



# DUAL COMP POROSITY LOG

Pioneer Energy Services

Company **GREAT PLAINS ENERGY, INC.**

Well **LANG NO.1**

Field **WILDCAT**

County **NORTON** State **KANSAS**

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 Field **WILDCAT**  
 County **NORTON**  
 State **KANSAS**

Location: **API #: 15-137-20749-00-00**  
**1650' FSL & 1400' FWL**  
**SEC 32 TWP 2S RGE 23W**  
 Permanent Datum **GROUND LEVEL Elevation 2339'**  
 Log Measured From **KELLY BUSHING**  
 Drilling Measured From **KELLY BUSHING**  
 Other Services **DIL MEL**  
 Elevation **K.B. 2346'**  
**D.F. N/A**  
**G.L. 2339'**

|                        |                  |      |               |        |      |      |      |
|------------------------|------------------|------|---------------|--------|------|------|------|
| Date                   | 7/26/2018        |      |               |        |      |      |      |
| Run Number             | ONE              |      |               |        |      |      |      |
| Type Log               | CNL/CDL          |      |               |        |      |      |      |
| Depth Driller          | 3645'            |      |               |        |      |      |      |
| Depth Logger           | 3639'            |      |               |        |      |      |      |
| Bottom Logged Interval | 3628'            |      |               |        |      |      |      |
| Top Logged Interval    | 3000'            |      |               |        |      |      |      |
| Type Fluid In Hole     | CHEMICAL         |      |               |        |      |      |      |
| Salinity, PPM CL       | 1400             |      |               |        |      |      |      |
| Density                | 9.1              |      |               |        |      |      |      |
| Level                  | FULL             |      |               |        |      |      |      |
| Max. Rec. Temp. F      | 112 DEG/F        |      |               |        |      |      |      |
| Operating Rig Time     | 3 HOURS          |      |               |        |      |      |      |
| Equipment -- Location  | 108 HAYS         |      |               |        |      |      |      |
| Recorded By            | J. HENRICKSON    |      |               |        |      |      |      |
| Witnessed By           | CLAYTON ERICKSON |      |               |        |      |      |      |
| Borehole Record        |                  |      | Casing Record |        |      |      |      |
| Run No.                | Bit              | From | To            | Size   | Wgt. | From | To   |
| ONE                    | 12.25"           | 0    | 221'          | 8.625" | 23#  | 0    | 221' |
| TWO                    | 7.875"           | 221' | TD            |        |      |      |      |

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All interpretations are opinions based on inferences from electrical or other measurements and Pioneer Wireline Services, LLC cannot and does not guarantee the accuracy or correctness of any interpretation, and Pioneer Wireline Services, LLC will not 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.

Comments

N/A DENOTES NOT AVAILABLE OR NON-APPLICABLE.

NORTON KANSAS  
 3 WEST TO W3 ROAD, 1/4 NORTH, EAST INTO

Log Measured From: **KELLY BUSHING** 7 Ft. Above Permanent Datum

THANK YOU FOR USING PIONEER ENERGY SERVICES  
[www.pioneerenergy.com](http://www.pioneerenergy.com) 785-625-3858

Your Pioneer Energy Services Crew

Engineer: **J. HENRICKSON**  
 Operator:  
 Operator:  
 Operator:

This Log Record Was Witnessed By

Primary Witness: **CLAYTON ERICKSON**  
 Secondary Witness:  
 Secondary Witness:  
 Secondary Witness:

# Log Variables






DatabaseC:\ProgramData\Warrior\Data\great\_plains\_lang\_1.db  
Dataset field/well/stackml/pass3.1/\_vars\_

## Top - 3556.00 ft

|           |              |                  |                   |                |                  |       |                  |
|-----------|--------------|------------------|-------------------|----------------|------------------|-------|------------------|
| A         | BOREID<br>in | BOTTEMP<br>degF  | CASEOD<br>in      | CASETHCK<br>in | FLUIDDEN<br>g/cc | M     | MATRXDEN<br>g/cc |
| 1         | 7.875        | 112              | 5.5               | 0              | 1                | 2     | 2.71             |
| NPORSEL   | PERFS        | SNDERR<br>mmho/m | SNDERRM<br>mmho/m | SPSHIFT<br>mV  | SRFTEMP<br>degF  | SZCOR | TDEPTH<br>ft     |
| Limestone | 0            | 0                | 0                 | -190           | 78               | Off   | 3639             |

## 3556.00 ft - Bottom

|           |              |                  |                   |                |                  |       |                  |
|-----------|--------------|------------------|-------------------|----------------|------------------|-------|------------------|
| A         | BOREID<br>in | BOTTEMP<br>degF  | CASEOD<br>in      | CASETHCK<br>in | FLUIDDEN<br>g/cc | M     | MATRXDEN<br>g/cc |
| 1         | 7.875        | 112              | 5.5               | 0              | 1                | 2     | 2.71             |
| NPORSEL   | PERFS        | SNDERR<br>mmho/m | SNDERRM<br>mmho/m | SPSHIFT<br>mV  | SRFTEMP<br>degF  | SZCOR | TDEPTH<br>ft     |
| Limestone | 0            | 0                | 0                 | -190           | 78               | Off   | 3639             |

