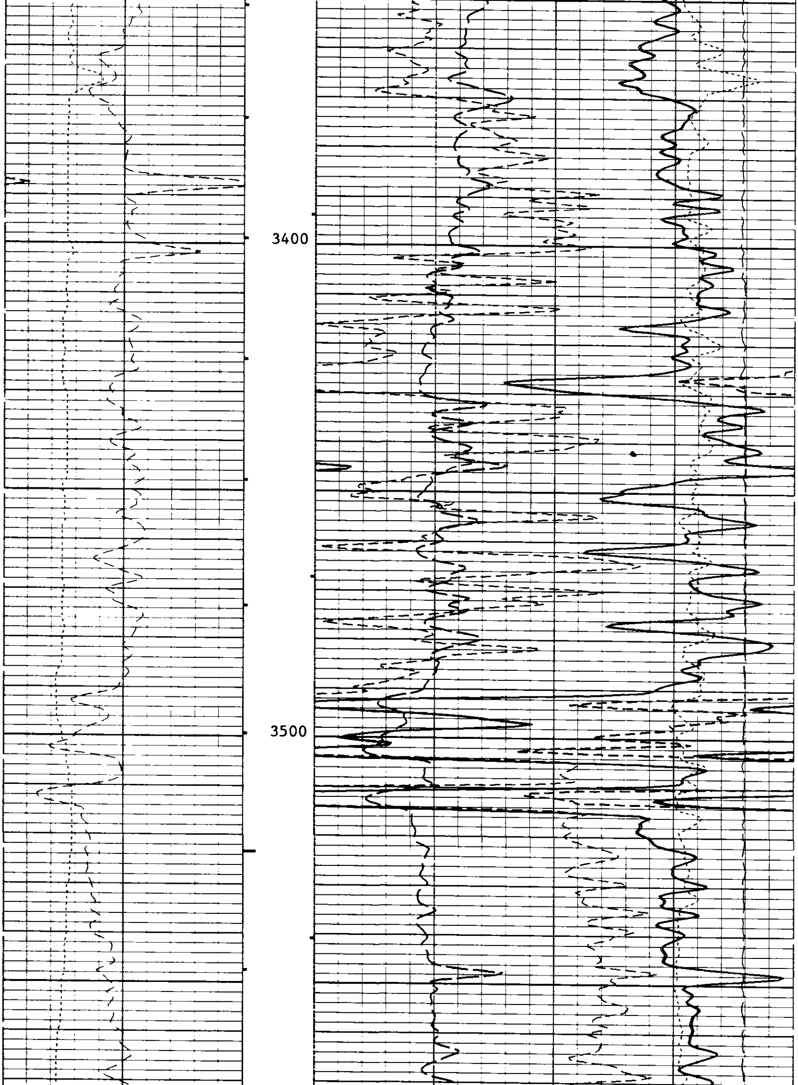


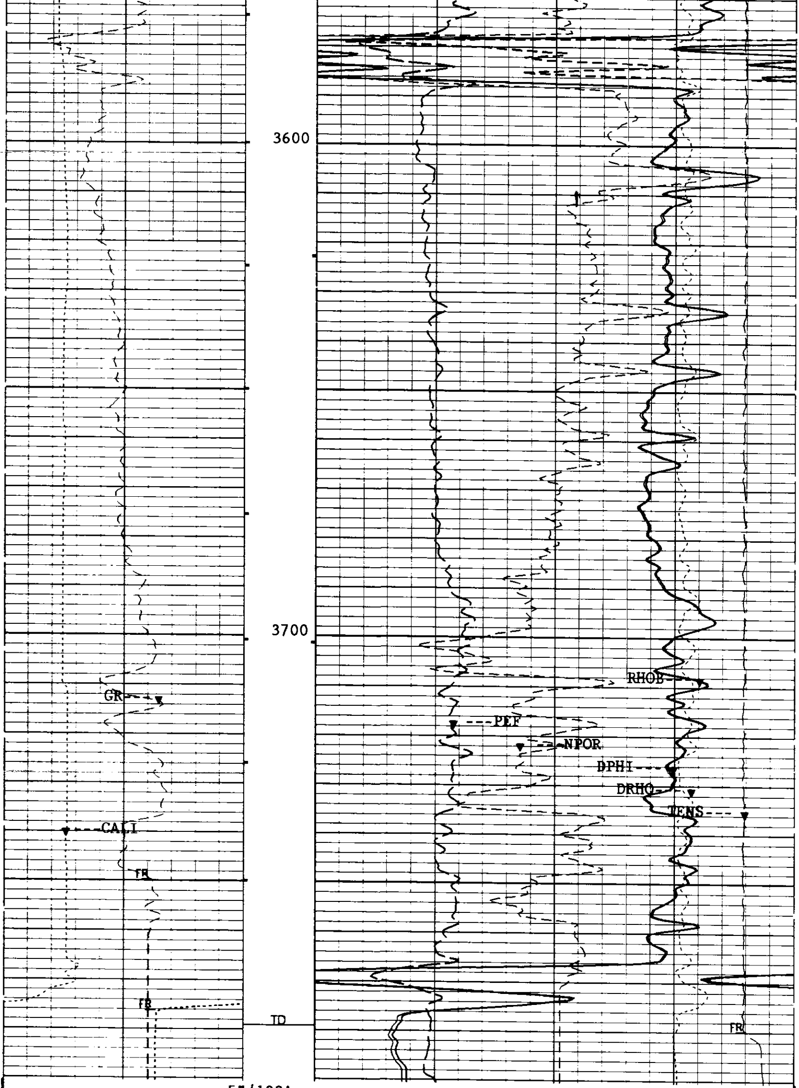






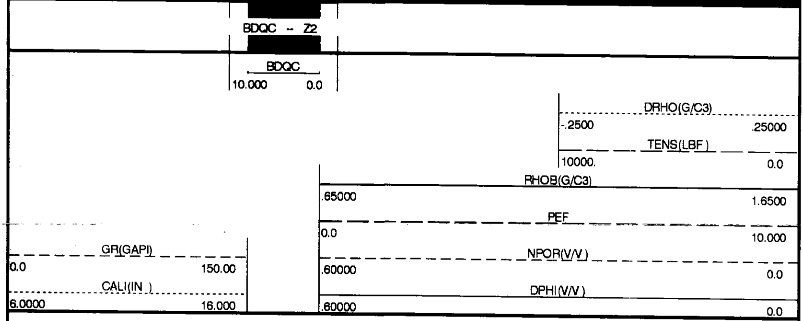






5"/100'

CP 38.2 FILE 4 15-OCT-1993 17:15 (UP)



SENSOR MEASURE POINT TO TOOL ZERO

CFTC	20.2	FEET	GR	29.2	FEET
LITH	2.6	FEET	CNTC	19.7	FEET
LS	2.6	FEET	LL	2.6	FEET
PARI	2.1	FEET	LU	2.6	FEET
SS2	2.1	FEET	SS1	2.1	FEET
TENS	-.9	FEET	CALI	2.7	FEET
TNRA	20.7	FEET	HGR	29.2	FEET
HCFT	20.2	FEET	HCNT	19.7	FEET
HSS1	2.1	FEET	HSS2	2.1	FEET
HLS	2.6	FEET	HLIT	2.6	FEET
HLL	2.6	FEET	HLU	2.6	FEET

PARAMETERS

PARAMETER	VALUE	UNIT
WMUD - Weight of Mud	9.10000	LB/G
TD - Total Depth	3779.00	F
FCD - Future Casing Diameter	7.00000	IN
DHC - Density Hole Correction	BS	
BFM - Borehole Fill Medium	LIQU	
MDEN - Matrix Density	2.65000	G/C3
FD - Fluid Density	1.00000	G/C3
DPPM - Density/Porosity Processing Mode	HIRS	
MATR - Matrix	SAND	
HC - Hole Correction Origin	CALI	
NPDC - Neutron Alpha Process Depth Constant	0	
HSCO - Hole Size Correction Option	YES	
SOCO - Stand Off Correction Option	NO	
MCCO - Mud Cake Correction Option	NO	
BSCO - Borehole Salinity Correction Option	NO	
FSCO - Formation Salinity Correction Option	NO	
MWCO - Mud Weight Correction Option	NO	
PTCO - Pressure Temperature Correction Option	NO	
CCCO - Casing & Cement Correction Option for Thick	NO	
SDAT - Standoff Data Source	SOCN	

