DUAL INDUCTION-SFL

Schlumberger

COUNTY COLUMBIA OREGON
FIELD MIST
LOCATION
WELL C.F.I.
NO. 33-9
COMPANY ARCO OIL & GAS

COMPANY ARCO OIL AND GAS COMPANY
WELL C.F.I. NO. 33-9
FIELD MIST
COUNTY COLUMBIA STATE OREGON

LOCATION
1695' NORTH AND 2525' WEST
FROM SOUTHEAST CORNER

Other Services:
BHC
CNL

API SERIAL NO	SEC	TWP	RANGE
	9	5-N	4-W

Permanent Datum: G.L. ; Elev.: 1110.3
Log Measured From K.B. 12 Ft. Above Perm. Datum
Drilling Measured From K.B.

Elev.: K.B. 1122.3
D.F. 1121.3
G.L. 1110.3

Date	9-2-86	9-2-86		
Run No.	ONE	TWO		
Depth—Driller	1783	3243		
Depth—Logger (Schl.)	1773	3234		
Btm. Log Interval	1770	3231		
Top Log Interval	448	1768		
Casing—Driller	9.625@449	7 @ 1773	@	@
Casing—Logger	448	1768		
Bit Size	8.5	6.25		
Type Fluid in Hole	×	LIGNO-SULFONATE		
Dens. | Visc.	9.10 | 36.0	10.20 | 39.0	|	|
pH | Fluid Loss	9.0 | 6.0 ml	9.5 | 5.6 ml	| ml	| ml
Source of Sample	FLOWLINE	FLOWLINE		
Rm @ Meas. Temp.	4.500 @ 80 °F	2.310 @ 88 °F	@ °F	@ °F
Rmf @ Meas. Temp.	4.920 @ 78 °F	1.950 @ 72 °F	@ °F	@ °F
Rmc @ Meas. Temp.	3.120 @ 80 °F	2.760 @ 72 °F	@ °F	@ °F
Source: Rmf | Rmc	MEAS | MEAS	M | M	|	|
Rm @ BHT	3.955 @ 92 °F	1.908 @ 108 °F	@ °F	@ °F
TIME Circulation Stopped	1630	1515		
TIME Logger on Bottom	1814	1811		
Max. Rec. Temp.	92 °F	108 °F	°F	°F
Equip. | Location	8128 | SAC	8128 | SACRAMENTO	|	|
Recorded By	HARPER	HARPER/PILCH		
Witnessed By	STAFFORD	ANDERSON		

FOLD HERE

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

Run No.	ONE	TWO		
Service Order No.	524306	524307		
Fluid Level				
Speed F.P.M.				
Salinity ppm. cl				

EQUIPMENT DATA

Panel				
Cartridge				
Sonde				
Memorizer Panel				
Centralizer Type				
Stand-off - Inches				
G.R. Panel				

SCALE CHANGES

Type Log	DEPTH	Scale Up Hole	Scale Down Hole

REMARKS

RUN ONE: LIGNO-SULFONATE

CALIBRATION DATA

REMARKS: Run 1

DUAL RAN IN COMBINATION WITH SONIC
SP SHIFT IS DUE TO INTERFERENCE
ON RIG

EQUIPMENT NUMBERS-

DIS 567 **DIC 552** **SLC** **SLS RC**

REMARKS: Run 2

DUAL RAN IN COMBINATION WITH SONIC

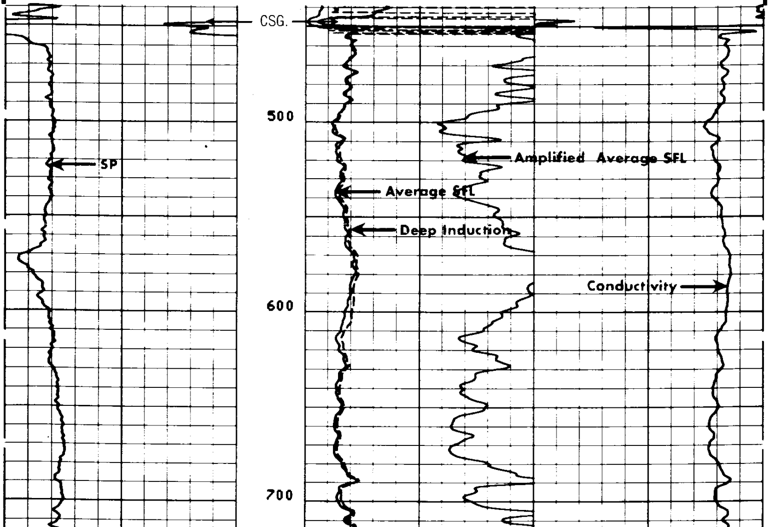
EQUIPMENT NUMBERS-

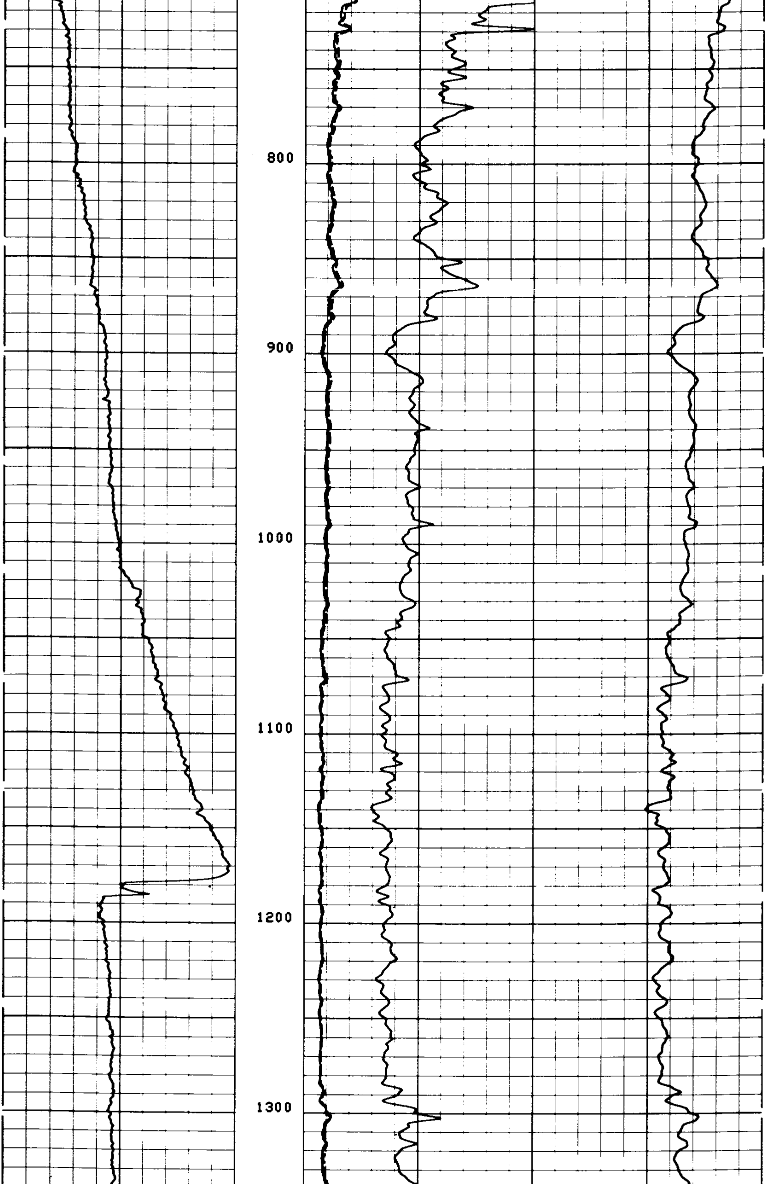
DIS 567 DIC 552 SLC SLS RC

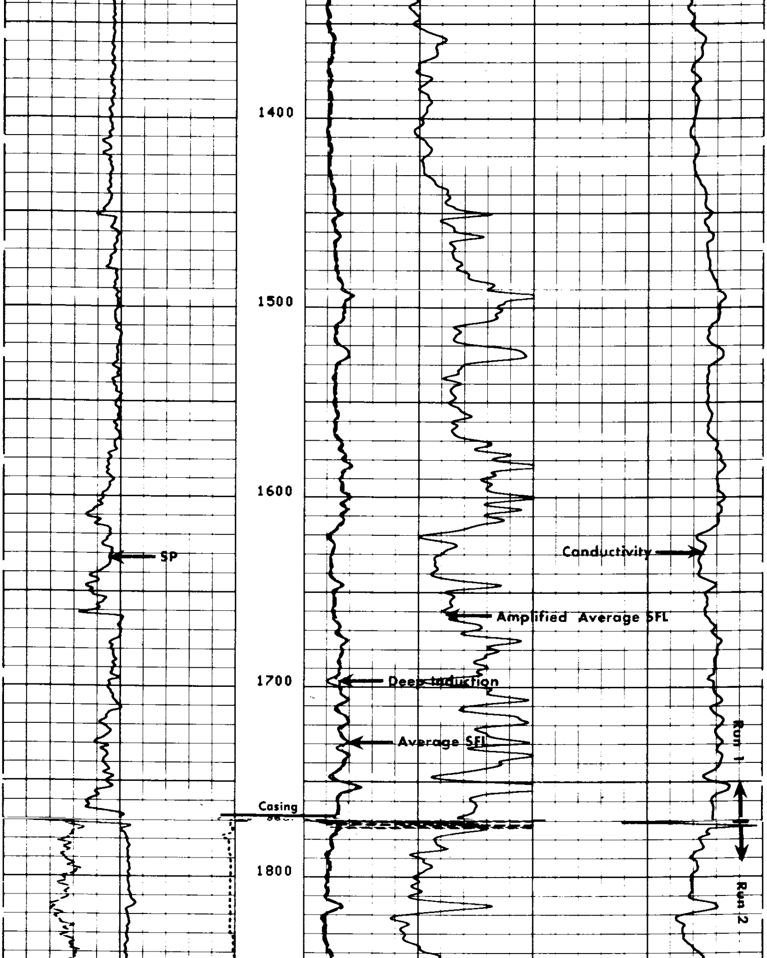
ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, 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 OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

