



**R<sub>1</sub> EXPLORER  
MICRO LATEROLOG  
GAMMA RAY LOG**

|                         |                                           |
|-------------------------|-------------------------------------------|
| FILE NO:<br>MD11798     | COMPANY<br><b>HOLLY FRONTIER - NAVAJO</b> |
| API NO:<br>30-015-44677 | WELL<br><b>NAVAJO REFINING WDW #4</b>     |
|                         | FIELD<br><b>ARTESIA</b>                   |
|                         | COUNTY<br><b>EDDY</b>                     |
|                         | STATE<br><b>NEW MEXICO</b>                |

|           |                                                                                 |                                    |
|-----------|---------------------------------------------------------------------------------|------------------------------------|
| Ver. 4.10 | LOCATION:<br>1217' FSL & 2443' FWL<br>SECTION 23, T17S, R27E<br>N.M.P.M. SURVEY | OTHER SERVICES<br>ZDLCN/GR<br>STAR |
|-----------|---------------------------------------------------------------------------------|------------------------------------|

|                   |    |           |            |                                                             |
|-------------------|----|-----------|------------|-------------------------------------------------------------|
| PERMANENT DATUM   | GL | ELEVATION | 3565.8 FT  | ELEVATIONS:<br>KB 3565.8 FT<br>DF 3584.8 FT<br>GL 3565.8 FT |
| LOG MEASURED FROM | KB | 20 FT     | ABOVE P.D. |                                                             |
| DRILL. MEAS. FROM | KB |           |            |                                                             |

| DATE                   | TRIP       | 29-JUN-2018 | 03-AUG-2018              |
|------------------------|------------|-------------|--------------------------|
| RUN                    | 3          | 1           | 4                        |
| SERVICE ORDER          | 134542     |             | 139174                   |
| DEPTH DRILLER          | 10360 FT   |             | 10700 FT                 |
| DEPTH LOGGER           | 10360 FT   |             | 10668 FT                 |
| BOTTOM LOGGED INTERVAL | 10360 FT   |             | 10664 FT                 |
| TOP LOGGED INTERVAL    | 9740 FT    |             | 10322 FT                 |
| CASING DRILLER         | 13.375 IN  | @ 1680 FT   | 9.625 IN @ 10326 FT      |
| CASING LOGGER          | 1680 FT    |             | 10322 FT                 |
| BIT SIZE               | 12.25 IN   |             | 8.5 IN                   |
| TYPE OF FLUID IN HOLE  | WBM        |             | WBM                      |
| DENSITY                | 9.7 LB/G   | 44 CP       | 8.4 LB/G                 |
| PH                     | 10         | N/A         | 10                       |
| SOURCE OF SAMPLE       | FLOWLINE   |             | FLOWLINE                 |
| RM AT MEAS. TEMP.      | 0.091 OHMM | @ 75 DEGF   | 0.117 OHMM @ 77 DEGF     |
| RMF AT MEAS. TEMP.     | 0.077 OHMM | @ 75 DEGF   | 0.101 OHMM @ 77 DEGF     |
| RMC AT MEAS. TEMP.     | 0.122 OHMM | @ 75 DEGF   | 0.133 OHMM @ 77 DEGF     |
| SOURCE OF RMF          | RMC        | MEASURED    | MEASURED                 |
| RM AT BHT              | 0.193 OHMM | @ 167 DEGF  | 0.099 OHMM @ 170.24 DEGF |
| TIME SINCE CIRCULATION | 9 HRS      |             | 12 HRS                   |
| MAX. RECORDED TEMP.    | 168 DEGF   |             | 170.24 DEGF              |
| EQUIP. NO.             | HL6690     | MIDLAND, TX | HL6845                   |
| RECORDED BY            | JKOSKI     |             | O. ROBLES / B. TELLER    |
| WITNESSED BY           | KCOOK      |             | K. COOK                  |

IN MAKING INTERPRETATIONS OF LOGS OUR EMPLOYEES WILL GIVE THE 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 3 TRIP 1: DATA TIED INTO RUN 2 DATA

RIG: PATRIOT #4  
CREW: J. ESPINOZA / A. FERREBUS

RUN 4 TRIP 1: DATA TIED INTO RUN 3 DATA

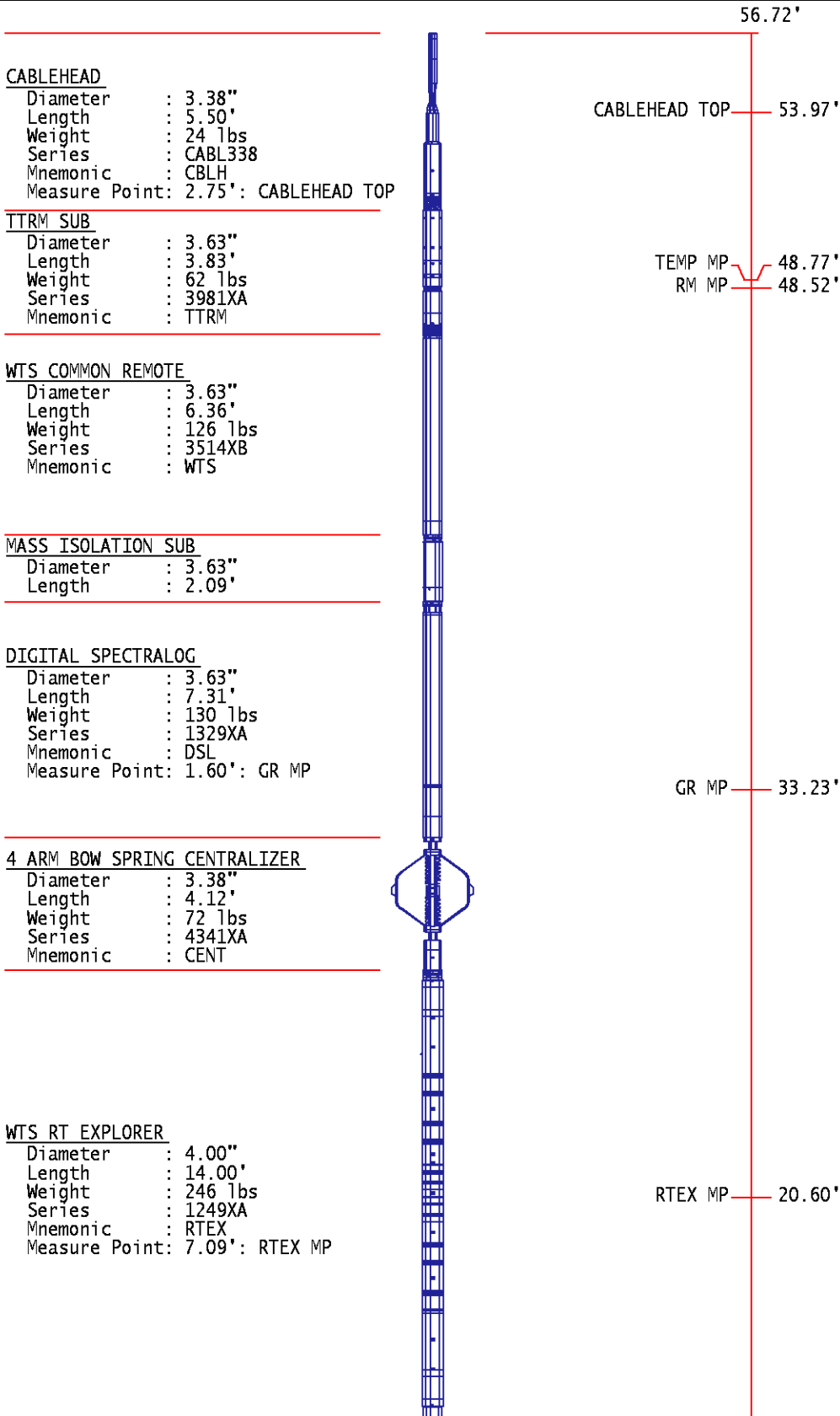
CREW: TELLER / BECK / BORDELON  
RIG: PATRIOT #4

**EQUIPMENT DATA**

| RUN | TRIP | TOOL  | SERIES NO. | SERIAL NO. | POSITION   |
|-----|------|-------|------------|------------|------------|
| 4   | 1    | TTRM  | 3981XA     | 12030561   | FREE       |
| 4   | 1    | COMM  | 3514XA     | Z188453    | FREE       |
| 4   | 1    | ISO   | 4485XA     | 13497242   | FREE       |
| 4   | 1    | GAMMA | 1329XA     | 10330272   | FREE       |
| 4   | 1    | CENT  | 4341XA     | 10063092   | 4-PADS     |
| 4   | 1    | RTEX  | 1249XA     | 12599240   | FREE       |
| 4   | 1    | MLL   | 1243XA     | 12006861   | PAD DEVICE |