MCOR	Mud Correction	NATU	
SOCN	Stand Off for Compensated Neutron	.500000	IN
FSAL	Formation Salinity	-50000.0	PPM
ANGL	Angle of Well	0.0	DEG
GGRD	Geothermal Gradient	.0100000	DF/F
BHFL	BoreHole Fluid Type	WATE	
CDSE	Corrected Density Selector	RHOB	
CNPS	Compensated Neutron Porosity Selector	NPHI	
NCJT	NGT Calibration Jig Type	GSRY	
GTSE	Generalized Temperature Selection	TEMP	
SHT	Surface Hole Temperature	80.0000	DEGF
BHT	Bottom Hole Temperature	100.000	DEGF
TDL	Total Depth - Logger	3779.00	F
MRT	Maximum Recorded Temperature	98.0000	DEGF
DFD	Drilling Fluid Density	9.10000	LB/G
RMFS	Resistivity of Mud Filtrate Sample	7.25000	OHMM
RMS	Resistivity of Mud Sample	6.30000	OHMM
MST	Mud Sample Temperature	62.0000	DEGF
MFST	Mud Filtrate Sample Temperature	60.0000	DEGF
BS	Bit Size	8.75000	IN
BHS	BoreHole Status (Open or Cased)	OPEN	

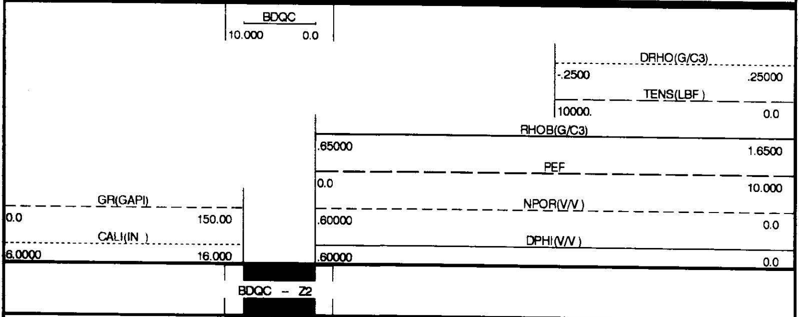
REPEAT SECTION

ACCUMULATED INTEGRATION VALUES SUMMARY:

```
Integrated Hole Volume:    88.9802 F3    FROM 3779.00 F    TO 3558.50 F
Integrated Cement Volume: 30.7439 F3    FROM 3779.00 F    TO 3558.50 F
  (ASSUMING 7.00000 IN   O.D. CASING)
```

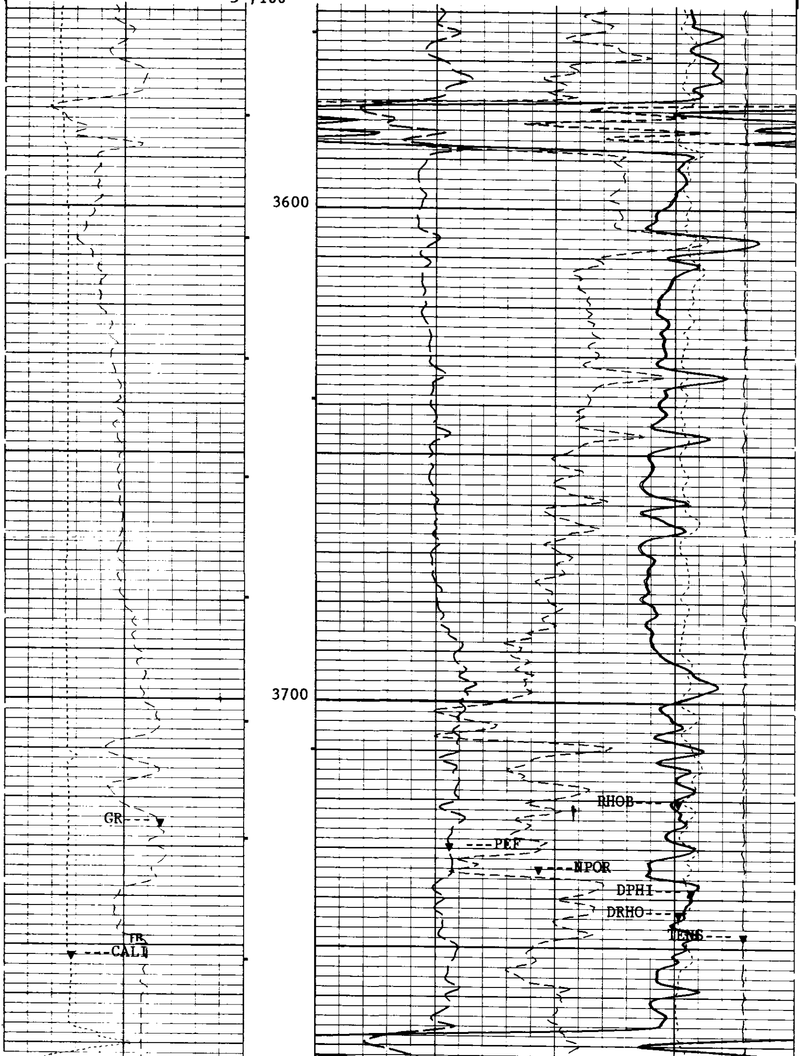
EVENT MARK SUMMARY:

OUTPUT	INTERVAL BETWEEN PIPS	DEPTH TRACK EDGE
Integrated Hole Volume	10.0000 F3	LEFT EDGE
Integrated Cement Volume	10.0000 F3	RIGHT EDGE



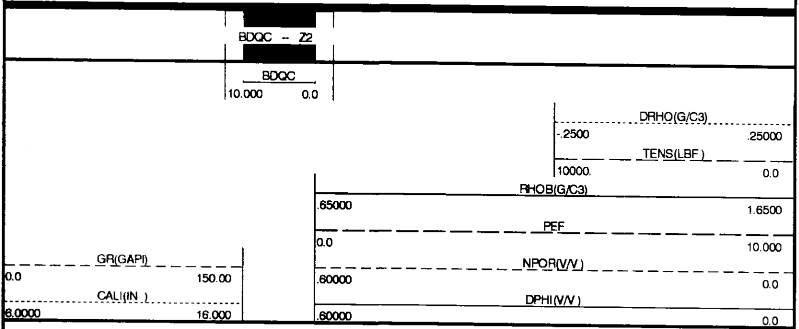
CP 38.2 FILE 3 15-OCT-1993 17:12 (UP)

5"/100'



5"/100'

CP 38.2 FILE 3 15-OCT-1993 16:59 (UP)



SENSOR MEASURE POINT TO TOOL ZERO

CFTC	20.2	FEET	GR	29.2	FEET
LITH	2.6	FEET	CNTC	19.7	FEET
LS	2.6	FEET	LL	2.6	FEET
PARI	2.1	FEET	LU	2.6	FEET
SS2	2.1	FEET	SS1	2.1	FEET
TENS	-.9	FEET	CALI	2.7	FEET
TNRA	20.7	FEET	HGR	29.2	FEET
HCFT	20.2	FEET	HCNT	19.7	FEET
HSS1	2.1	FEET	HSS2	2.1	FEET
HLS	2.6	FEET	HLIT	2.6	FEET
HLL	2.6	FEET	HLU	2.6	FEET

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
WMUD	9.10000	LB/G	TD	3779.00	F
FCD	7.00000	IN	DHC	BS	
BFM	LIQU		MDEN	2.65000	G/C3
FD	1.00000	G/C3	DPPM	HIRS	
MATR	SAND		HC	CALI	
NPDC	0		HSCO	YES	
SOCO	NO		MCCO	NO	
BSCO	NO		FSCO	NO	
MWCO	NO		PTCO	NO	
CCCO	NO		SDAT	SOCN	
MCOR	NATU		SOCN	.500000	IN
FSAL	-50000.0	PPM	ANGL	0.0	DEG
GGRD	.0100000	DF/F	BHFL	WATE	
CDSE	RHOB		CNPS	NPHI	
NCJT	GSRY		GTSE	TEMP	
SHT	80.0000	DEGF	BHT	100.000	DEGF
TDL	3779.00	F	MRT	98.0000	DEGF
DFD	9.10000	LB/G	RMFS	7.25000	OHMM
RMS	6.30000	OHMM	MST	62.0000	DEGF
MFST	60.0000	DEGF	BS	8.75000	IN
BHS	OPEN				