| Sensor             | Offset (ft)             | Schematic   | Description  | Length (ft) | O.D. (in) | Weight (lb) |
|--------------------|-------------------------|---|--|-------------|-----------|-------------|
| GR                 | 40.58                   |    | GR-M&W (89-M&W)                                      | 3.00        | 3.50      | 50.00       |
| CNLSC<br>CNSSC     | 37.48<br>36.73          |   | CNT-M&W (tk10-MW)                                    | 5.50        | 3.50      | 100.00      |
| LSD<br>DCAL<br>SSD | 28.43<br>28.42<br>27.93 |  | CDL-M&W (168-130)                                    | 8.50        | 4.00      | 250.00      |
| MCAL<br>MI<br>MN   | 19.83<br>19.83<br>19.83 |  | ML-PSI STKBL ML (PSI-01)<br>Stackable Microlog Tools | 7.58        | 4.00      | 65.00       |
| RLL3<br>RLL3F      | 15.80<br>15.79          |  |  |             |           |             |

CILD 8.00

CILM 4.70

SP 0.20

DIL-M&W (1987)

18.50

3.50

220.00

Dataset: great\_plains\_lang\_1.db: field/well/stackml/pass3.1  
 Total length: 43.08 ft  
 Total weight: 685.00 lb  
 O.D.: 4.00 in

