Schlumberger

COMPENSATED NEUTRON-LITHO-DENSITY

COUNTY	COLUMBIA
FIELD	MIST
LOCATION	1092'S AND 1365'E
WELL	"C.E.R." #11-16-64
COMPANY	NAHAMA & WEAGANT ENERGY C

COMPANY	NAHAMA & WEAGANT ENERGY COMPAN		
WELL	"C.E.R." #11-16-64		
FIELD	MIST		
COUNTY	COLUMBIA	STATE	OREGON

LOCATION: 1092'S AND 1365'E
FROM NW CORNER

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

API SERIAL NO.	SECT.	TWP.	RANGE
	16	6N	4W

Permanent Datum	GL	Elev.	1448.0 F	Elev.: K.B.1460.0 F
Log Measured From	KB	11.5 F	above Perm. Datum	D.F.
Drilling Measured From	KB			G.L.1448.0 F

Date		10-OCT-90			
Run No.		ONE			
Depth Driller		2338.0 F			
Depth Logger (Schl.)		2338.0 F			
Btm. Log Interval		2332.0 F			
Top Log Interval		1300.0 F			
Casing-Driller		8 5/8 @ 592.0 F		@	@
Casing-Logger		590.0 F			
Bit Size		7 7/8"			
Type Fluid in Hole		GEL POLYMER			
Dens.	Visc.	9.20 LB/G	47.0 S		
pH	Fld. Loss	8.0	4.8 C3		
Source of Sample		FLOWLINE			
Rm @ Meas. Temp.		4.390 OHMM @ 66.0 DEGF		@	
Rmf @ Meas. Temp.		5.700 OHMM @ 46.0 DEGF		@	
Rmc @ Meas. Temp.		5.100 OHMM @ 46.0 DEGF		@	
Source: Rmf	Rmc	MEASURED	MEASURED		
Rm @ BHT		3.601 OHMM @ 82.0 DEGF		@	
Time	Circulation Ended	07:00 10-10			
	Logger on Bottom	13:04 10-10			
Max. Rec. Temp.		82.0 DEGF			
Equip.	Location	8504	SACRAMENTO		
Recorded By		SCOTT PILCH / JOHN LOPEZ			
Witnessed By		VAUGHAN, PARKER (SEE REMARKS)			

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.	560669	
Drilling Fluid Level	6.0 F	
Salinity	500.0 PPM	
Rmf @ BHT	3.394 OHMM @ 82.0 DEGF	@
Rmc @ BHT	3.037 OHMM @ 82.0 DEGF	@
Logging Speed	3600.0 F/HR	
EQUIPMENT DATA		
Tool Number 1	DRS-B 3756	
Tool Number 2	NSC-D 1055	
Tool Number 3	CNC-HA 1263	
Tool Number 4	SGC-SA 660	
Tool Number 5	TCC-B 13312	
Tool Number 6	TCM-AB 1317	
Tool Number 7		
Tool Number 8		
Tool Number 9		
Tool Number 10		
Tool Number 11		
Tool Number 12		

REMARKS:

WITNESSED BY: J. VAUGHAN, D. PARKER

T. THOMAS, M. CHALMERS

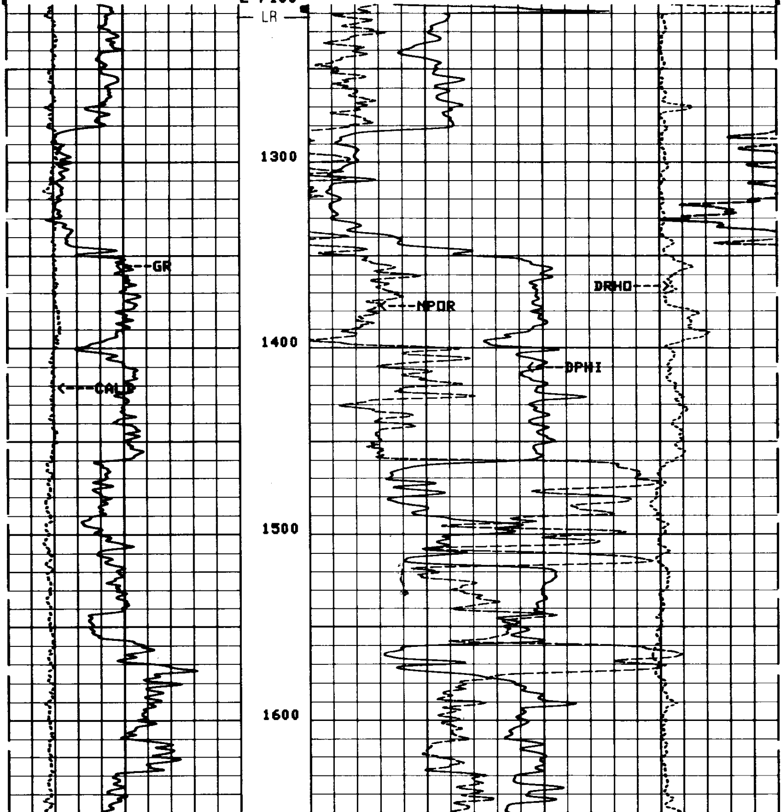
GR (GAPI)		NPOR	DRHO(G/C3)
0.0 150.00		.60000 0.0	-.2500 .25000
CALI(IN)		DPHI	
6.0000 16.000		.60000 0.0	

