Western Atlas International

ATLAS WIRELINE SERVICES

BHC ACOUSTILOG®
GAMMA RAY

FILE NO. 3960

API NO. 36-009-00269

5" = 100'

COMPANY NORTHWEST NATURAL GAS COMPANY
WELL I. W. 23d - 3
FIELD MIST
COUNTY COLUMBIA STATE OREGON

LOCATION:
2475.11' EAST & 299.39' SOUTH
FROM THE WEST 1/4 CORNER OF:
SEC 3 TWP 6N RGE 5W

OTHER SERVICES
DIFL-SP-CAL
CDLC-CN-GR
DIPLOG

PERMANENT DATUM GROUND LEVEL ELEV. 1187.8
LOGGING MEASURED FROM K. B. 11.4 FT. ABOVE P.D.
DRILLING MEASURED FROM K. B.

ELEVATIONS
KB 1199.25'
DF ---
GL 1187.85'

FINAL PRINT

DATE	15-OCT-91	20-OCT-91		
RUN	1	2		
SERVICE ORDER	66915	66917		
DEPTH-DRILLER	2730'	3079'		
DEPTH-LOGGER	2725'	3072'		
BOTTOM LOGGED INTERVAL	2691'	3038'		
TOP LOGGED INTERVAL	684'	2708'		
CASING - DRILLER	13 3/8" @ 684'	8 5/8" @ 2715'	@	@
CASING - LOGGER	684'	2708'		
BIT SIZE	12 1/4"	7 7/8"		
TYPE FLUID IN HOLE	GEL/POLYMER	GEL/CACL/HEC 10		
DENSITY / VISCOSITY	9.6+ 40	8.6 38		
PH / FLUID LOSS	8.7 5.6	11.5 15.0		
SOURCE OF SAMPLE	FLOWLINE	FLOWLINE		
RM AT MEAS. TEMP.	2.72 @ 79 F	.297 @ 72F	@	@
RMF AT MEAS. TEMP.	2.97 @ 79 F	.286 @ 72F	@	@
RMC AT MEAS. TEMP.	2.29 @ 79 F	'.315 @ 72F	@	@
SOURCE OF RMF / RMC	MEASURED MEASURED	MEASURED MEASURED		
RM AT BHT	2.13 @ 101 F	2 HRS. @ 101F	@	@
TIME SINCE CIRCULATION	2 HRS.	.212		
MAX. REC. TEMP. DEG. F	101 F	101F		
EQUIP. NO. / LOC.	HL 6399 BAKRSFLD	HL 6399 BAKRSFLD		
RECORDED BY	TORGERSON	TORGERSON		
WITNESSED BY	CLAYTON ROTH	CLAYTON ROTH		

FOLD HERE

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE CUSTOMER THE BENEFIT OF THEIR BEST JUDGEMENT, BUT SINCE ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS, WE CANNOT, AND WE DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATION. WE SHALL NOT BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COST, DAMAGES, OR EXPENSES WHATSOEVER INCURRED OR SUSTAINED BY THE CUSTOMER RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR EMPLOYEES.

REMARKS RUN (1)

TAYLOR RIG NO. 4
BHT 101 F & 101 F
VOLUME COMPUTED FOR 8 5/8" CASING = 950 FT3
THE BHC ACOUSTILOG MANDREL USED IS A T3R1R3T TYPE.

REMARKS RUN (2)

TAYLOR RIG NO. 4
BHT 101 F & 101 F
TOTAL BOREHOLE VOLUME RECORDED
THE BHC ACOUSTILOG MANDREL IS A T3R1R3T TYPE.

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
1	1	DIFL	72370	1503XA	1.5" S. O.
1	1	AC	79731-79726	1609-1603	CENTRALIZED
1	1	GR	60519	1309XA	CENTRALIZED
1	1	CAL	55718	4209XA	CENTRALIZED

EQUIPMENT DATA

RUN	TRIP	TOOL	SERIAL NO.	SERIES NO.	POSITION
2	1	DIFL	72370	1503XA	1.5" S. O.
2	1	AC	79731-79726	1609-1603	CENTRALIZED
2	1	GR	60519	1309XA	CENTRALIZED
2	1	CAL	55718	4209XA	CENTRALIZED

5" = 100'

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                                FILE:   4


          PARAMETERS
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                    NAME       DEPTH INTERVAL      VALUE     UNITS
                  --------     --------------   ----------   -----
                  A             2745 TO   605        1.000
                  DEL-T F       2745 TO   605      189.000   MICS/FT
                  DEL-T M       2745 TO   605       55.500   MICS/FT
                  DEL-T S       2745 TO   605      100.000   MICS/FT
                  M             2745 TO   605        2.000
                  O.D.          2745 TO   605        8.625   INCH
                  PORA          2745 TO   605       WYLLIE


          DISPLAY SCALE CHANGES
          ---------------------

                                *** NONE ***


    COMPANY:    NORTHWEST NATURAL GAS COMPANY                          RUN:  1

    WELL NAME:  I. W. 23d - 3                                          TRIP: 1

    SERVICE:    BK214M        FILE:   4        DATE:  10/15/91         TIME: 00:39:57

    REVISION:   FSY5256 REV:G002 VER:2.0                               MODE: PLAYBACK


             BIT(INCH)
   |--------------------------|
   6                          16

                    VOL(CUFT)
                     ____
                     0 30
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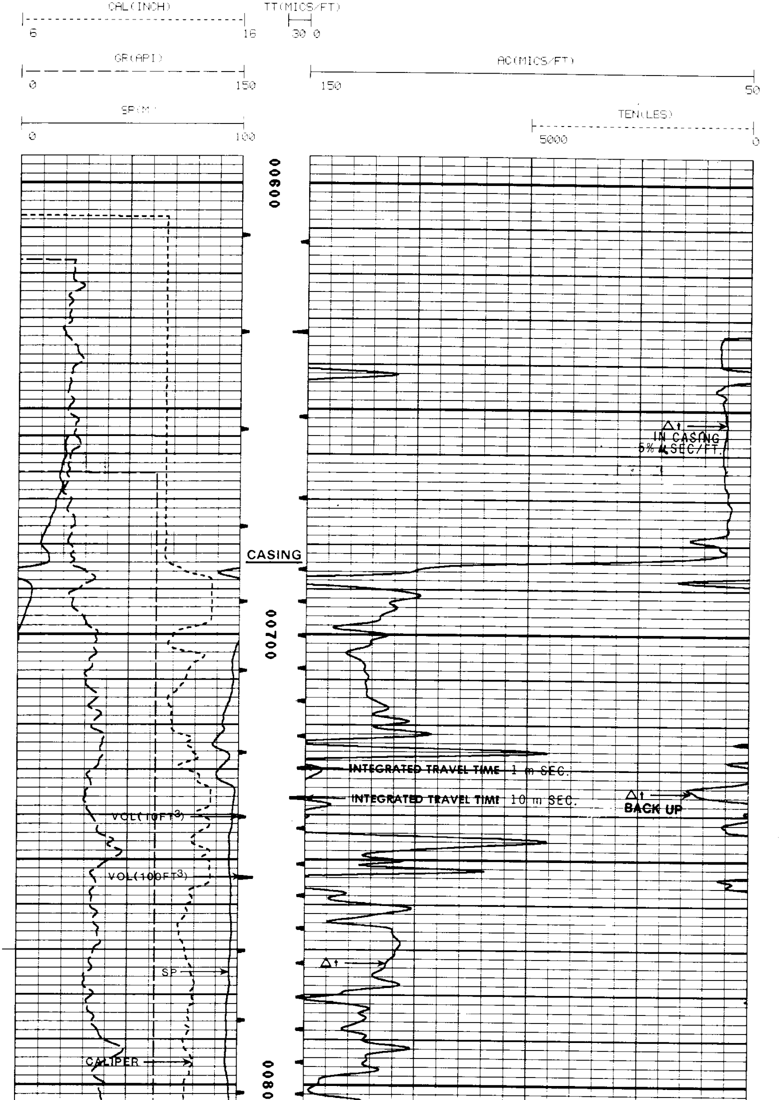

