

# Bullwinkle J-Sand Log Responses and Synthetic Seismic Ties

v1.1

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## Overview

This compilation is a summary of log responses and synthetic seismograms in each of the wells in the Bullwinkle field which penetrate the J Sand package. All available log data is shown for each well with the exception of the SP. All wells contain at least a gamma ray and resistivity log. The track on the far right shows the NPHI and RHOB logs scaled in sandstone porosity units. The basic wireline response logs are all referenced in TVDSS (feet). This means that TVDSS is the linear scale.

Wells with enough logs for synthetic seismogram construction have been tied to the data from the Bull34 survey. All of the welltie logs are referenced in TWTIME (seconds). The first seismic trace to the left of the Bull34 extraction is a synthetic that Shell has computed. The following is a description of the methods used to build a seismic tie:

1. The DT log and checkshot data from the 109-1 survey are used to build an initial time-depth pair. The checkshot data tie perfectly at each of the checkshot survey points (shown in the far right track on all the seismic ties). The DT log is integrated in between each checkshot point to fill in the missing time-depth pairs.
2. The intial depth referenced wireline logs are transformed and resampled into TWTIME for use in building the synthetic. The sampling rate for this transformation is 3 ms.
3. The TWTIME referenced DT and RHOB logs are used to calculate an RFC at each sample point (shown in the RFC track for each seismic tie). The RFC log is then integrated and detrended.
4. The detrended RFC log is bandpass filtered using corner frequencies of 10 and 60 Hz. This detrended RFC log is the RUNSUM synthetic (shown next to the extracted trace for each seismic tie).
5. Sometimes there is a time shift between events in the extracted trace and the synthetic. This is corrected by applying a static shift to the synthetic to make the events match in time. When this is done, a seperate TWTIME track is shown in blue next to Shell's synthetic. The two-way times in this track are the original time-depth data calculated from the 109-1 checkshot survey. The other two TWTIME tracks are the corrected two-way times which correct the synthetic to match the extracted Bull34 trace.

The following table is a summary of the depth shift performed in each well.

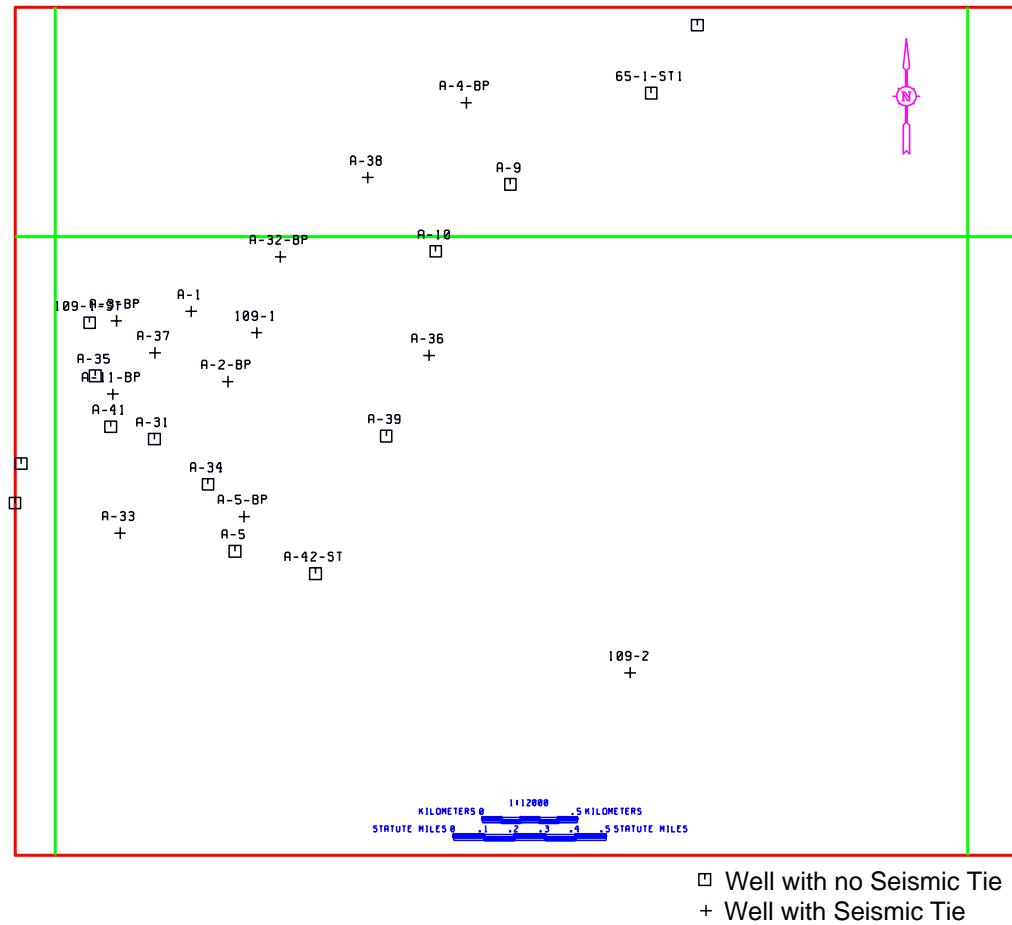
$$\text{Diff} = \text{Twttime(original)} - \text{Twttime(corrected)}$$

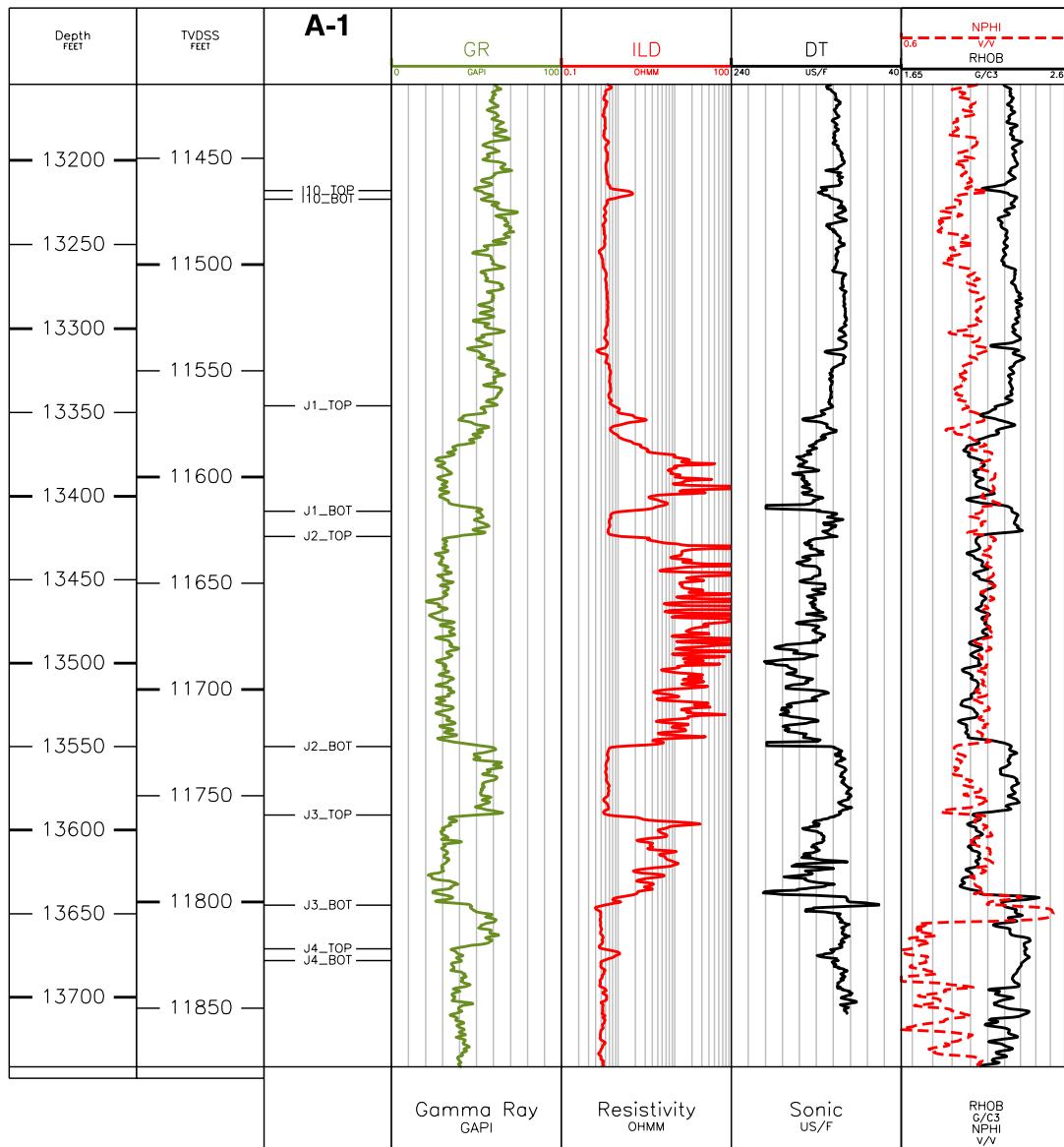
where Twttime(original) is the initial time-depth tie calculated using the Checkshot data from the 109-1 well. Twttime(corrected) is a static shift I performed which lined up the J2 event from the synthetic with the extracted trace.

**Table 1:**

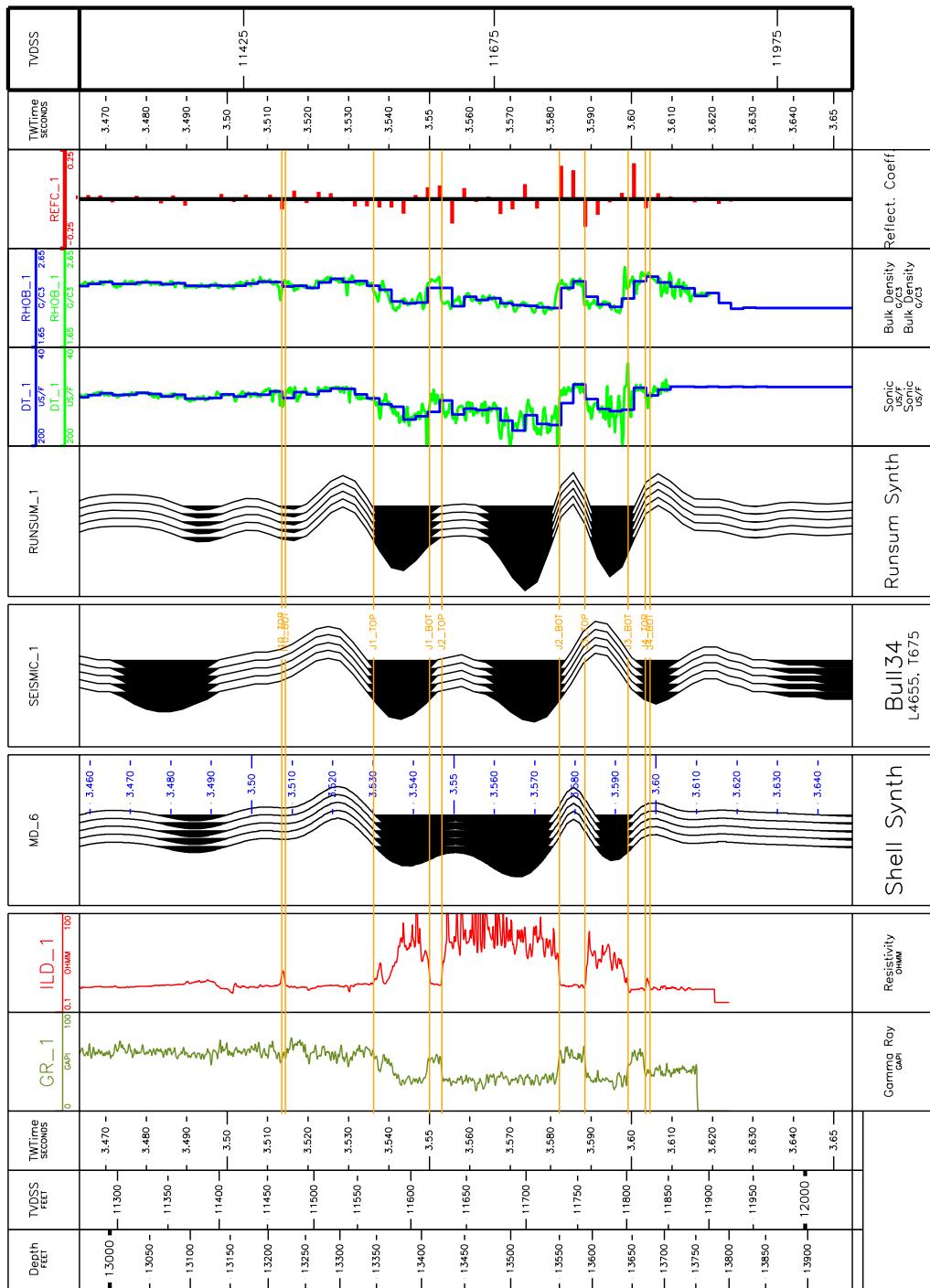
Well	Diff (sec)
A-1	-0.006
A-11-BP	0.006
A-2-BP	0
A-3-BP	0
A-32-BP	0
A-33	-0.054
A-36	0.045
A-37	-0.018
A-38	0.015
A-37	0.015
A-4-BP	0.036
A-5-BP	0.018
65-1	0.078
109-2	0.078
109-1	0