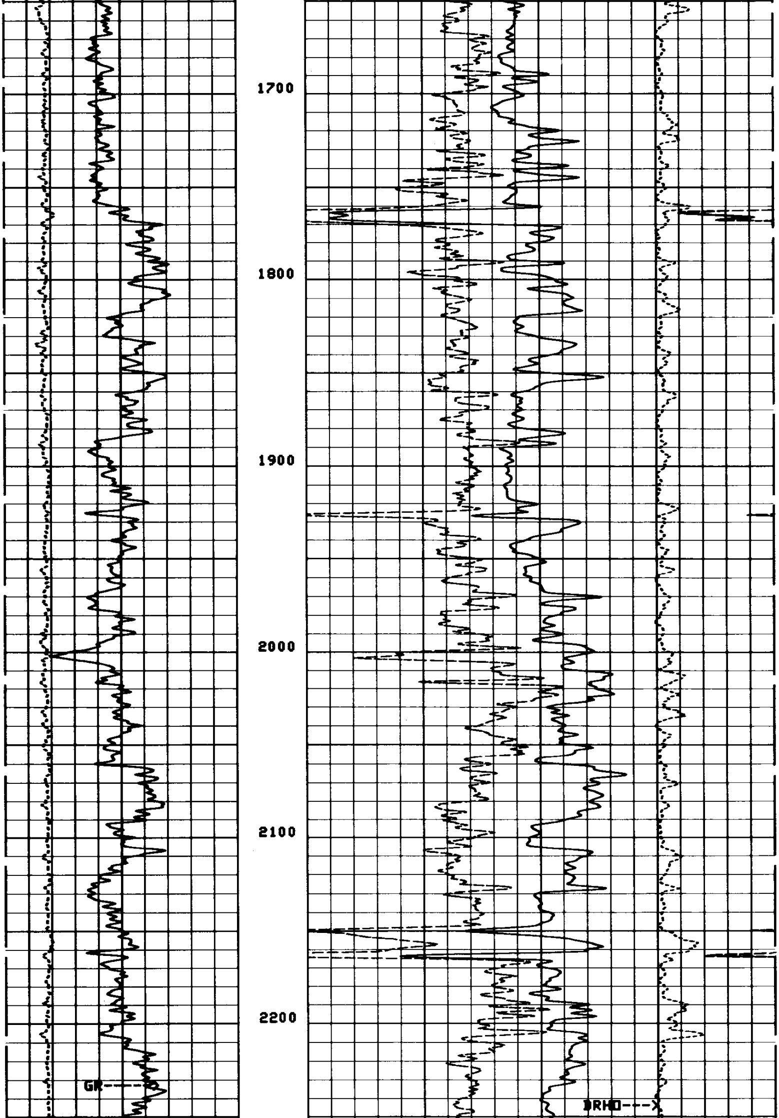
CP 32.2 FILE 1 10-OCT-1990 13:44

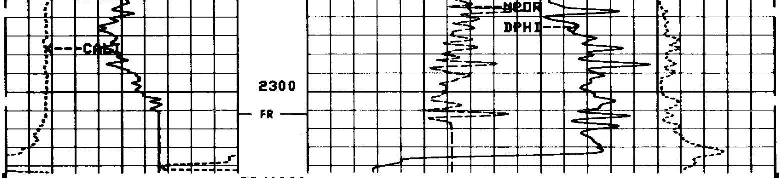
INPUT FILE(S)
30

DATA ACQUIRED
10-OCT-1990 13:28

2"/100'







2"/100'

CP 32.2 FILE 1 10-OCT-1990 13:42

INPUT FILE(S) DATA ACQUIRED
30 10-OCT-1990 13:03

GR (GAPI)			DRHO(G/C3)
0.0 — 150.00		NPOR .60000 — 0.0	-.2500 — .25000
CALI(IN) 6.0000 — 16.000		DPHI .60000 — 0.0	

SENSOR MEASURE POINT TO TOOL ZERO

CFTC	23.2	FEET	GR	32.3	FEET
LITH	2.6	FEET	CNTC	22.7	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
FSS	2.1	FEET	FLS	2.1	FEET
TLS	2.1	FEET	SEQ	2.1	FEET
CALI	2.7	FEET	TSS	2.1	FEET
TNRA	23.7	FEET	TENS	-.9	FEET