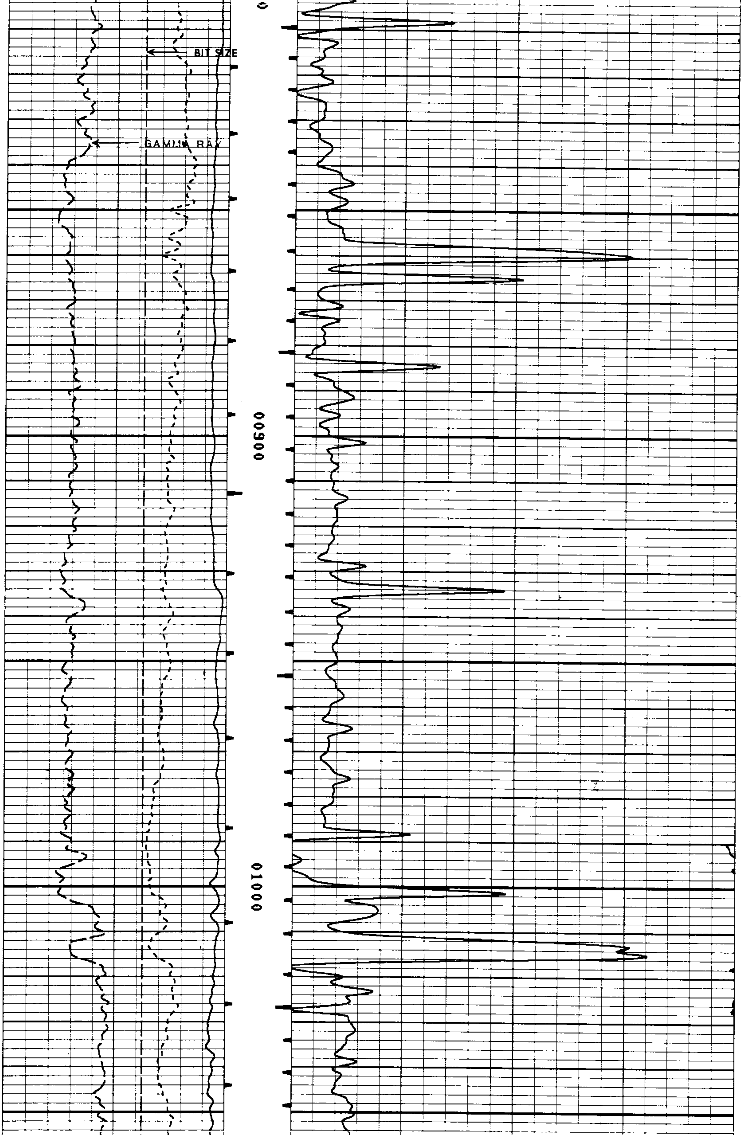

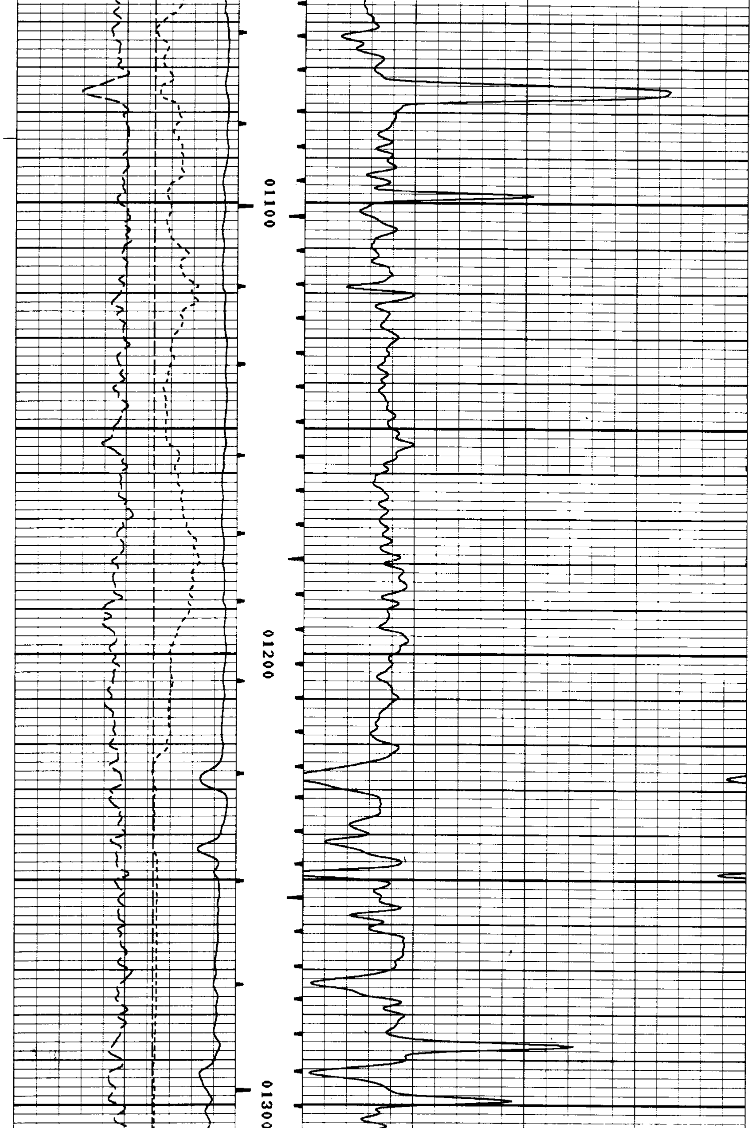

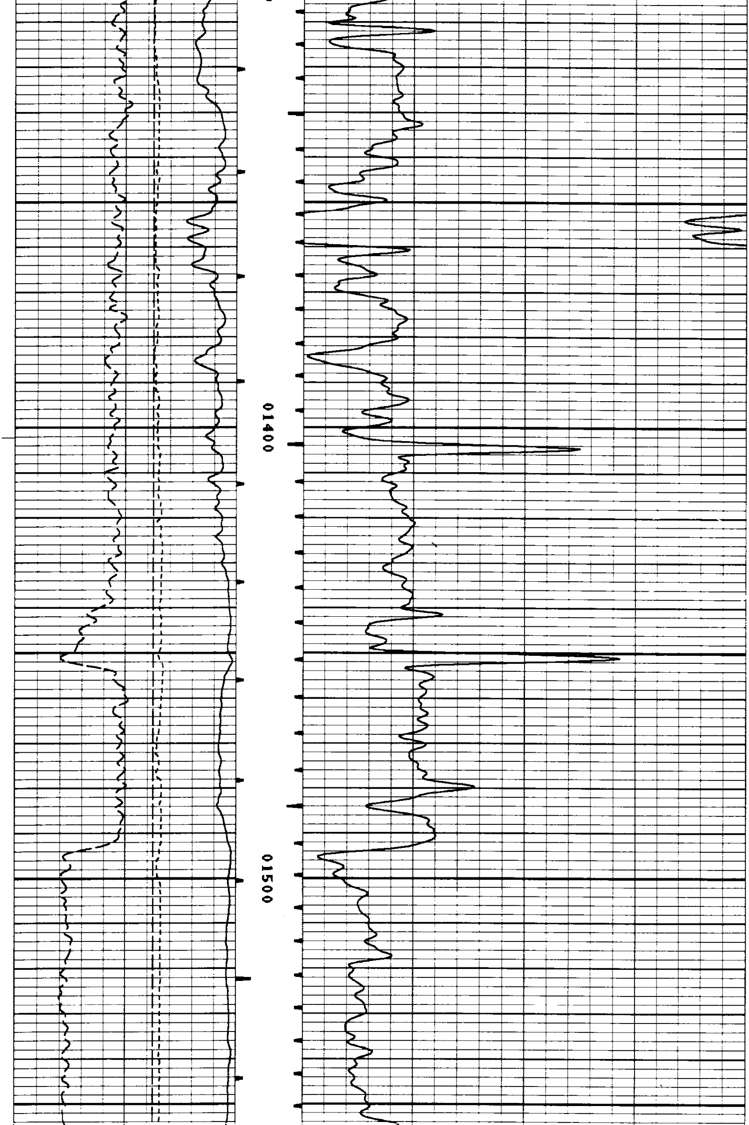

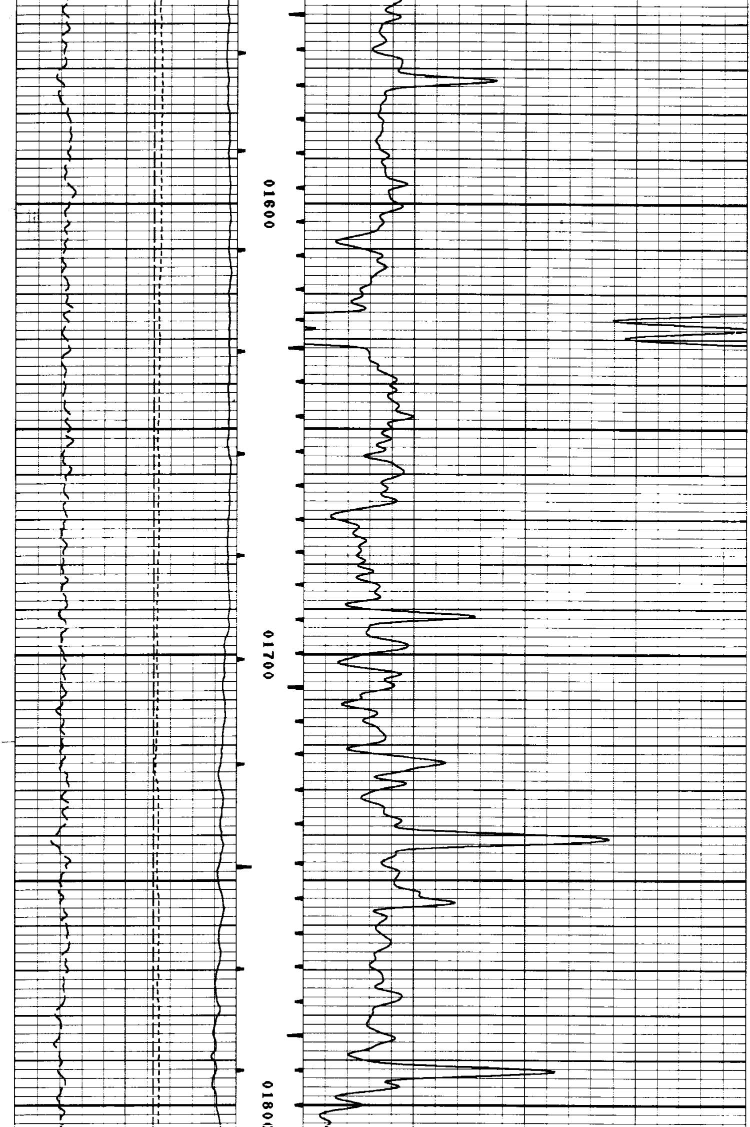