INSTRUMENT CONFIGURATION

Source File: /dat1a/md11798r4/p87cc~WS1-tdg



# WTS MICROLATEROLOG

Diameter : 4.00"  
 Length : 11.25'  
 Weight : 258 lbs  
 Series : 1243XA  
 Mnemonic : MLL  
 Measure Point: 1.55': MP

# MASS ISOLATION SUB

Diameter : 3.63"  
 Length : 2.09'

# BULL PLUG 2 5/6

TOTAL LENGTH: 56.72'  
 TOTAL WEIGHT: 1028 lbs  
 MAX DIAMETER: 0"4.00"



MP 3.82'

0.00'

## MAIN LOG 2"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Patches: 3

Plotted: Fri Aug 3 15:23:27 2018

## PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/md11798r4/p87cc02.prm  
 LOGGING MODE: DEPTH DIRECTION: UP  
 TOP DEPTH: 9837.250 ft BOTTOM DEPTH: 10669.250 ft

### SYMMETRIC FILTER

| MEASUREMENT TYPE   | PARAMETER   | VALUE      | UNITS | INTERVAL (ft) |        |
|--------------------|-------------|------------|-------|---------------|--------|
| TTRM               | FILTER ( )  | medium (1) |       | TOP           | BOTTOM |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| TENSION            | FILTER ( )  | medium (1) |       | "             | "      |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| GR                 | FILTER ( )  | medium (1) |       | "             | "      |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| RTeX               | FILTER ( )  | light (2a) |       | "             | "      |
|                    | FILTER (.h) | light (2a) |       | "             | "      |
|                    | FILTER (.i) | light (2a) |       | "             | "      |
| CALA (3rd CALIPER) | FILTER ( )  | medium(1)  |       | "             | "      |
|                    | FILTER (.i) | medium(1)  |       | "             | "      |
|                    | FILTER (.j) | medium(1)  |       | "             | "      |
| MLL                | FILTER ( )  | light (2a) |       | "             | "      |
|                    | FILTER (.i) | light (2a) |       | "             | "      |
|                    | FILTER (.j) | light (2a) |       | "             | "      |

### BOREHOLE & CEMENT

| MEASUREMENT TYPE            | PARAMETER         | VALUE | UNITS | INTERVAL (ft) |        |
|-----------------------------|-------------------|-------|-------|---------------|--------|
| BIT SIZE                    | BIT SIZE          | 8.500 | in    | TOP           | BOTTOM |
| MUD SAMPLE RESISTIVITY      | MUD SAMPLE TEMP   | 77.0  | degF  | "             | "      |
|                             | MUD SAMPLE RES    | 0.117 | ohm.m | "             | "      |
| BOREHOLE TEMP from GRADIENT | Known BH REF TEMP | 161.0 | degF  | "             | "      |

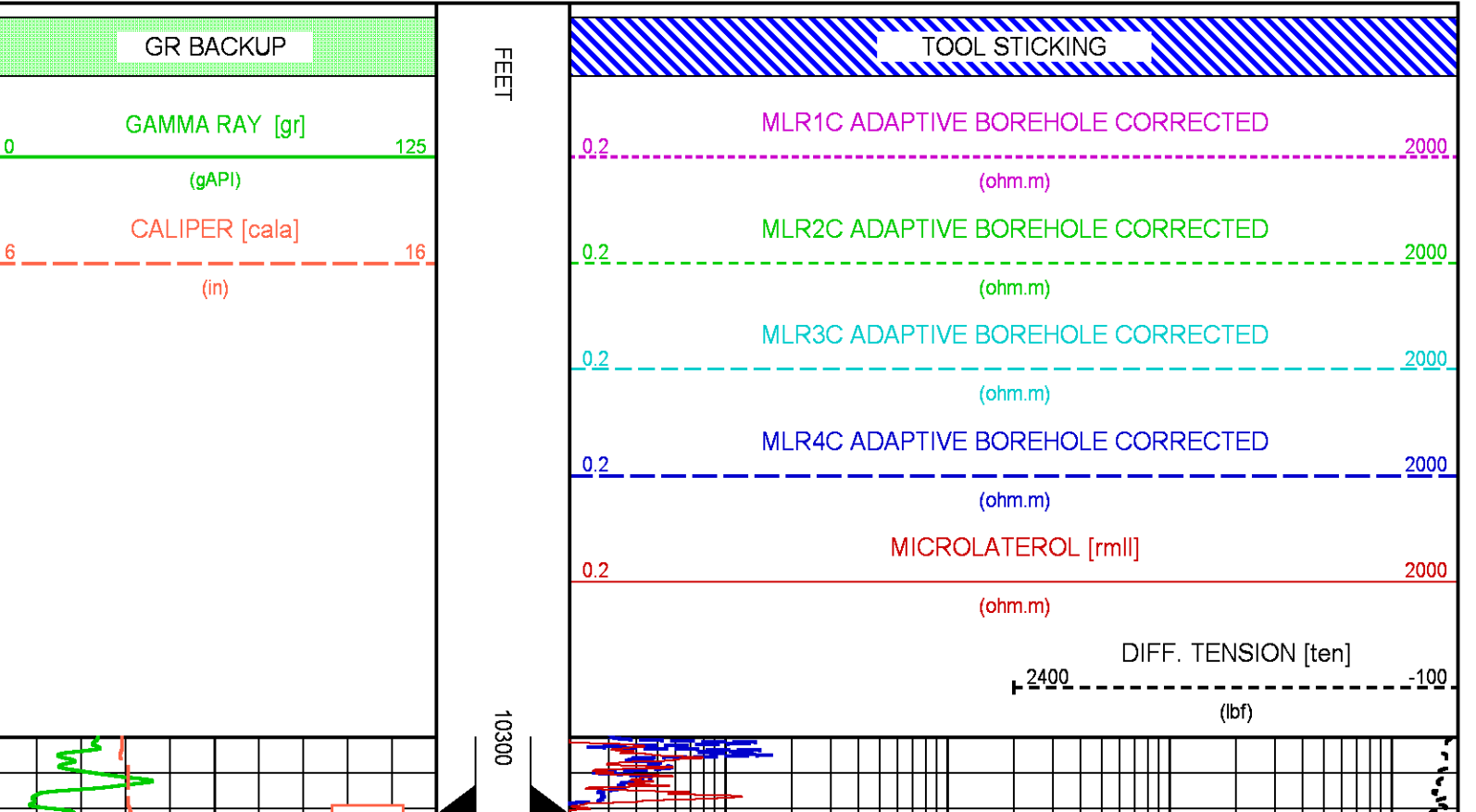
|                               |                             |               |              |   |   |
|-------------------------------|-----------------------------|---------------|--------------|---|---|
|                               | at BH REF DEPTH             | 10250.0       | ft           | " | " |
|                               | with TEMP GRADIENT          | 0.700         | 0.01 degF/ft | " | " |
| BOREHOLE CORR DIAMETER SOURCE | CALIPER/FIXED DIA. (calmu*) | USE CALIPER   |              | " | " |
| BOREHOLE CORR DIAMETER        | FIXED DIAMETER (mlr1c*)     | 8.500         | in           | " | " |
| BH MUD RESISTIVITY SOURCE     | RMUD SOURCE                 | TOOL MEASURED |              | " | " |