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
PP	NORM		DO	0.0	F
WMUD	9.20000	LB/G	TD	2338.00	F
FCD	4.50000	IN	DHC	BS	
BFM	LIQU		MDEN	2.65000	G/C3
FD	1.00000	G/C3	MATR	SAND	
HC	CALI		NPDC	2	
HSCO	YES		SOCO	NO	
MCCO	NO		BSCO	NO	
FSCO	NO		MWCO	NO	
PTCO	NO		SDAT	SOCN	
MCOR	NATU		SOCN	.500000	IN
FSAL	-50000.0	PPM	ANGL	0.0	DEG
GGRD	.0100000	DF/F	BHFL	WATE	
GTSE	TEMP		SHT	80.0000	DEGF
BHT	112.000	DEGF	BS	7.87500	IN
BHS	OPEN				

EVENT MARK SUMMARY:

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

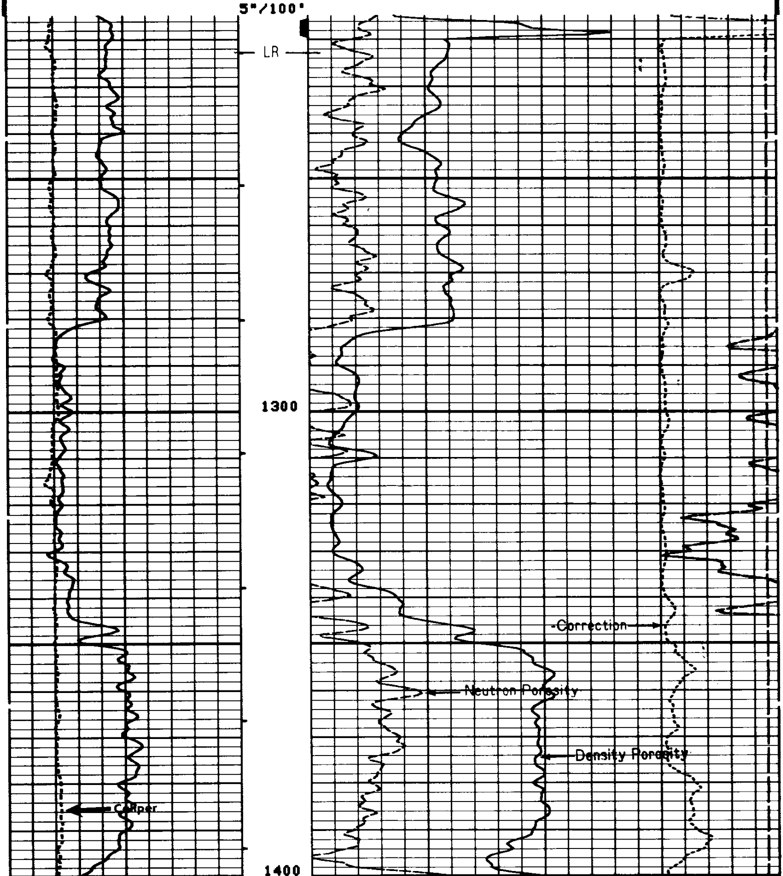
CEMENT VOLUME = 248.962 F3 (ASSUMING 4.50000 IN O.D. CASING)
HOLE VOLUME = 373.103 F3
FROM 2338.0 TO 1214.0 FEET

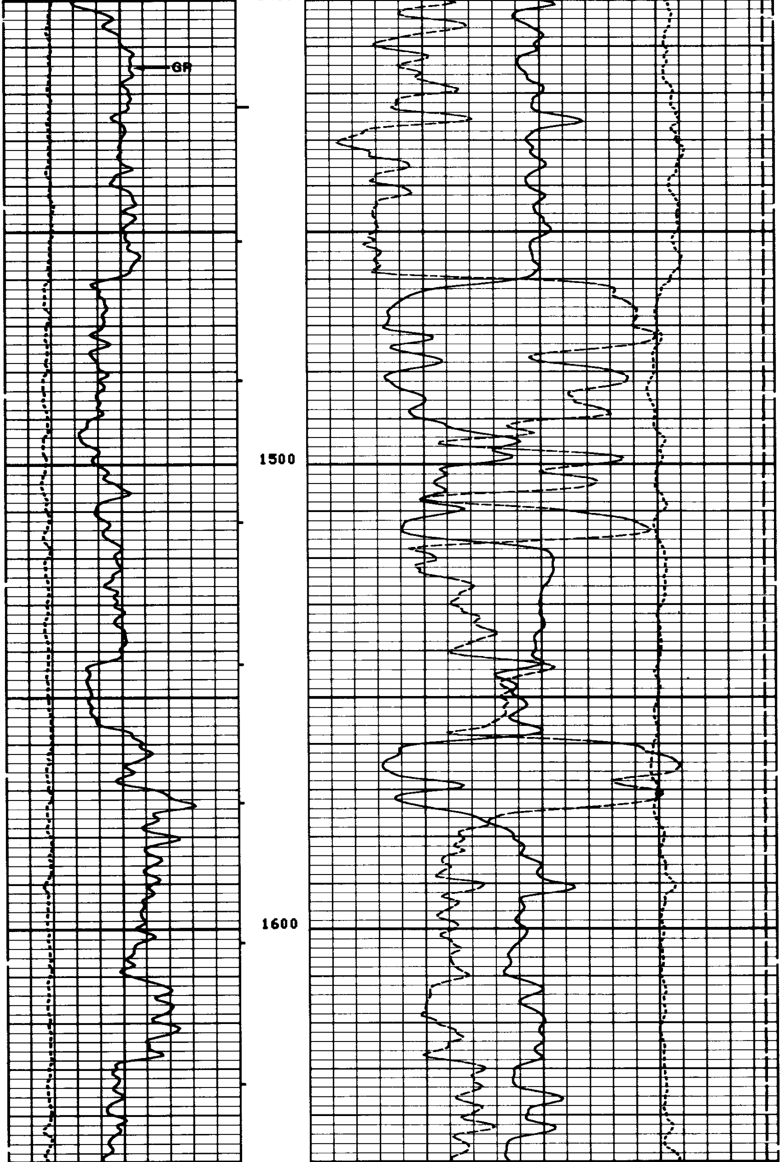
TENS(LBF)
20000. 0.0
DRHO(G/C3)
-.2500 .25000