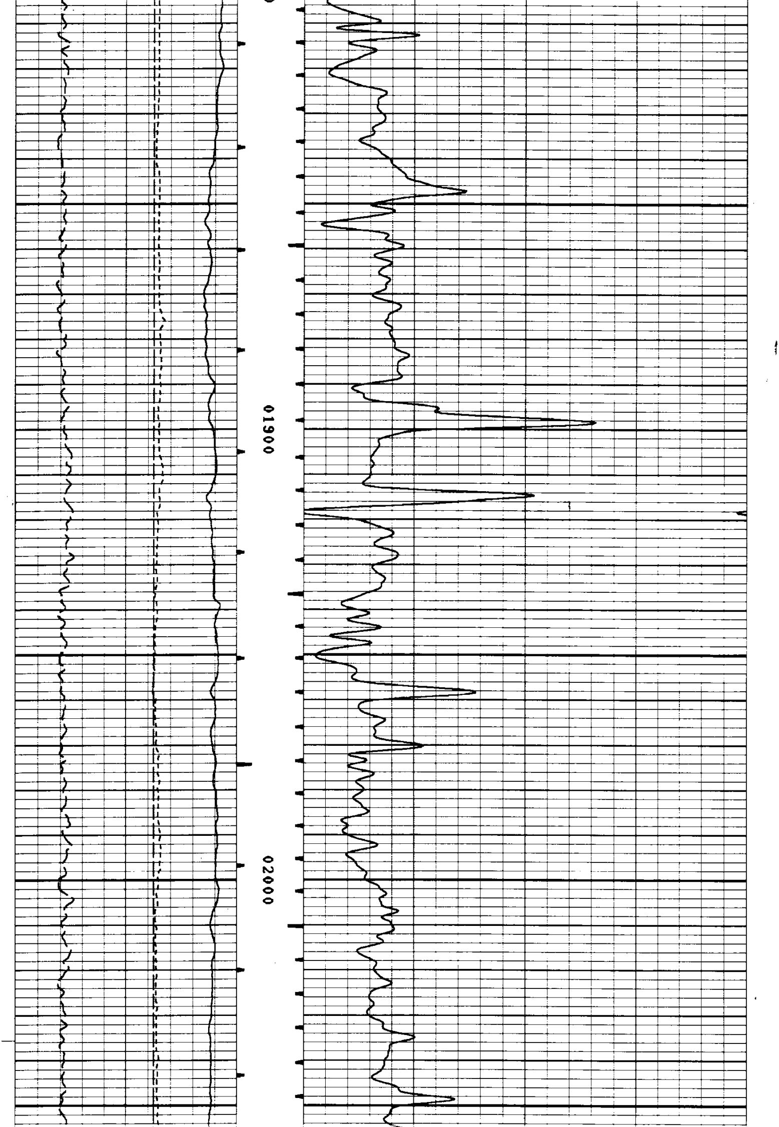

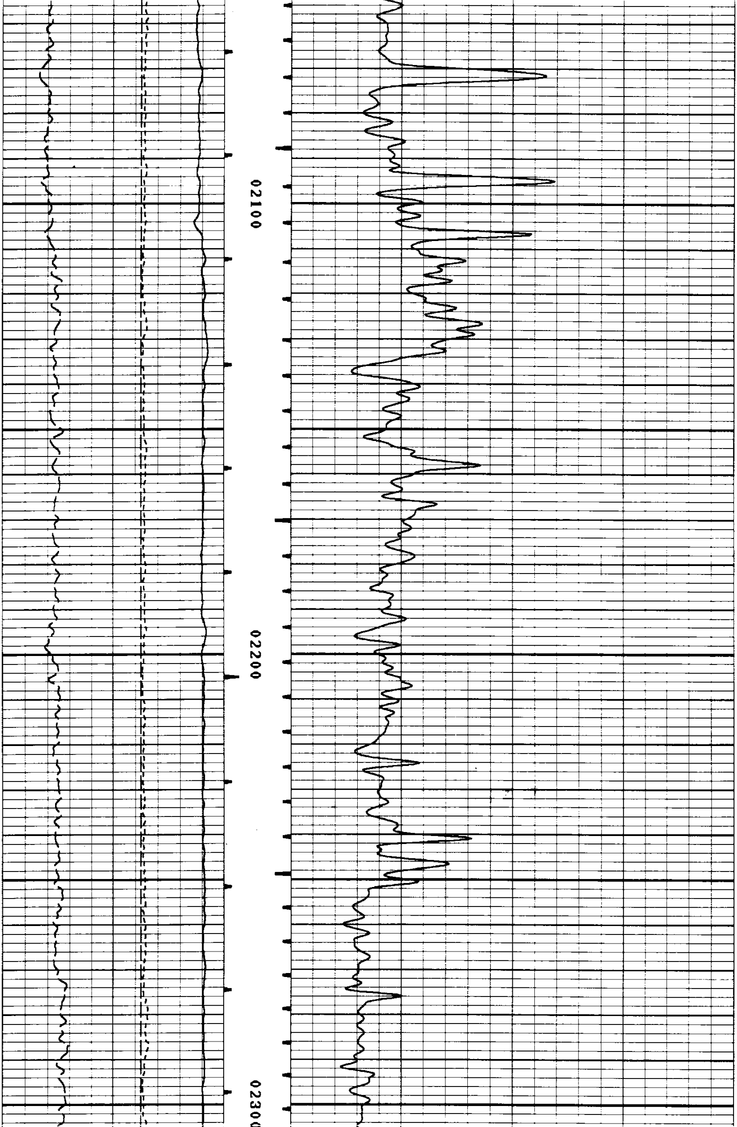

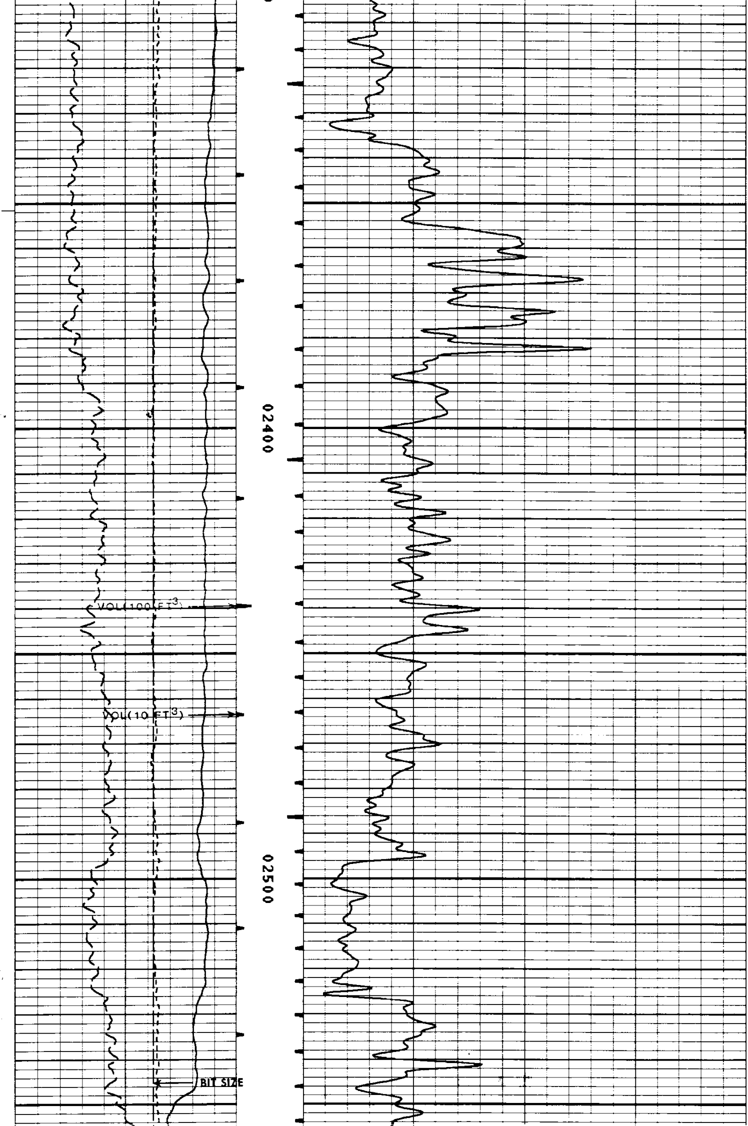

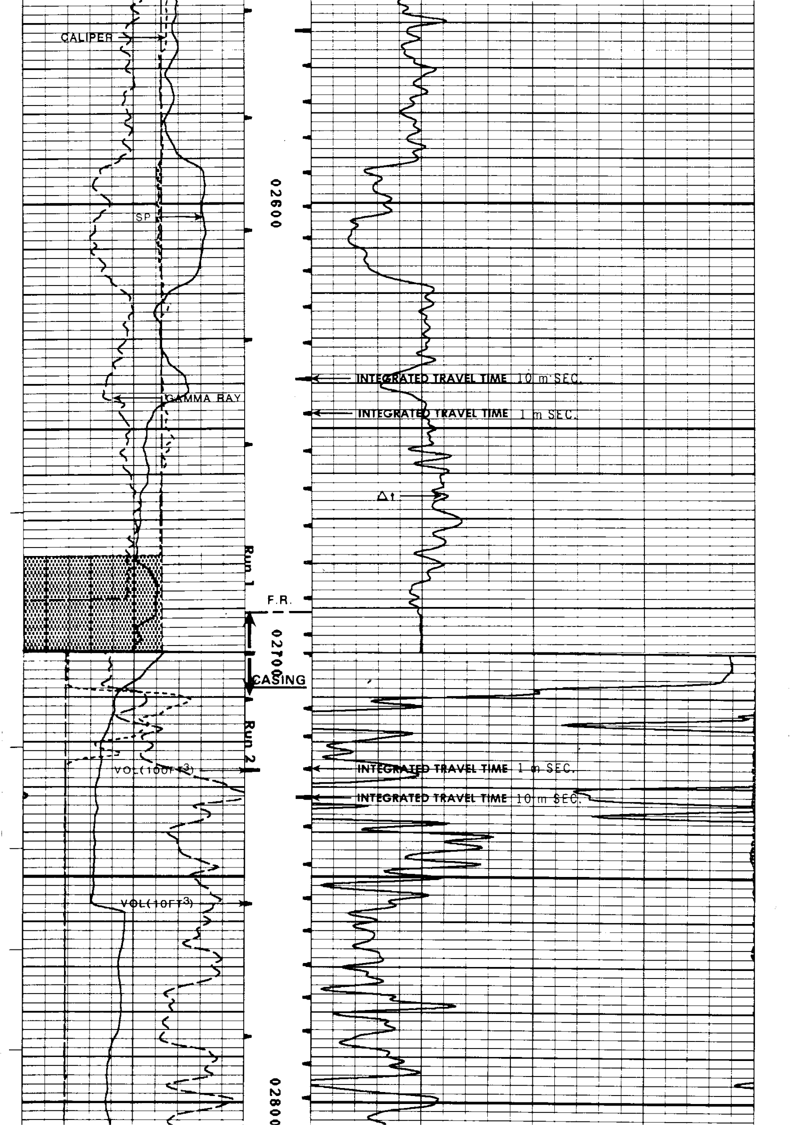