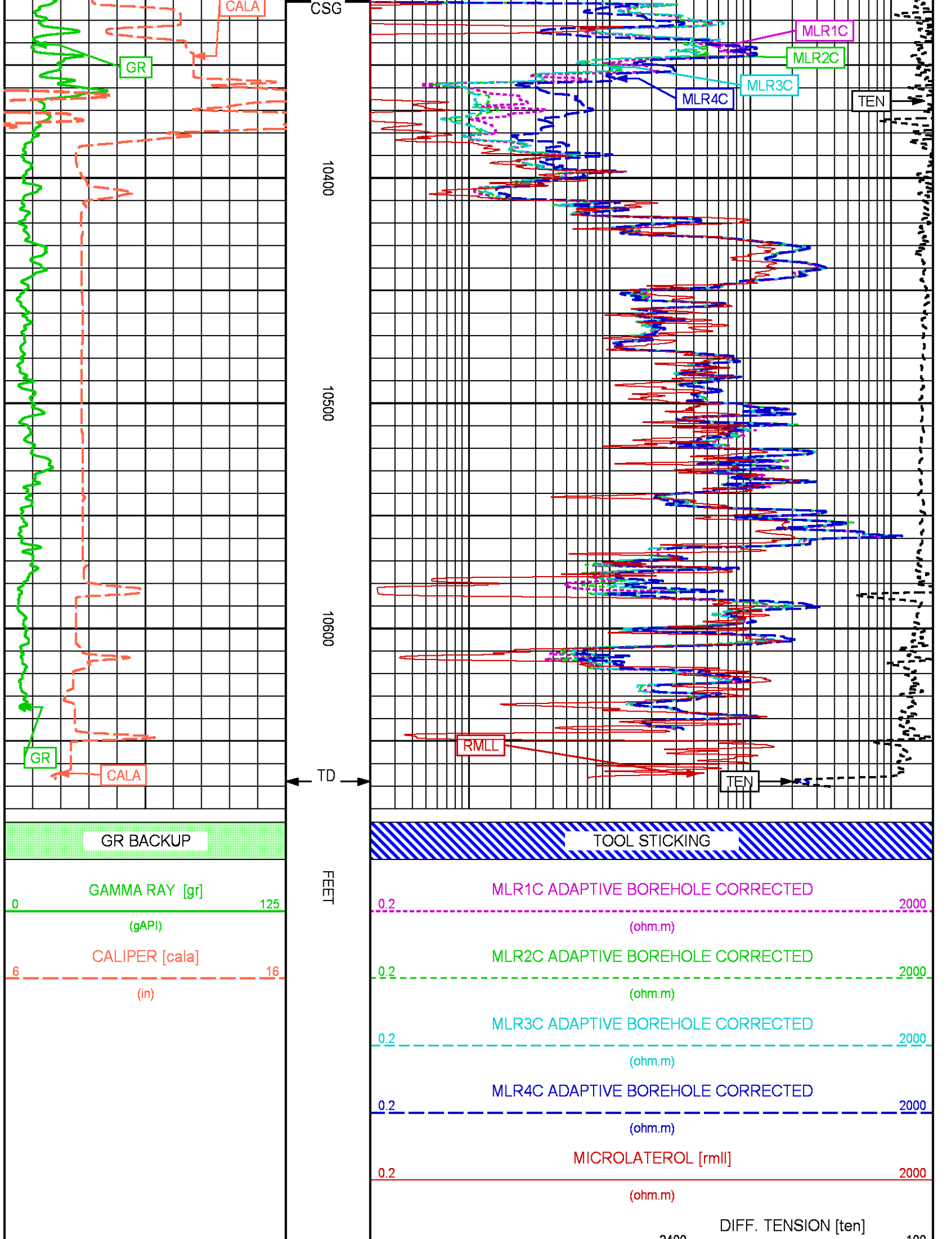
| RTeX PROCESSING                   |                                   |                      |       |               |             |
|-----------------------------------|-----------------------------------|----------------------|-------|---------------|-------------|
| MEASUREMENT TYPE                  | PARAMETER                         | VALUE                | UNITS | INTERVAL (ft) |             |
| RTeX ADAPTIVE BOREHOLE CORRECTION | BOREHOLE CORRECTION<br>Rxo Source | ON<br>MICROLATEROLOG |       | TOP<br>"      | BOTTOM<br>" |

| CURVE DESCRIPTION REPORT |               |                                                          |
|--------------------------|---------------|----------------------------------------------------------|
| CURVE NAME               | CREATION DATE | CURVE DESCRIPTION                                        |
| F1:CALA                  | N/A           | CALIPER FROM 3104 OR 1233 WITH OTHER CALIPERS IN STRING  |
| F1:GR                    | N/A           | GAMMA RAY                                                |
| F1:MLR1C                 | N/A           | RTEX SHALLOW RESISTIVITY 1, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR2C                 | N/A           | RTEX SHALLOW RESISTIVITY 2, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR3C                 | N/A           | RTEX MEDIUM RESISTIVITY 3, ADAPTIVE BOREHOLE CORRECTION  |
| F1:MLR4C                 | N/A           | RTEX DEEP RESISTIVITY 4, ADAPTIVE BOREHOLE CORRECTION    |
| F1:RMLL                  | N/A           | RESISTIVITY                                              |
| F1:TEN                   | N/A           | DIFFERENTIAL TENSION                                     |

| CURVE MEASURE POINT OFFSET |             |       |             |       |             |
|----------------------------|-------------|-------|-------------|-------|-------------|
| CURVE                      | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) |
| CALA                       | -3.50       | MLR1C | -20.50      | MLR3C | -20.50      |
| GR                         | -33.00      | MLR2C | -20.50      | MLR4C | -20.50      |
|                            |             |       |             | RMLL  | -3.50       |
|                            |             |       |             | TEN   | 0.00        |

|               |                                                         |
|---------------|---------------------------------------------------------|
| Presentation  | : SysA:/dat1a/md11798r4/RTEX_TX_2.fvpdf [2"/100' Scale] |
| Plot Interval | : 10300 - 10671.5 Feet                                  |
| Data File 1   | : F1 : SysA:/dat1a/md11798r4/R4RES_MAIN.xtf             |
| Created On    | : N/A                                                   |
| Company       | : HOLLY FRONTIER - NAVAJO                               |
| Well          | : NAVAJO REFINING WDW #4                                |
| Field         | : ARTESIA                                               |
| File Interval | : 9790.75 - 10671.5 Feet                                |
| OCT           | : p87cc                                                 |





## MAIN LOG 5"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017

Patches: 3

Plotted: Fri Aug 3 15:22:36 2018

## PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/md11798r4/p87cc02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 9837.250 ft BOTTOM DEPTH: 10669.250 ft

## SYMMETRIC FILTER

| MEASUREMENT TYPE   | PARAMETER   | VALUE      | UNITS | INTERVAL (ft) |        |
|--------------------|-------------|------------|-------|---------------|--------|
| TTRM               | FILTER ( )  | medium (1) |       | TOP           | BOTTOM |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| TENSION<br>GR      | FILTER ( )  | medium (1) |       | "             | "      |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| RTeX               | FILTER ( )  | light (2a) |       | "             | "      |
|                    | FILTER (.h) | light (2a) |       | "             | "      |
|                    | FILTER (.i) | light (2a) |       | "             | "      |
| CALA (3rd CALIPER) | FILTER ( )  | medium(1)  |       | "             | "      |
|                    | FILTER (.i) | medium(1)  |       | "             | "      |
|                    | FILTER (.j) | medium(1)  |       | "             | "      |
| MLL                | FILTER ( )  | light (2a) |       | "             | "      |
|                    | FILTER (.i) | light (2a) |       | "             | "      |
|                    | FILTER (.j) | light (2a) |       | "             | "      |

## BOREHOLE &amp; CEMENT

| MEASUREMENT TYPE              | PARAMETER                   | VALUE         | UNITS        | INTERVAL (ft) |        |
|-------------------------------|-----------------------------|---------------|--------------|---------------|--------|
| BIT SIZE                      | BIT SIZE                    | 8.500         | in           | TOP           | BOTTOM |
| MUD SAMPLE RESISTIVITY        | MUD SAMPLE TEMP             | 77.0          | degF         | "             | "      |
|                               | MUD SAMPLE RES              | 0.117         | ohm.m        | "             | "      |
| BOREHOLE TEMP from GRADIENT   | Known BH REF TEMP           | 161.0         | degF         | "             | "      |
|                               | at BH REF DEPTH             | 10250.0       | ft           | "             | "      |
|                               | with TEMP GRADIENT          | 0.700         | 0.01 degF/ft | "             | "      |
| BOREHOLE CORR DIAMETER SOURCE | CALIPER/FIXED DIA. (calmu*) | USE CALIPER   |              | "             | "      |
| BOREHOLE CORR DIAMETER        | FIXED DIAMETER (mlr1c*)     | 8.500         | in           | "             | "      |
| BH MUD RESISTIVITY SOURCE     | RMUD SOURCE                 | TOOL MEASURED |              | "             | "      |

## RTeX PROCESSING

| MEASUREMENT TYPE                  | PARAMETER           | VALUE          | UNITS | INTERVAL (ft) |        |
|-----------------------------------|---------------------|----------------|-------|---------------|--------|
| RTeX ADAPTIVE BOREHOLE CORRECTION | BOREHOLE CORRECTION | ON             |       | TOP           | BOTTOM |
|                                   | Rxo Source          | MICROLATEROLOG |       | "             | "      |

## CURVE DESCRIPTION REPORT

| CURVE NAME | CREATION DATE | CURVE DESCRIPTION                                        |
|------------|---------------|----------------------------------------------------------|
| F1:CALA    | N/A           | CALIPER FROM 3104 OR 1233 WITH OTHER CALIPERS IN STRING  |
| F1:GR      | N/A           | GAMMA RAY                                                |
| F1:MLR1C   | N/A           | RTeX SHALLOW RESISTIVITY 1, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR2C   | N/A           | RTeX SHALLOW RESISTIVITY 2, ADAPTIVE BOREHOLE CORRECTION |