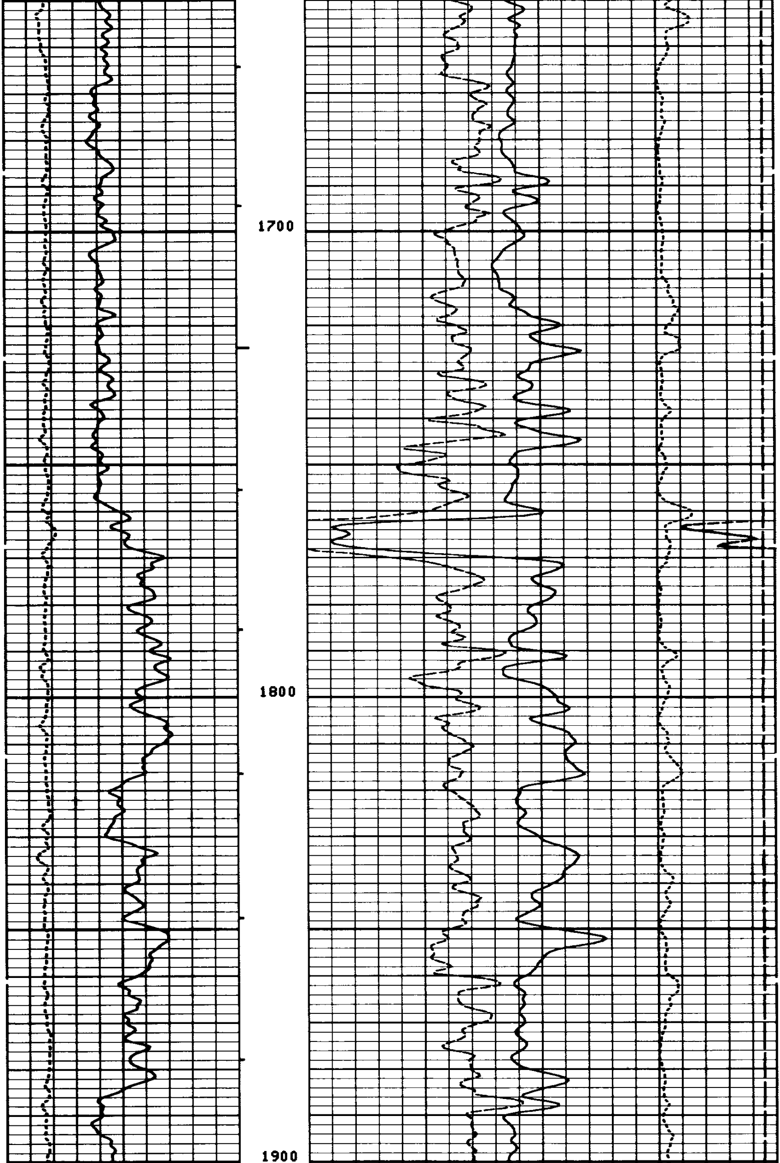
GR (GAPI)
0.0 150.00
CALI(IN)
6.0000 16.000