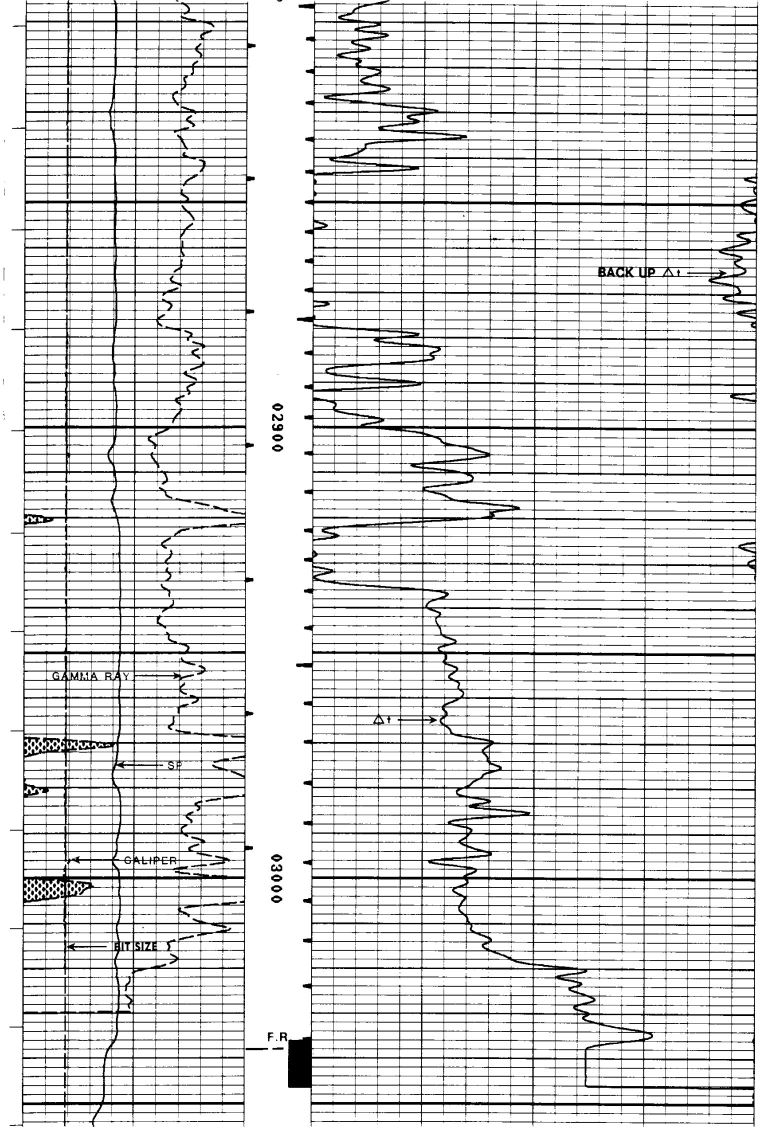

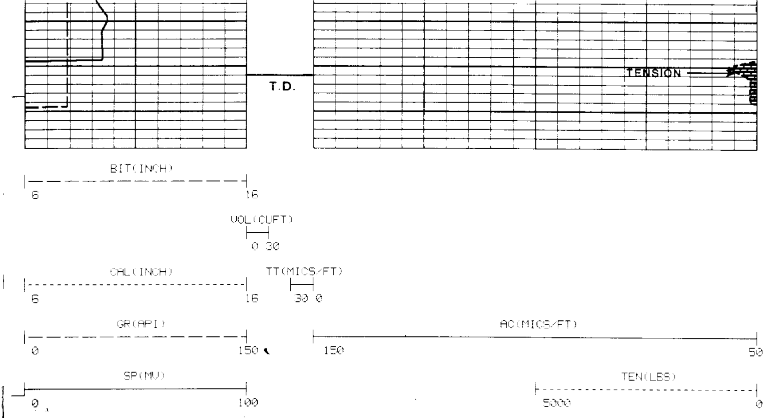

FILE: 3

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REPEAT SECTION

RUN # 1

****

FILE: 2

CURVE DELAY REPORT

CURVE	PHYS. DELAY	UNITS
CFOC	0	FT,IN
CILM	6.0	FT,IN
CILD	9.3	FT,IN
SP	9.3	FT,IN
GR	48.3	FT,IN
CAL	58.0	FT,IN
ACQ	31.9	FT,IN
AC	31.9	FT,IN