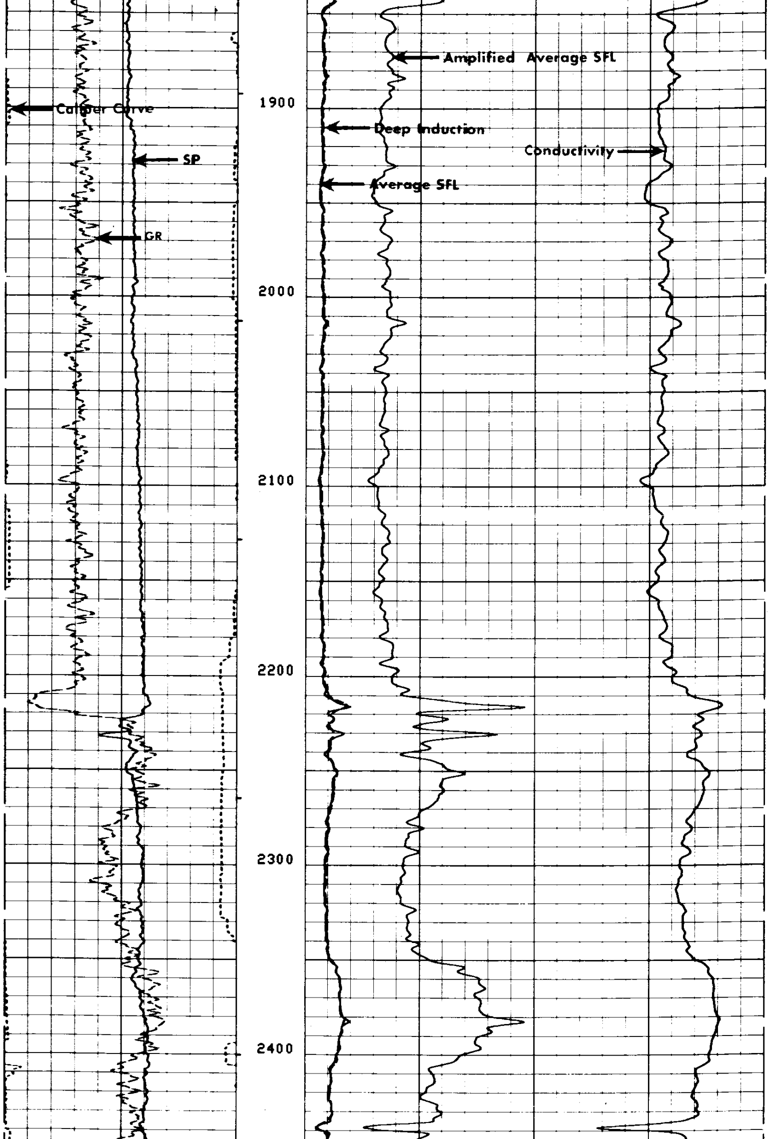
			ILD (OHMM)			
			0.0	30.000		
			SFLA(OHMM)			
			0.0	6.0000		
SP (MV)		Run 1	SFLA(OHMM)		CILD(MMHO)	
-80.00	20.000		0.0	30.000	1000.0	0.0

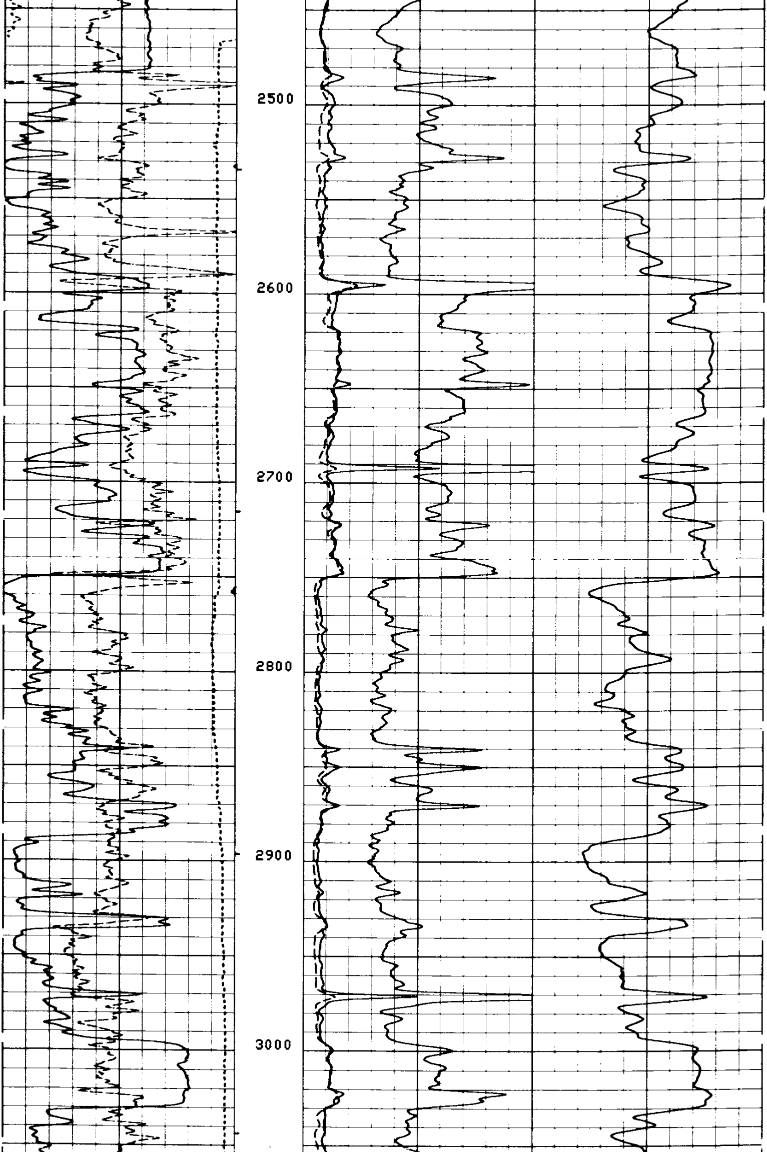
CP 28.2A FILE 4 02-SEP-86 19:01
DATA ACQUIRED 02-SEP-86 18:38

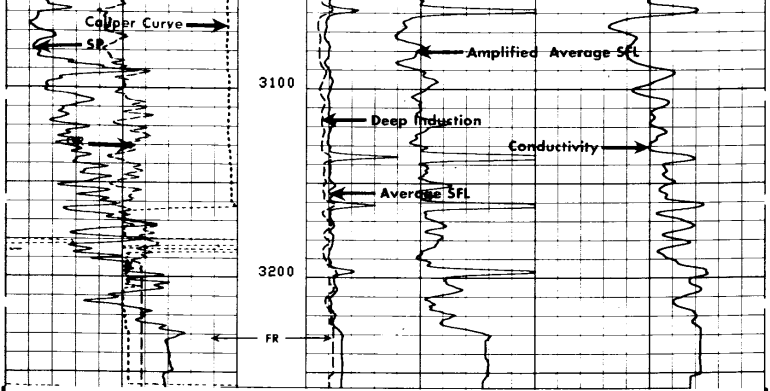












CP 28.2A

FILE 8 06-SEP-86 18:48
DATA ACQUIRED 06-SEP-86 18:10

CALI(IN)		ILD (OHMM)	
4.0000 14.000		0.0 30.000	
GR (GAPI)		SFLA(OHMM)	
0.0 150.00	Run 2	0.0 6.0000	
SP (MV)		SFLA(OHMM)	CILD(MMHO)
-80.00 20.000		0.0 30.000	1000.0 0.0

SENSOR MEASURE POINT TO TOOL ZERO

SRAT	41.4	FEET	AMPL	43.9	FEET
TT1	42.9	FEET	CBL	43.9	FEET
TT3	40.2	FEET	TT2	43.9	FEET
T0	43.9	FEET	TT4	39.2	FEET
SLTT	43.9	FEET	TT	43.9	FEET
GR	64.1	FEET	SCBL	43.9	FEET
ILD	9.4	FEET	CALI	31.8	FEET
SFL	6.4	FEET	ILM	5.8	FEET
SPAR	2.5	FEET	SP	2.5	FEET
NOIS	2.5	FEET	TENS	2.5	FEET