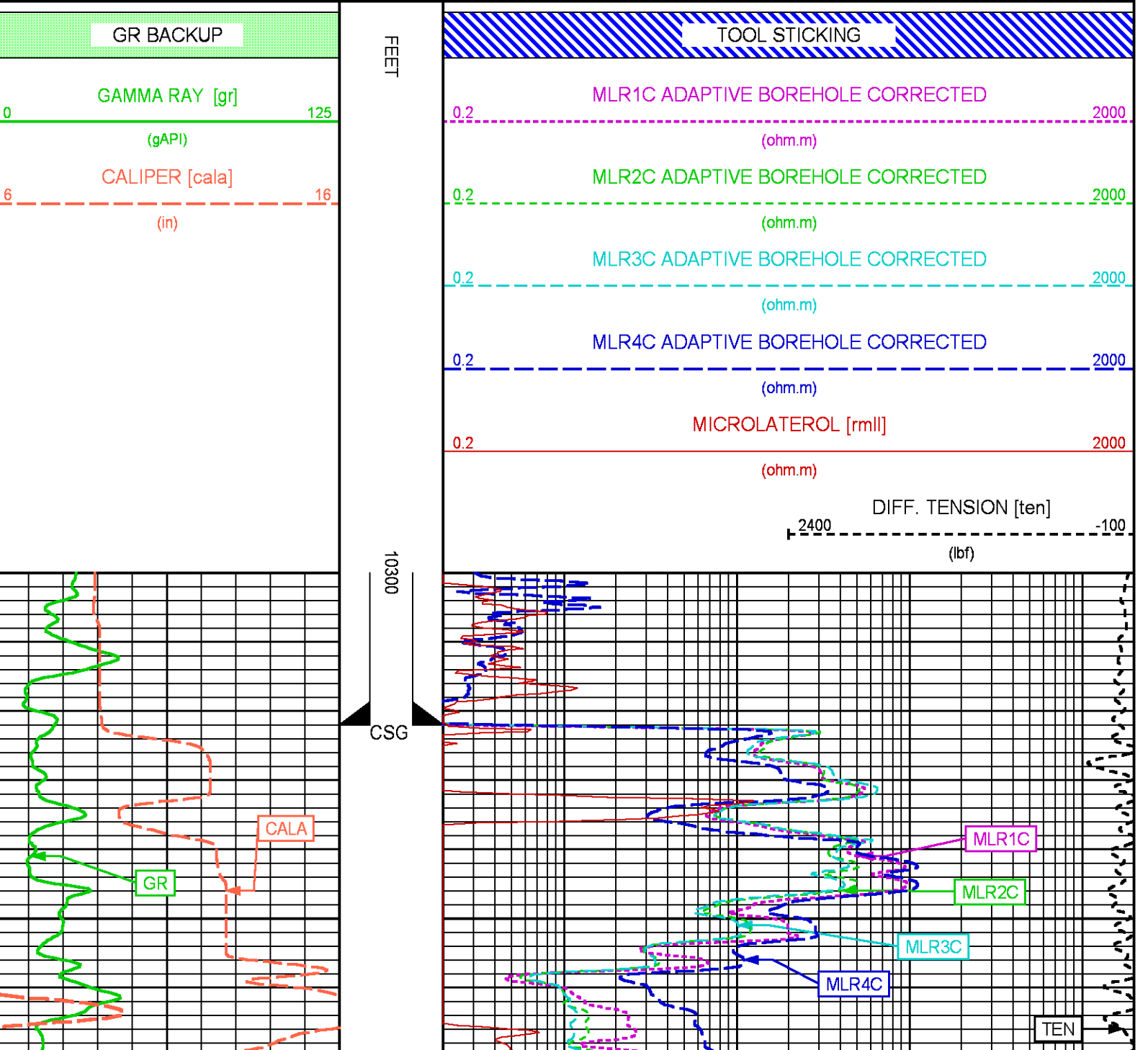
|          |     |                                                          |
|----------|-----|----------------------------------------------------------|
| F1:MLR2C | N/A | RTEX CHANNEL RESISTIVITY 2, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR3C | N/A | RTEX MEDIUM RESISTIVITY 3, ADAPTIVE BOREHOLE CORRECTION  |
| F1:MLR4C | N/A | RTEX DEEP RESISTIVITY 4, ADAPTIVE BOREHOLE CORRECTION    |
| F1:RMLL  | N/A | RESISTIVITY                                              |
| F1:TEN   | N/A | DIFFERENTIAL TENSION                                     |

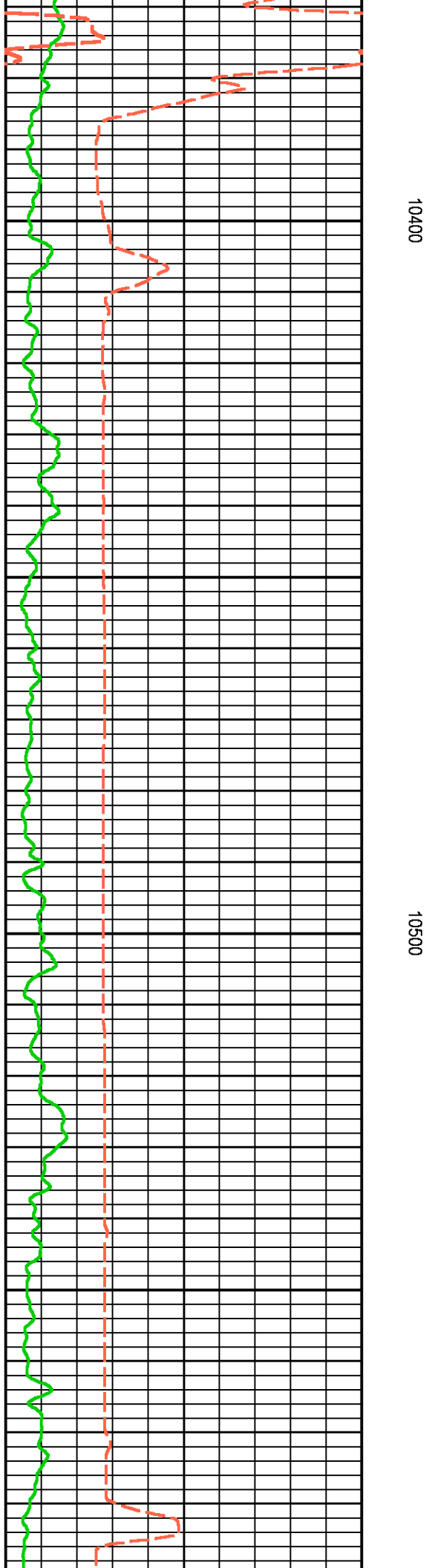
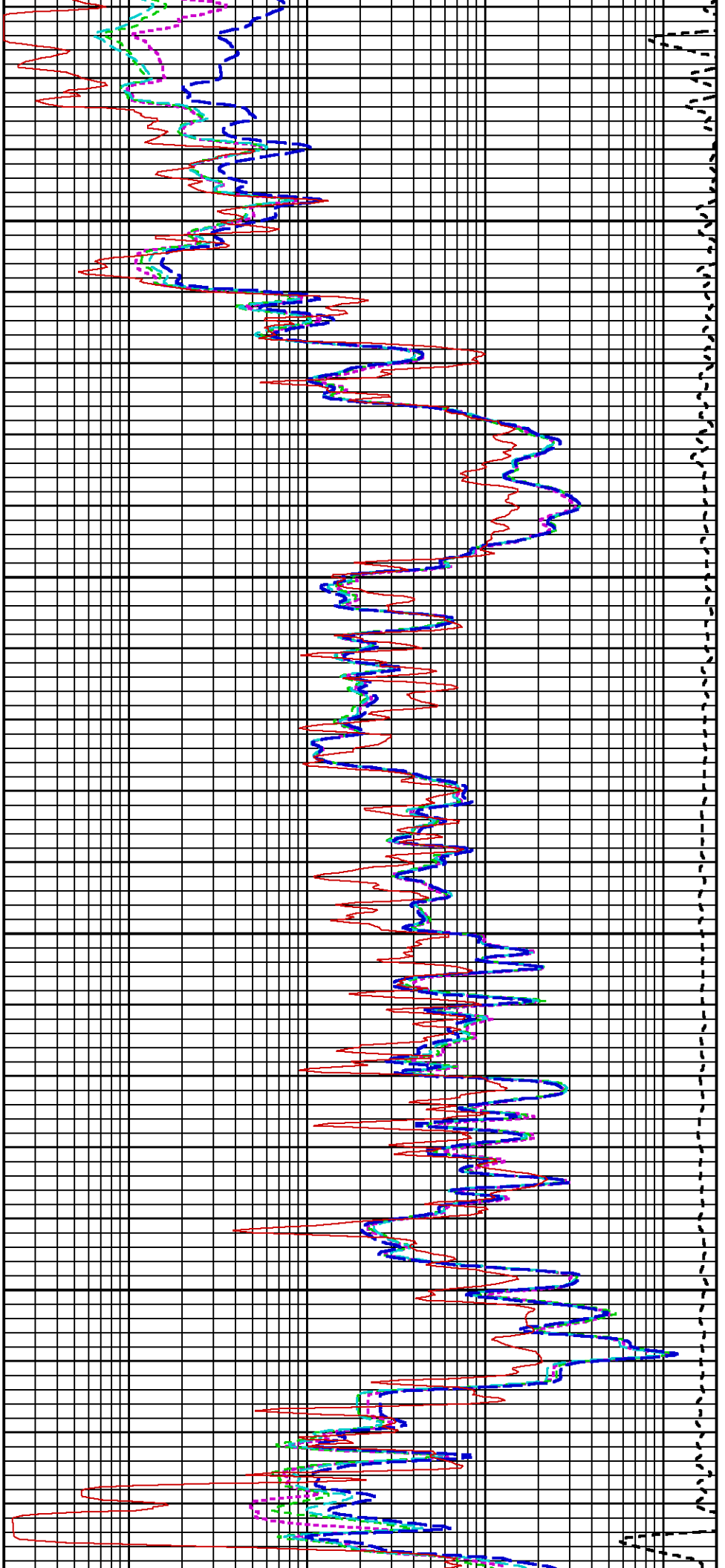
CURVE MEASURE POINT OFFSET

| CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) |
|-------|-------------|-------|-------------|-------|-------------|-------|-------------|
| CALA  | -3.50       | MLR1C | -20.50      | MLR3C | -20.50      | RMLL  | -3.50       |
| GR    | -33.00      | MLR2C | -20.50      | MLR4C | -20.50      | TEN   | 0.00        |

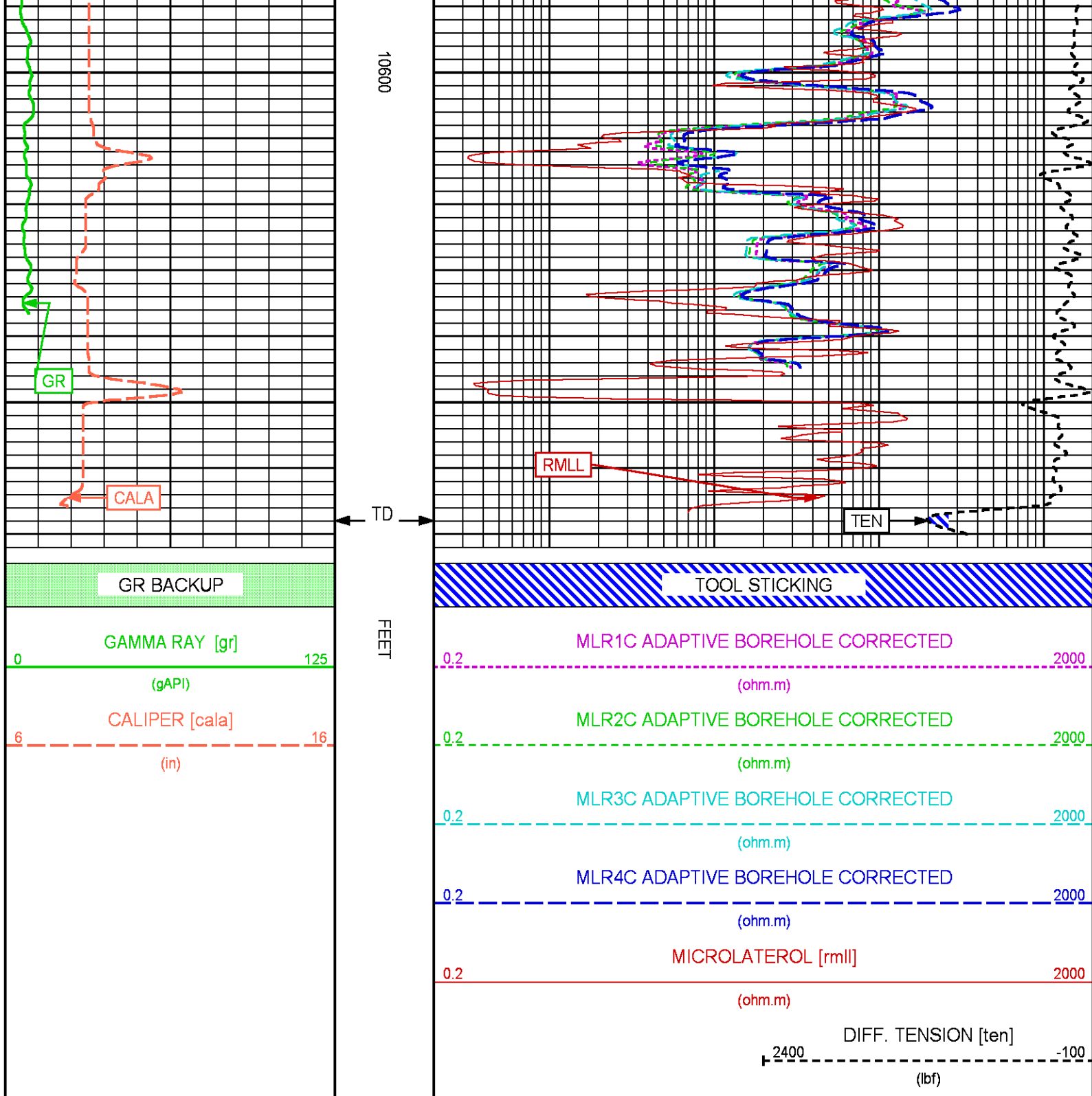
Presentation : SysA:/dat1a/md11798r4/RTEX\_TX\_5.fvpdf [5"/100" Scale]  
Plot Interval : 10300 - 10671.5 Feet

Data File 1 : F1 : SysA:/dat1a/md11798r4/R4RES\_MAIN.xtf  
Created On : N/A  
Company : HOLLY FRONTIER - NAVAJO  
Well : NAVAJO REFINING WDW #4  
Field : ARTESIA  
File Interval : 9790.75 - 10671.5 Feet  
OCT : p87cc









REPEAT LOG 5"/100FT SCALE

# PARAMETER AND FILTER SUMMARY REPORT

File: /dat1a/md11798r4/p87cc01.prm  
 LOGGING MODE: DEPTH  
 TOP DEPTH: 10304.500 ft DIRECTION: UP  
 BOTTOM DEPTH: 10672.500 ft

## SYMMETRIC FILTER

| MEASUREMENT TYPE   | PARAMETER   | VALUE      | UNITS | INTERVAL (ft) |        |
|--------------------|-------------|------------|-------|---------------|--------|
| TTRM               | FILTER (i)  | medium (1) |       | TOP           | BOTTOM |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| TENSION            | FILTER (i)  | medium (1) |       | "             | "      |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| GR                 | FILTER (i)  | medium (1) |       | "             | "      |
|                    | FILTER (.h) | medium (1) |       | "             | "      |
|                    | FILTER (.i) | medium (1) |       | "             | "      |
| RTeX               | FILTER (i)  | light (2a) |       | "             | "      |
|                    | FILTER (.h) | light (2a) |       | "             | "      |
|                    | FILTER (.i) | light (2a) |       | "             | "      |
| CALA (3rd CALIPER) | FILTER (i)  | medium(1)  |       | "             | "      |
|                    | FILTER (.i) | medium(1)  |       | "             | "      |
|                    | FILTER (.j) | medium(1)  |       | "             | "      |
| MLL                | FILTER (i)  | light (2a) |       | "             | "      |
|                    | FILTER (.i) | light (2a) |       | "             | "      |
|                    | FILTER (.j) | light (2a) |       | "             | "      |

## BOREHOLE & CEMENT

| MEASUREMENT TYPE              | PARAMETER                   | VALUE         | UNITS        | INTERVAL (ft) |        |
|-------------------------------|-----------------------------|---------------|--------------|---------------|--------|
| BIT SIZE                      | BIT SIZE                    | 8.500         | in           | TOP           | BOTTOM |
| MUD SAMPLE RESISTIVITY        | MUD SAMPLE TEMP             | 77.0          | degF         | "             | "      |
|                               | MUD SAMPLE RES              | 0.117         | ohm.m        | "             | "      |
| BOREHOLE TEMP from GRADIENT   | Known BH REF TEMP           | 161.0         | degF         | "             | "      |
|                               | at BH REF DEPTH             | 10250.0       | ft           | "             | "      |
|                               | with TEMP GRADIENT          | 0.700         | 0.01 degF/ft | "             | "      |
| BOREHOLE CORR DIAMETER SOURCE | CALIPER/FIXED DIA. (calmu*) | USE CALIPER   |              | "             | "      |
| BOREHOLE CORR DIAMETER        | FIXED DIAMETER (mlr1c*)     | 8.500         | in           | "             | "      |
| BH MUD RESISTIVITY SOURCE     | RMUD SOURCE                 | TOOL MEASURED |              | "             | "      |