## Basemap

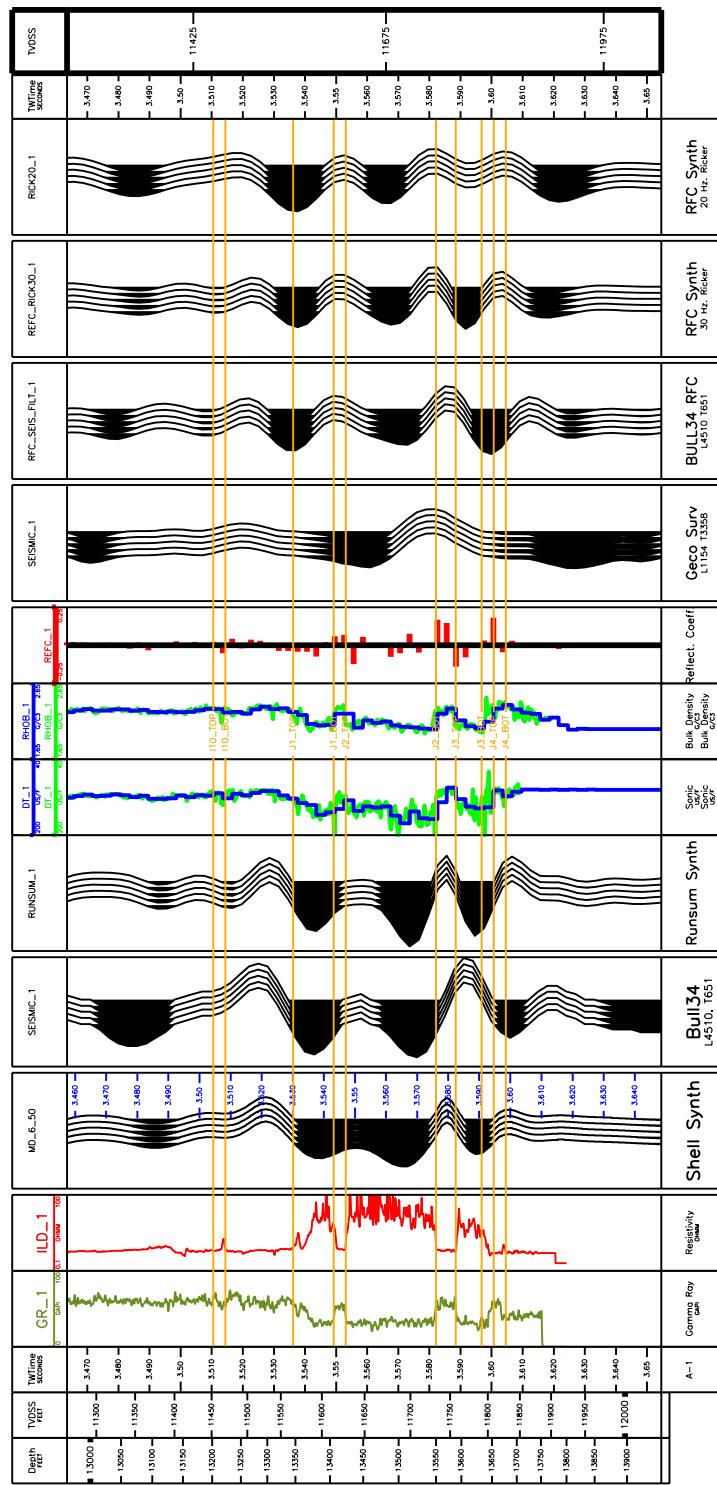


**A-1**

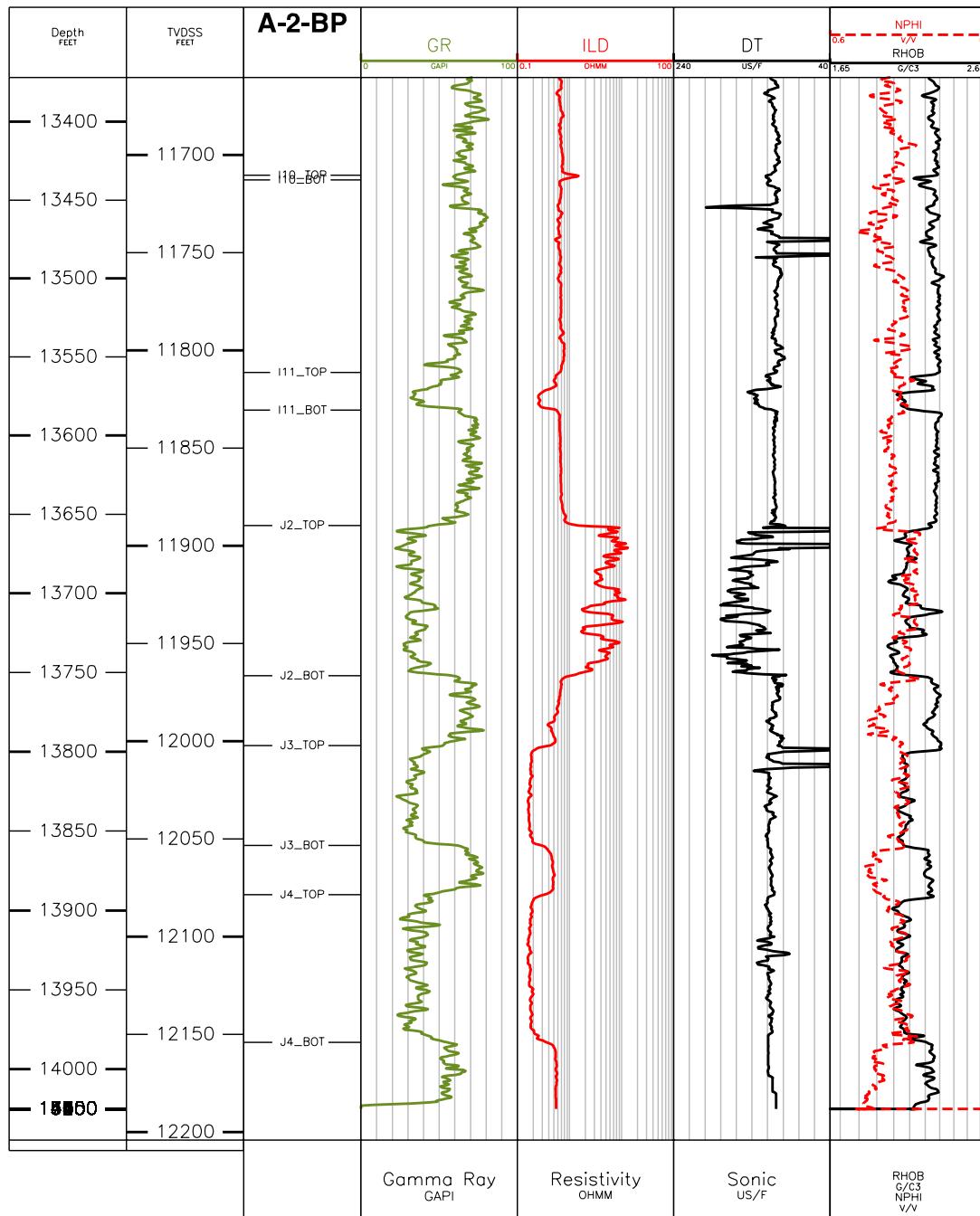
## A-1 Well Tie



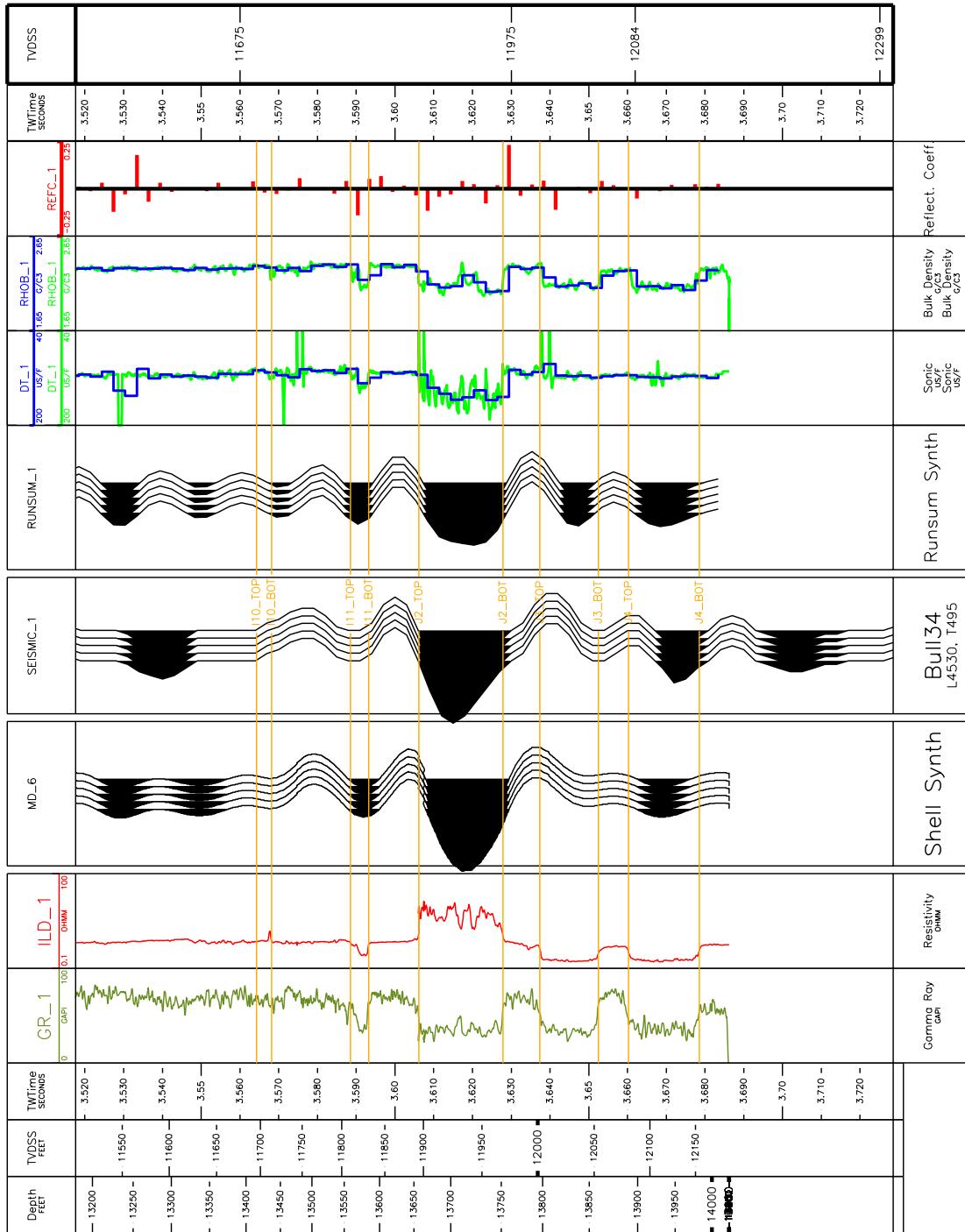
## A-1 Geco Survey (1995) Trace



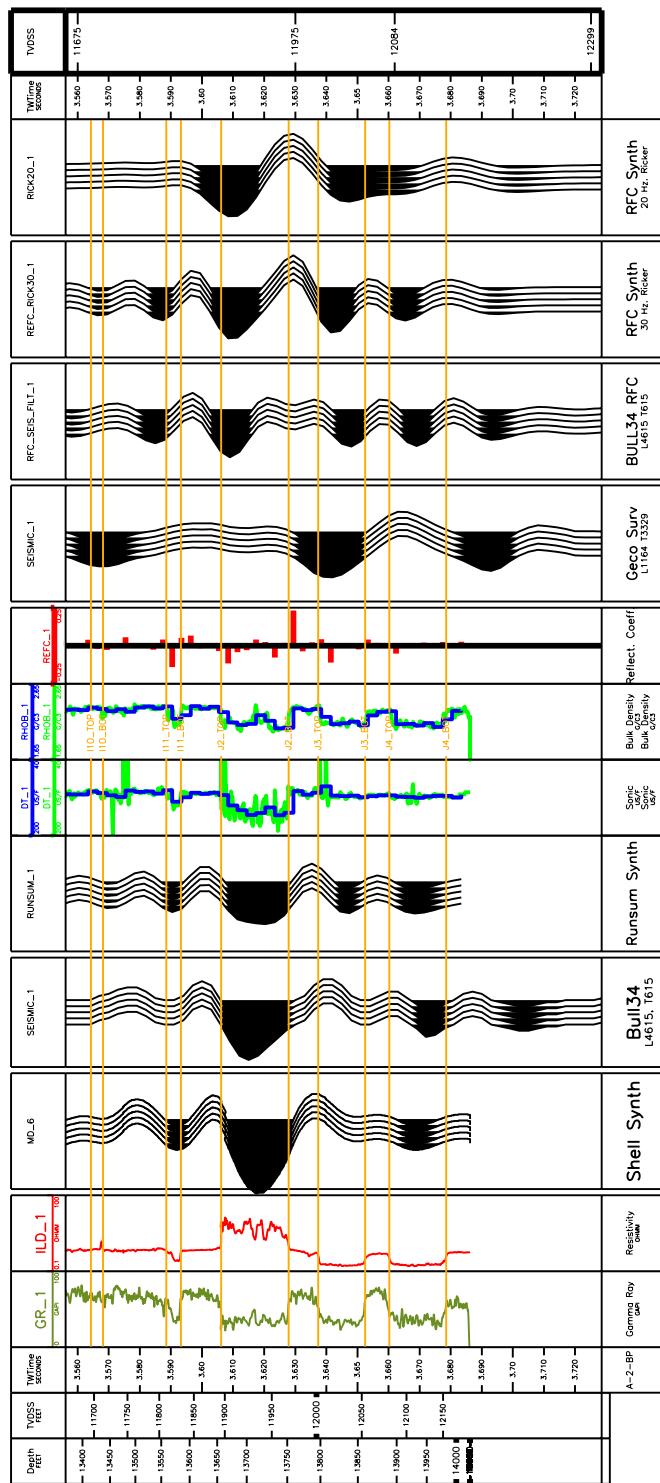
## A-2-BP



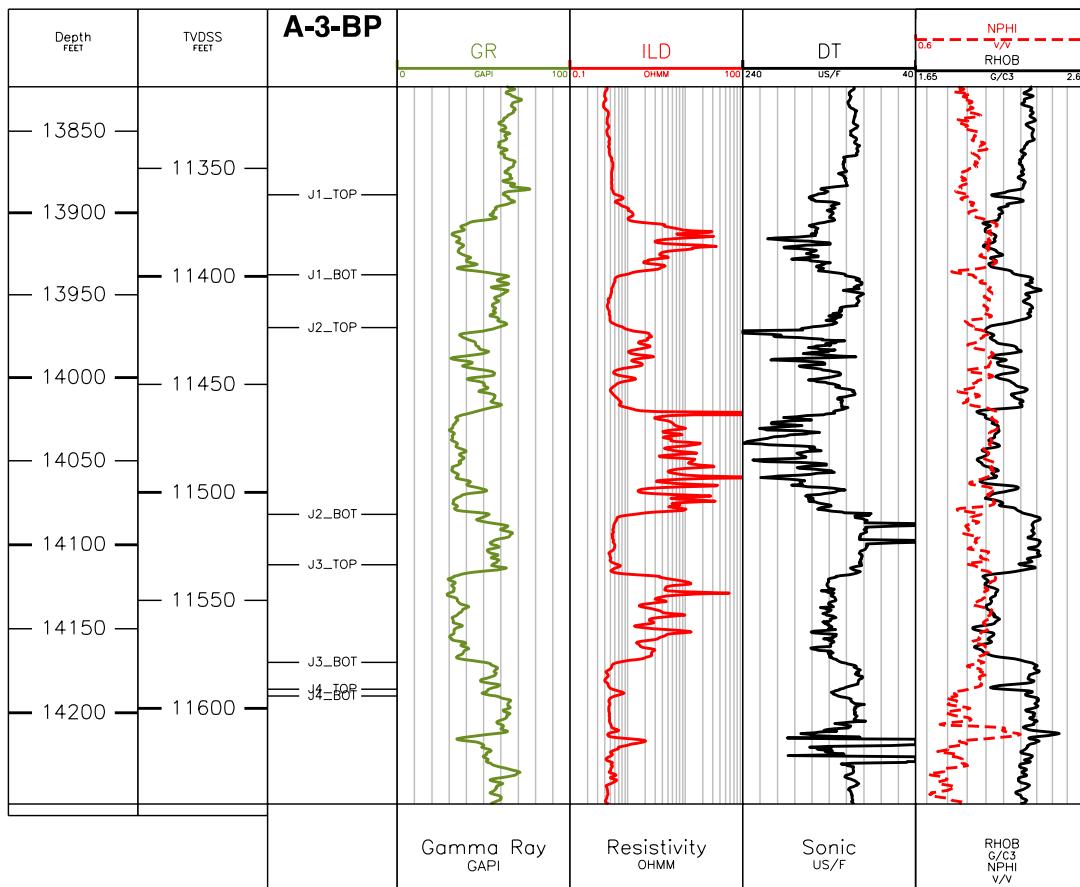