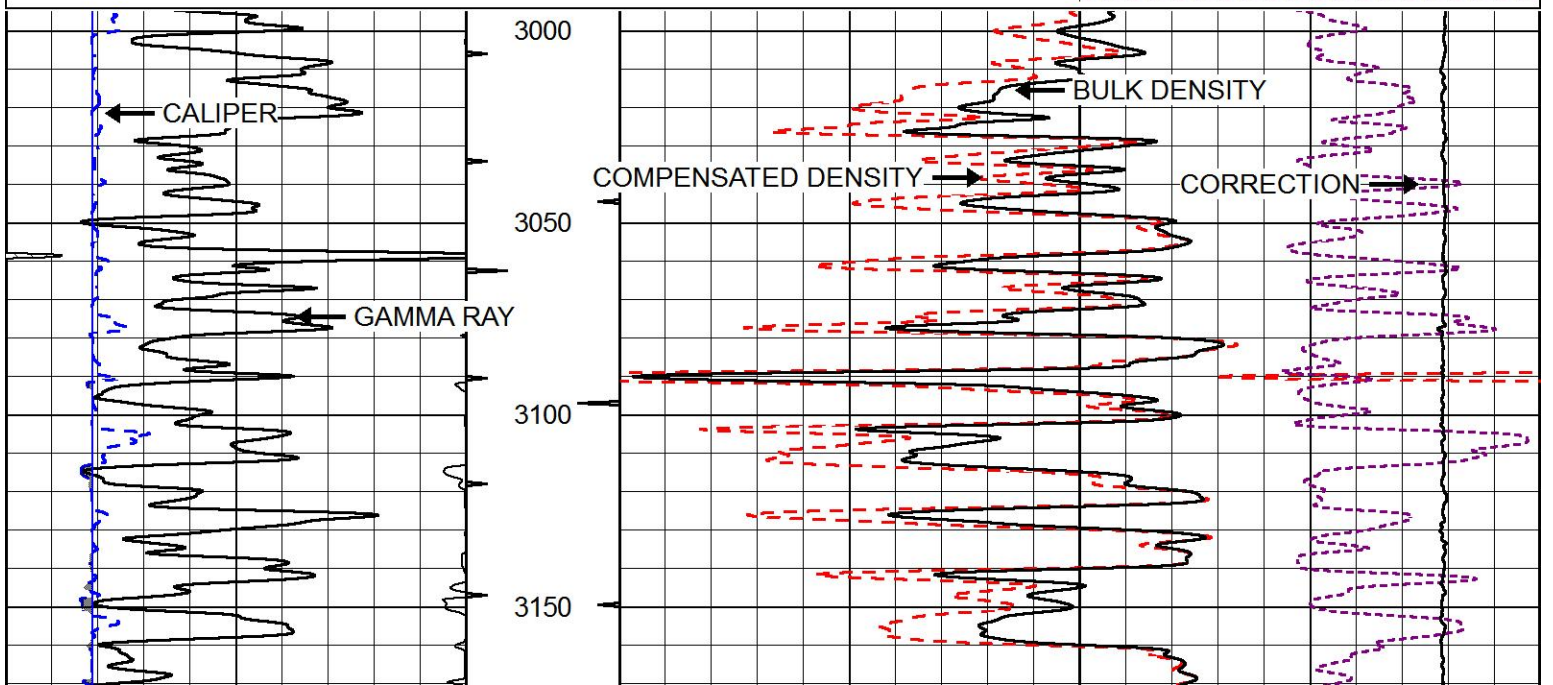


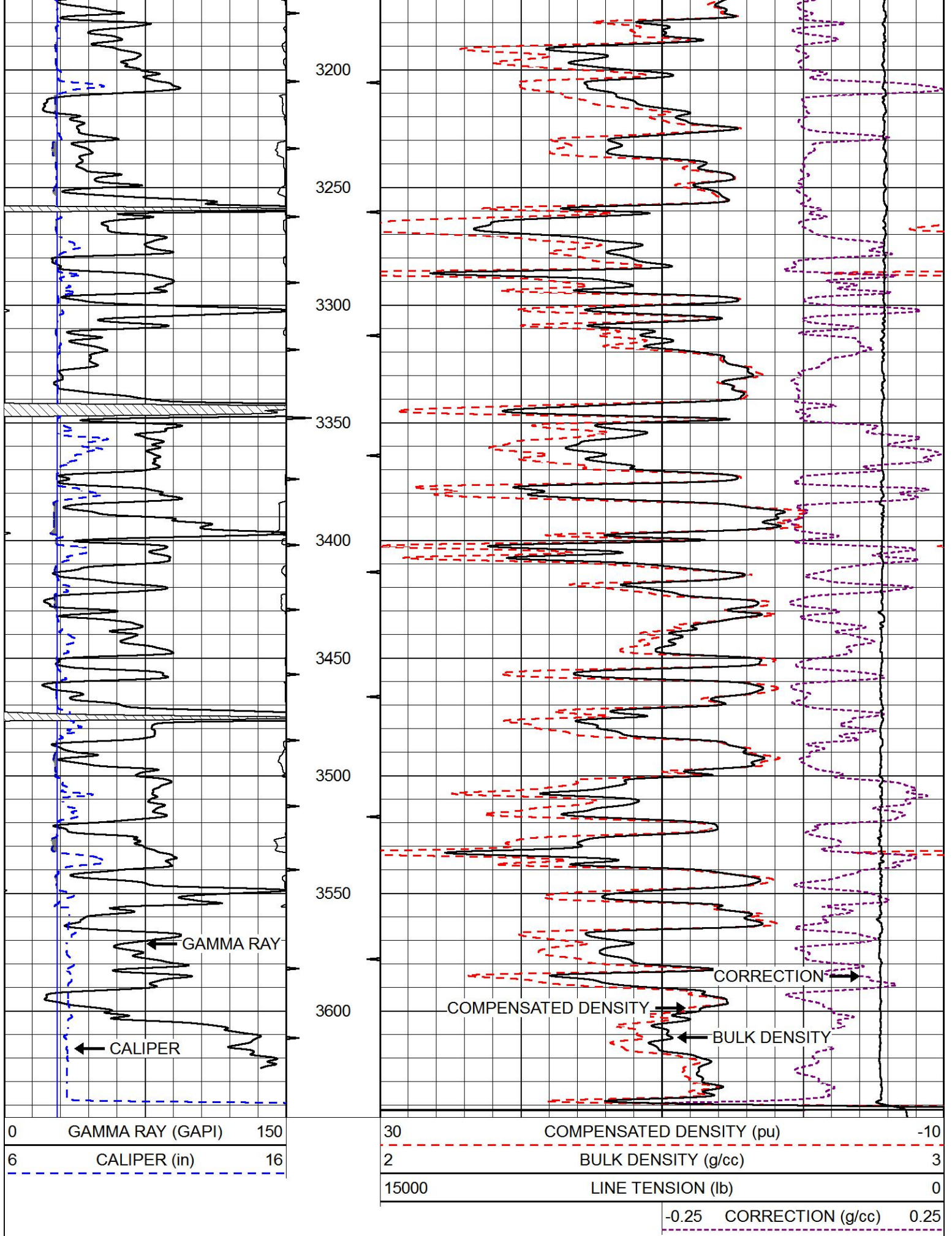
# MAIN PASS

Database File: great\_plains\_lang\_1.db  
 Dataset Pathname: stackml/pass3.1  
 Presentation Format: cdl  
 Dataset Creation: Thu Jul 26 14:12:50 2018  
 Charted by: Depth in Feet scaled 1:600

|   |                  |     |
|---|------------------|-----|
| 0 | GAMMA RAY (GAPI) | 150 |
| 6 | CALIPER (in)     | 16  |