## RTeX PROCESSING

| MEASUREMENT TYPE                  | PARAMETER                         | VALUE                | UNITS | INTERVAL (ft) |             |
|-----------------------------------|-----------------------------------|----------------------|-------|---------------|-------------|
| RTeX ADAPTIVE BOREHOLE CORRECTION | BOREHOLE CORRECTION<br>Rxo Source | ON<br>MICROLATEROLOG |       | TOP<br>"      | BOTTOM<br>" |

## CURVE DESCRIPTION REPORT

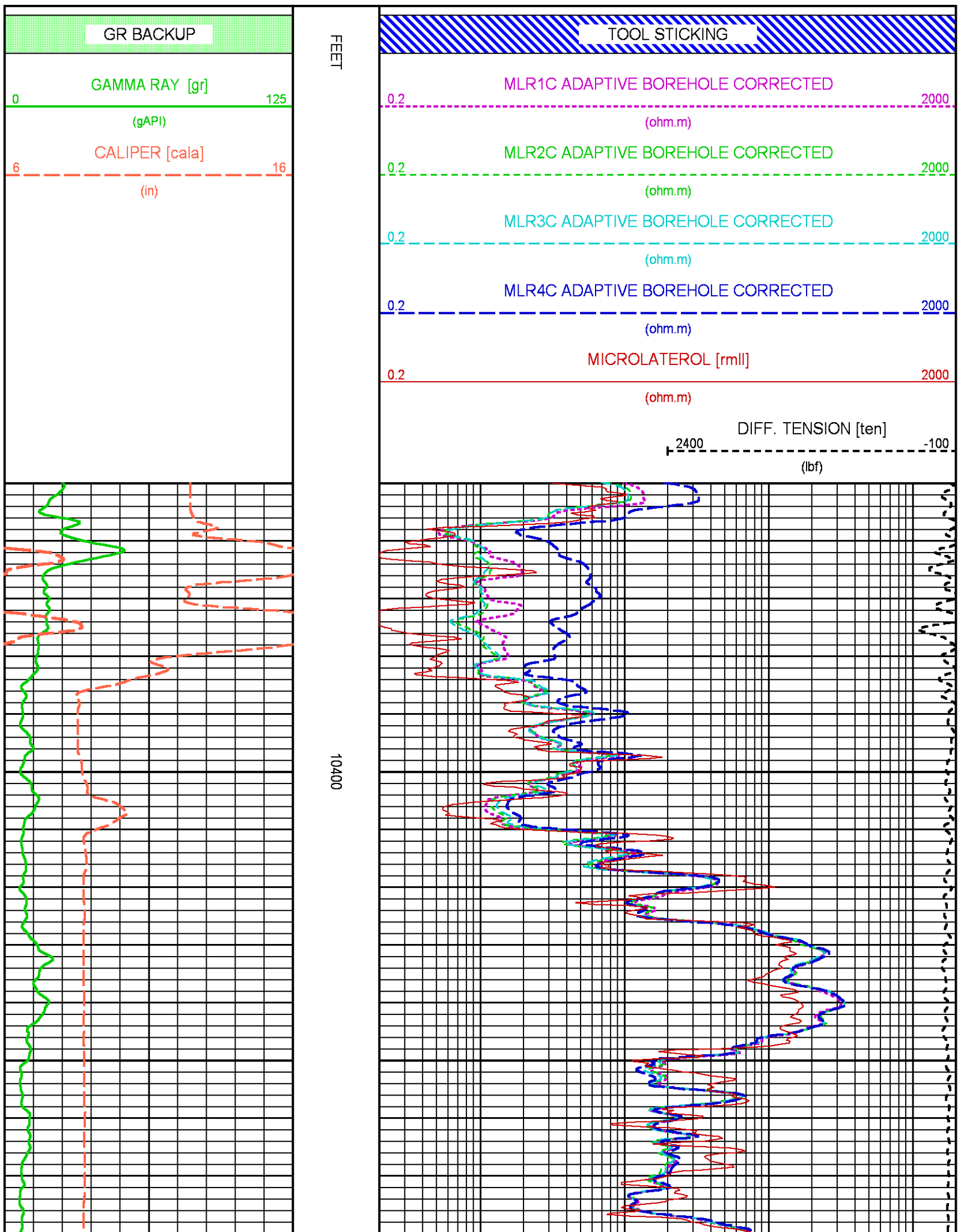
| CURVE NAME | CREATION DATE | CURVE DESCRIPTION                                        |
|------------|---------------|----------------------------------------------------------|
| F1:CALA    | N/A           | CALIPER FROM 3104 OR 1233 WITH OTHER CALIPERS IN STRING  |
| F1:GR      | N/A           | GAMMA RAY                                                |
| F1:MLR1C   | N/A           | RTEX SHALLOW RESISTIVITY 1, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR2C   | N/A           | RTEX SHALLOW RESISTIVITY 2, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR3C   | N/A           | RTEX MEDIUM RESISTIVITY 3, ADAPTIVE BOREHOLE CORRECTION  |
| F1:MLR4C   | N/A           | RTEX DEEP RESISTIVITY 4, ADAPTIVE BOREHOLE CORRECTION    |
| F1:RMLL    | N/A           | RESISTIVITY                                              |
| F1:TEN     | N/A           | DIFFERENTIAL TENSION                                     |

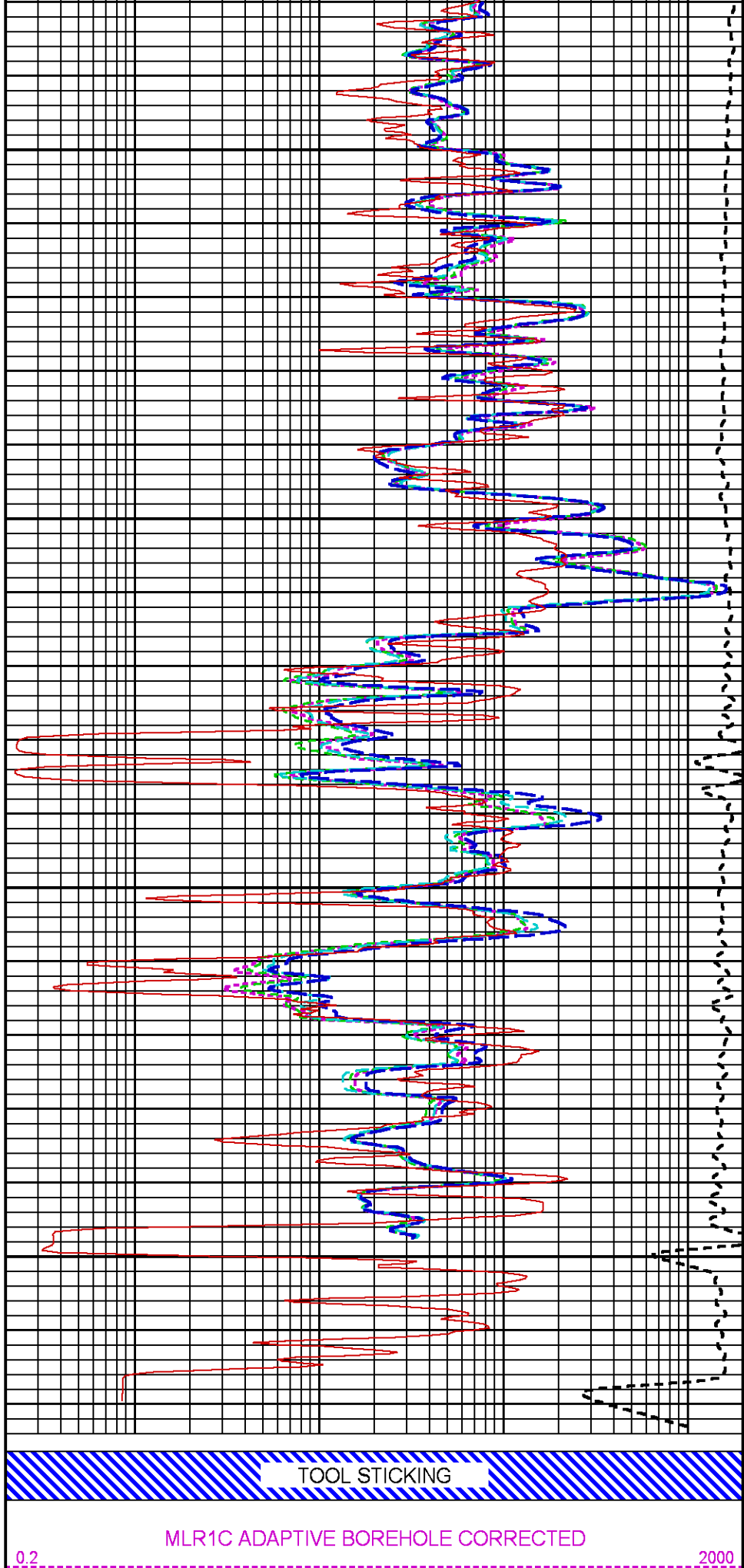
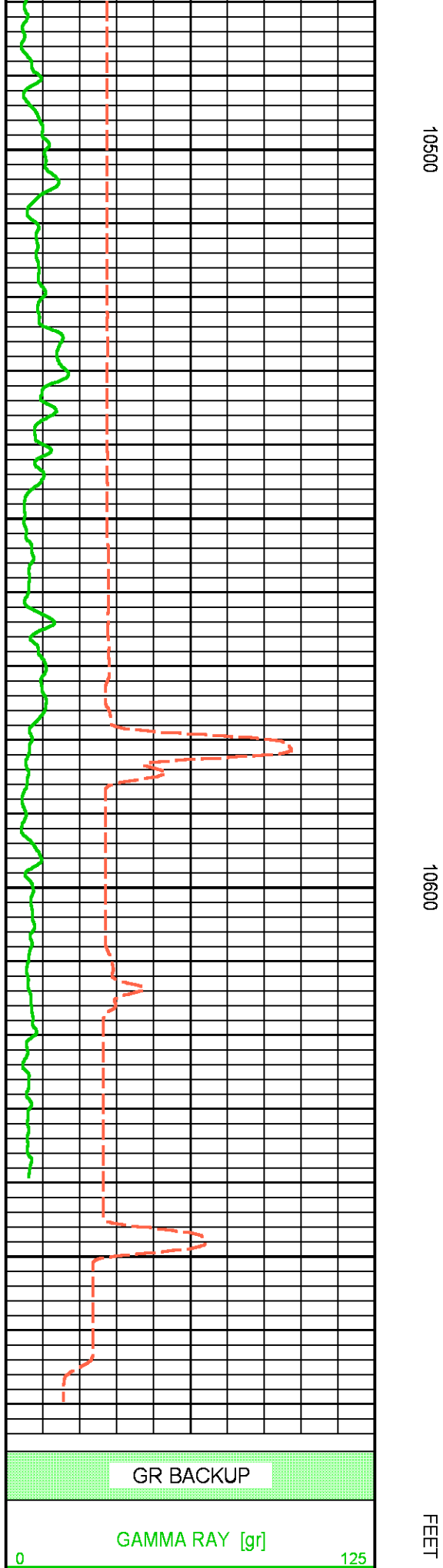
## CURVE MEASURE POINT OFFSET