## A-2-BP Welltie



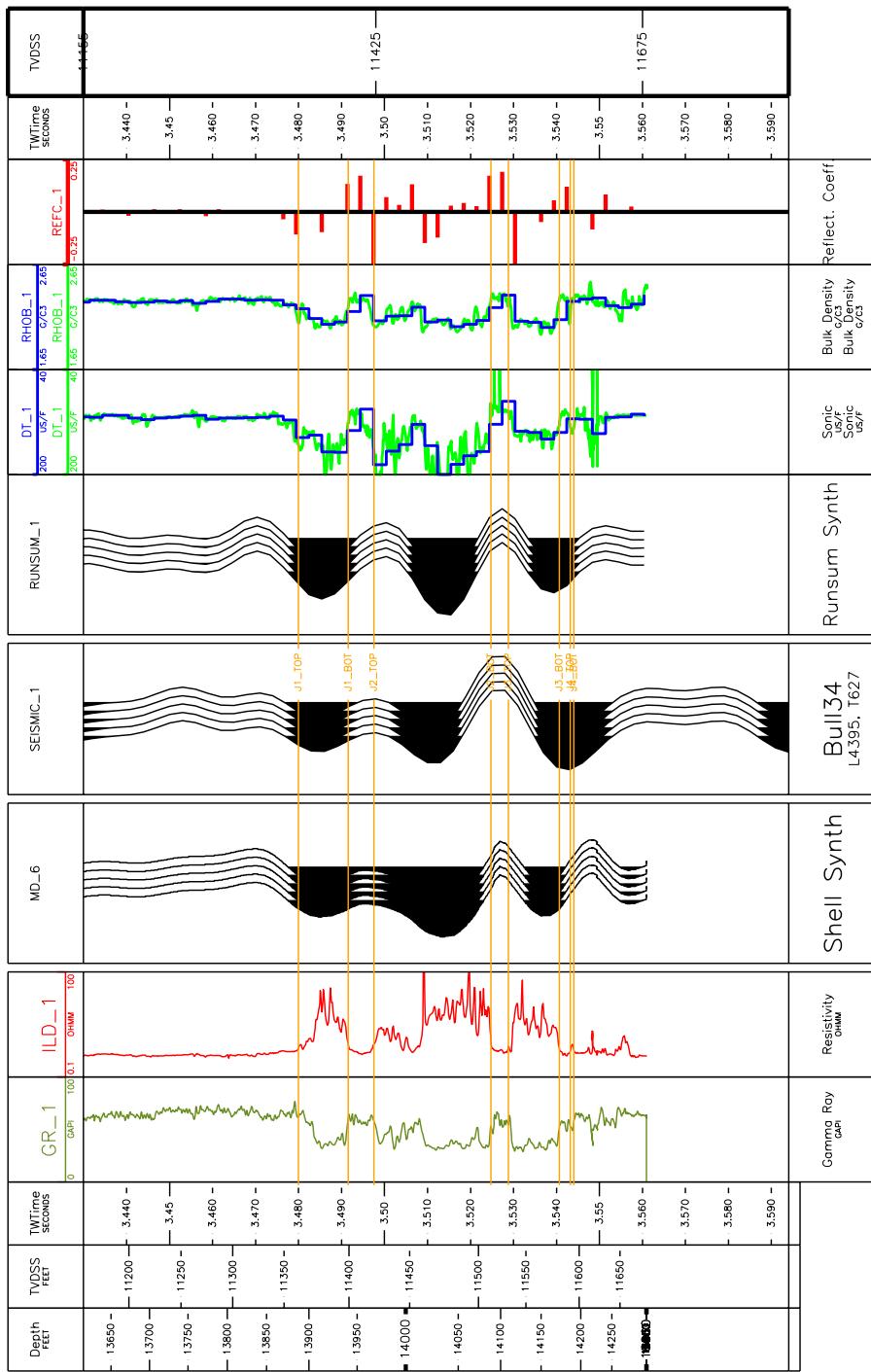
## A-2-BP Geco Survey (1995) Trace



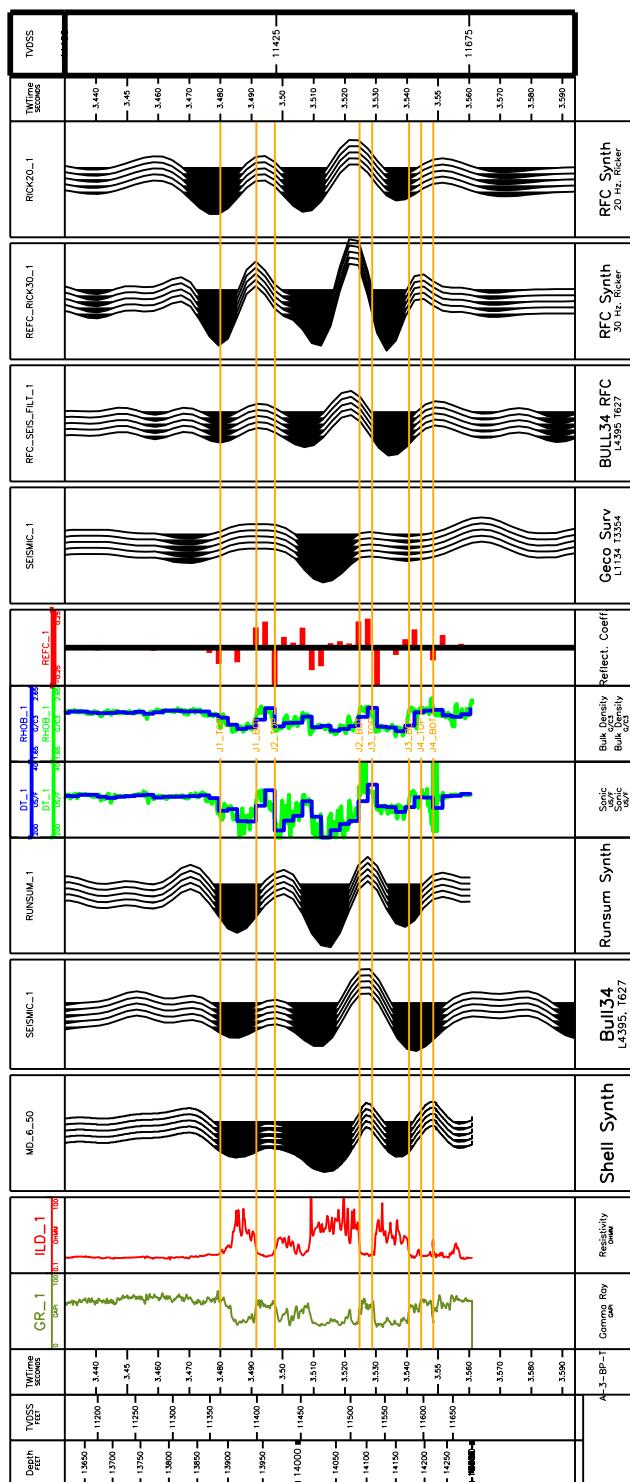
A-3-BP



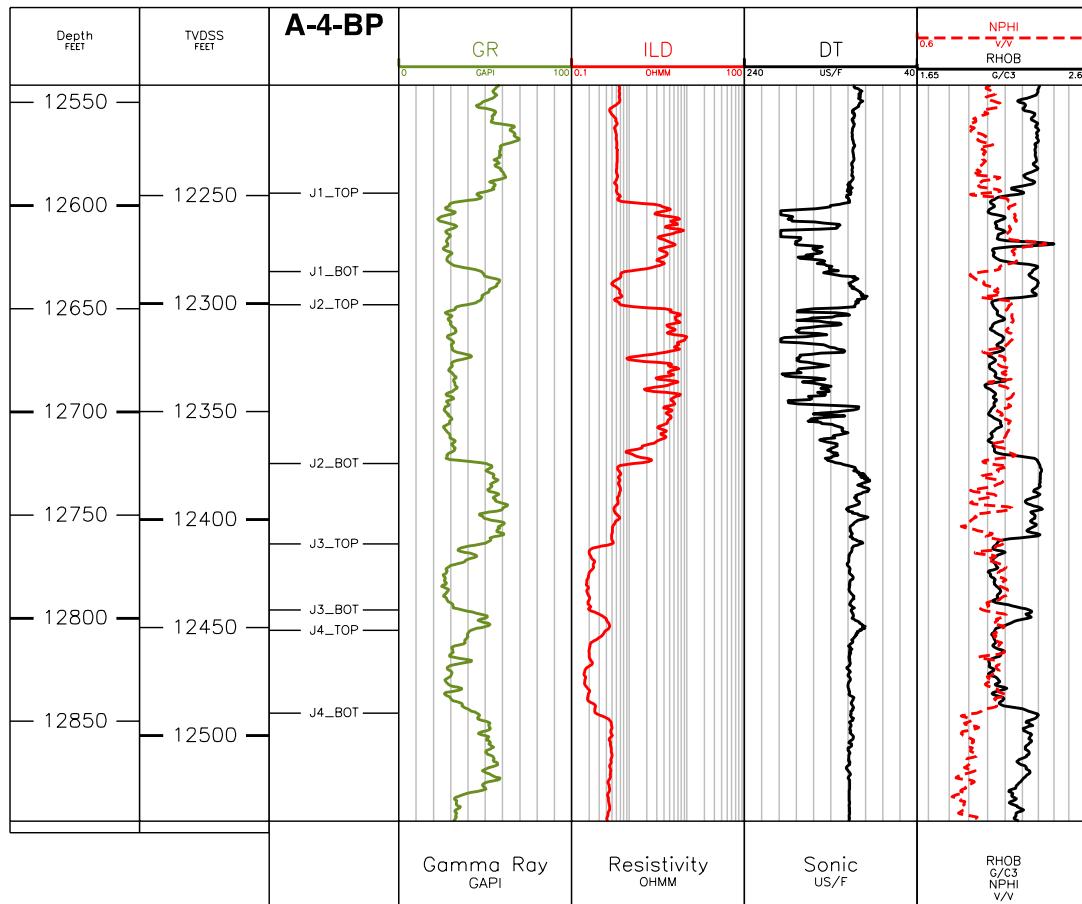
A-3-BP Welltie



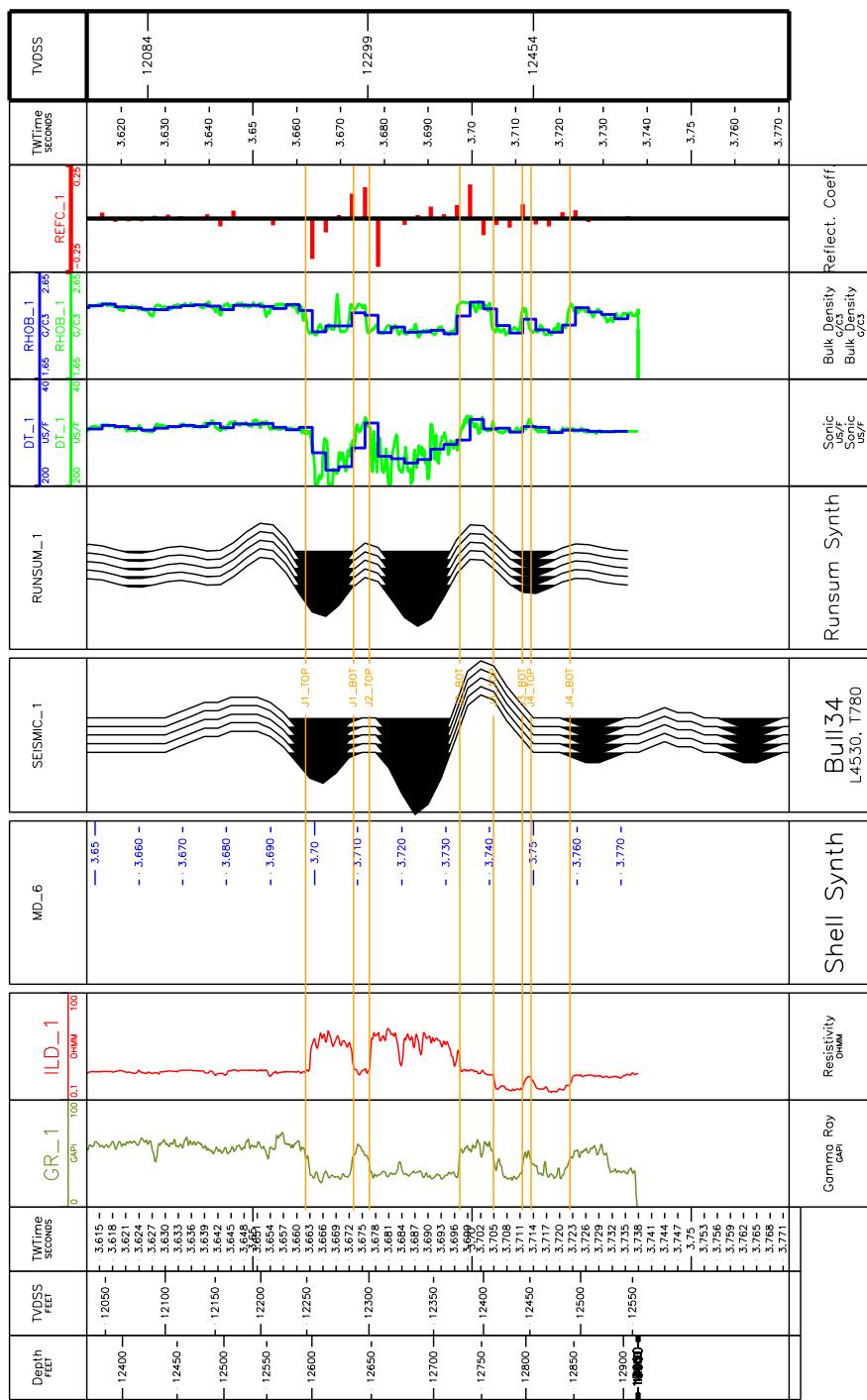