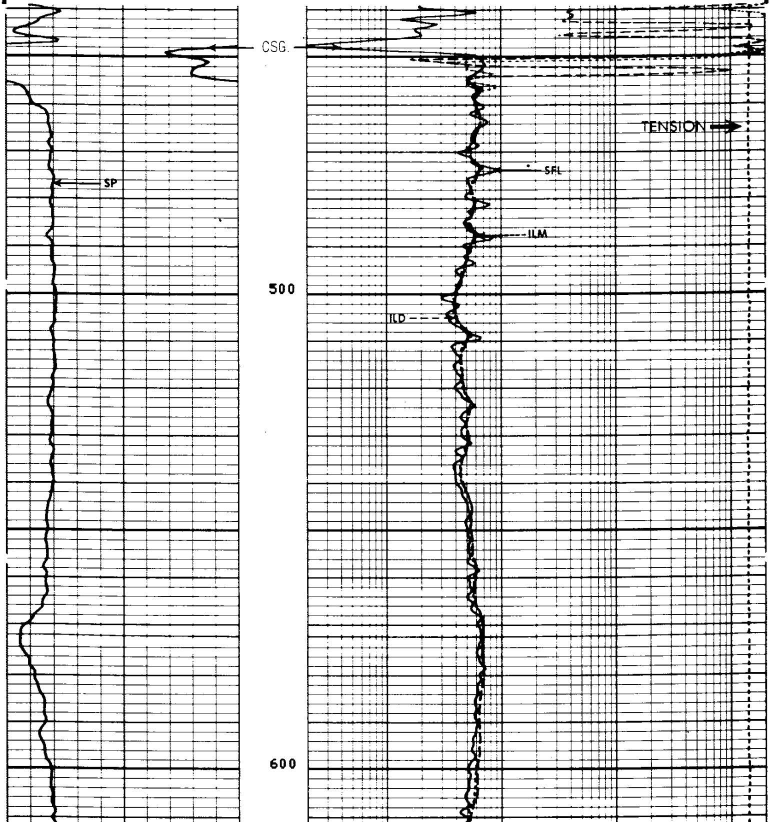
PARAMETERS

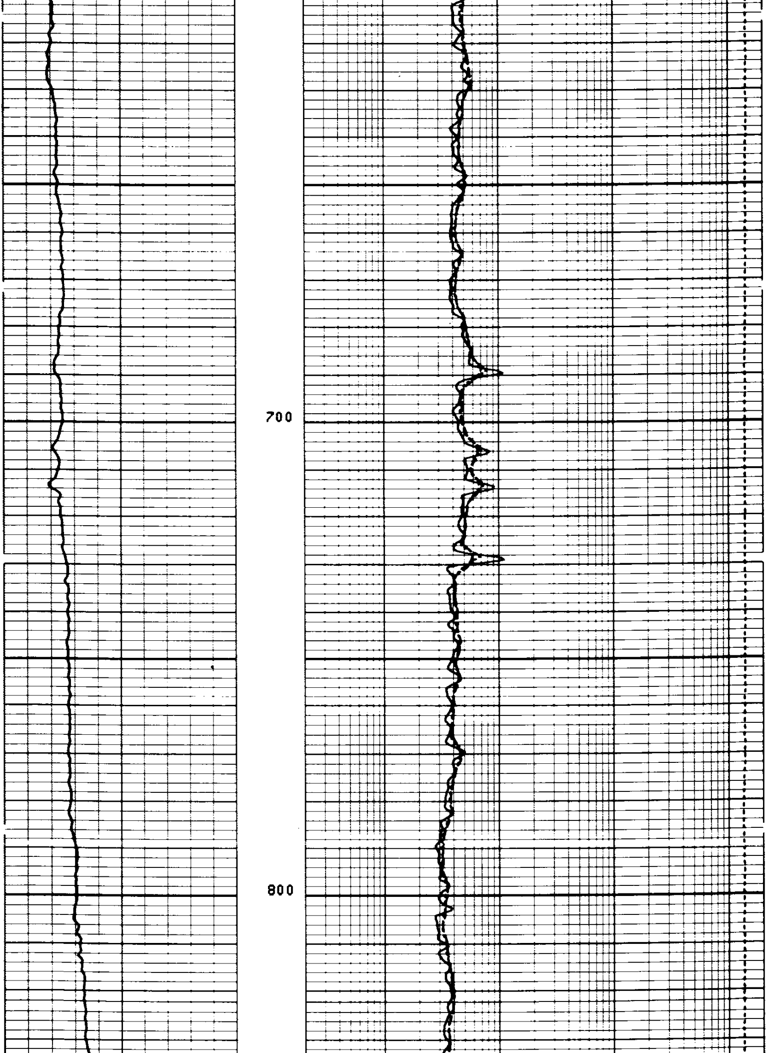
NAME	VALUE	UNIT	NAME	VALUE	UNIT
CDTS	100.000		SPFS	R-H	
DTF	189.000	US/F	DTM	56.0000	US/F
DSIN	5	US	DDEL	200	US
WMUD	10.2000	LB/G	DWCO	512	
SBR	1.00000	OHMM	DSEC	10.5000	MMHO
FPHI	SPHI		MSEC	6.60000	MMHO
BS	6.25000	IN	BHS	OPEN	
PP	NORM		DO	0.0	F