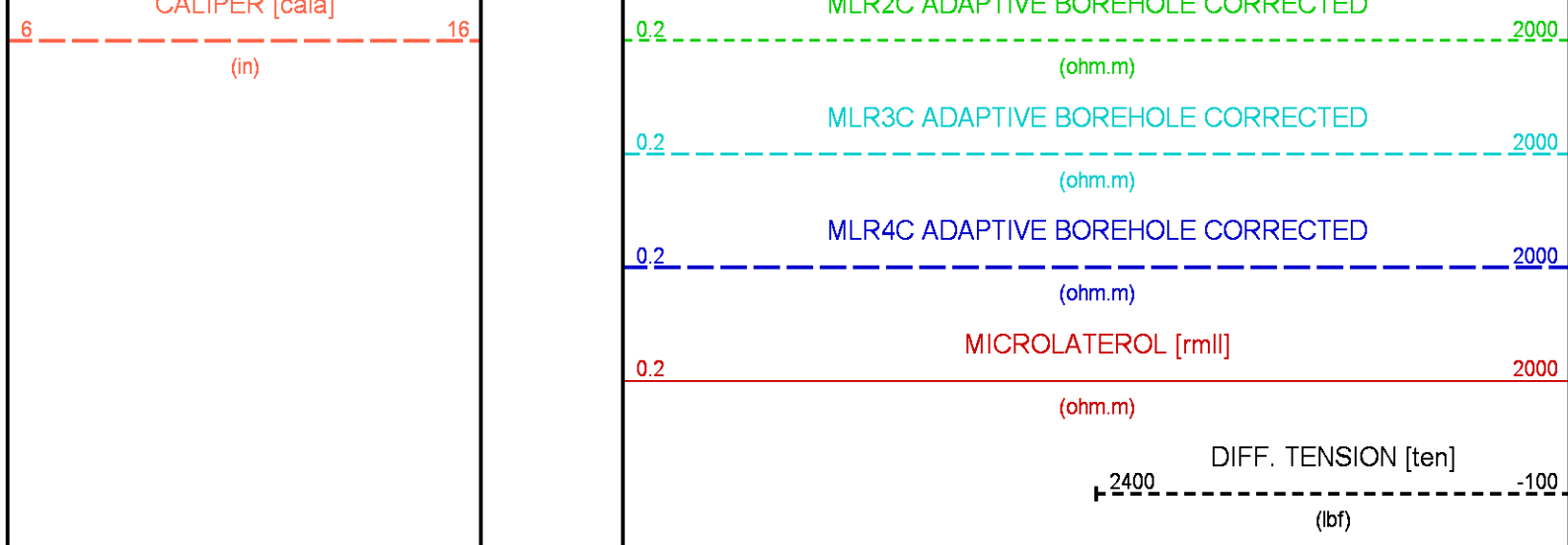
| CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) |
|-------|-------------|-------|-------------|-------|-------------|-------|-------------|
| CALA  | -3.50       | MLR1C | -20.50      | MLR3C | -20.50      | RMLL  | -3.50       |
| GR    | -33.00      | MLR2C | -20.50      | MLR4C | -20.50      | TEN   | 0.00        |

Presentation : SysA:RTEX\_TX\_5REPEAT.fvpdf [5"/100' Scale]  
 Plot Interval : 10350 - 10674.2 Feet

Data File 1 : F1 : SysA:/dat1a/md11798r4/R4RES\_REP.xtf  
 Created On : N/A  
 Company : HOLLY FRONTIER - NAVAJO  
 Well : NAVAJO REFINING WDW #4  
 Field : ARTESIA  
 File Interval : 10257.5 - 10674.2 Feet







## CALIBRATION / VERIFICATION SUMMARY

Source File: /dat1a/md11798r4/p87cc\_RTX.tp1

### GR PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 10330272

DATE/TIME PERFORMED: Mon Jul 23 13:02:58 2018

UNIT #: 5753XD 10215900

CALB JIG #: 4702NK VD-486

|    | BACKGROUND<br>(cts/s) | CALBRTR ON<br>(cts/s) | CR DIFF<br>(cts/s)   | MULT  | BACKGROUND<br>(gAPI) | CALBRTR ON<br>(gAPI) | CALBRTR<br>(gAPI) |
|----|-----------------------|-----------------------|----------------------|-------|----------------------|----------------------|-------------------|
| GR | 148.38                | 1065.71               | 917.3<br>830.0 960.0 | 0.164 | 24.26                | 174.26               | 150               |

### GR PRIMARY VERIFICATION SUMMARY

TOOL #: 1329XA 10330272

DATE/TIME PERFORMED: Mon Jul 23 13:06:34 2018

UNIT #: 5753XD 10215900

VERI JIG #: 4702NK VD-486

|    | BACKGROUND<br>(cts/s) | CALBRTR ON<br>(cts/s) | MULT  | BACKGROUND<br>(gAPI) | CALBRTR ON<br>(gAPI) | DIFF.<br>(gAPI)         |
|----|-----------------------|-----------------------|-------|----------------------|----------------------|-------------------------|
| GR | 145.49                | 1068.44               | 0.164 | 23.79                | 174.71               | 150.92<br>140.00 160.00 |