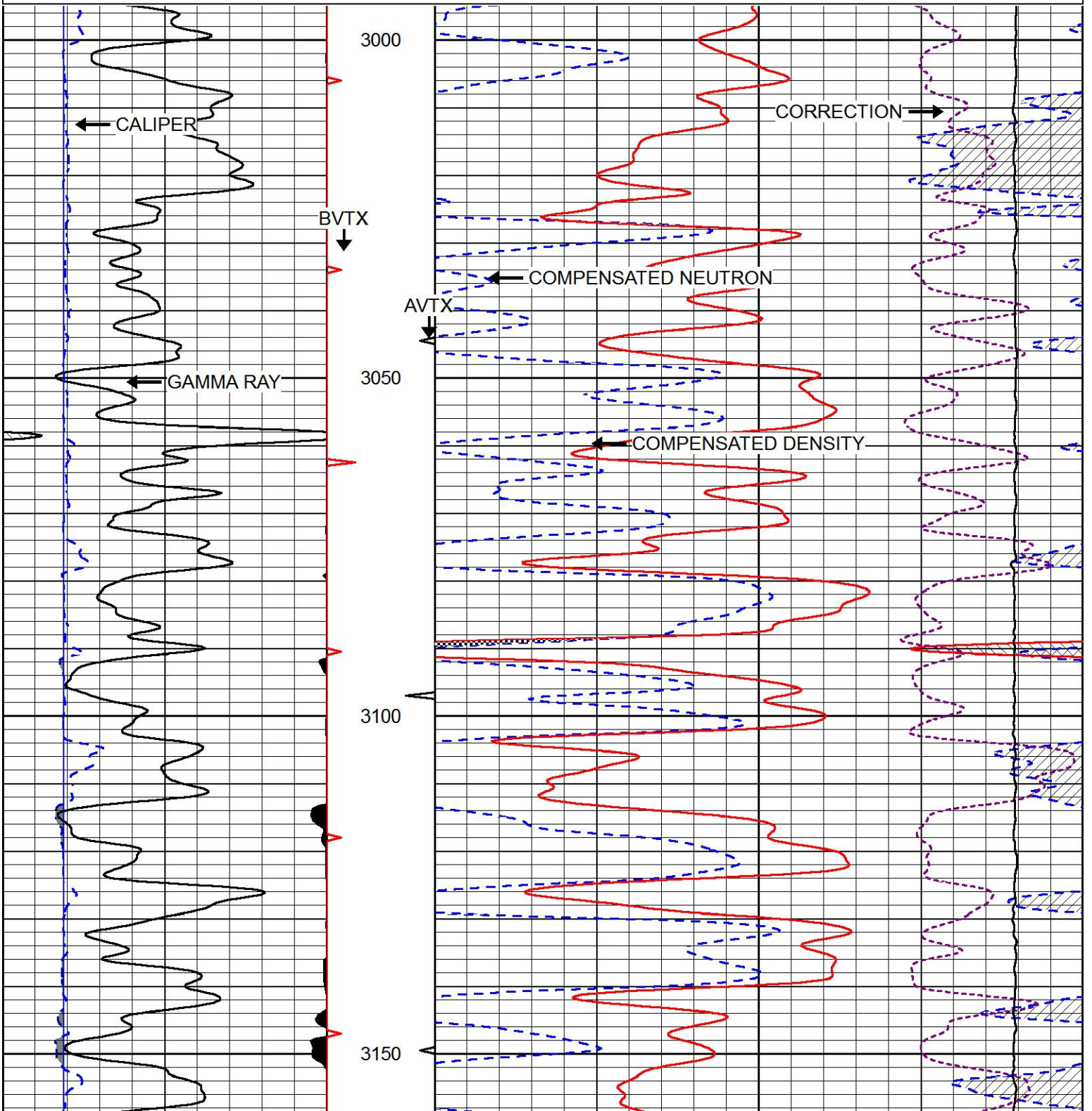
|       |                          |      |
|-------|--------------------------|------|
| 30    | COMPENSATED DENSITY (pu) | -10  |
| 2     | BULK DENSITY (g/cc)      | 3    |
| 15000 | LINE TENSION (lb)        | 0    |
| -0.25 | CORRECTION (g/cc)        | 0.25 |