## A-3-BP Geco Survey (1995) Trace



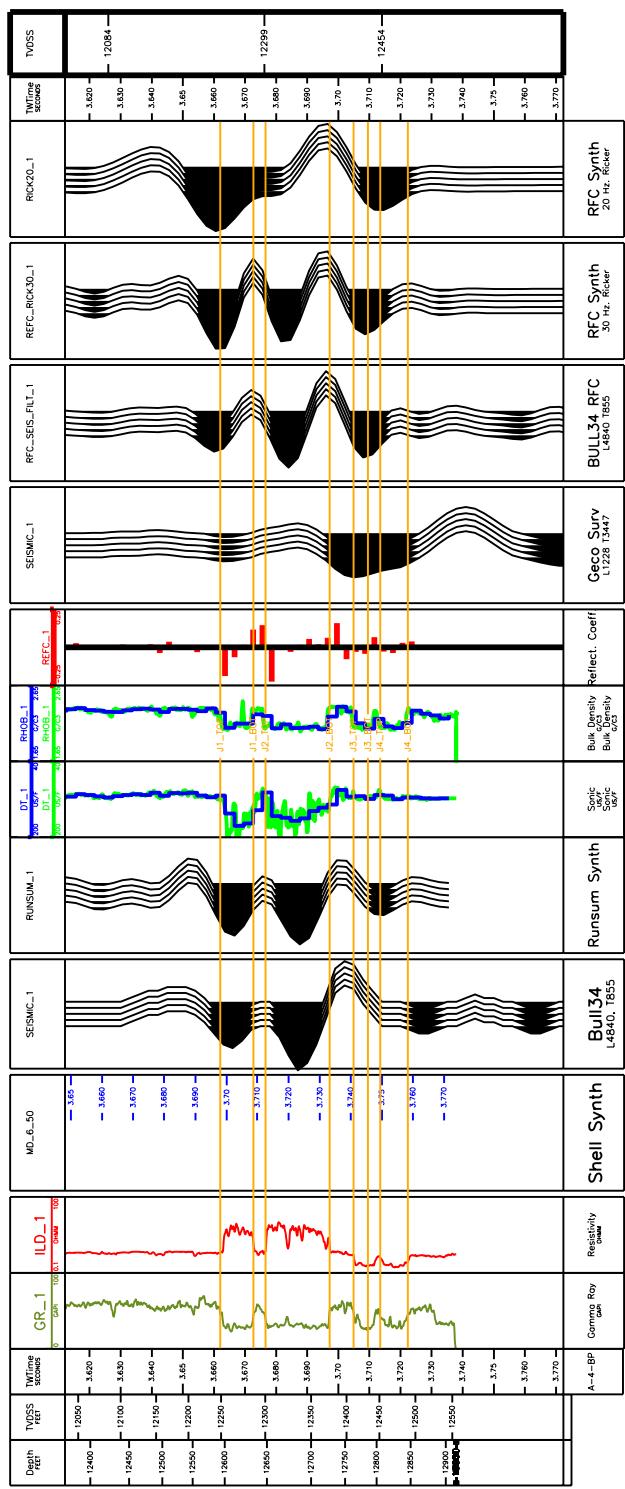
## A-4-BP



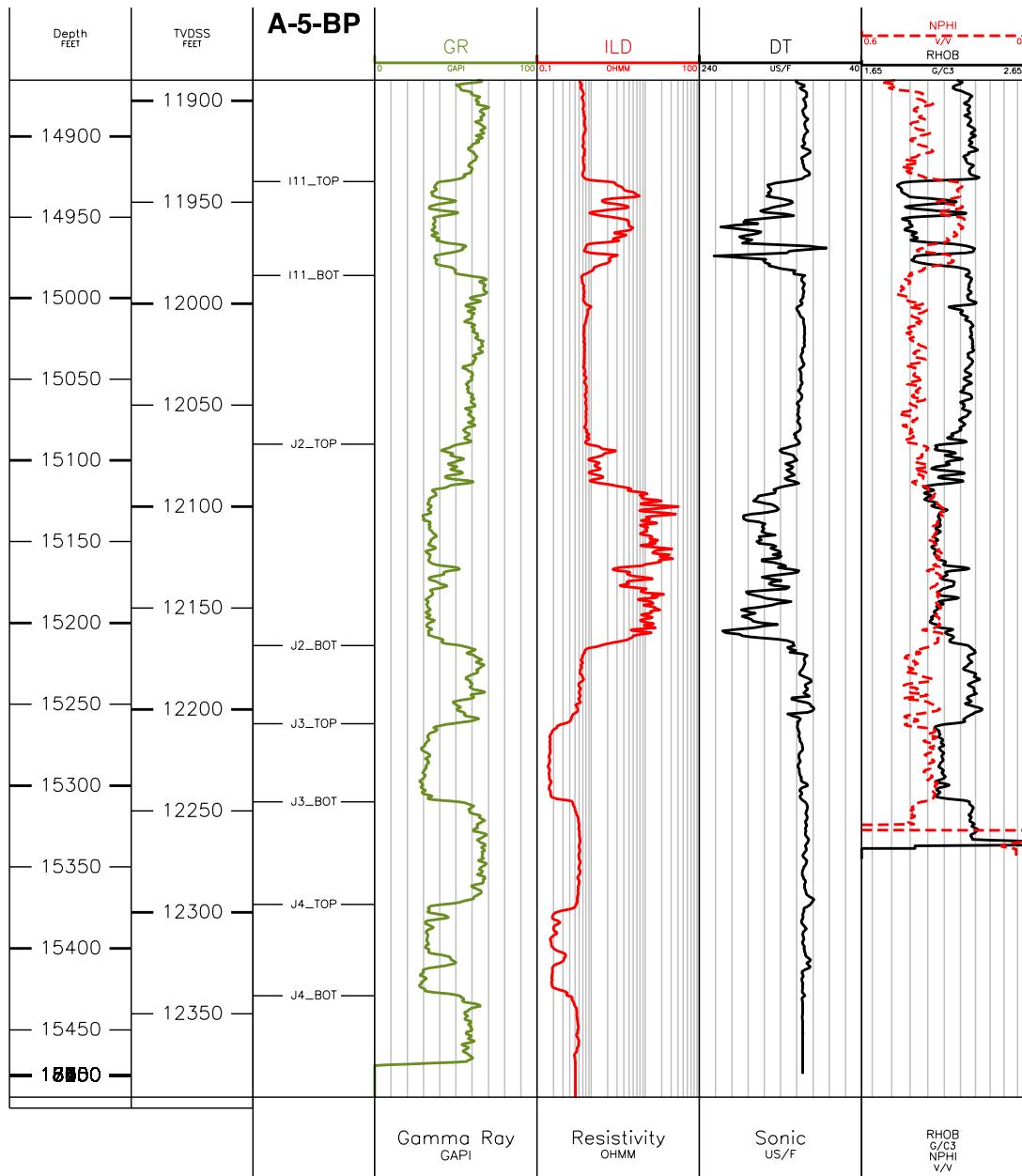
A-4-BP Welltie



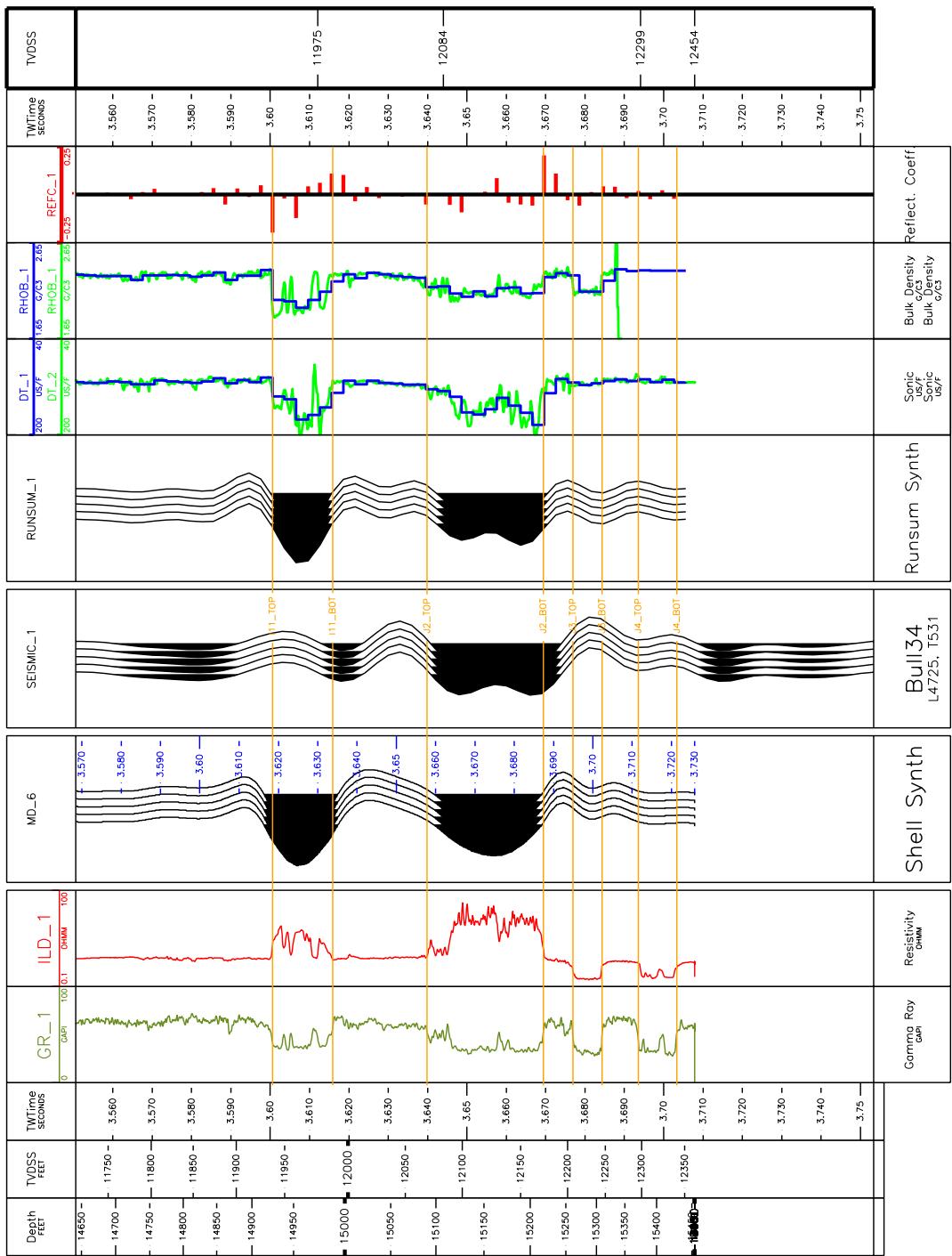
## A-4-BP Geco Survey (1995) Trace



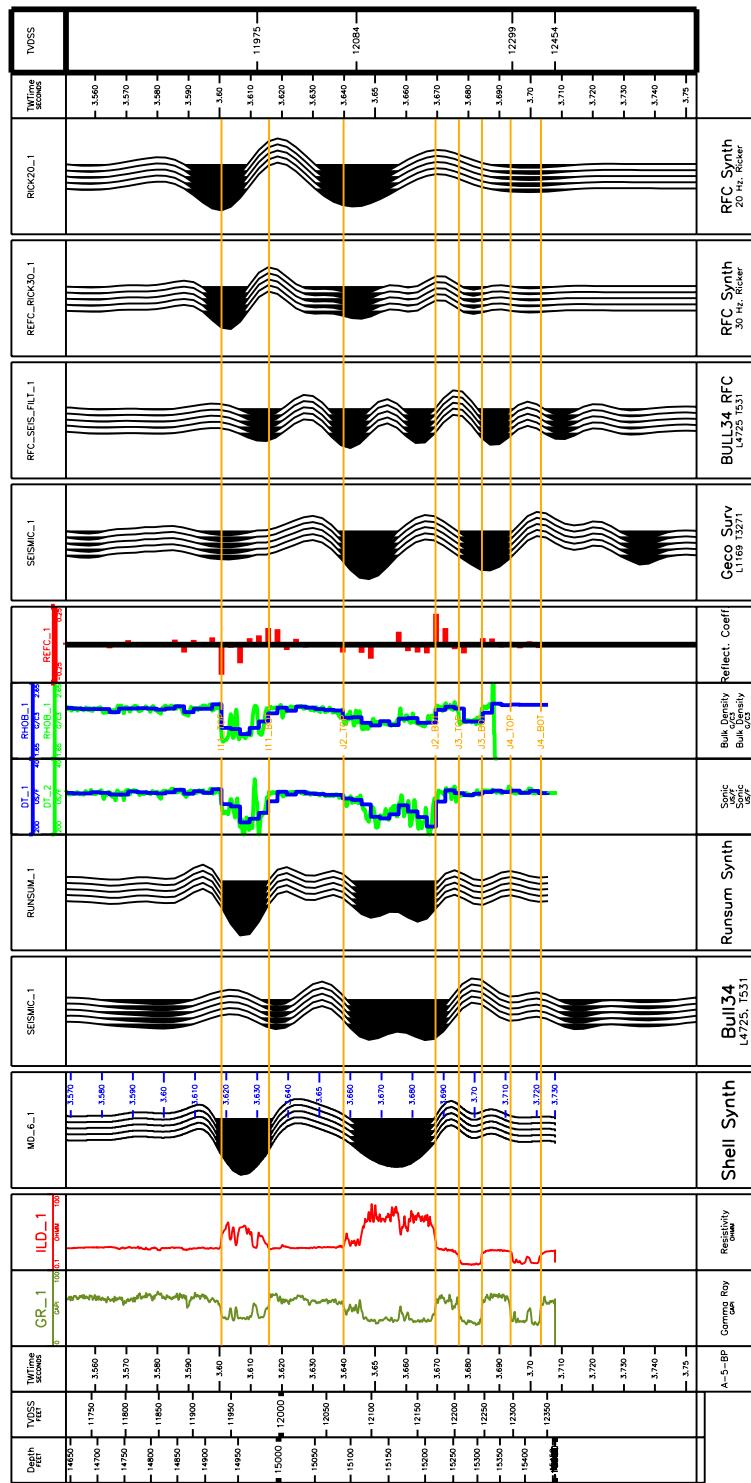