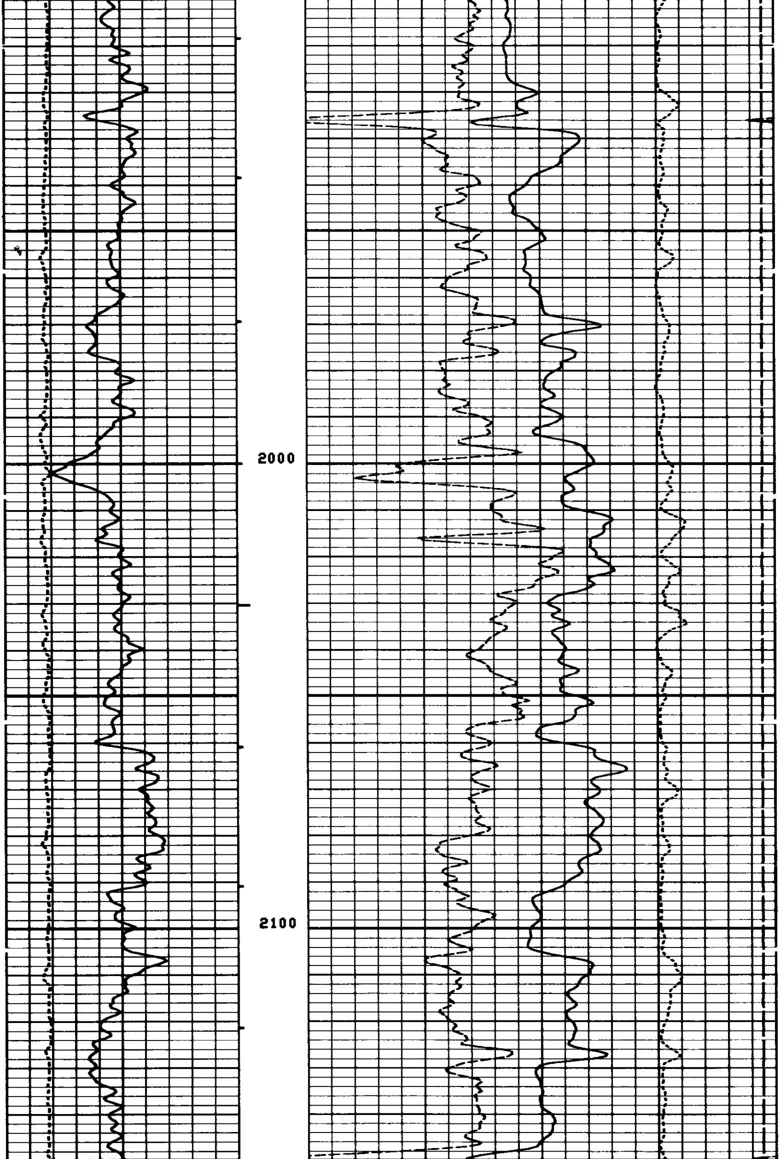
NPOR
.60000 0.0
DPHI
.60000 0.0

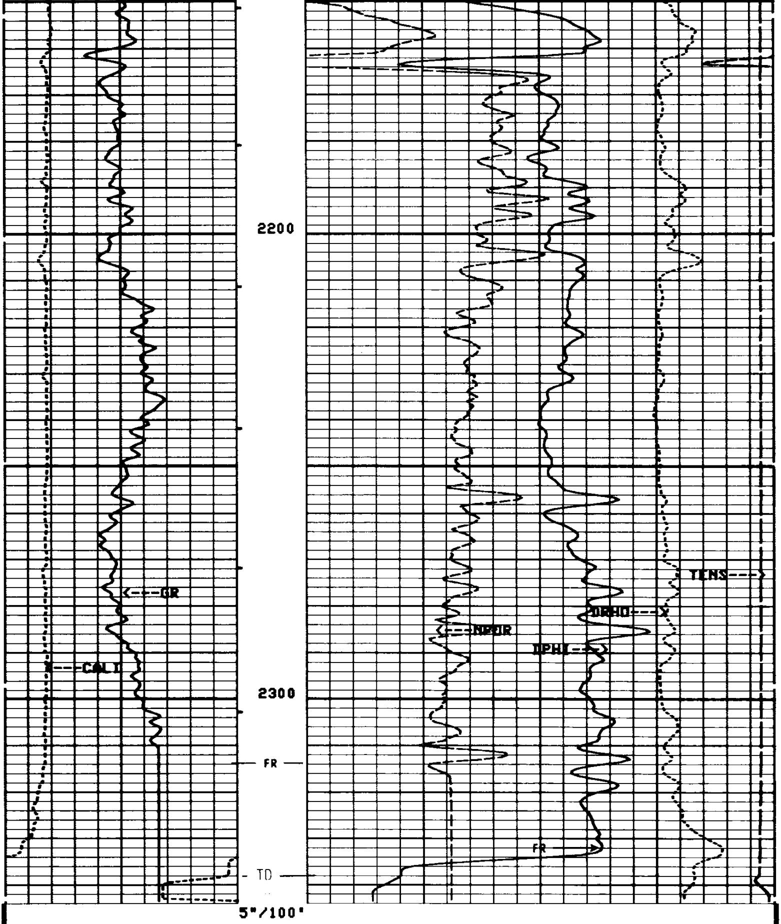
CP 32.2 FILE 30 10-OCT-1990 13:28











CP 32.2 FILE 30 10-OCT-1990 13:02

TENS(LBF)
20000. 0.0
DRHO(G/C3)
-.2500 .25000

GR (GAPI)
0.0 150.00
CALI(IN)
6.0000 16.000

NPOR
.60000 0.0
DPHI
.60000 0.0

SENSOR MEASURE POINT TO TOOL ZERO

CFTC	23.2	FEET	GR	32.3	FEET
LITH	2.6	FEET	CNTC	22.7	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
FSS	2.1	FEET	FLS	2.1	FEET
TLS	2.1	FEET	SEQ	2.1	FEET
CALI	2.7	FEET	TSS	2.1	FEET
TNRA	23.7	FEET	TENS	-.9	FEET

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