PARAMETERS

NAME	DEPTH INTERVAL	VALUE	UNITS
A	2744 TO 2449	1.000	
DEL-T F	2744 TO 2449	189.000	MICS/FT
DEL-T M	2744 TO 2449	55.500	MICS/FT
DEL-T S	2744 TO 2449	100.000	MICS/FT
M	2744 TO 2449	2.000	
O.D.	2744 TO 2449	8.625	INCH
PORA	2744 TO 2449	WYLLIE	

DISPLAY SCALE CHANGES

*** NONE ***

COMPANY: NORTHWEST NATURAL GAS COMPANY

RUN: 1

WELL NAME: I. W. 23d - 3

TRIP: 1

SERVICE: BK214M

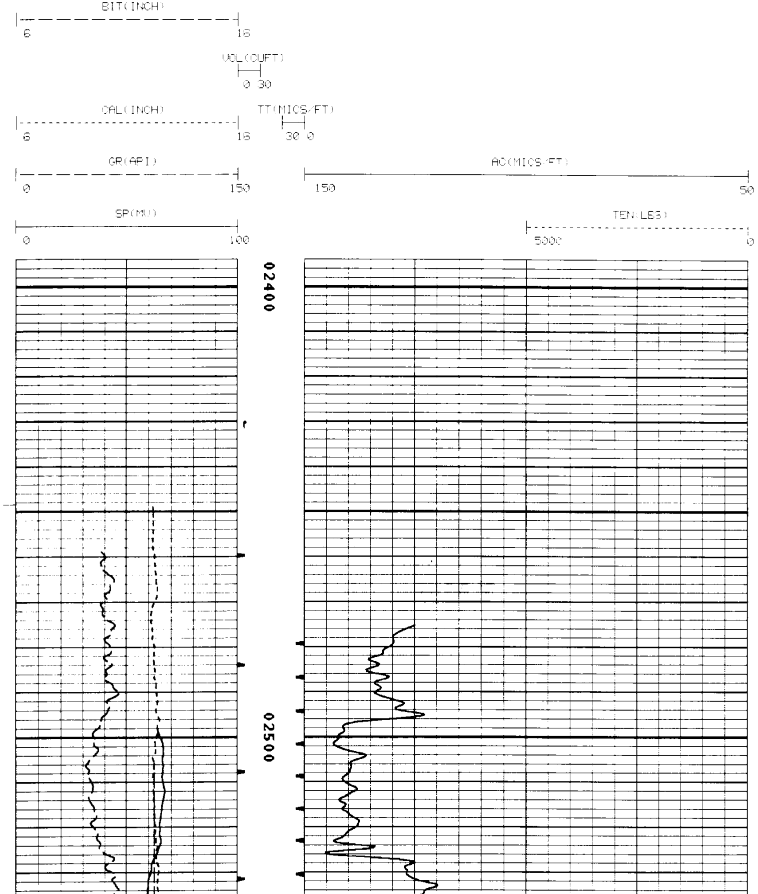
FILE: 2

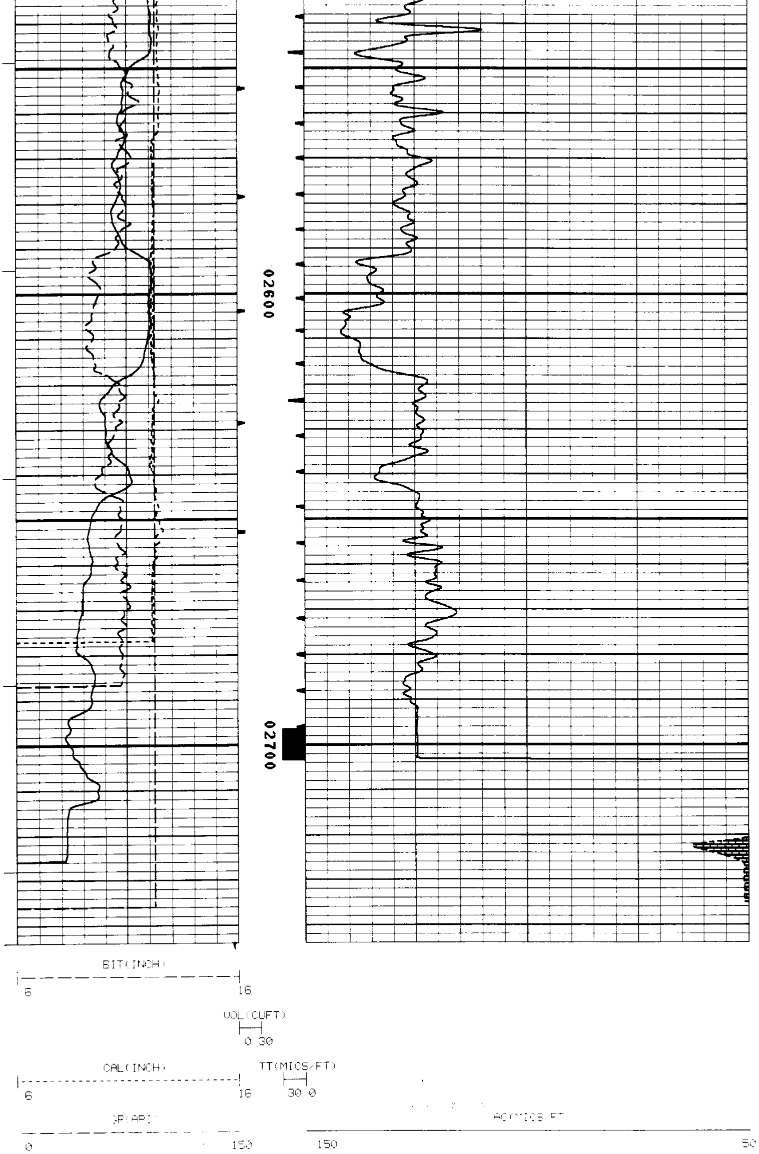
DATE: 10/15/91

TIME: 00:22:14

REVISION: FSYS256 REV:G002 VER:2.0

MODE: RECORD





```
        SP(MV)                                                         TEN(LBS)
|-----------------------------------|                 |- - - - - - - - - - - - - - - - - - - -|
0                                  100                 5000                                    0

                                      FILE:   2
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REPEAT SECTION

RUN # 2

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                                      FILE:   2

            CURVE  DELAY  REPORT
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                                      PHYS.
                              CURVE   DELAY   UNITS
                              -----   -----   -----

                              CFOC        0   FT.IN
                              CILM      6.0   FT.IN
                              CILD      3.3   FT.IN
                              SP        3.3   FT.IN
                              GR       43.3   FT.IN
                              CAL      53.0   FT.IN
                              ACQ      31.9   FT.IN
                              AC       31.9   FT.IN


            PARAMETERS
            ----------

                       NAME       DEPTH INTERVAL        VALUE      UNITS
                     --------    --------------    ----------    -----
                     A            3087 TO   2804         1.000
                     DEL-T F      3087 TO   2804       189.000   MICS/FT
                     DEL-T M      3087 TO   2804        55.500   MICS/FT
                     DEL-T S      3087 TO   2804       100.000   MICS/FT
                     M            3087 TO   2804         2.000
                     O.D.         3087 TO   2804         0.000   INCH
                     PORA         3087 TO   2804        WYLLIE


            DISPLAY SCALE CHANGES
            ---------------------

                                       *** NONE ***


   COMPANY:    NORTHWEST NATURAL GAS COMPANY                      RUN:  2

   WELL NAME:  I. W. 23d - 3                                      TRIP: 1

   SERVICE:    BK214M        FILE:   2        DATE:  10/20/91     TIME: 13:36:06

   REVISION:   FSYS256 REV:G002 VER:2.0                           MODE: RECORD


              BIT(INCH)
|— — — — — — — — — — — — — — — — —|
6                                 16

                        VOL(CUFT)
                         |--|
                          0 30

              CAL(INCH)            [illegible]
|- - - - - - - - - - - - - - - - -|     |--|
6                                 16    30 0
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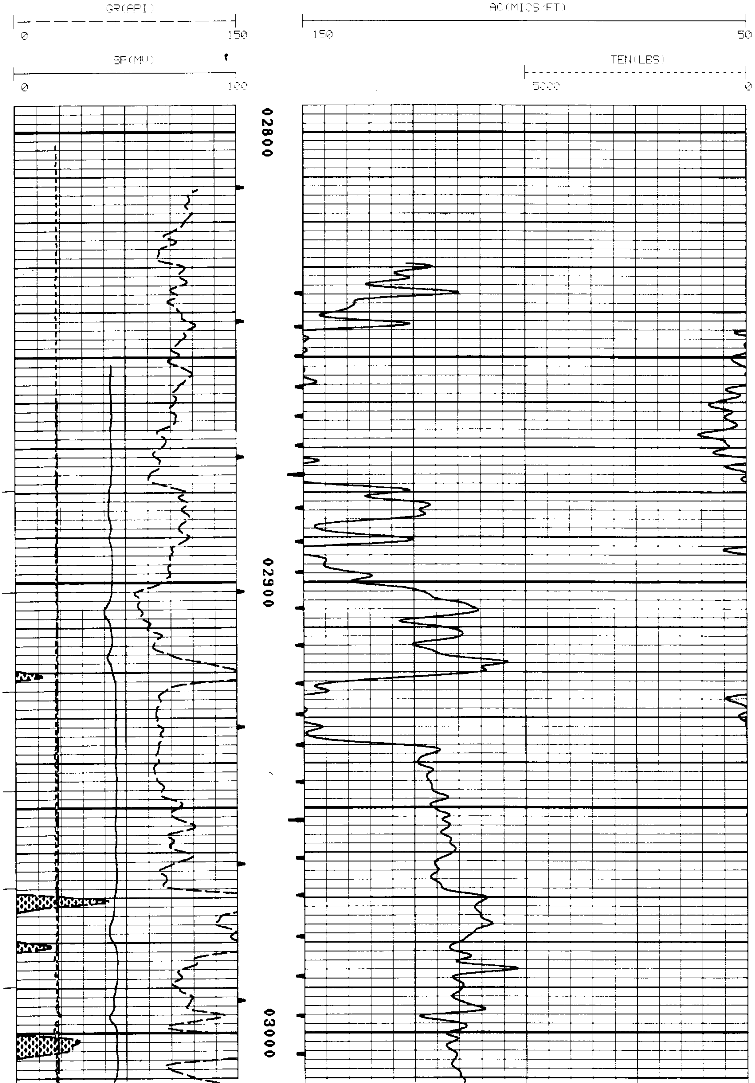

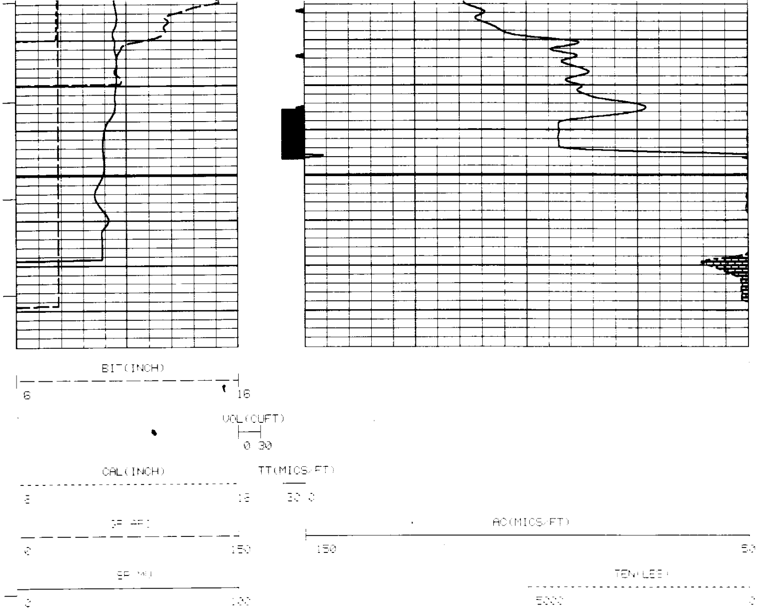

FILE: 3

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RUN # 1

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            *****************************************
            *                                       *