### RTX\_RES PRIMARY CALIBRATION SUMMARY

TOOL #: 1329XA 12589240

DATE/TIME PERFORMED: Fri Aug 3 13:18:05 2018

TOOL #.: 1243AA 12599240

DATE/TIME TRANSFORMED

11 Aug 5 15.16.05 2016

UNIT #: 5753XD 10215900

| CAL FACTORS | F1                     | F2                     | F3                     | F4                     |
|-------------|------------------------|------------------------|------------------------|------------------------|
| MIOL Real   | 1.00<br>0.97 1.03      | 1.00<br>0.97 1.03      | 1.00<br>0.97 1.03      | 1.00<br>0.97 1.03      |
| MIOL Quad   | -0.01<br>-0.05 0.05    | -0.01<br>-0.05 0.05    | -0.01<br>-0.05 0.05    | -0.01<br>-0.05 0.05    |
| MIOM Real   | 20.1<br>19.5 20.7      | 20.1<br>19.5 20.7      | 20.1<br>19.5 20.7      | 20.1<br>19.5 20.7      |
| MIOM Quad   | -0.123<br>-1.050 1.050 | -0.234<br>-1.050 1.050 | -0.197<br>-1.050 1.050 | -0.160<br>-1.050 1.050 |
| MIOH Real   | 405<br>392 416         | 405<br>392 416         | 405<br>392 416         | 405<br>392 416         |
| MIOH Quad   | 0.59<br>-21.10 21.10   | -6.51<br>-21.10 21.10  | -4.44<br>-21.10 21.10  | -2.15<br>-21.10 21.10  |
| MVML Real   | 1.000<br>0.999 1.001   | 1.000<br>0.999 1.001   | 1.000<br>0.999 1.001   | 1.000<br>0.999 1.001   |
| MVML Quad   | 0.000<br>-0.001 0.001  | 0.000<br>-0.001 0.001  | 0.000<br>-0.001 0.001  | 0.000<br>-0.001 0.001  |
| MVMH Real   | 10.09<br>9.79 10.39    | 10.09<br>9.79 10.39    | 10.09<br>9.79 10.39    | 10.09<br>9.79 10.39    |
| MVMH Quad   | -0.006<br>-0.528 0.528 | -0.010<br>-0.528 0.528 | -0.009<br>-0.528 0.528 | -0.008<br>-0.528 0.528 |

## CAL PRIMARY CALIBRATION SUMMARY

TOOL #: 1243XA 12006861

DATE/TIME PERFORMED: Thu Aug 2 12:11:35 2018

UNIT #: 5753XD 10215900

|            | SIZE<br>(in) | VALUE<br>(mV) | MULTIPLIER | ADD      |
|------------|--------------|---------------|------------|----------|
| SMALL RING | 8.000        | 637           |            |          |
| LARGE RING | 12.000       | 894           | 0.01552    | -1.87792 |

## MLL PRIMARY CALIBRATION SUMMARY

TOOL #: 1243XA 12006861

DATE/TIME PERFORMED: Fri Aug 3 13:17:51 2018

UNIT #: 5753XD 10215900

|             | Raw Low |        | Raw High |          | Mult  | Add    | K-factor | Eng Low |      | Eng High |        |
|-------------|---------|--------|----------|----------|-------|--------|----------|---------|------|----------|--------|
|             | ohm     |        | ohm      |          |       |        |          | (ohm.m) |      | (ohm.m)  |        |
| RESISTIVITY | 101.98  |        | 101702.2 |          | 0.983 | -0.281 | 0.01429  | 1.43    |      | 1428.6   |        |
|             | 95.00   | 105.00 | 95000.0  | 105000.0 |       |        |          | 1.36    | 1.50 | 1360.0   | 1500.0 |



COMPANY  
WELL  
FIELD  
COUNTY

HOLLY FRONTIER - NAVAJO  
NAVAJO REFINING WDW #4  
ARTESIA  
EDDY STATE NEW MEXICO

FILE NO:  
MD11798  
API NO:  
30-015-44677

LOCATION:

1217' FSL & 2443' FWL  
SECTION 23, T17S, R27E  
N.M.P.M. SURVEY

ELEVATIONS:

KB 3585.8 FT  
DF 3584.8 FT  
GL 3565.8 FT

FINAL PRINT

DATE 29-JUN-2018

## MAIN LOG 1"/100FT SCALE

ECLIPS 7.0i ECLIPS General Release Rel 7.0i Thu Jun 08 20:36:10 CDT 2017  
Patches: 3

Plotted: Fri Aug 3 15:22:18 2018

### PARAMETER AND FILTER SUMMARY REPORT

File: fdat1a/md11798/r4/res02.prm  
LOGGING MODE: DEPTH DIRECTION: UP  
TOP DEPTH: 9937.250 ft BOTTOM DEPTH: 10669.250 ft

#### SYMMETRIC FILTER

| MEASUREMENT TYPE   | PARAMETER  | VALUE      | UNITS | INTERVAL (ft) |        |
|--------------------|------------|------------|-------|---------------|--------|
| TTRM               | FILTER Q   | medium (1) |       | TOP           | BOTTOM |
|                    | FILTER (h) | medium (1) |       | "             | "      |
|                    | FILTER (j) | medium (1) |       | "             | "      |
| TENSION            | FILTER Q   | medium (1) |       | "             | "      |
|                    | FILTER (h) | medium (1) |       | "             | "      |
|                    | FILTER (j) | medium (1) |       | "             | "      |
| RTxX               | FILTER Q   | light (2a) |       | "             | "      |
|                    | FILTER (h) | light (2a) |       | "             | "      |
|                    | FILTER (j) | light (2a) |       | "             | "      |
| CALA (3rd CALIPER) | FILTER Q   | medium(1)  |       | "             | "      |
|                    | FILTER (j) | medium(1)  |       | "             | "      |
|                    | FILTER (j) | medium(1)  |       | "             | "      |
| MLL                | FILTER Q   | light (2a) |       | "             | "      |
|                    | FILTER (j) | light (2a) |       | "             | "      |
|                    | FILTER (j) | light (2a) |       | "             | "      |

#### BOREHOLE & CEMENT

| MEASUREMENT TYPE              | PARAMETER                   | VALUE         | UNITS        | INTERVAL (ft) |        |
|-------------------------------|-----------------------------|---------------|--------------|---------------|--------|
| BIT SIZE                      | BIT SIZE                    | 8.500         | in           | TOP           | BOTTOM |
| MUD SAMPLE RESISTIVITY        | MUD SAMPLE TEMP             | 77.0          | degF         | "             | "      |
|                               | MUD SAMPLE RES              | 0.117         | ohm.m        | "             | "      |
| BOREHOLE TEMP from GRADIENT   | Known BH REF TEMP           | 161.0         | degF         | "             | "      |
|                               | at BH REF DEPTH             | 10250.0       | ft           | "             | "      |
|                               | with TEMP GRADIENT          | 0.700         | 0.01 degF/ft | "             | "      |
| BOREHOLE CORR DIAMETER SOURCE | CALIPER/FIXED DIA. (calmu") | USE CALIPER   |              | "             | "      |
| BOREHOLE CORR DIAMETER        | FIXED DIAMETER (mlr1 e")    | 8.500         | in           | "             | "      |
| BH MUD RESISTIVITY SOURCE     | RMUD SOURCE                 | TOOL MEASURED |              | "             | "      |

#### RTxX PROCESSING

| MEASUREMENT TYPE                  | PARAMETER           | VALUE          | UNITS | INTERVAL (ft) |        |
|-----------------------------------|---------------------|----------------|-------|---------------|--------|
| RTxX ADAPTIVE BOREHOLE CORRECTION | BOREHOLE CORRECTION | ON             |       | TOP           | BOTTOM |
|                                   | Rho Source          | MICROLATEROLOG |       | "             | "      |

### CURVE DESCRIPTION REPORT

| CURVE NAME | CREATION DATE | CURVE DESCRIPTION                                       |
|------------|---------------|---------------------------------------------------------|
| F1:CALA    | N/A           | CALIPER FROM 3104 OR 1233 WITH OTHER CALIPERS IN STRING |
| F1:GR      | N/A           | GAMMA RAY                                               |
| F1:MLR1C   | N/A           | RTX SHALLOW RESISTIVITY 1, ADAPTIVE BOREHOLE CORRECTION |
| F1:MLR2C   | N/A           | RTX MEDIUM RESISTIVITY 2, ADAPTIVE BOREHOLE CORRECTION  |
| F1:MLR3C   | N/A           | RTX DEEP RESISTIVITY 3, ADAPTIVE BOREHOLE CORRECTION    |
| F1:MLR4C   | N/A           | RTX DEEP RESISTIVITY 4, ADAPTIVE BOREHOLE CORRECTION    |
| F1:RMLL    | N/A           | RESISTIVITY                                             |
| F1:TEN     | N/A           | DIFFERENTIAL TENSION                                    |

### CURVE MEASURE POINT OFFSET

| CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) | CURVE | OFFSET (ft) |
|-------|-------------|-------|-------------|-------|-------------|-------|-------------|
| CALA  | -3.50       | MLR1C | -20.50      | MLR3C | -20.50      | RMLL  | -3.50       |
| GR    | -33.00      | MLR2C | -20.50      | MLR4C | -20.50      | TEN   | 0.00        |

Presentation : SysA:RTEX TX 1.rpt [2"/100' Scale]  
Plot Interval : 10300 - 10671.5 Feet  
Data File 1 : F1 : SysA:/data/md11798/r4/R4RES\_MAIN.xtf  
Created On : N/A  
Company : HOLLY FRONTIER - NAVAJO  
Well : NAVAJO REFINING WDW #4  
Field : ARTESIA  
File Interval : 9790.75 - 10671.5 Feet  
OCT : p87cc