WMUD	9.20000	LB/G	TD	2338.00	F
FCD	4.50000	IN	DHC	BS	
DFM	LIQU		MDEN	2.65000	G/C3
FD	1.00000	G/C3	MATR	SAND	
HC	CALI		NPDC	2	
HSCO	YES		SOCO	NO	
MCCO	NO		BSCO	NO	
FSCO	NO		MWCO	NO	
PTCO	NO		SDAT	SOCN	
MCOR	NATU		SOCN	.500000	IN
FSAL	-50000.0	PPM	ANGL	0.0	DEG
GGRD	.0100000	DF/F	BHFL	WATE	
GTSE	TEMP		SHT	80.0000	DEGF
BHT	112.000	DEGF	BS	7.87500	IN
BHS	OPEN				

EVENT MARK SUMMARY:

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

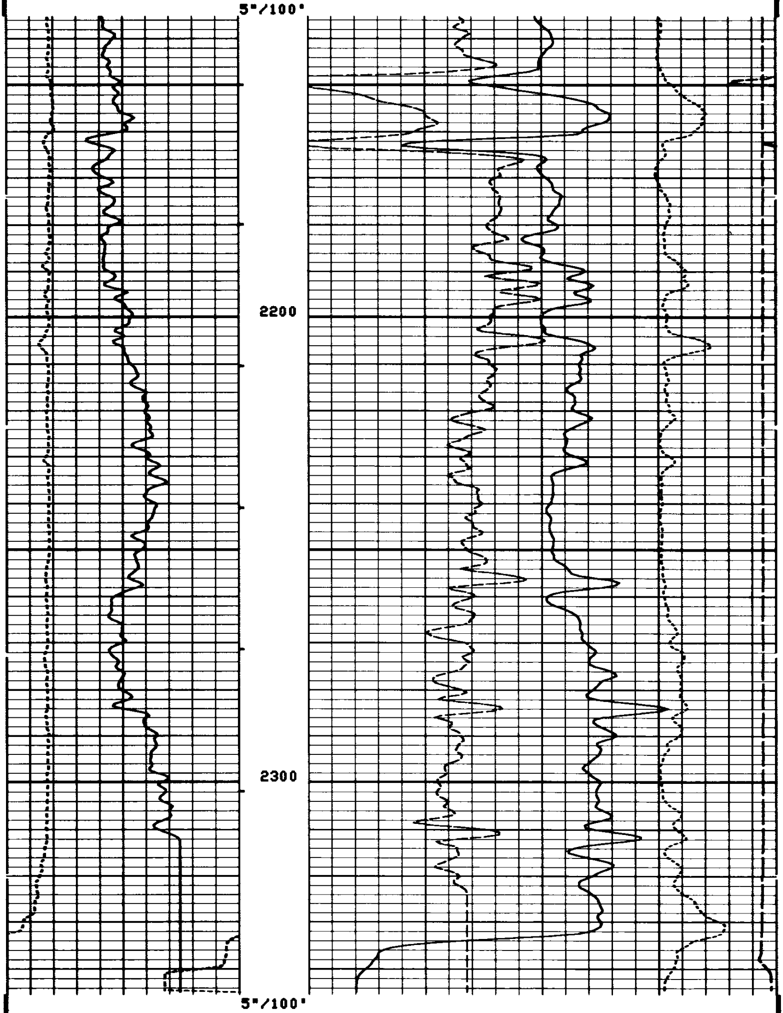
CEMENT VOLUME = 42.7561 F3 (ASSUMING 4.50000 IN O.D. CASING)
HOLE VOLUME = 65.2318 F3
FROM 2338.0 TO 2134.5 FEET