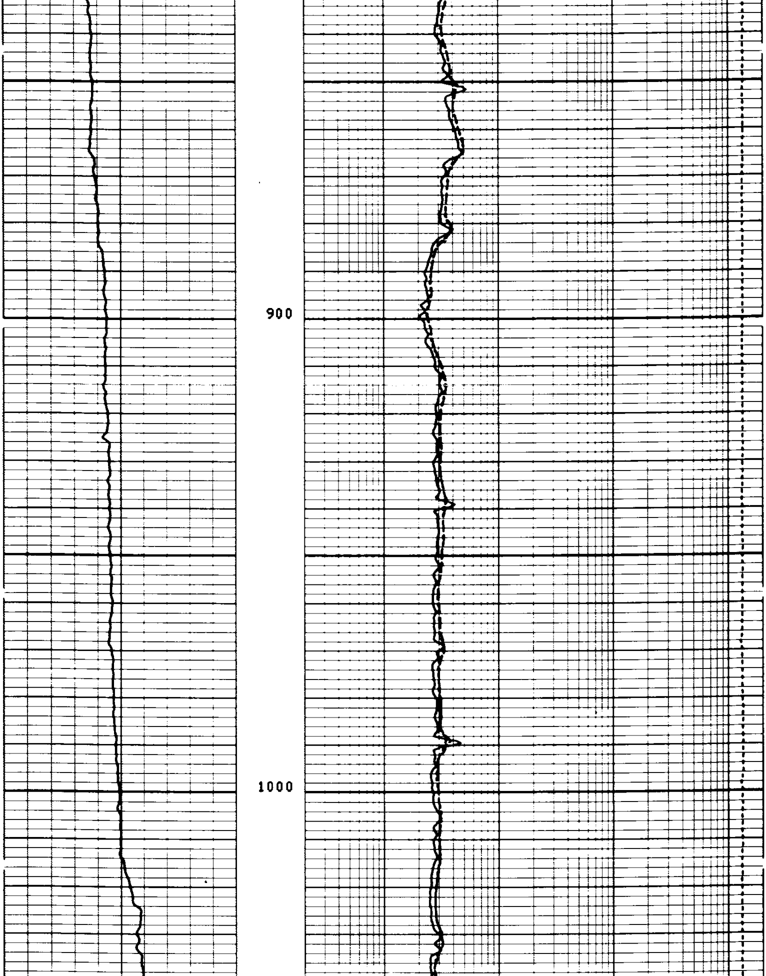
TAPE NOT MADE

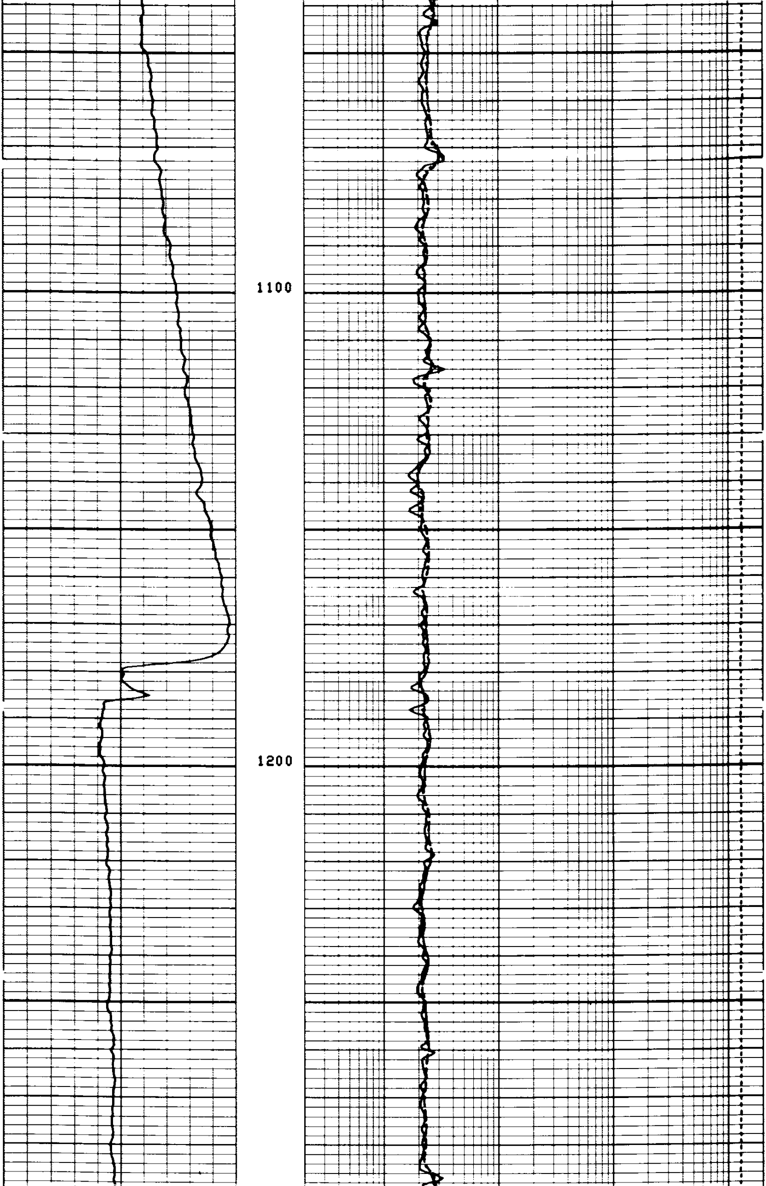
SP (MV)		TENS(LB)
-80.00 20.000	Run 1	10000. 0.0
		ILD (OHMM) .20000 2000.0
		ILM (OHMM) .20000 2000.0
		SFLU(OHMM) .20000 2000.0

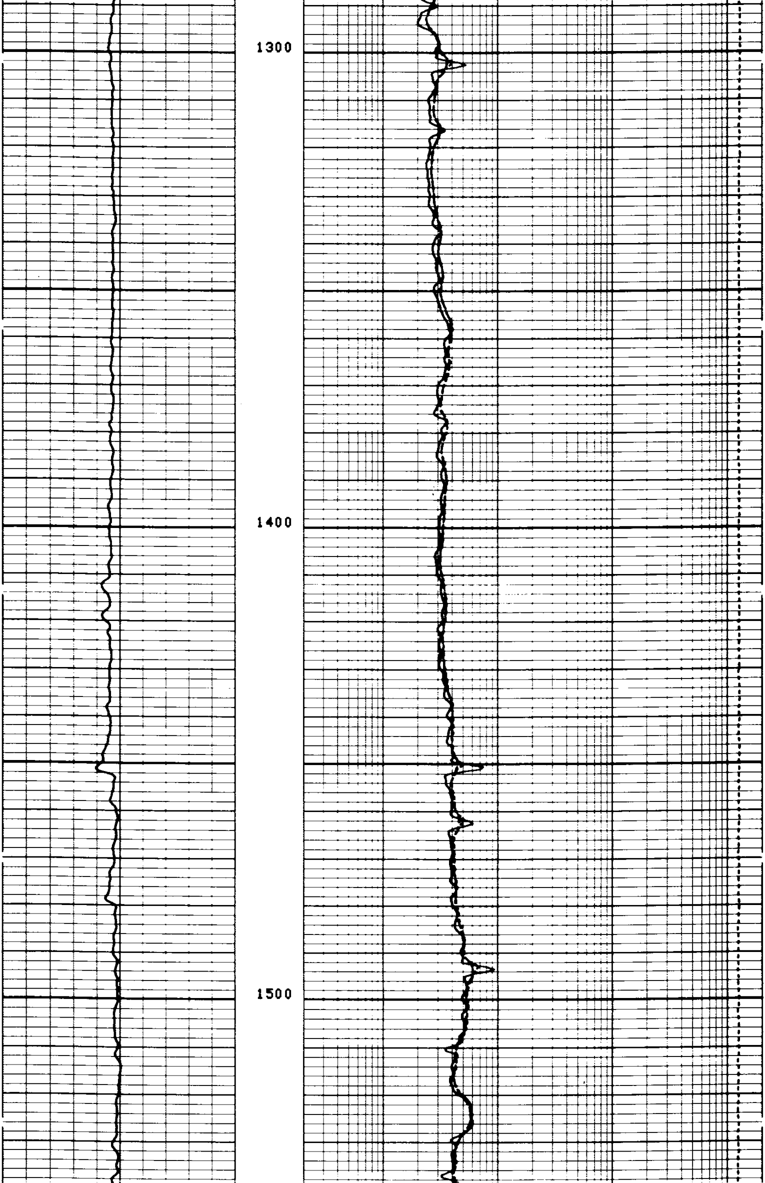
CP 28.2A FILE 4 02-SEP-86 18:54
DATA ACQUIRED 02-SEP-86 18:38

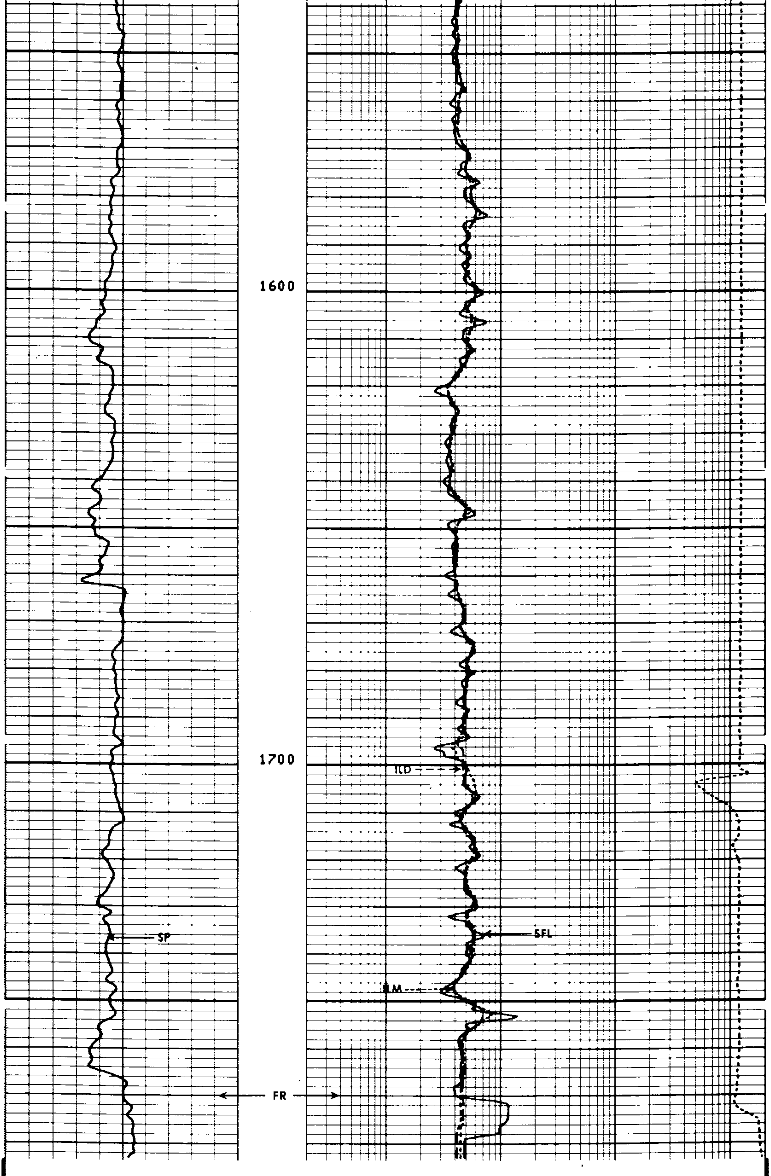












CP 28.2A FILE 4 02-SEP-86 18:50
DATA ACQUIRED 02-SEP-86 18:13

TENS(LB)
10000. 0.0
ILD (OHMM)
.20000 2000.0
ILM (OHMM)
.20000 2000.0
SFLU(OHMM)
.20000 2000.0
SP (MV)
-80.00 20.000

SENSOR MEASURE POINT TO TOOL ZERO

SRAT	41.4	FEET	AMPL	43.9	FEET
TT1	42.9	FEET	CBL	43.9	FEET
TT3	40.2	FEET	TT2	43.9	FEET
TO	43.9	FEET	TT4	39.2	FEET
SLTT	43.9	FEET	TT	43.9	FEET
CALI	31.8	FEET	SCBL	43.9	FEET
ILM	5.8	FEET	ILD	9.4	FEET
SP	2.5	FEET	SFL	6.4	FEET
TENS	2.5	FEET	SPAR	2.5	FEET
NOIS	2.5	FEET			