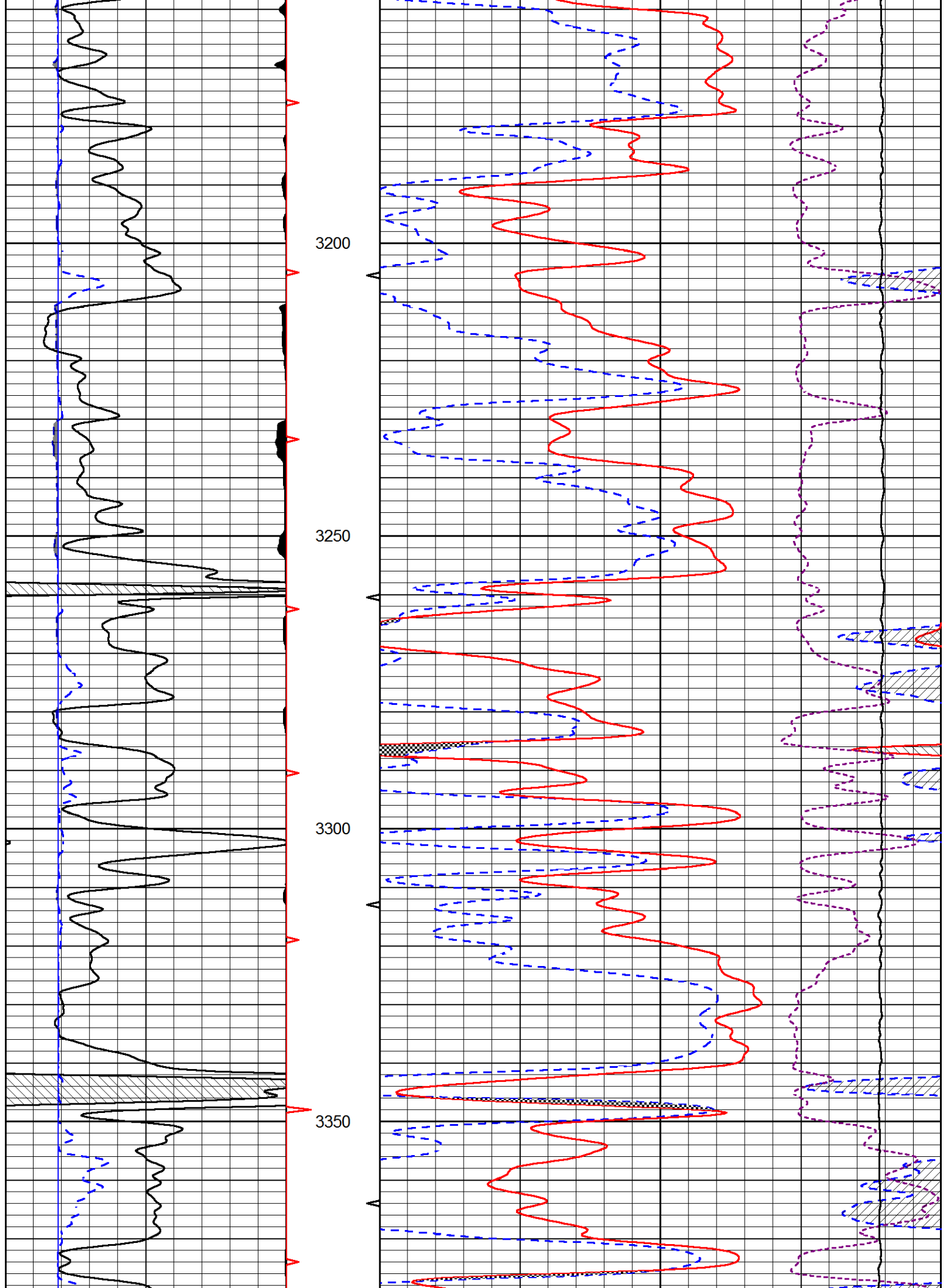


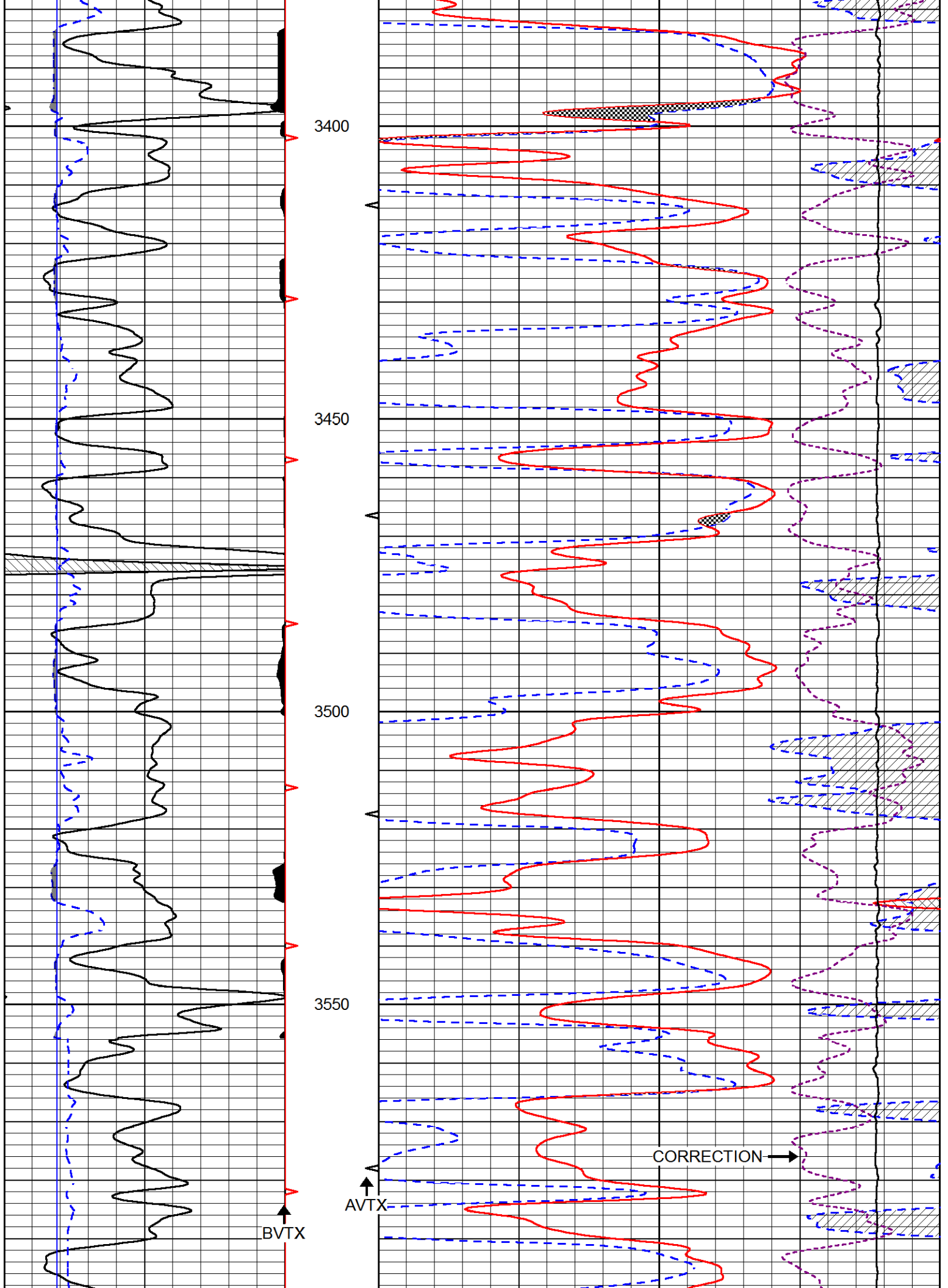


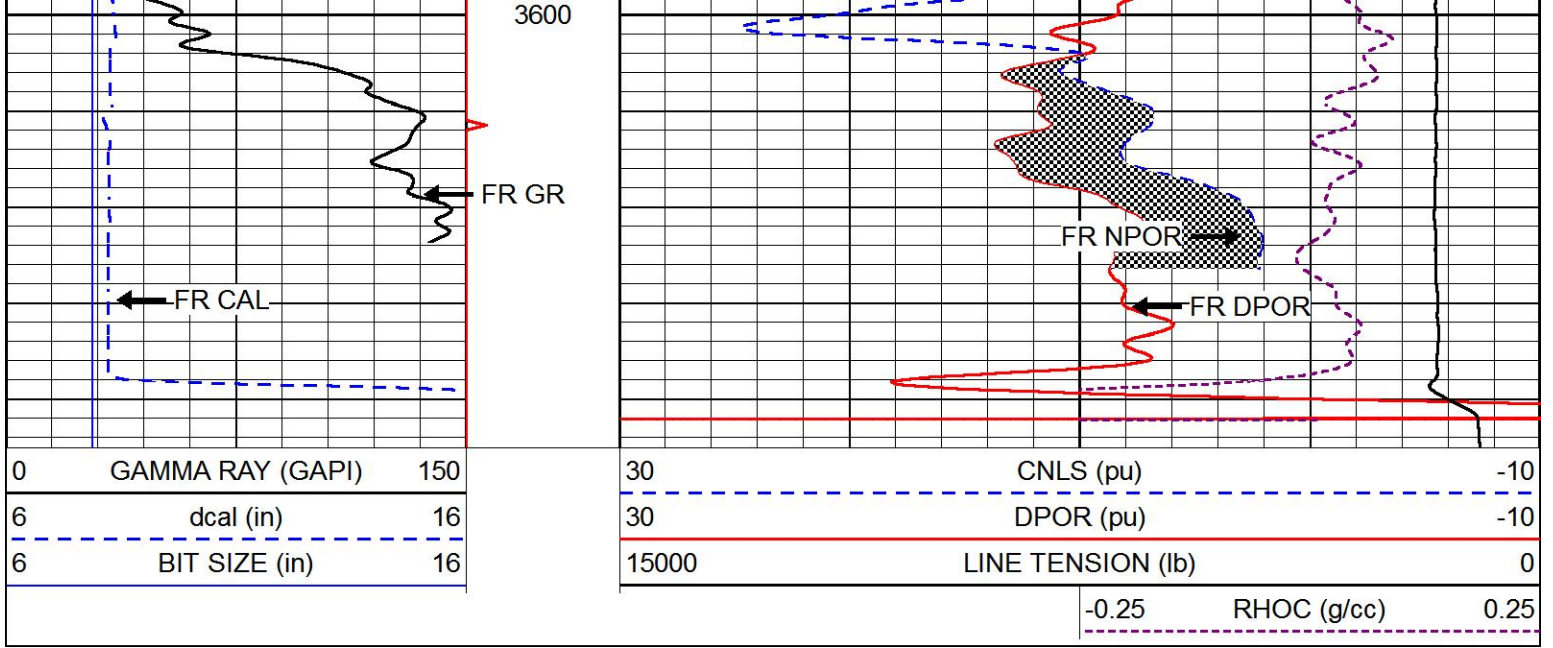
Database File: great\_plains\_lang\_1.db  
 Dataset Pathname: stackml/pass3.1  
 Presentation Format: cndlspec  
 Dataset Creation: Thu Jul 26 14:12:50 2018  
 Charted by: Depth in Feet scaled 1:240

|   |                  |     |       |                   |             |      |
|---|------------------|-----|-------|-------------------|-------------|------|
| 0 | GAMMA RAY (GAPI) | 150 | 30    | CNLS (pu)         | -10         |      |
| 6 | dcal (in)        | 16  | 30    | DPOR (pu)         | -10         |      |
| 6 | BIT SIZE (in)    | 16  | 15000 | LINE TENSION (lb) | 0           |      |
|   |                  |     |       | -0.25             | RHOC (g/cc) | 0.25 |