## A-5-BP



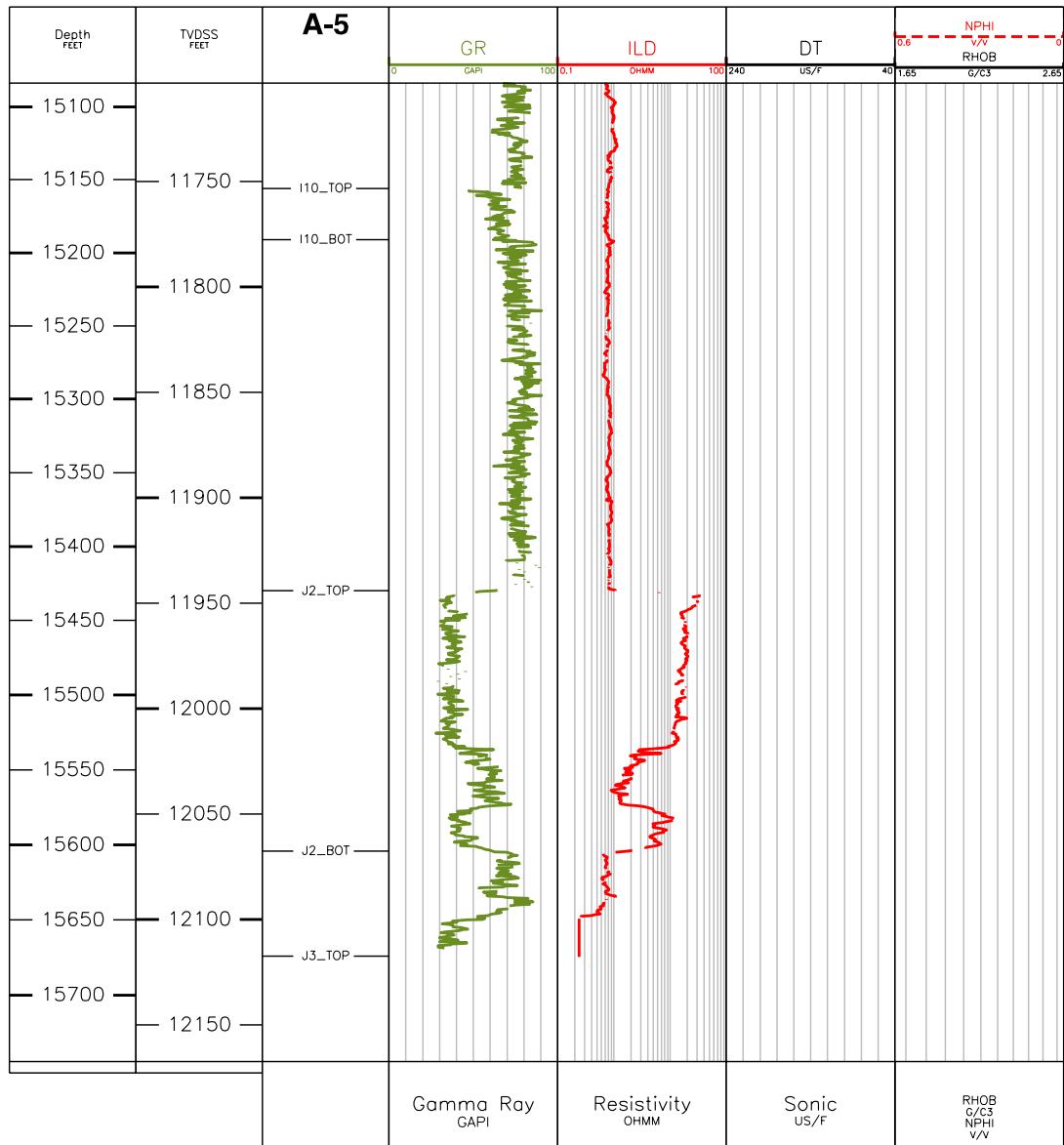
A-5-BP Welltie



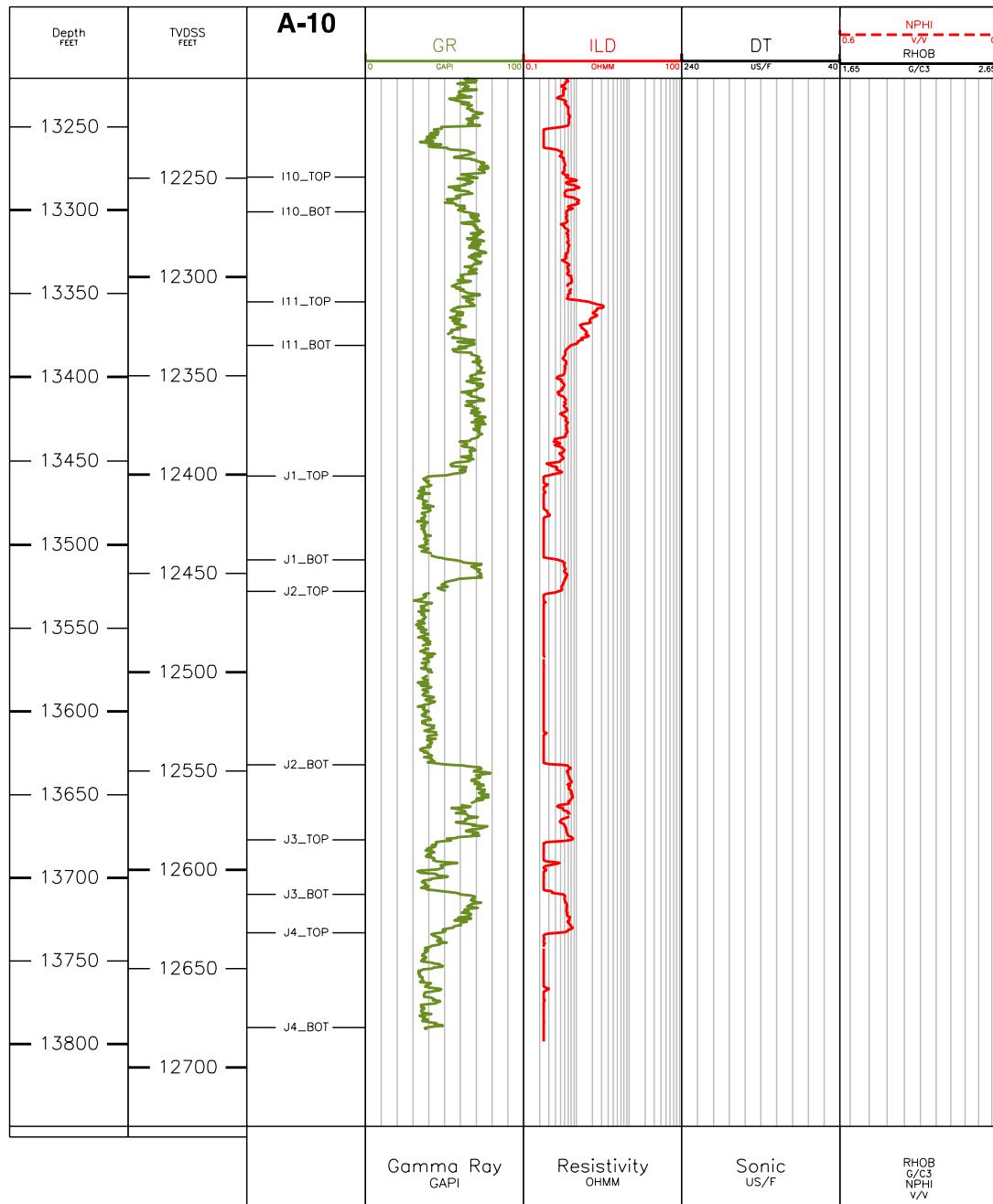
## A-5-BP Geco Survey (1995) Trace



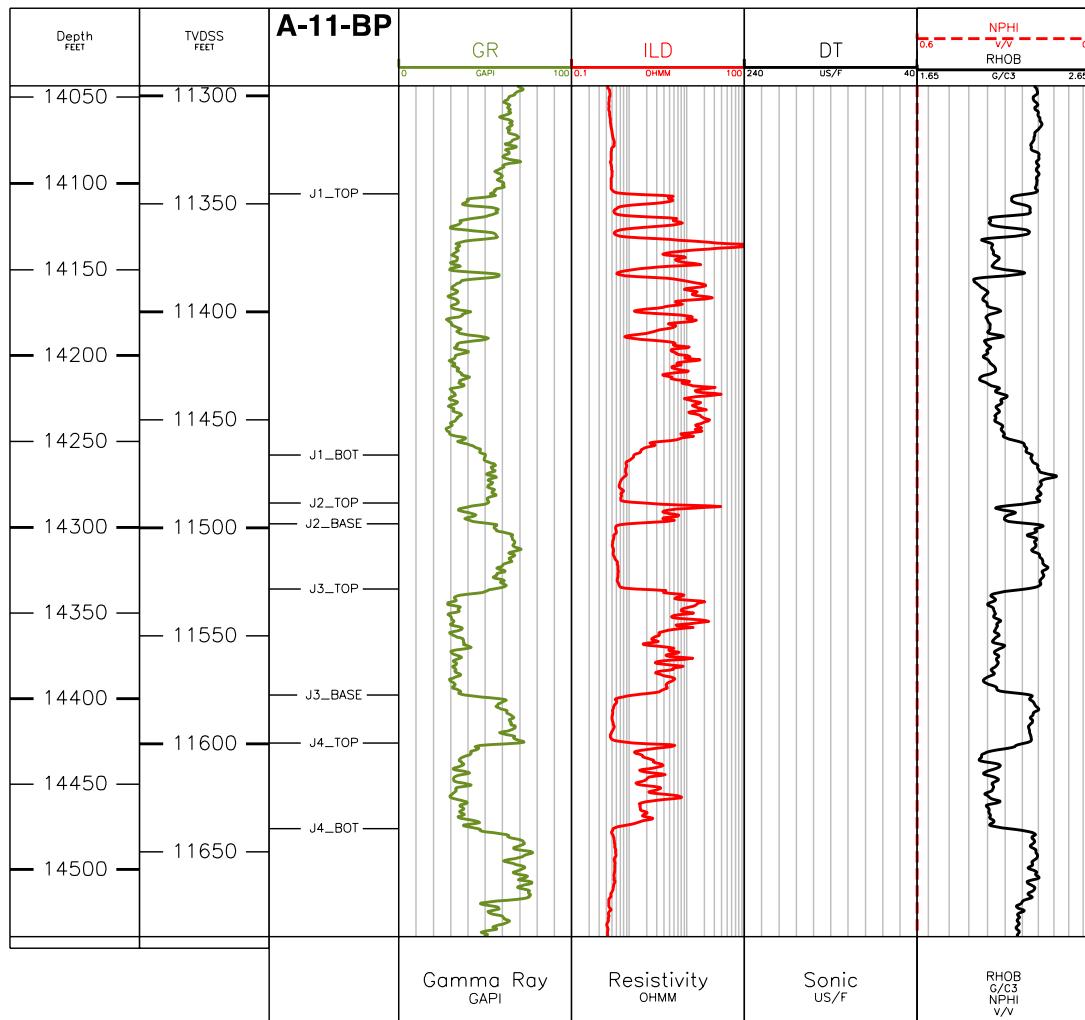
## A-5



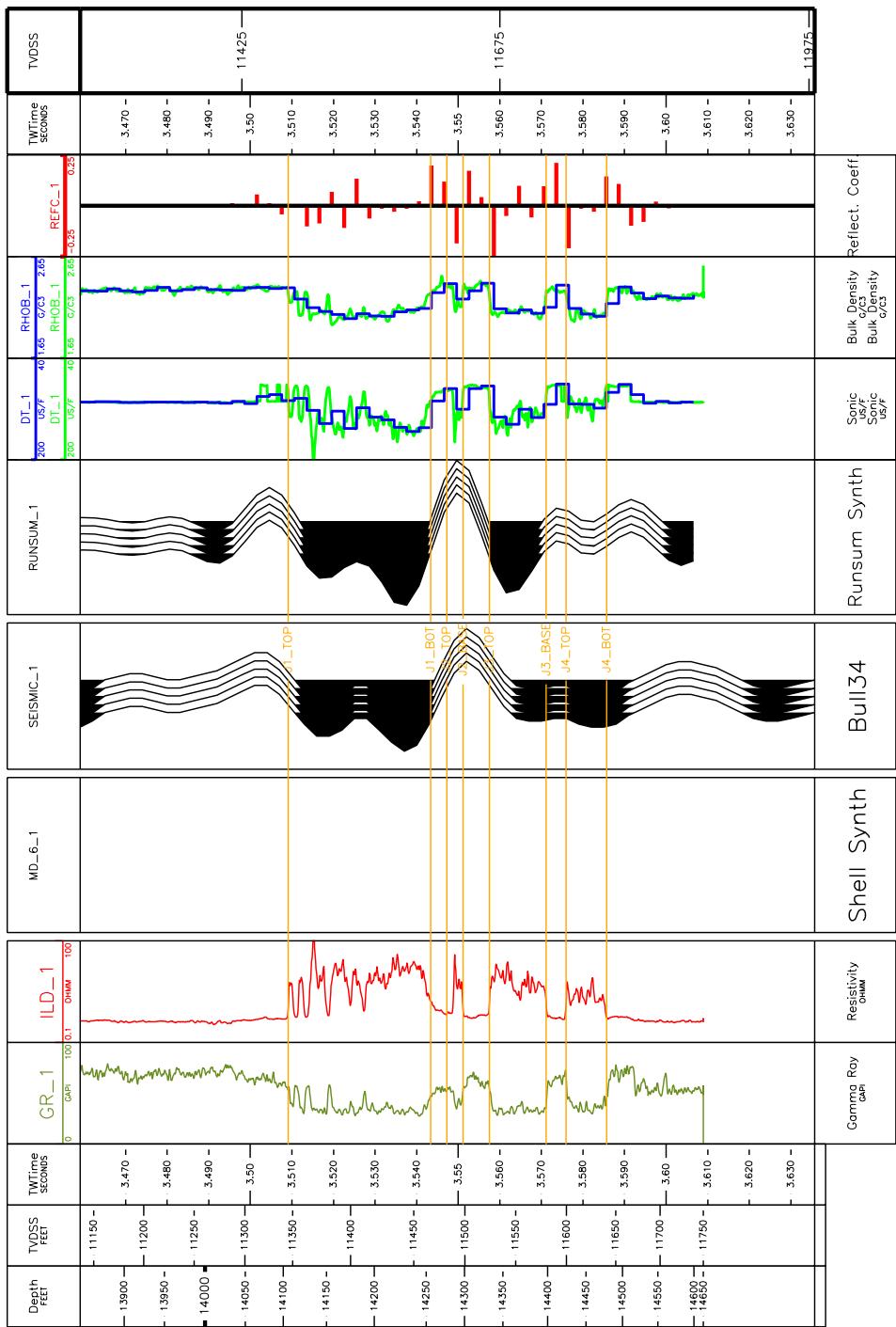
## A-10



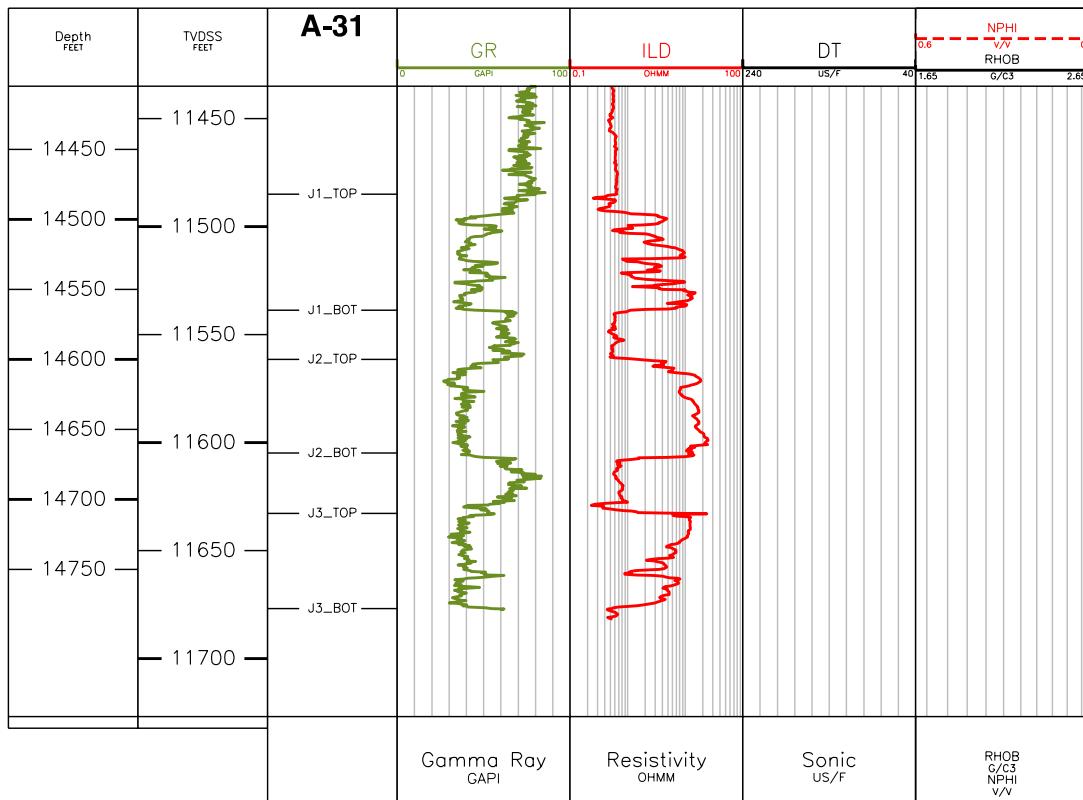