PARAMETERS

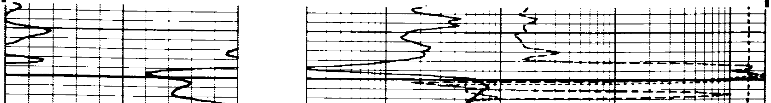
NAME	VALUE	UNIT	NAME	VALUE	UNIT
CDTS	100.000		SPFS	R-H	
DTF	189.000	US/F	DTM	56.0000	US/F
DSIN	5	US	DDEL	200	US
DSEC	10.5000	MMHO	DWCO	512	
MSEC	6.60000	MMHO	SBR	1.00000	OHMM
BHS	OPEN		FPHI	SPHI	
DO	5.60000	F	BS	8.50000	IN
PP	NORM				

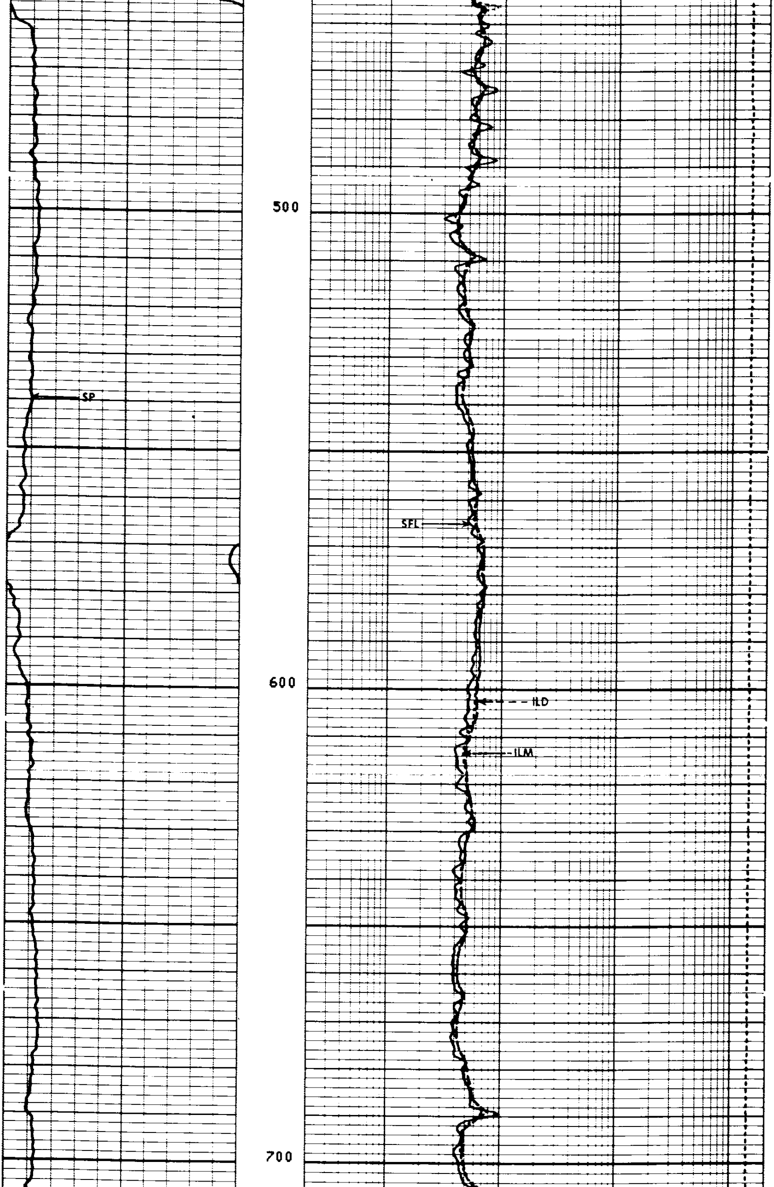
TAPE NOT MADE

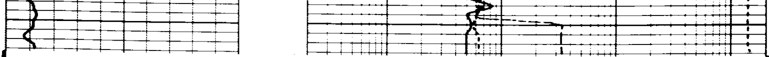
TENS(LB)
10000. 0.0
ILD (OHMM)
.20000 2000.0
ILM (OHMM)
.20000 2000.0
SFLU(OHMM)
.20000 2000.0
SP (MV)
-80.00 20.000

REPEAT SECTION REPEAT SECTION REPEAT SECTION

CP 28.2A FILE 5 02-SEP-86 18:44







CP 28.2A FILE 5 02-SEP-86 18:39

SP (MV)		Run 1	TENS(LB)	
-80.00	20.000		10000.	0.0
			ILD (OHMM)	
			.20000	2000.0
			ILM (OHMM)	
			.20000	2000.0
			SFLU(OHMM)	
			.20000	2000.0

SENSOR MEASURE POINT TO TOOL ZERO

SRAT	41.4	FEET	AMPL	43.9	FEET
TT1	42.9	FEET	CBL	43.9	FEET
TT3	40.2	FEET	TT2	43.9	FEET
TO	43.9	FEET	TT4	39.2	FEET
SLTT	43.9	FEET	TT	43.9	FEET
CALI	31.8	FEET	SCBL	43.9	FEET
ILM	5.8	FEET	ILD	9.4	FEET
SP	2.5	FEET	SFL	6.4	FEET
TENS	2.5	FEET	SPAR	2.5	FEET
NDIS	2.5	FEET			

PARAMETERS

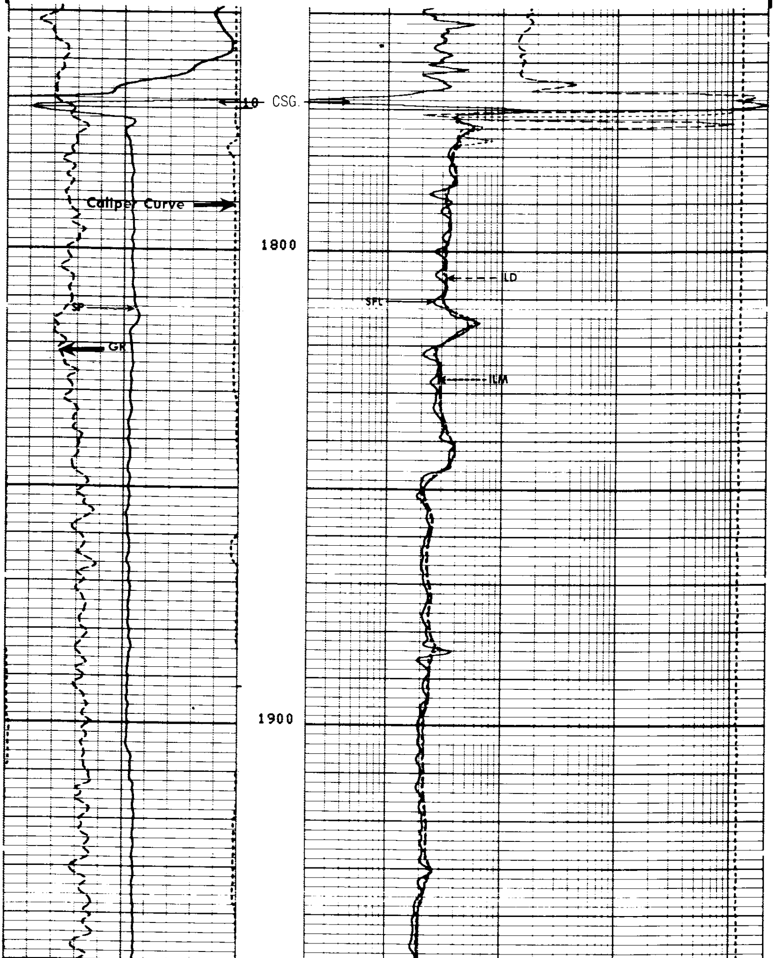
NAME	VALUE	UNIT	NAME	VALUE	UNIT
CDTS	100.000		SPFS	R-H	
DTF	189.000	US/F	DTM	56.0000	US/F
DSIN	5	US	DDEL	200	US
DSEC	10.5000	MMHO	DWCO	512	
MSEC	6.60000	MMHO	SBR	1.00000	OHMM
BHS	OPEN		FPHI	SPHI	
BS	8.50000	IN			