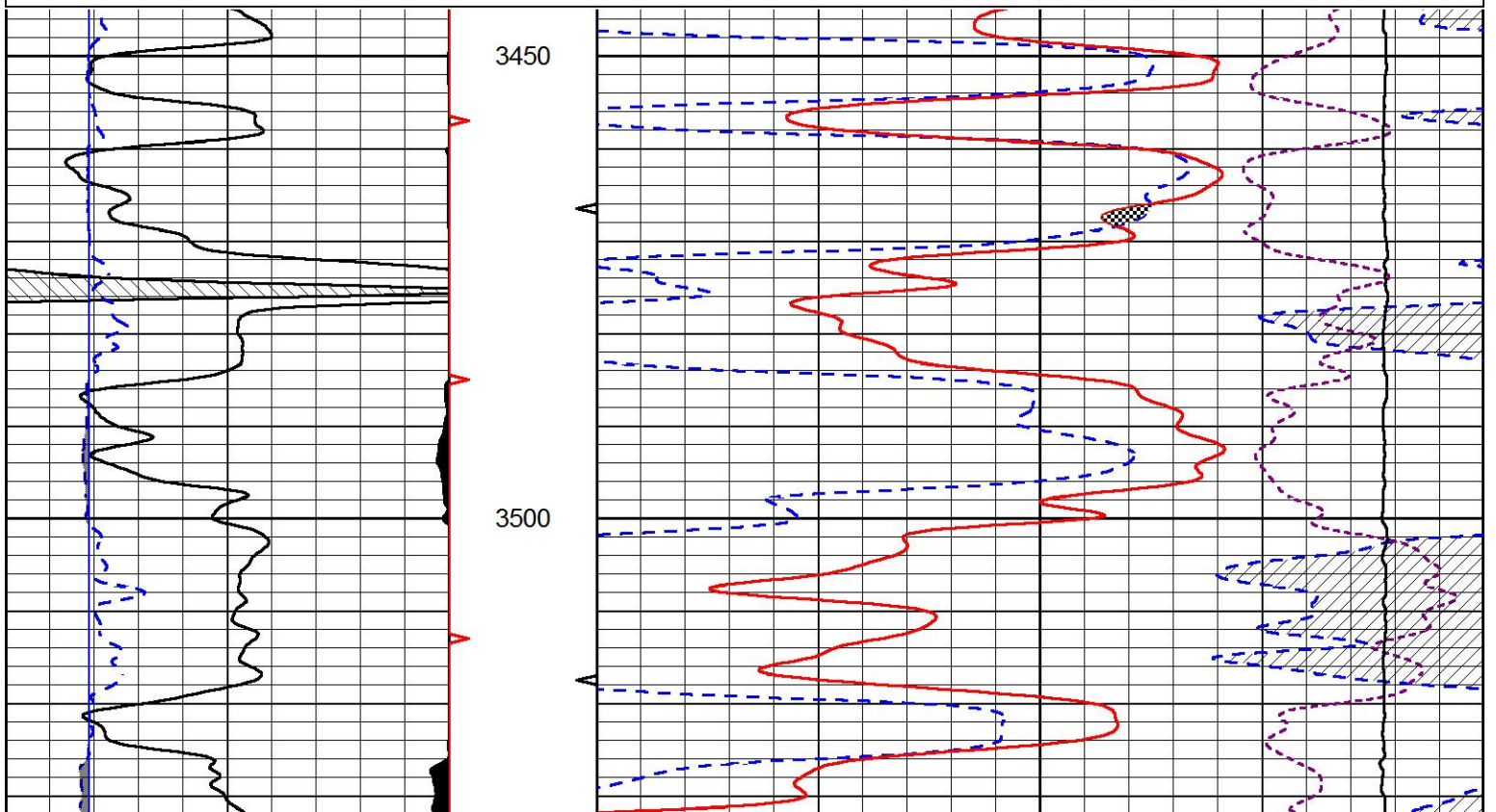
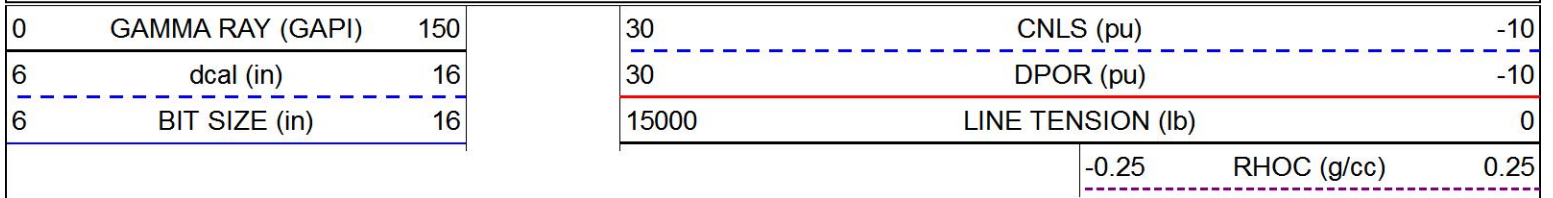