CALIBRATION SUMMARY

```
           AFTER SURVEY TOOL CHECK SUMMARY


   PERFORMED:     15-OCT-1993 20:02
   PROGRAM FILE: TOH     (VERSION    38.2    92/10/12  92/10/12)


 LDTD                      TOOL  CHECK

        DENSITY RESISTIVITY SONDE NUMBER        :     3959
        NUCLEAR SERVICE CARTRIDGE NUMBER        :     2941
        POWERED DETECTOR HOUSING NUMBER         :     3840
        POWERED GAMMA-GAMMA DETECTOR NUMBER     :     2868
        LDT LOGGING SOURCE NUMBER               :     1862
        LDT CALIBRATION MODE                    :     WATE

             MEASURED BACKGROUND                  TOLERANCE ON
             BEFORE          AFTER      UNITS     BEFORE-AFTER
       LL     16.7            16.5       CPS        +/- 1.0
       LU     64.6            64.1       CPS        +/- 1.0
       LS     49.0            48.5       CPS        +/- 1.0
     LITH      4.8             4.7       CPS        +/- 0.3
      SS1     14.0            13.9       CPS        +/- 0.5
      SS2      9.3             9.3       CPS        +/- 0.5

             HV SETTINGS            DETECTOR RESOLUTIONS
           HV LS:   1638.5 V              LS:   8.6 %
           HV SS:   1514.5 V              SS:   8.6 %

 BKGD                             BKGD
   BEFORE SURVEY: 15-OCT-1993 15:58   AFTER SURVEY: 15-OCT-1993 19:52


 CNTH                      TOOL  CHECK


           INPUT     BEFORE JIG    AFTER JIG


           CNTC       2609.27       2603.48

           CFTC       1116.44       1109.98


 CHANGE IN THERMAL POROSITY AT 20 PU IS    .122  PU


 BEFORE SURVEY:               BACK: 15-OCT-1993 15:58   JIG: 15-OCT-1993 16:04
 AFTER SURVEY CHECK:          BACK: 15-OCT-1993 19:52   JIG: 15-OCT-1993 20:01

    CP 38.2            FILE    6      15-OCT-1993 20:01


           BEFORE SURVEY CALIBRATION SUMMARY
```

```
  PERFORMED:     15-OCT-1993 16:07
  PROGRAM FILE: TOH    (VERSION    38.2    92/10/12  92/10/12)


SGTL             DETECTOR CALIBRATION SUMMARY

            MEASURED
          BKGD    JIG          CALIBRATED           UNITS
    GR     21     189              165              GAPI

BACK: 15-OCT-1993 15:58   JIG: 15-OCT-1993 16:04  COMP: 15-OCT-1993 16:04


LDTD             DETECTOR CALIBRATION SUMMARY

        DENSITY RESISTIVITY SONDE NUMBER      :     3959
        NUCLEAR SERVICE CARTRIDGE NUMBER      :     2941
        POWERED DETECTOR HOUSING NUMBER       :     3840
        POWERED GAMMA-GAMMA DETECTOR NUMBER :       2868
        LDT LOGGING SOURCE NUMBER             :     1862
        LDT CALIBRATION MODE                  :     WATE

               MEASURED       SHOP  VALUES
                 BKGD        AL+FE    AL       UNITS
          LL     16.7         94.3  100.6       CPS
          LU     64.6        139.5  148.9       CPS
          LS     49.0        164.1  175.1       CPS
        LITH      4.8         42.8   63.4       CPS
         SS1     14.0        188.0  199.8       CPS
         SS2      9.3        266.0  281.7       CPS

           HV SETTINGS           DETECTOR RESOLUTIONS
         HV LS:  1640.6 V             LS:  8.6 %
         HV SS:  1535.4 V             SS:  8.7 %

BKGD: 15-OCT-1993 15:58


CNTH             DETECTOR CALIBRATION SUMMARY

      NEUTRON COMPENSATED CARTRIDGE NUMBER: 2524
      NEUTRON SOURCE SERIAL NUMBER        : 1441
      THERMAL HOUSING NUMBER              : 3290
      THERMAL CALIBRATED NEUTRON BOX      : 1446

         INPUT     PLUS       SHOP      SHOP      BEFORE     GAIN
                 REFERENCE    TANK       JIG        JIG
                  COUNTS     COUNTS    COUNTS     COUNTS