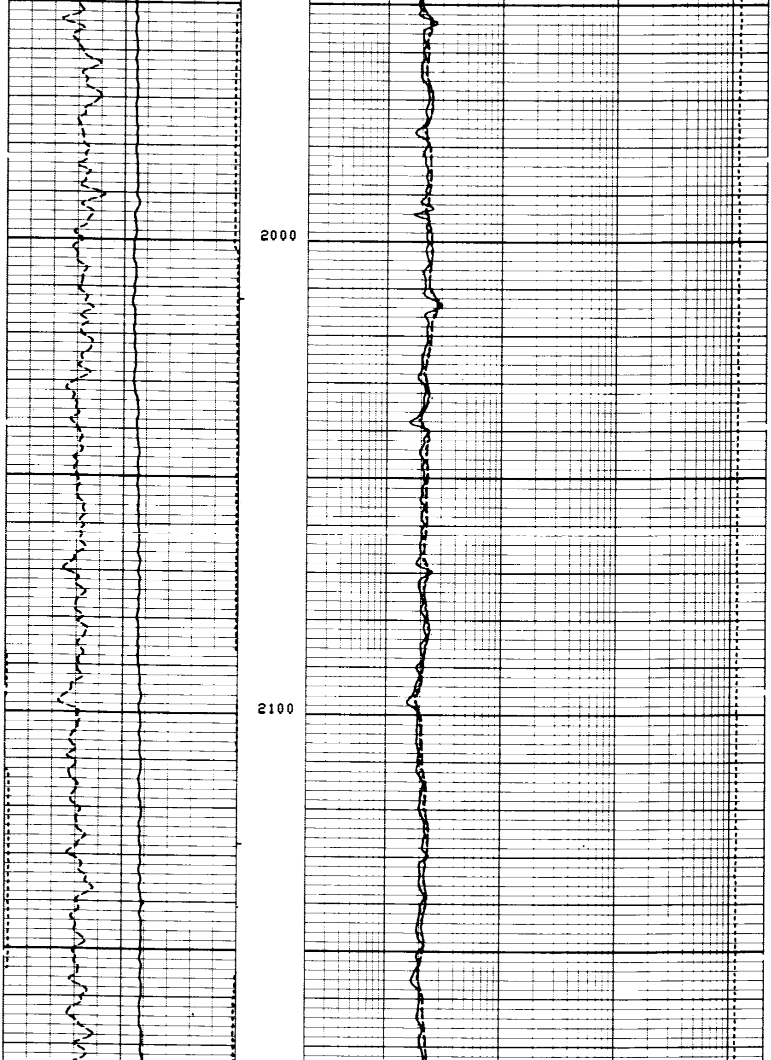
EVENT MARK SUMMARY:

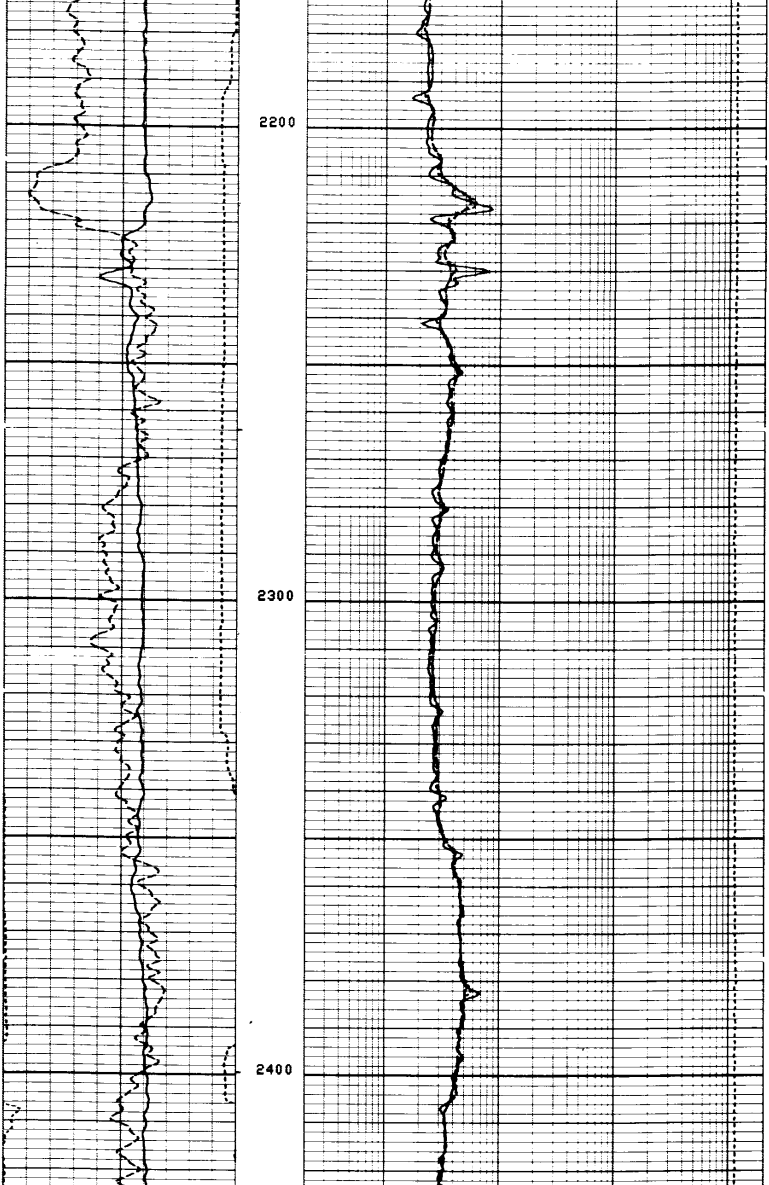
OUTPUT	INTERVAL BETWEEN PIPS	DEPTH TRACK EDGE
IHV	10.0000 F3	LEFT EDGE

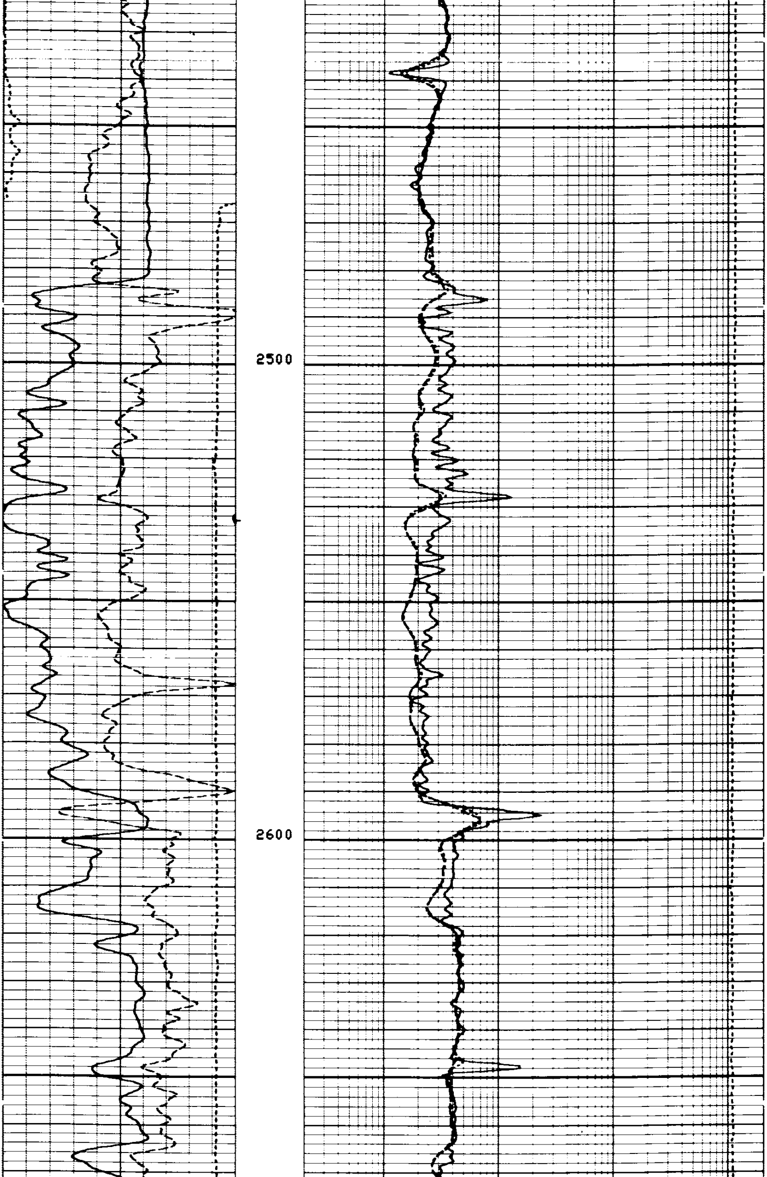
GR (GAPI)		Run 2	TENS(LB)	
0.0	150.00		10000.	0.0
CALI(IN)			ILD (OHMM)	
4.0000	14.000		.20000	2000.0
SP (MV)			ILM (OHMM)	
-80.00	20.000		.20000	2000.0
			SFLU(OHMM)	
			.20000	2000.0