TENS(LBF)
20000. 0.0
DRHO(G/C3)
-.2500 .25000

GR (GAPI)
0.0 150.00
CALI(IN)
6.0000 16.000

NPOR
.60000 0.0
DPHI
.60000 0.0

REPEAT SECTION



```
                                                                TENS(LBF )
                                                          20000.            0.0
                                                                DRHO(G/C3)
                                                          -.2500         .25000
          GR   (GAPI)                          NPOR
0.0                150.00      .60000                                       0.0
          CALI(IN  )                           DPHI
6.0000             16.000      .60000                                       0.0
```

SENSOR MEASURE POINT TO TOOL ZERO

```
CFTC 23.2  FEET                     GR    32.3  FEET
LITH  2.6  FEET                     CNTC 22.7   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
FSS   2.1  FEET                     FLS    2.1  FEET
TLS   2.1  FEET                     SEQ    2.1  FEET
CALI  2.7  FEET                     TSS    2.1  FEET
TNRA 23.7  FEET                     TENS   -.9  FEET
```

PARAMETERS

```
NAME  VALUE        UNIT                  NAME  VALUE       UNIT

WMUD 9.20000       LB/G                  TD    2338.00     F
FCD  4.50000       IN                    DHC   BS
BFM  LIQU                                MDEN 2.65000      G/C3
FD   1.00000       G/C3                  MATR SAND
HC   CALI                                NPDC 2
HSCO YES                                 SOCO NO
MCCO NO                                  BSCO NO
FSCO NO                                  MWCO NO
PTCO NO                                  SDAT SOCN
MCOR NATU                                SOCN .500000      IN
FSAL -50000.0      PPM                   ANGL 0.0          DEG
GGRD .0100000      DF/F                  BHFL WATE
GTSE TEMP                                SHT   80.0000     DEGF
BHT  112.000       DEGF                  BS    7.87500     IN
BHS  OPEN
```