## A-11-BP



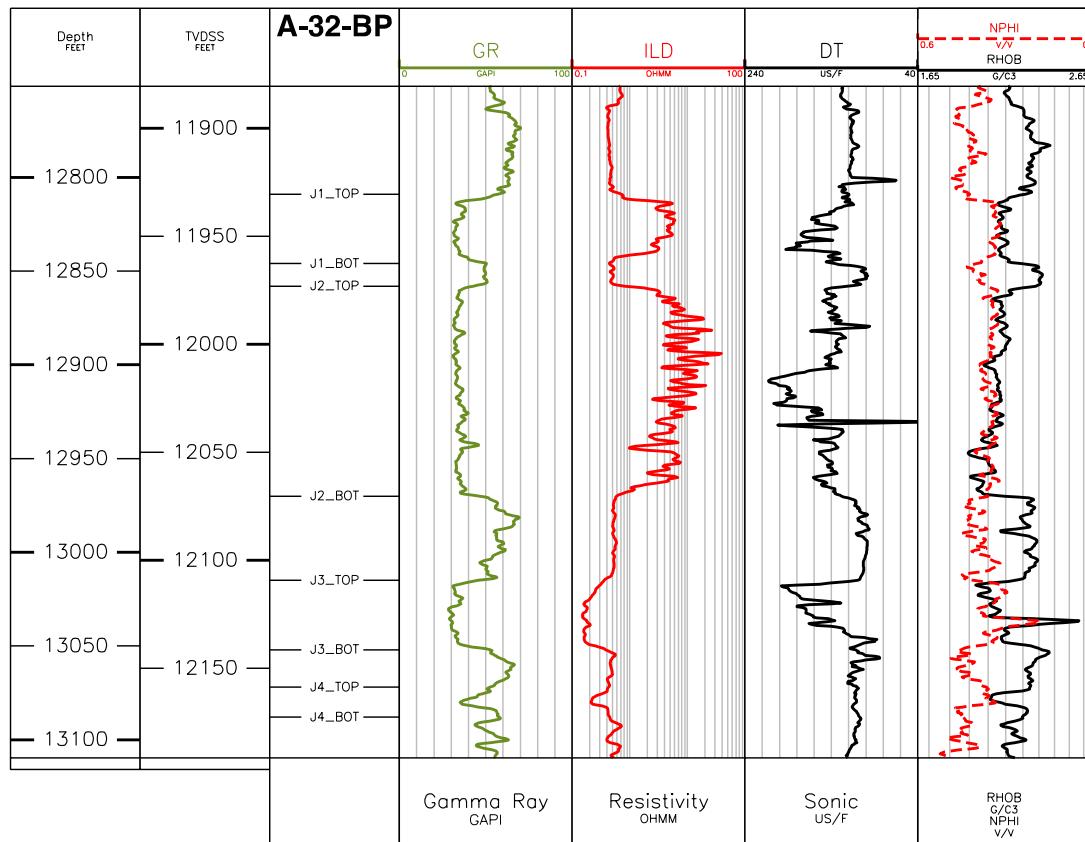
A-11-BP Welltie



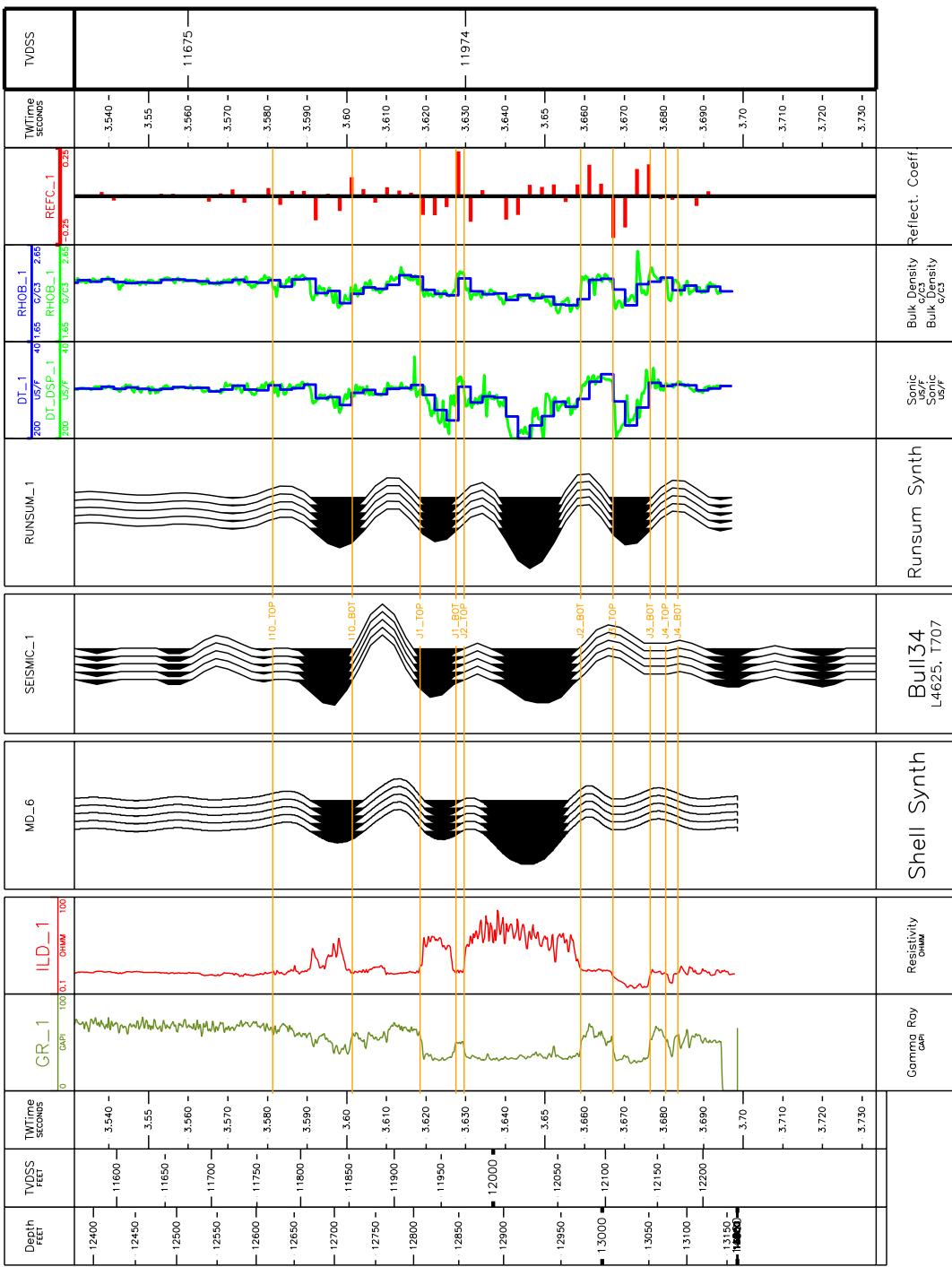
## A-31



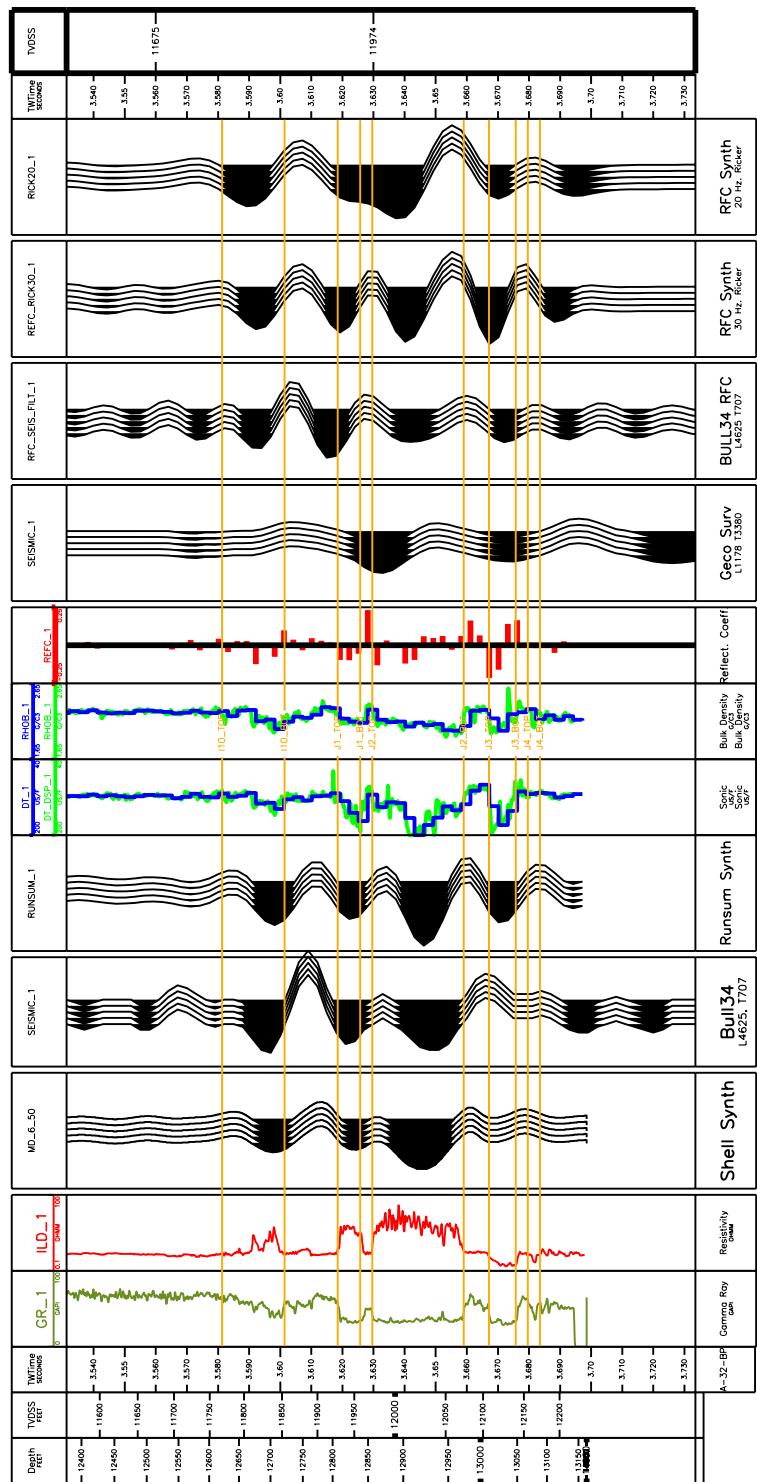
## A-32-BP



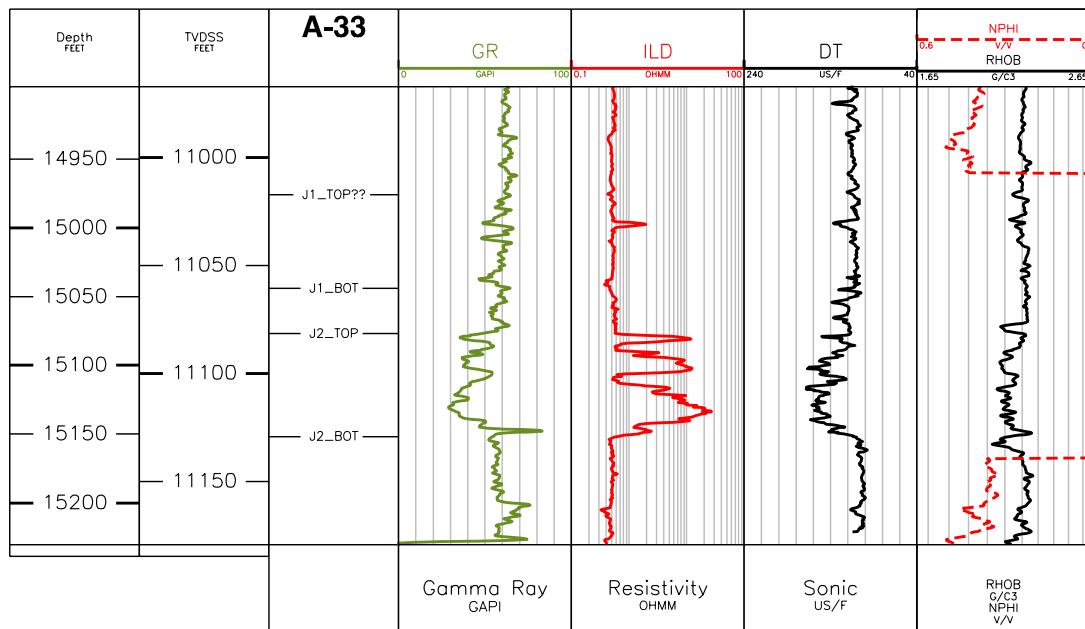
A-32-BP Welltie



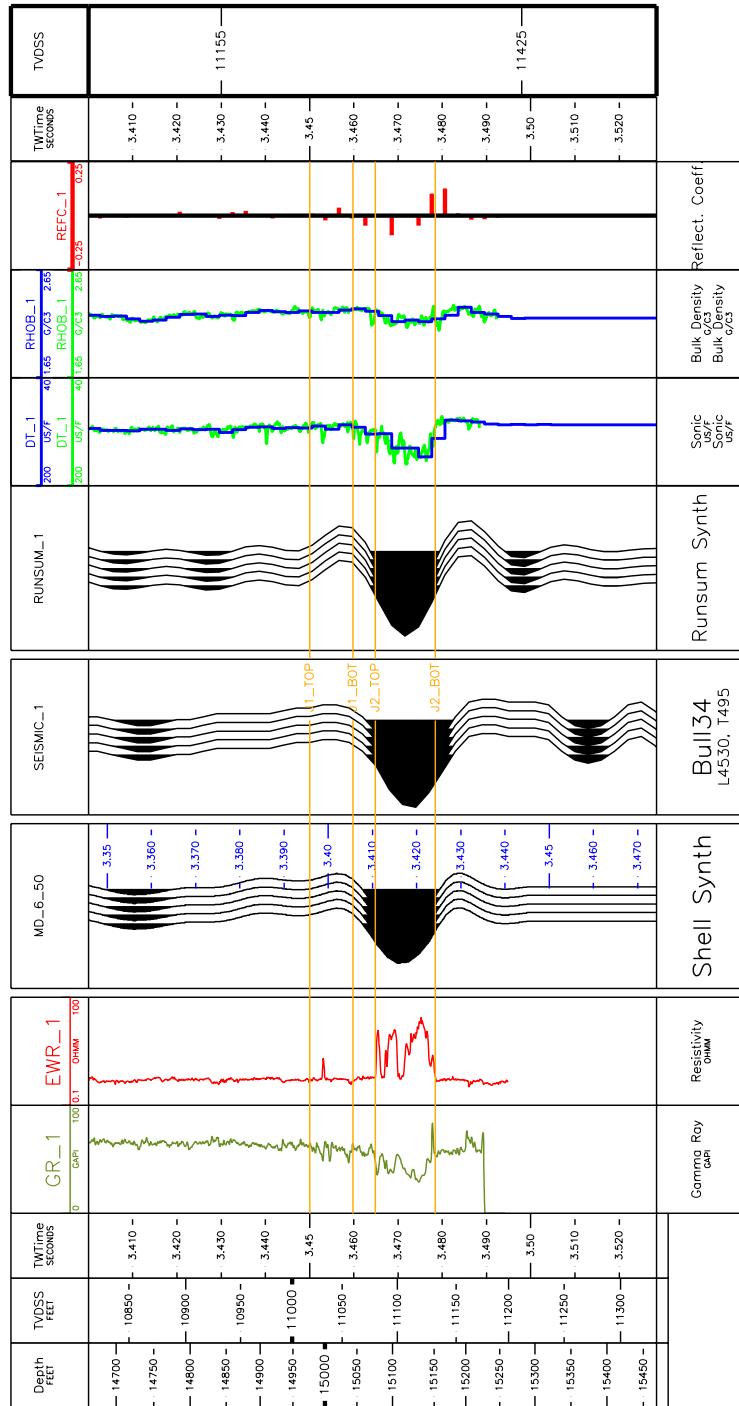