            *  CALIBRATION/VERIFICATION SUMMARIES   *
            *  DATE 10/15/91         TIME 02:55:20  *
            *  RUN  1                TRIP 1         *
            *                                       *
            *****************************************


        LOG NAME DIFL   ASSET NO. 72370    UNIT NO. HL 6320
     CALIBRATION ENTERED ON  10/14/91 AT 21:19:01

   CURVE   MILLIVOLTS      SCALING FACTORS    ENGINEERING VALUES   UNITS
            LOW    HIGH    ADD.     MULT.        LOW        HIGH
   ----   -------------- ----------------- -------------------- -----

       DATE 10/11/91          CALIBRATION           TIME 16:39:32

   CILD      -2.1   483.8    2.193    2.0063       0.500     500.000 MMHO
   CILM      -0.0   524.5    0.524    2.1494       0.500     500.000 MMHO
   CFOC       3.9   485.6   -3.056    2.5276       1.000     500.000 MMHO

       DATE 10/11/91    PRIMARY VERIFICATION        TIME 16:45:22

   CILD      -0.0   488.1    2.193    2.0063       2.193     504.529 MMHO
   CILM      -0.2   527.2    0.524    2.1494       0.309     502.685 MMHO
   CFOC       4.7   481.7   -3.056    2.5276       1.766     495.893 MMHO

       DATE 10/15/91   BEFORE LOG VERIFICATION      TIME 00:01:12

   CILD       0.2   488.9    1.970    2.0039       2.193     504.529 MMHO
   CILM       0.2   527.0    0.171    2.1516       0.309     502.685 MMHO
   CFOC       4.5   483.4   -3.337    2.5537       1.766     495.893 MMHO

       DATE 10/15/91    AFTER LOG VERIFICATION      TIME 01:31:13
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CILD       0.3   489.2    1.970     2.0039          2.296     504.906 MMHO
CILM      -0.1   527.0    0.171     2.1516          0.076     502.622 MMHO
CFOC       4.3   463.5   -2.897     2.5987          1.608     480.635 MMHO


        LOG NAME GR      ASSET NO. 60519    UNIT NO. HL 6339
    CALIBRATION ENTERED ON  10/14/91 AT 21:20:36

CURVE    COUNTS/SEC.     SCALING FACTORS     ENGINEERING VALUES    UNITS
           LOW    HIGH    ADD.     MULT.          LOW        HIGH
----   --------------- ------------------ ---------------------- -----

      DATE 09/19/91           CALIBRATION           TIME 16:43:20

GR          63.2   357.2     0.000     0.7729       0.000     150.000 API

      DATE 09/19/91     PRIMARY VERIFICATION       TIME 16:47:12

GR          63.0   254.1     0.000     0.7729      48.673     198.355 API

      DATE 10/14/91    BEFORE LOG VERIFICATION     TIME 21:31:21

GR          52.1   246.7     0.000     0.7729      40.268     190.712 API

      DATE 10/15/91     AFTER LOG VERIFICATION     TIME 01:56:06

GR          79.9   278.0     0.000     0.7729      61.735     214.885 API


        LOG NAME CAL     ASSET NO. 55718    UNIT NO. HL 6399
    CALIBRATION ENTERED ON  10/14/91 AT 21:21:16

CURVE    MILLIVOLTS      SCALING FACTORS     ENGINEERING VALUES    UNITS
           LOW    HIGH    ADD.     MULT.          LOW        HIGH
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      DATE 09/19/91           CALIBRATION           TIME 16:14:45

CAL     4591.9 11166.3    1.412     0.0089       7.000       15.000 INCH

                        PRIMARY VERIFICATION              NOT DONE

      DATE 10/14/91    BEFORE LOG VERIFICATION     TIME 23:57:55

CAL        E      9883.0    0.383     0.0089       E             12.844 INCH

      DATE 10/15/91     AFTER LOG VERIFICATION     TIME 01:36:53

CAL        E    ' 9679.3    0.262     0.0089       E             12.641 INCH
```