BEFORE SURVEY CALIBRATION SUMMARY

```
PERFORMED:     09-OCT-1990 13:54
PROGRAM FILE: GTS    (VERSION    32.2    89/01/19  88/11/16)


SGTL               DETECTOR CALIBRATION SUMMARY

         MEASURED
        BKGD    JIG        CALIBRATED         UNITS
  GR     33     215           165             GAPI

BACK: 09-OCT-1990 13:38   JIG: 09-OCT-1990 13:44   COMP: 09-OCT-1990 13:44


CNTH               DETECTOR CALIBRATION SUMMARY
```

```
      NEUTRON COMPENSATED CARTRIDGE NUMBER: 1263
      NEUTRON SOURCE SERIAL NUMBER        : 1163
      THERMAL HOUSING NUMBER              : 3476
      THERMAL CALIBRATED NEUTRON BOX      : 2124

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

          CNTC    6031.00   6001.97   2957.52   2965.84   1.005
          CFTC    2793.00   2694.08   1403.36   1416.81   1.037

          RATIO     2.159     2.228     2.107     2.093


BACK: 09-OCT-1990 13:38   JIG: 09-OCT-1990 13:44  COMP: 09-OCT-1990 13:08


LDTC                DETECTOR CALIBRATION SUMMARY

        DENSITY RESISTIVITY SONDE NUMBER     :     3756
        NUCLEAR SERVICE CARTRIDGE NUMBER     :     1955
        POWERED DETECTOR HOUSING NUMBER      :     2942
        POWERED GAMMA-GAMMA DETECTOR NUMBER  :     2933
        LDT LOGGING SOURCE NUMBER            :     7137
        LDT CALIBRATION MODE                 :     WATE

                  MEASURED       SHOP  VALUES
                    BKGD         AL+FE    AL      UNITS
             LL     17.2          77.6   85.6      CPS
             LU     65.4         116.2  128.6      CPS
             LS     49.9         135.7  149.9      CPS
           LITH      4.9          29.2   44.2      CPS
            SS1     12.5         168.6  188.9      CPS
            SS2      8.5         237.5  260.8      CPS

                         HV SETTINGS
                       HV LS:  1424.9 V
                       HV SS:  1433.0 V

BKGD: 09-OCT-1990 13:38


LDTC                CALIPER CALIBRATION SUMMARY

                MEASURED                     CALIBRATED
              SMALL   LARGE               SMALL      LARGE        UNITS
  CALI        8.09    12.3                8.00       12.0          IN

SMALL: 09-OCT-1990 13:31 LARGE: 09-OCT-1990 13:33 COMP: 09-OCT-1990 13:34
```

```
   CP 32.2           FILE    5      09-OCT-1990 13:53
                 AFTER SURVEY TOOL CHECK SUMMARY


  PERFORMED:    10-OCT-1990 14:01
  PROGRAM FILE: GTS    (VERSION    32.2    89/01/19  88/11/16)


CNTH                      TOOL  CHECK


          INPUT    BEFORE JIG   AFTER JIG


          CNTC       2965.84     2945.44

          CFTC       1416.81     1406.68


CHANGE IN THERMAL POROSITY AT 20 PU IS    .009  PU
```

```
BEFORE SURVEY:           BACK: 09-OCT-1990 13:38   JIG: 09-OCT-1990 13:44
AFTER SURVEY CHECK:      BACK:                     JIG: 10-OCT-1990 13:59


LDTC                     TOOL  CHECK

       DENSITY RESISTIVITY SONDE NUMBER     :    3756
       NUCLEAR SERVICE CARTRIDGE NUMBER     :    1955
       POWERED DETECTOR HOUSING NUMBER      :    2942
       POWERED GAMMA-GAMMA DETECTOR NUMBER :    2933
       LDT LOGGING SOURCE NUMBER            :    7137
       LDT CALIBRATION MODE                 :    WATE

           MEASURED BACKGROUND                   TOLERANCE ON
           BEFORE        AFTER        UNITS     BEFORE-AFTER
     LL      17.2          17.2        CPS        +/- 1.0
     LU      65.4          65.1        CPS        +/- 1.0
     LS      49.9          49.8        CPS        +/- 1.0
   LITH       4.9           4.9        CPS        +/- 0.3
    SS1      12.5          12.5        CPS        +/- 0.5
    SS2       8.5           8.5        CPS        +/- 0.5

                         HV SETTINGS
                       HV LS:  1415.5 V
                       HV SS:  1419.5 V

BKGD                                BKGD
 BEFORE SURVEY: 09-OCT-1990 13:38   AFTER SURVEY: 10-OCT-1990 13:54

   CP 32.2            FILE   35      10-OCT-1990 14:01
```

```
                SHOP SUMMARY


 PERFORMED:     04-OCT-1990 13:43
 PROGRAM FILE: CCSHOP (VERSION    32.2    88/12/01  88/11/30)


LDTC                DETECTOR CALIBRATION SUMMARY

       DENSITY RESISTIVITY SONDE NUMBER     :  3756
       NUCLEAR SERVICE CARTRIDGE NUMBER     :  1955
       POWERED DETECTOR HOUSING NUMBER      :  2942
       POWERED GAMMA-GAMMA DETECTOR NUMBER :  2933
       LDT LOGGING SOURCE NUMBER            :  7137
       LDT CALIBRATION MODE                 :  WATE

                     MASTER CALIBRATED
                    BKGD   AL+FE     AL  UNITS
              LL    17.2    77.6    85.6   CPS
              LU    64.7   116.2   128.6   CPS
              LS    49.6   135.7   149.9   CPS
            LITH     5.0    29.2    44.2   CPS
             SS1    12.5   168.6   188.9   CPS
             SS2     8.5   237.5   260.8   CPS

                         HV SETTINGS
                       HV LS:  1421.8 V
                       HV SS:  1415.8 V

                    SPECTRUM QUALITY RATIOS
         COMPUTED VALUE         NOMINAL VALUE   TOLERANCE
  QRLS         .666                 0.65        +/- 0.05
  QRSS         .724                 0.72        +/- 0.10
  QRLI         .295                 0.32        +/- 0.06
  QLIR        1.368                 1.35        +/- 0.06
  QR           .986                 1.00        +/- 0.02

BKGD: 04-OCT-1990 13:26   AL: 04-OCT-1990 13:33   AL+FE: 04-OCT-1990 13:40

   CP 32.2            FILE    6      04-OCT-1990 13:43
```

```
                  SHOP SUMMARY

   PERFORMED:     02-OCT-1990  10:48
   PROGRAM FILE:  CCSHOP (VERSION    32.2    88/12/01   88/11/30)


 CNTH                DETECTOR CALIBRATION SUMMARY

        NEUTRON COMPENSATED CARTRIDGE NUMBER: 1263
        NEUTRON SOURCE SERIAL NUMBER        : 1163
        THERMAL HOUSING NUMBER              : 3476
        THERMAL CALIBRATED NEUTRON BOX      : 2124


            INPUT     PLUS      SHOP      SHOP      GAIN
                    REFERENCE   TANK      JIG
                     COUNTS    COUNTS    COUNTS

            CNTC    6031.00   6001.97   2957.52   1.005
            CFTC    2793.00   2694.08   1403.36   1.037

            RATIO     2.159     2.228     2.107

            SHOP COUNTS TEMPERATURE AND HOUSING SIZE CORRECTED

 BKGD: 02-OCT-1990 10:30 TANK: 02-OCT-1990 10:36  COMP: 02-OCT-1990 10:36
```

COMPANY	NAHAMA & WEAGANT ENERGY COMPAN			**SCHL.**	**FR**	**[illegible] F**
				SCHL.	**TD**	**[illegible] F**
WELL	"C.E.R." #11-16-64			**DRLR.**	**TD**	**[illegible] F**
				Elev.	**KB**	**1460.0 F**
FIELD	MIST				**DF**	
COUNTY	COLUMBIA	STATE	OREGON		**GL**	**1448.0 F**

COMPENSATED NEUTRON-LITHO-DENSITY