## A-32-BP Geco Survey (1995) Trace



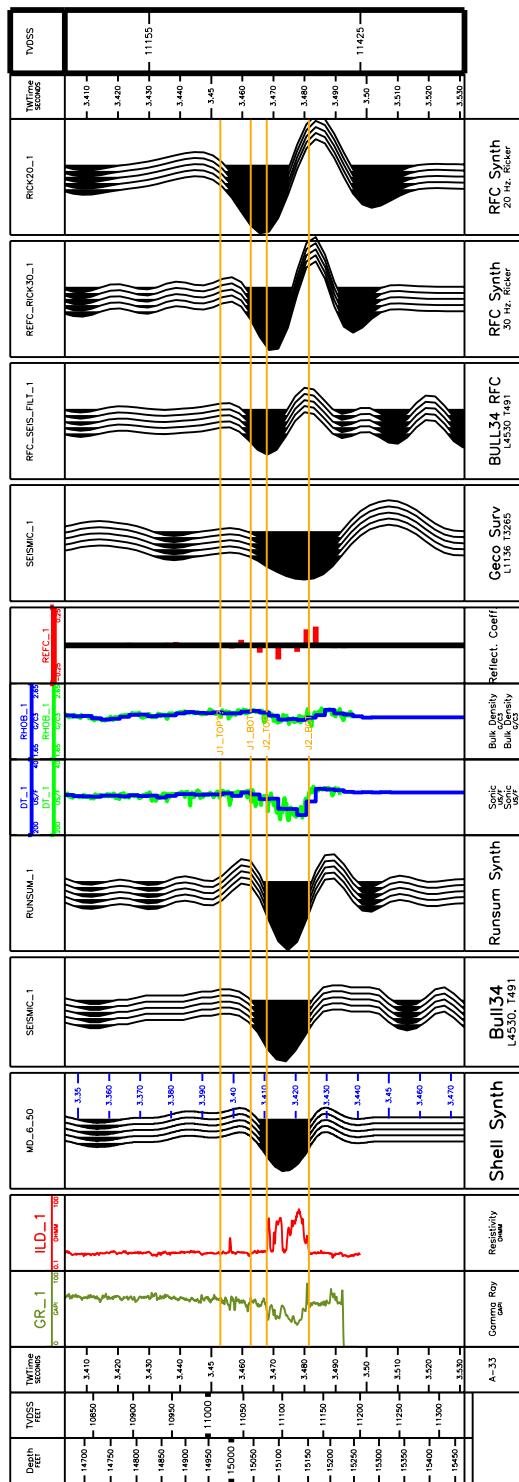
## A-33



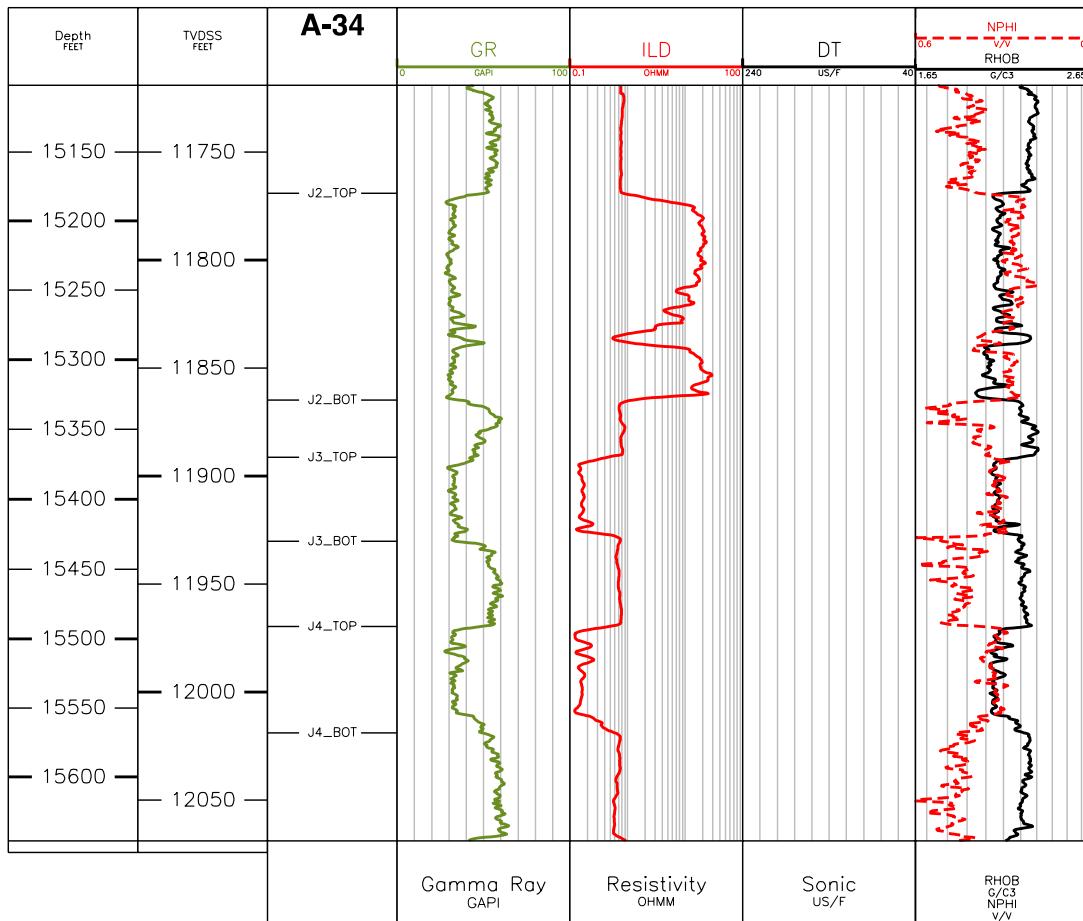
## A-33 Welltie



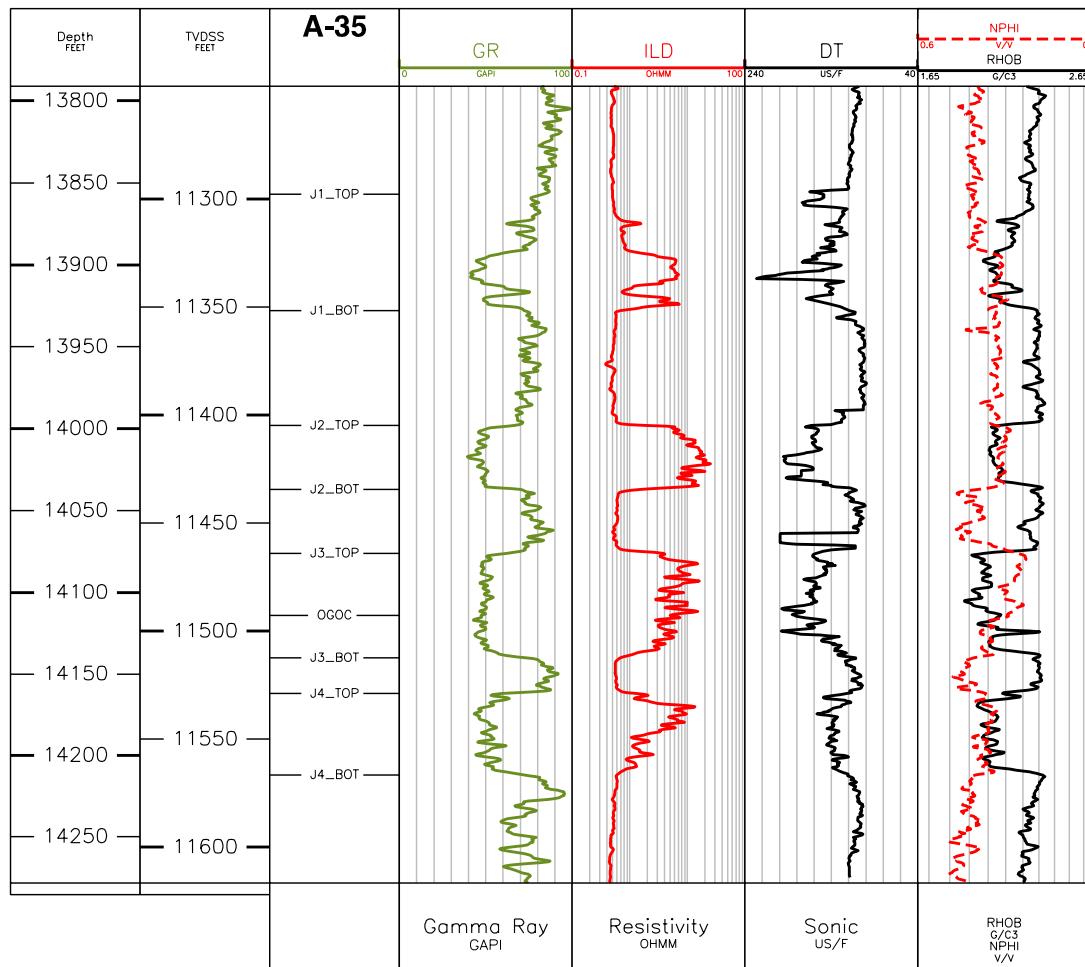
## A-33 Geco Survey (1995) Trace



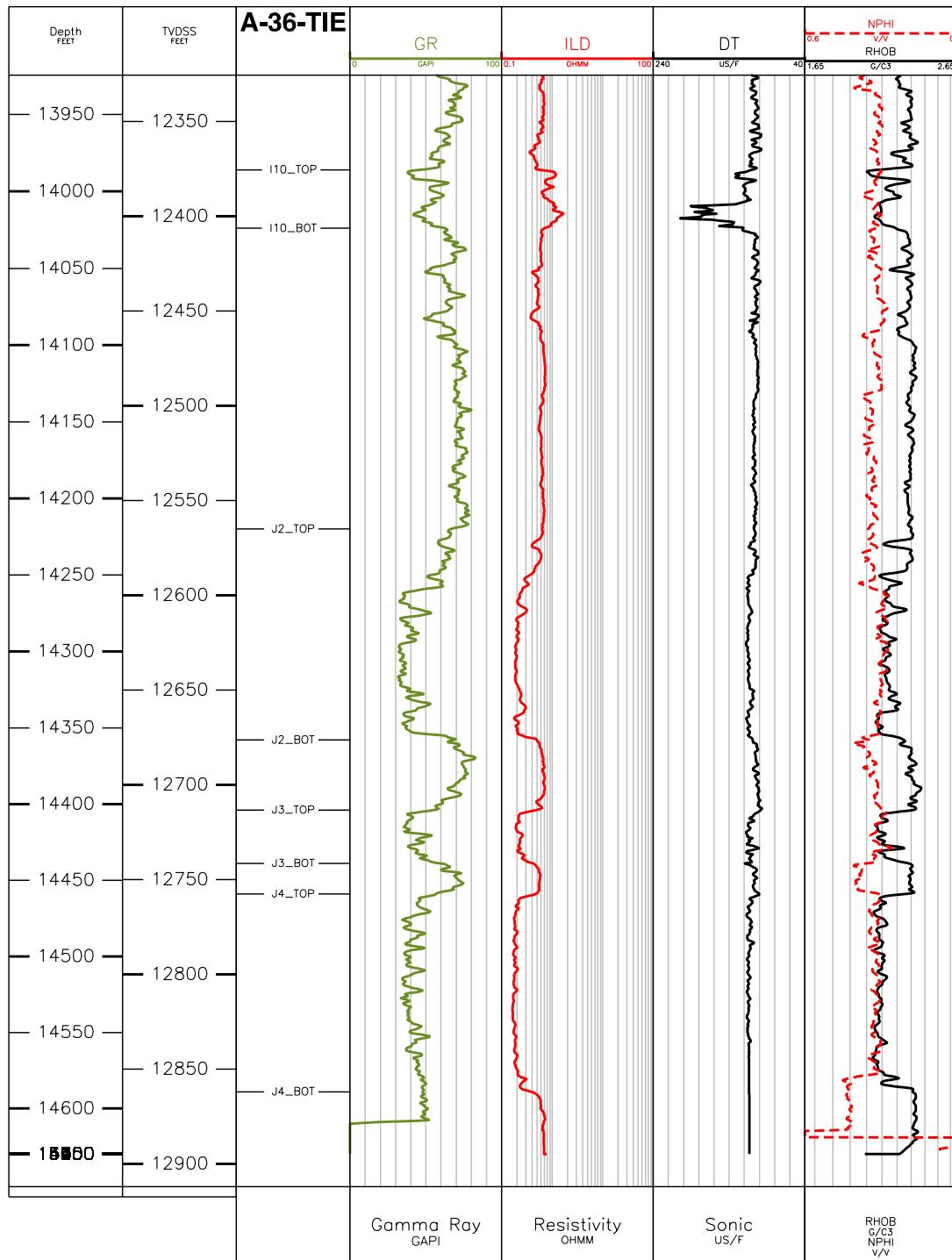