RUN # 2

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                 ****************************************
                 *                                      *
                 *  CALIBRATION/VERIFICATION SUMMARIES  *
                 *  DATE 10/20/91         TIME 20:18:55  *
                 *  RUN  2                TRIP 1        *
                 *                                      *
                 ****************************************


       LOG NAME DIFL    ASSET NO. 72370     UNIT NO. HL 6320
    CALIBRATION ENTERED ON  10/20/91 AT 17:59:49

CURVE   MILLIVOLTS      SCALING FACTORS     ENGINEERING VALUES   UNITS
          LOW    HIGH    ADD.     MULT.          LOW        HIGH
----   --------------- ------------------ ---------------------- -----

      DATE 10/11/91          CALIBRATION           TIME 16:39:32

CILD      -2.1   483.8    2.193     2.0063         0.500     500.000 MMHO
CILM      -0.0   524.5    0.524     2.1494         0.500     500.000 MMHO
CFOC       3.9   485.6   -3.056     2.5276         1.000     500.000 MMHO

      DATE 10/11/91     PRIMARY VERIFICATION       TIME 16:45:22

CILD      -0.0   488.1    2.193     2.0063         2.193     504.529 MMHO
CILM      -0.2   527.2    0.524     2.1494         0.309     502.685 MMHO
CFOC       4.7   481.7   -3.056     2.5276         1.766     495.893 MMHO

      DATE 10/20/91    BEFORE LOG VERIFICATION     TIME 18:29:15

CILD       0.3   488.4    1.922     2.0082         2.193     504.529 MMHO
CILM       0.0   525.6    0.292     2.1568         0.309     502.685 MMHO
CFOC       4.7   486.4   -3.079     2.5030         1.766     495.893 MMHO

      DATE 10/20/91     AFTER LOG VERIFICATION     TIME 19:20:48
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CILD        0.2   488.6     1.923     2.0062         2.151      504.756 MMHO
CILM        0.1   526.1     0.292     2.1568         0.400      503.124 MMHO
CFOC        4.8   481.3    -3.079     2.5030         1.825      490.636 MMHO


       LOG NAME GR      ASSET NO. 60519    UNIT NO. HL 6399
   CALIBRATION ENTERED ON  10/20/91 AT 18:00:59

CURVE    COUNTS/SEC.    SCALING FACTORS    ENGINEERING VALUES   UNITS
          LOW    HIGH    ADD.     MULT.         LOW        HIGH
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      DATE 09/19/91          CALIBRATION           TIME 16:43:20

GR          63.2   257.2    0.000     0.7729       0.000     150.000 API

      DATE 09/19/91    PRIMARY VERIFICATION        TIME 16:47:12

GR          63.0   254.1    0.000     0.7729      48.673     196.355 API

      DATE 10/20/91   BEFORE LOG VERIFICATION     TIME 16:58:10

GR         206.3   398.5    0.000     0.7729     159.429     308.019 API

      DATE 10/20/91    AFTER LOG VERIFICATION     TIME 19:56:25

GR         169.2   361.4    0.000     0.7729     130.794     279.286 API


       LOG NAME CAL     ASSET NO. 55713    UNIT NO. HL 6399
   CALIBRATION ENTERED ON  10/20/91 AT 18:01:59

CURVE    MILLIVOLTS     SCALING FACTORS    ENGINEERING VALUES   UNITS
          LOW    HIGH    ADD.     MULT.         LOW        HIGH
----   --------------- ------------------ -------------------- -----

      DATE 09/19/91          CALIBRATION           TIME 16:14:46

CAL    4591.9 11162.3    1.412    0.0089       7.000      15.000 INCH

                       PRIMARY VERIFICATION             NOT DONE

      DATE 10/20/91   BEFORE LOG VERIFICATION     TIME 19:22:00

CAL        E     5244.7    1.537    0.0089       E             7.319 INCH

      DATE 10/20/91    AFTER LOG VERIFICATION     TIME 19:25:02

CAL        E     5283.5    1.537    0.0089       E             7.367 INCH
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