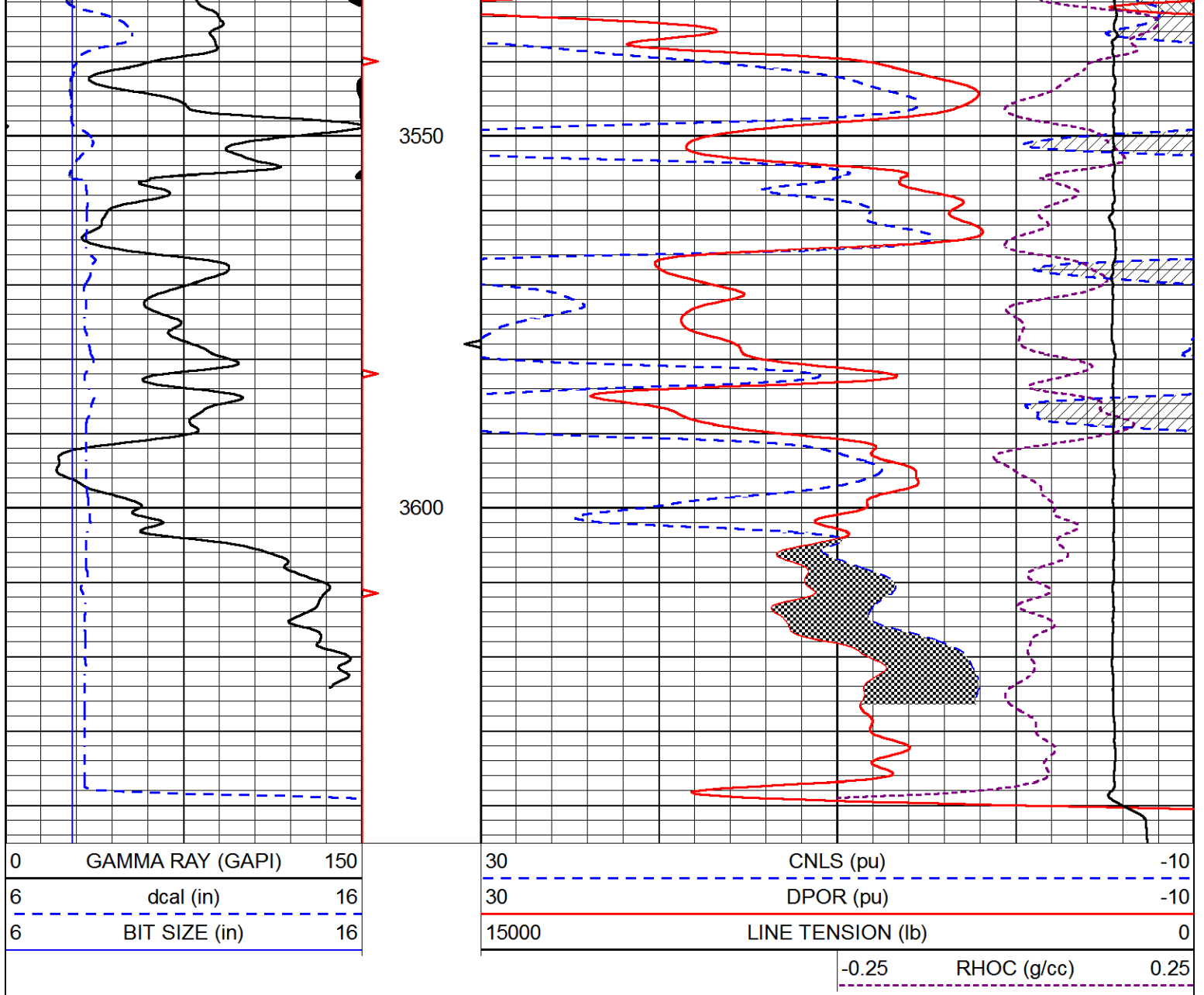




# REPEAT SECTION

Database File great\_plains\_lang\_1.db  
 Dataset Pathname stackml/pass2.1  
 Presentation Format cndlspec  
 Dataset Creation Thu Jul 26 14:49:42 2018  
 Charted by Depth in Feet scaled 1:240





### Calibration Report

Database File great\_plains\_lang\_1.db  
 Dataset Pathname stackml/pass3.1  
 Dataset Creation Thu Jul 26 14:12:50 2018

### Dual Induction Calibration Report

Serial-Model: 1987-M&W  
 Calibration Performed: Tue Apr 11 17:07:38 2017

| Loop:  | Readings |          | References |         |        | Results |          |
|--------|----------|----------|------------|---------|--------|---------|----------|
|        | Air      | Loop     | Air        | Loop    | mmho/m | Gain    | Offset   |
| Deep   | 178.615  | 710.235  | 0.000      | 255.800 | mmho/m | 0.530   | -36.500  |
| Medium | 161.982  | 1441.110 | 0.000      | 255.800 | mmho/m | 0.440   | -110.500 |

### Microlog Calibration Report

Serial-Model: PSI-01-PSI STKBL ML  
 Performed: Thu Mar 31 18:14:32 2016

Readings References Results

|         | Readings |        | References |         |       | Results    |          |
|---------|----------|--------|------------|---------|-------|------------|----------|
|         | Zero     | Cal    | Zero       | Cal     |       | m          | b        |
| Normal  | 0.0000   | 1.0000 | 0.0000     | 1.0000  | Ohm-m | 14500.0000 | 0.0000   |
| Inverse | 0.0000   | 1.0000 | 0.0000     | 1.0000  | Ohm-m | 16000.0000 | 0.0000   |
| Caliper | 1.0001   | 1.1397 | 6.5000     | 18.5000 | in    | 86.0000    | -82.7000 |

**Compensated Density Calibration Report**

Serial-Model: 168-130-M&W  
 Source / Verifier: /  
 Master Calibration Performed: Sun Nov 17 12:46:06 2013

**Master Calibration**

|                     | Density |      | Far Detector                | Near Detector |     |
|---------------------|---------|------|-----------------------------|---------------|-----|
| Magnesium           | 1.755   | g/cc | 4659.47                     | 5064.14       | cps |
| Aluminum            | 2.680   | g/cc | 853.93                      | 3180.74       | cps |
| Spine Angle = 74.67 |         |      | Density/Spine Ratio = 0.526 |               |     |
|                     | Size    |      | Reading                     |               |     |
| Small Ring          | 4.00    | in   | 0.91                        |               |     |
| Large Ring          | 14.00   | in   | 0.22                        |               |     |

**Compensated Neutron Calibration Report**

Serial Number: tk10-MW  
 Tool Model: M&W  
 Calibration Performed: Wed Nov 16 11:21:36 2016

| Detector    | Readings    | Target      | Normalization |
|-------------|-------------|-------------|---------------|
| Short Space | 6240.00 cps | 1000.00 cps | 1.6025        |
| Long Space  | 460.00 cps  | 1000.00 cps | 1.9500        |

**Gamma Ray Calibration Report**

Serial Number: 89-M&W  
 Tool Model: M&W  
 Calibration Performed: Tue Apr 11 17:08:01 2017

Calibrator Value: 1000.0 GAPI

Background Reading: 0.0 cps  
 Calibrator Reading: 6.2 cps

Sensitivity: 0.5200 GAPI/cps



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 County NORTON  
 State KANSAS