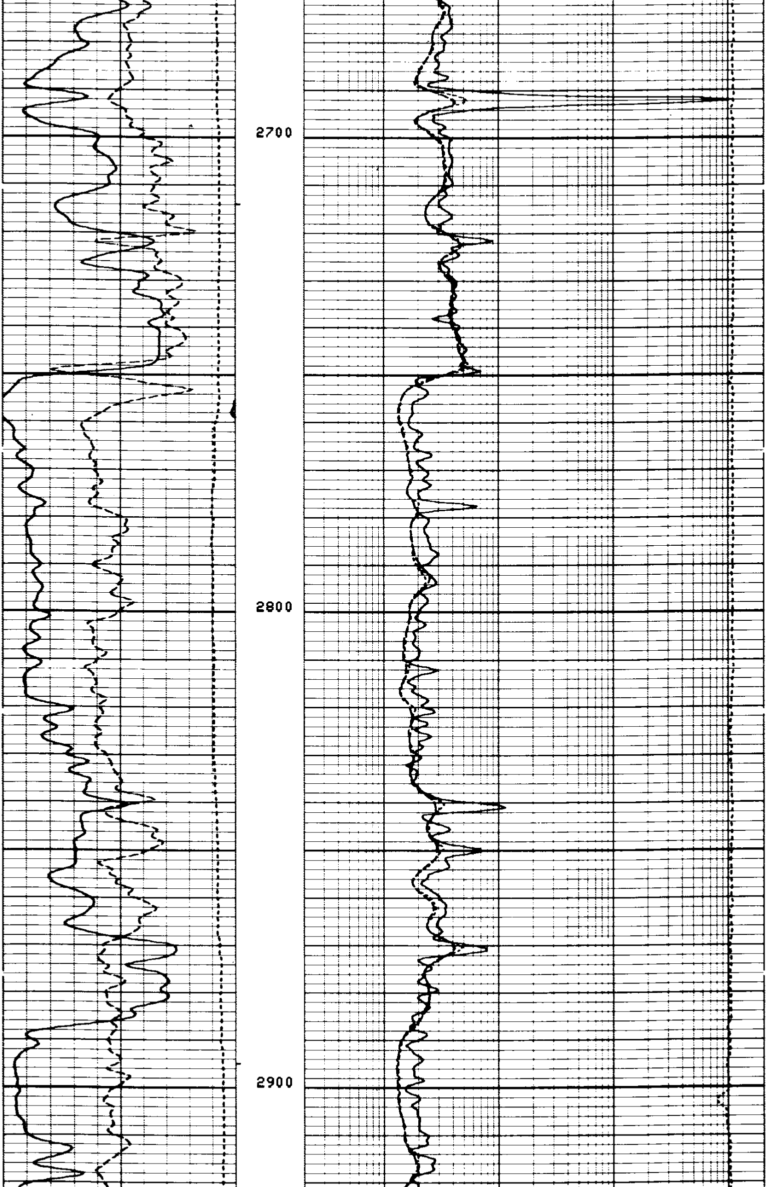
CP 28.2A FILE 8 06-SEP-86 18:38

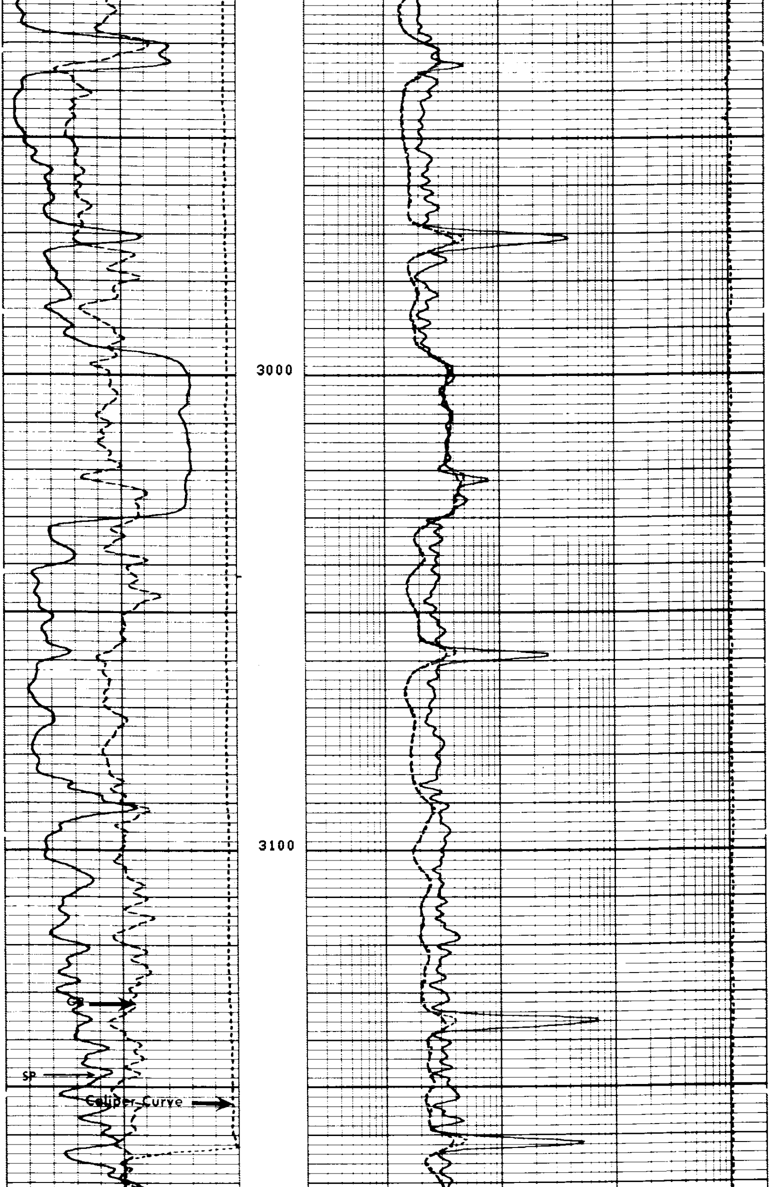


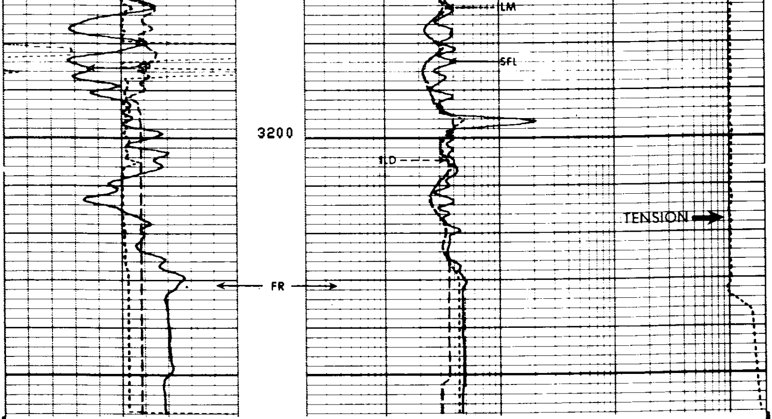












CP 28.2A FILE 8 06-SEP-86 18:10

TENS(LB)
10000. 0.0

GR (GAPI)
0.0 150.00

ILD (OHMM)
.20000 2000.0

CALI(IN)
4.0000 14.000

ILM (OHMM)
.20000 2000.0

SP (MV)
-80.00 20.000

SFLU(OHMM)
.20000 2000.0

SENSOR MEASURE POINT TO TOOL ZERO

SRAT	41.4	FEET	AMPL	43.9	FEET
TT1	42.9	FEET	CBL	43.9	FEET
TT3	40.2	FEET	TT2	43.9	FEET
TO	43.9	FEET	TT4	39.2	FEET
SLTT	43.9	FEET	TT	43.9	FEET
GR	64.1	FEET	SCBL	43.9	FEET
ILD	9.4	FEET	CALI	31.8	FEET
SFL	6.4	FEET	ILM	5.8	FEET
SPAR	2.5	FEET	SP	2.5	FEET
NOIS	2.5	FEET	TENS	2.5	FEET

PARAMETERS

NAME	VALUE	UNIT	NAME	VALUE	UNIT
CDTS	100.000		SPFS	R-H	
DTF	189.000	US/F	DTM	56.0000	US/F
DSIN	5	US	DDEL	200	US
WMUD	10.2000	LB/G	DWCO	512	
SBR	1.00000	OHMM	DSEC	10.5000	MMHO
FPHI	SPHI		MSEC	6.60000	MMHO
BS	6.25000	IN	BHS	OPEN	

EVENT MARK SUMMARY:

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

TENS(LB)
10000. 0.0

GR (GAPI)
0.0 150.00

ILD (OHMM)
.20000 2000.0

CALI(IN)
4.0000 14.000

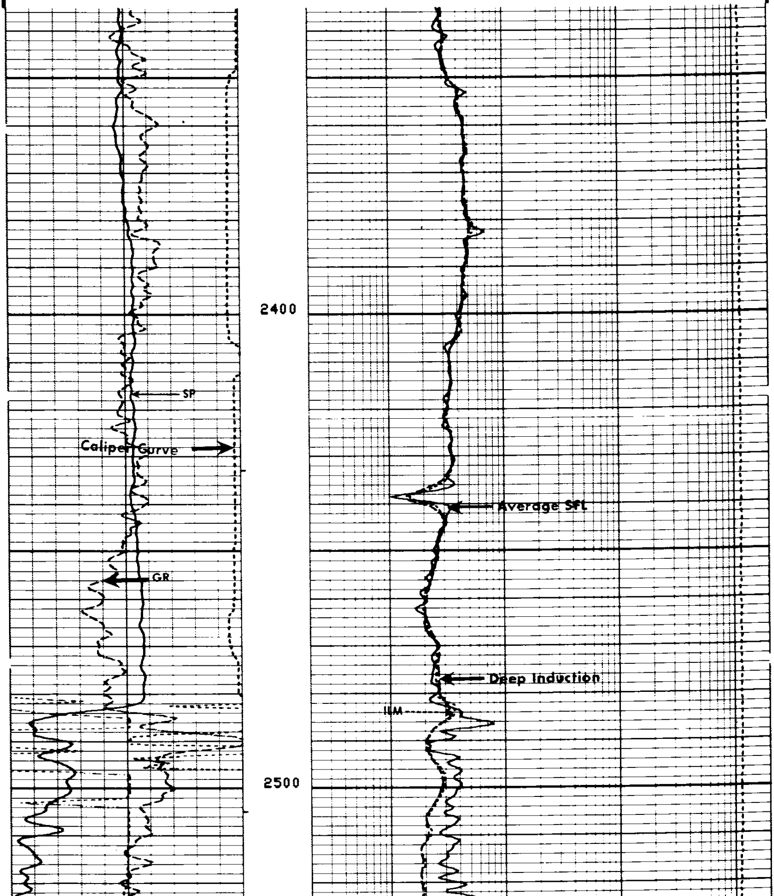
ILM (OHMM)
.20000 2000.0

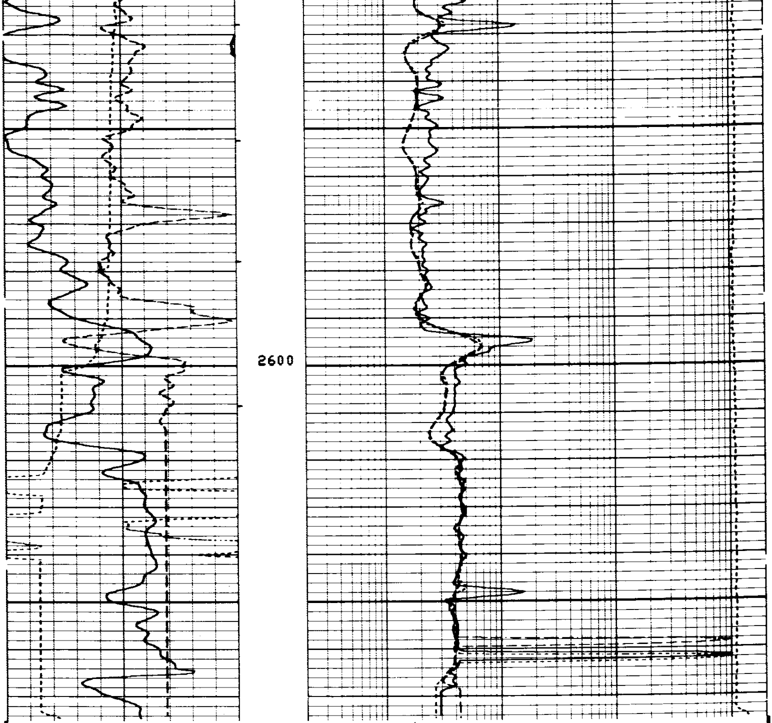
SP (MV)
-100.0 0.0

SFLU(OHMM)
.20000 2000.0

REPEAT SECTION REPEAT SECTION REPEAT SECTION

CP 28.2A
FILE 7 06-SEP-86 18:57
DATA ACQUIRED 06-SEP-86 18:05





CP 28.2A FILE 7 06-SEP-86 18:56
DATA ACQUIRED 06-SEP-86 17:59

GR (GAPI) 0.0 150.00			TENS(LB) 10000. 0.0
CALI(IN) 4.0000 14.000	Run 2	ILD (OHMM) .20000 2000.0	
SP (MV) -100.0 0.0		ILM (OHMM) .20000 2000.0 SFLU(OHMM) .20000 2000.0	

SENSOR MEASURE POINT TO TOOL ZERO

SRAT	41.4	FEET	AMPL	43.9	FEET
TT1	42.9	FEET	CBL	43.9	FEET
TT3	40.2	FEET	TT2	43.9	FEET
TO	43.9	FEET	TT4	39.2	FEET
SLTT	43.9	FEET	TT	43.9	FEET
GR	64.1	FEET	SCBL	43.9	FEET
ILD	9.4	FEET	CALI	31.8	FEET
SFL	6.4	FEET	ILM	5.8	FEET
SPAR	2.5	FEET	SP	2.5	FEET
NOIS	2.5	FEET	TENS	2.5	FEET

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                              PARAMETERS

      NAME  VALUE       UNIT                     NAME  VALUE       UNIT

      CDTS 100.000                               SPFS R-H
      DTF  189.000      US/F                     DTM  56.0000      US/F
      DSIN 5            US                       DDEL 200          US
      WMUD 10.2000      LB/G                     DWCO 512
      SBR  1.00000      OHMM                     DSEC 10.5000      MMHO
      FPHI SPHI                                  MSEC 6.60000      MMHO
      BS   6.25000      IN                       BHS  OPEN
      PP   NORM                                  DO   0.0          F

                            TAPE NOT MADE
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Run 1

              BEFORE SURVEY CALIBRATION SUMMARY


   PERFORMED:     02-SEP-86 18:12
   PROGRAM FILE: ISN     (VERSION    28.2A   85/07/10)


 DITD                ELECTRONICS CALIBRATION SUMMARY

              MEASURED                       CALIBRATED
           ZERO     PLUS                  ZERO       PLUS         UNITS
    ILD      .03    548.2                 0.0        495.3         MMHO
    ILM    -1.70    532.6                 0.0        500.0         MMHO
    SFL    -2.79    517.0                 0.0        500.0         MMHO

 ILD SONDE ERROR CORRECTION :       10.5 MMHO
 ILM SONDE ERROR CORRECTION :        6.6 MMHO


 MCDB                 CALIPER CALIBRATION SUMMARY

              MEASURED                       CALIBRATED
           SMALL    LARGE                 SMALL      LARGE        UNITS
   CALI     -.07     0.0                  -.07        0.0          IN

    CP 28.2A          FILE     0       02-SEP-86 18:11
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              AFTER SURVEY TOOL CHECK SUMMARY


   PERFORMED:     02-SEP-86 18:46
   PROGRAM FILE: ISN     (VERSION    28.2A   85/07/10)


 DITD                       TOOL   CHECK

                    ZERO                         PLUS
          BEFORE           AFTER          BEFORE      AFTER     UNITS
    ILD     0.0              -.0          495.3       495.3     MMHO
    ILM     0.0              -.0          500.0       499.8     MMHO
    SFL     0.0              -.1          500.0       494.7     MMHO

 ILD SONDE ERROR CORRECTION :       10.5 MMHO
 ILM SONDE ERROR CORRECTION :        6.6 MMHO

    CP 28.2A          FILE     7       02-SEP-86 18:46
```

Run 2

```
                 BEFORE SURVEY CALIBRATION SUMMARY


  PERFORMED:     06-SEP-86 17:58
  PROGRAM FILE: ISN    (VERSION    28.2A   85/07/10)


DITD               ELECTRONICS CALIBRATION SUMMARY

            MEASURED                        CALIBRATED
          ZERO     PLUS                   ZERO       PLUS          UNITS
   ILD    -.22     545.0                  0.0        499.9          MMHO
   ILM   -1.86     530.1                  0.0        500.0          MMHO
   SFL   -2.92     515.0                  0.0        500.0          MMHO

ILD SONDE ERROR CORRECTION :        10.5 MMHO
ILM SONDE ERROR CORRECTION :         6.6 MMHO


SGTE               DETECTOR CALIBRATION SUMMARY

            MEASURED
          BKGD     JIG          CALIBRATED          UNITS
   GR      22      178             165              GAPI


MCDB               CALIPER CALIBRATION SUMMARY

            MEASURED                        CALIBRATED
          SMALL    LARGE                  SMALL      LARGE         UNITS
  CALI    8.25     10.7                   8.00       12.0           IN

   CP 28.2A          FILE    6       06-SEP-86 17:58


                 AFTER SURVEY TOOL CHECK SUMMARY


  PERFORMED:     06-SEP-86 18:40
  PROGRAM FILE: ISN    (VERSION    28.2A   85/07/10)


DITD                         TOOL  CHECK

                  ZERO                            PLUS
           BEFORE        AFTER           BEFORE       AFTER     UNITS
   ILD       0.0           .1             499.9       499.6     MMHO
   ILM       0.0           .0             500.0       499.8     MMHO
   SFL       0.0          -.4             500.0       494.9     MMHO

ILD SONDE ERROR CORRECTION :        10.5 MMHO
ILM SONDE ERROR CORRECTION :         6.6 MMHO

   CP 28.2A          FILE   10       06-SEP-86 18:40


                 SHOP SUMMARY


  PERFORMED:     14-AUG-86 13:50
  PROGRAM FILE: SHOP   (VERSION    28.4    85/11/11)


DITD               ELECTRONICS CALIBRATION SUMMARY

              TEST LOOP CALIBRATION                  TOOL CHECK
            MEASURED           CALIBRATED            CALIBRATED
          ZERO      PLUS     ZERO       PLUS        ZERO      PLUS     UNITS
   ILD   -10.5     524.8      0.0      500.0         0.0     495.5     MMHO
   ILM    -6.6     496.1      0.0      500.0         0.0     500.2     MMHO
ILD  SONDE ERROR CORRECTION :        10.5 MMHO
ILM  SONDE ERROR CORRECTION :         6.6 MMHO
```

COMPANY ARCO OIL AND GAS COMPANY

WELL C.F.I. NO. 33-9

FIELD MIST

COUNTY COLUMBIA STATE OREGON

SCHL. FR 3231
SCHL. TD 3234
DRLR. TD 3243

Elev: KB 1122.3
DF 1121.3
GL 1110.3