         CNTC    6031.00    6119.77   2611.69    2609.27     .985
         CFTC    2793.00    2534.45   1125.95    1116.44    1.102

         RATIO     2.159      2.415     2.320      2.337

BACK: 15-OCT-1993 15:58   JIG: 15-OCT-1993 16:04  COMP: 15-OCT-1993 15:51

LDTD             CALIPER CALIBRATION SUMMARY
```

```
                 MEASURED                          CALIBRATED
               SMALL   LARGE                    SMALL      LARGE        UNITS
    CALI       11.98   15.03                    8.00       12.00         IN

 SMALL: 15-OCT-1993 15:47 LARGE: 15-OCT-1993 15:48 COMP: 15-OCT-1993 15:48

     CP 38.2             FILE    1        15-OCT-1993 16:06



                    SHOP SUMMARY


   PERFORMED:      14-OCT-1993 10:54
   PROGRAM FILE: CCSHOP (VERSION    38.2     92/10/12  92/10/12)


 CNTH               DETECTOR CALIBRATION SUMMARY

       NEUTRON COMPENSATED CARTRIDGE NUMBER: 2524
       NEUTRON SOURCE SERIAL NUMBER        : 1441
       THERMAL HOUSING NUMBER              : 3290
       THERMAL CALIBRATED NEUTRON BOX      : 1446


           INPUT     PLUS        SHOP       SHOP       GAIN
                  REFERENCE      TANK       JIG
                    COUNTS      COUNTS     COUNTS

           CNTC    6031.00    6119.77    2611.69      .985
           CFTC    2793.00    2534.45    1125.95     1.102

           RATIO     2.159      2.415      2.320

           SHOP COUNTS TEMPERATURE AND HOUSING SIZE CORRECTED

 BKGD: 14-OCT-1993 10:28 TANK: 14-OCT-1993 10:36  COMP: 14-OCT-1993 10:36

     CP 38.2             FILE    5        14-OCT-1993 10:54



                    SHOP SUMMARY


   PERFORMED:      07-SEP-1993 11:32
   PROGRAM FILE: CCSHOP (VERSION    38.2     92/10/12  92/10/12)


 LDTD               DETECTOR CALIBRATION SUMMARY

         DENSITY RESISTIVITY SONDE NUMBER      :  3959
         NUCLEAR SERVICE CARTRIDGE NUMBER      :  2941
         POWERED DETECTOR HOUSING NUMBER       :  3840
         POWERED GAMMA-GAMMA DETECTOR NUMBER   :  2868
         LDT LOGGING SOURCE NUMBER             :  1862
         LDT CALIBRATION MODE                  :  WATE

                        MASTER CALIBRATED
                       BKGD    AL+FE      AL  UNITS
                 LL    16.9     94.3   100.6   CPS
                 LU    64.7    139.5   148.9   CPS
                 LS    49.3    164.1   175.1   CPS
               LITH     4.9     42.8    63.4   CPS
                SS1    14.0    188.0   199.8   CPS
                SS2     9.4    266.0   281.7   CPS

           HV SETTINGS             DETECTOR RESOLUTIONS
         HV LS:  1620.8 V               LS:  8.6 %
         HV SS:  1515.0 V               SS:  8.7 %
```

```
                    SPECTRUM QUALITY RATIOS
           COMPUTED VALUE           NOMINAL VALUE    TOLERANCE
    QRLS         .676                    0.65         +/- 0.05
    QRSS         .709                    0.72         +/- 0.10
    QRLI         .362                    0.39         +/- 0.06
    QLIR        1.391                    1.39         +/- 0.06
    QR          1.004                    1.00         +/- 0.02

  BKGD: 07-SEP-1993 11:17   AL: 07-SEP-1993 11:31   AL+FE: 07-SEP-1993 11:25

    CP 38.2          FILE   13      07-SEP-1993 11:32
```

COMPANY	CARBON ENERGY INT.			**SCHL.**	**FR**	**3776.0 F**
				SCHL.	**TD**	**3779.0 F**
WELL	"COOS COUNTY FOREST" #7-1			**DRLR.**	**TD**	**3804.0 F**
FIELD	WILD CAT			**Elev:**	**KB**	**548.0 F**
					DF	**547.0 F**
COUNTY	COOS	**STATE**	OREGON		**GL**	**530.0 F**

Schlumberger

COMPENSATED NEUTRON LITHO DENSITY LOG