## A-34



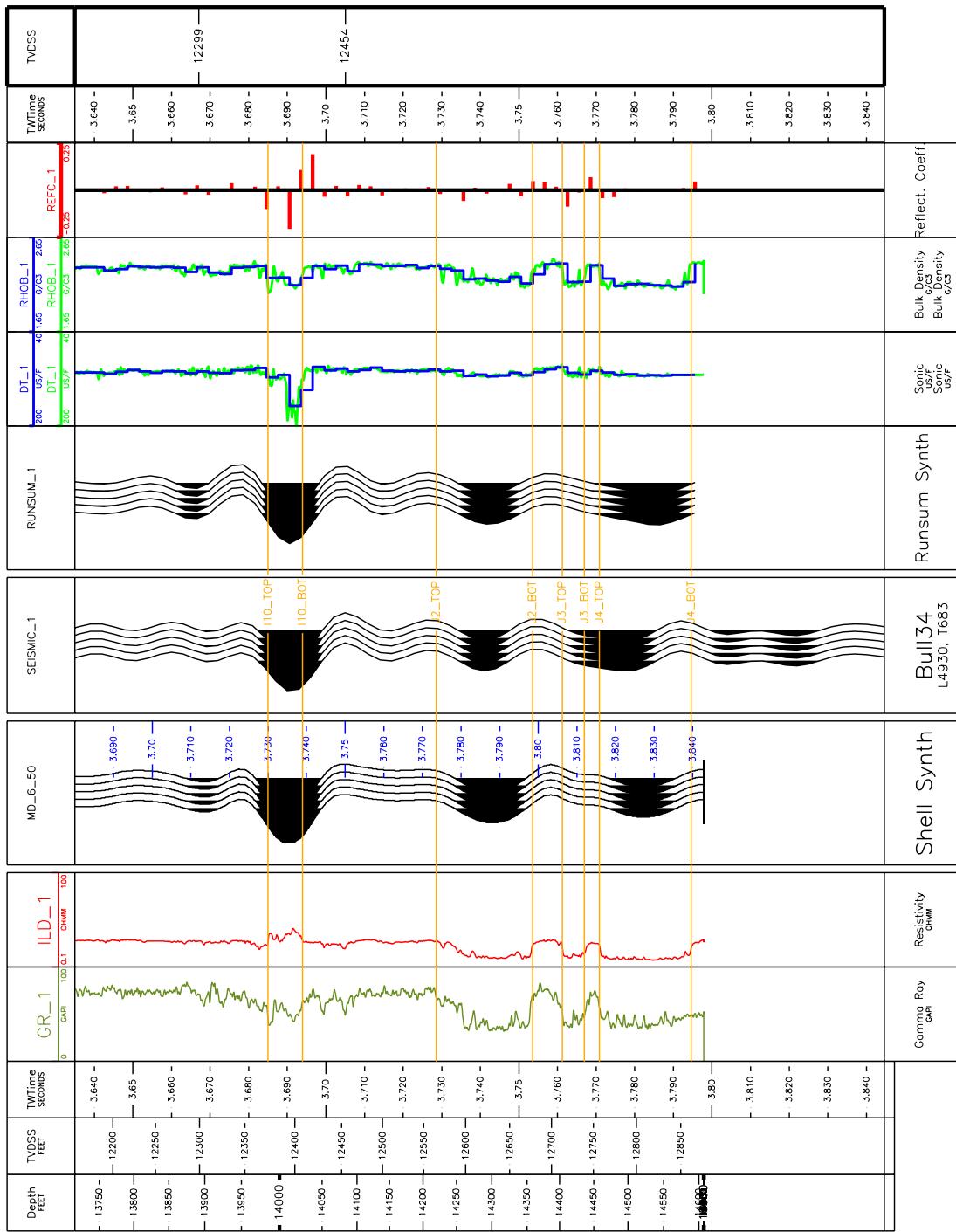
## A-35



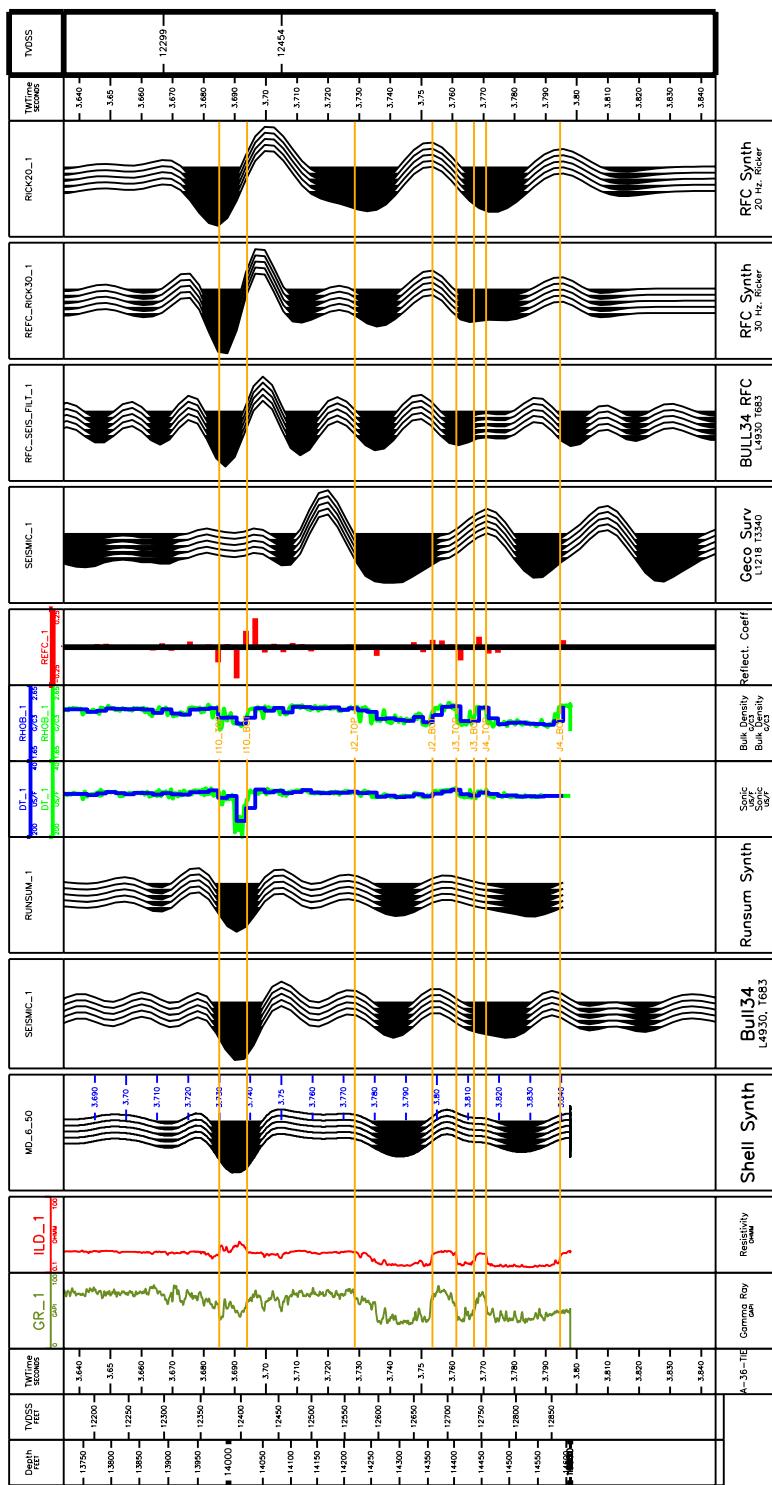
## A-36



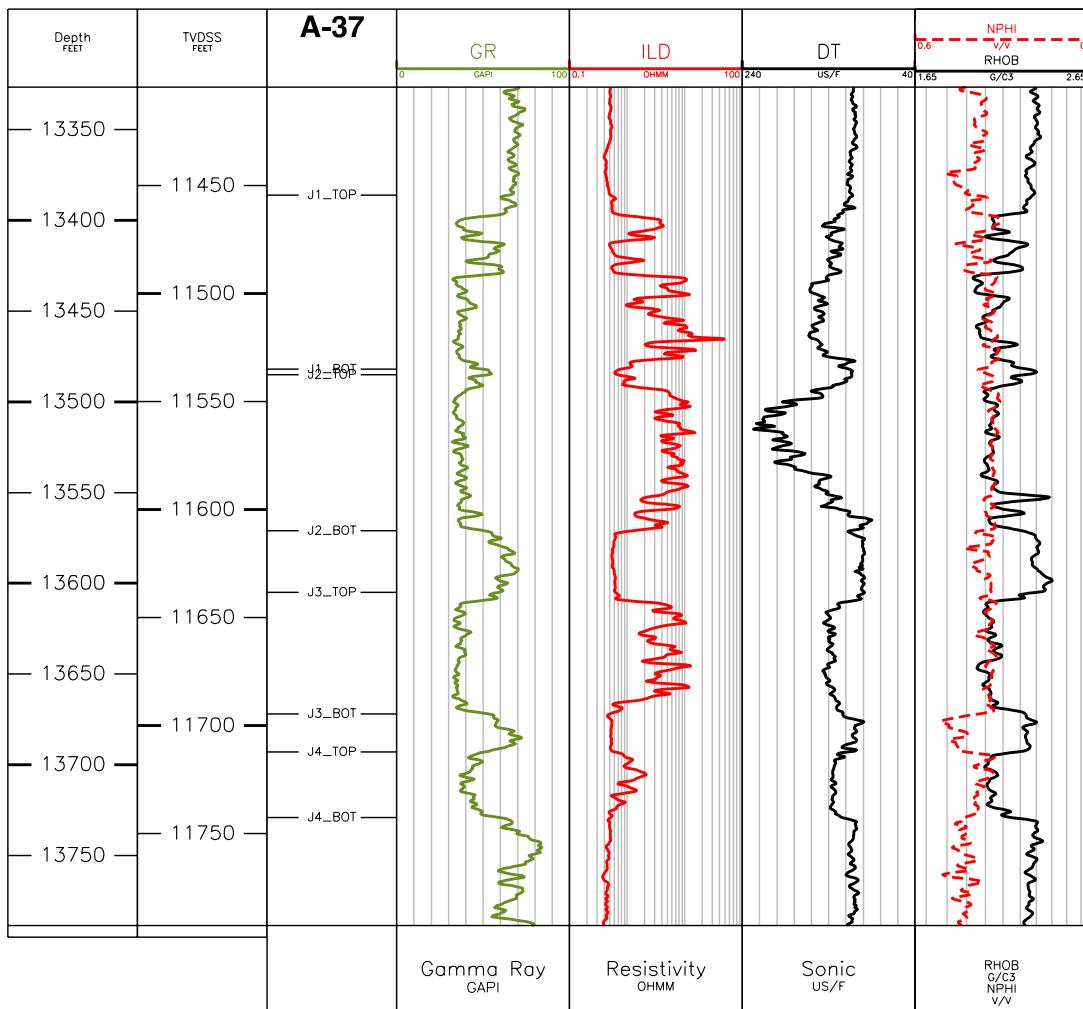
A-36 Welltie



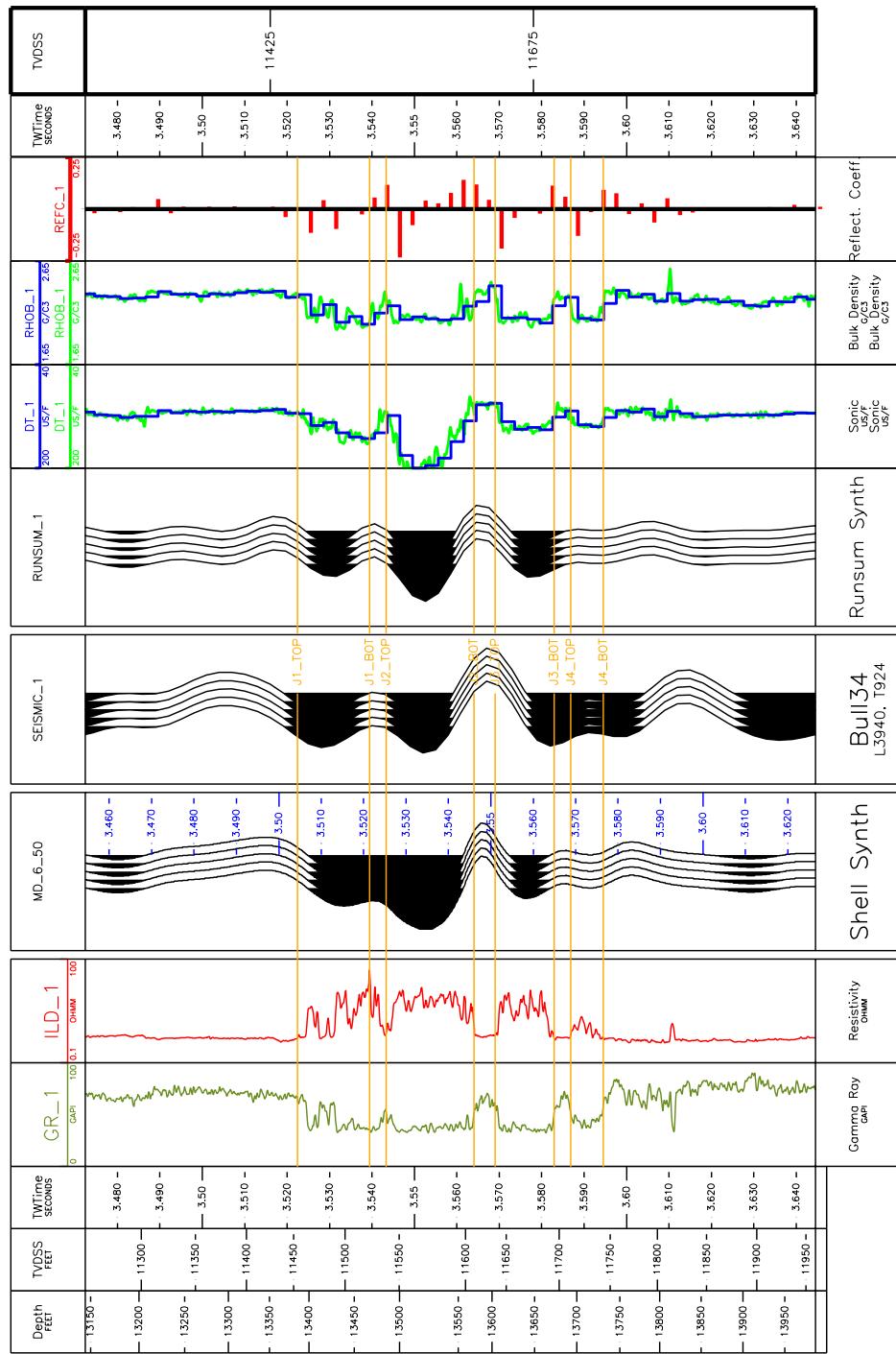
## A-36 Geco Survey (1995) Trace



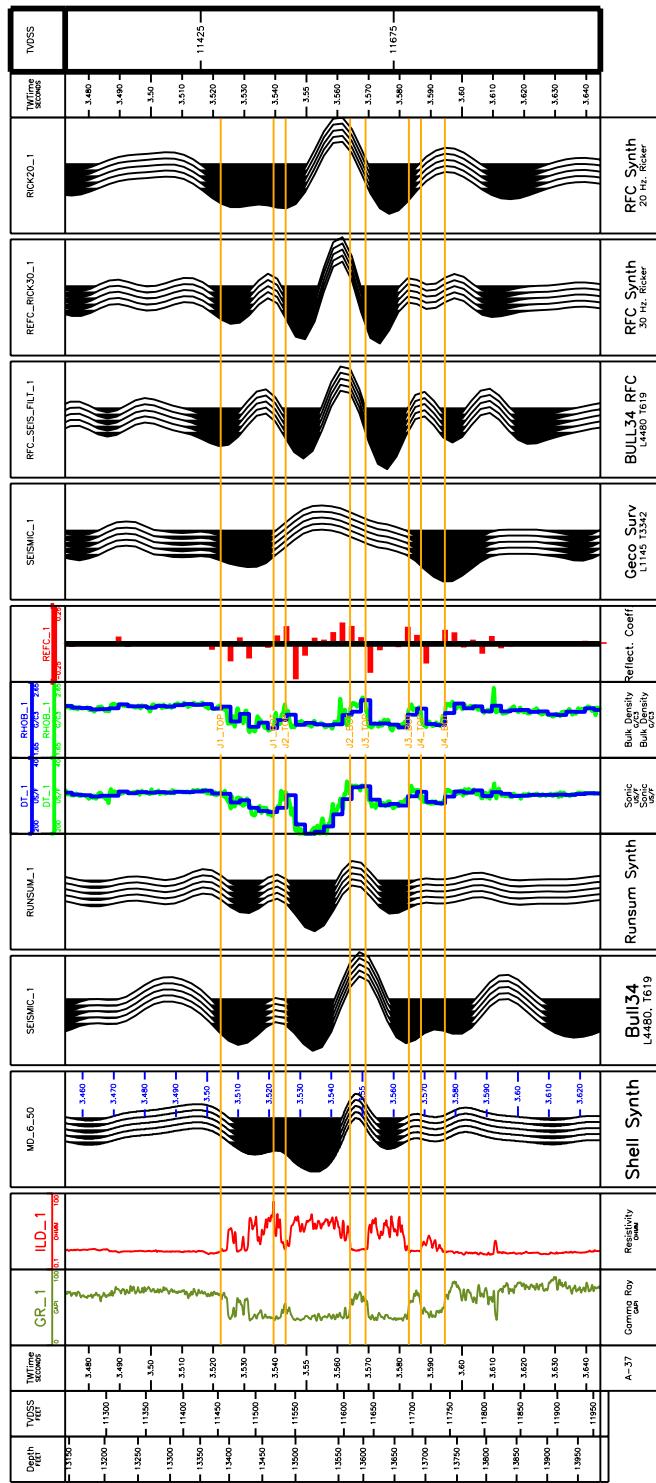
## A-37



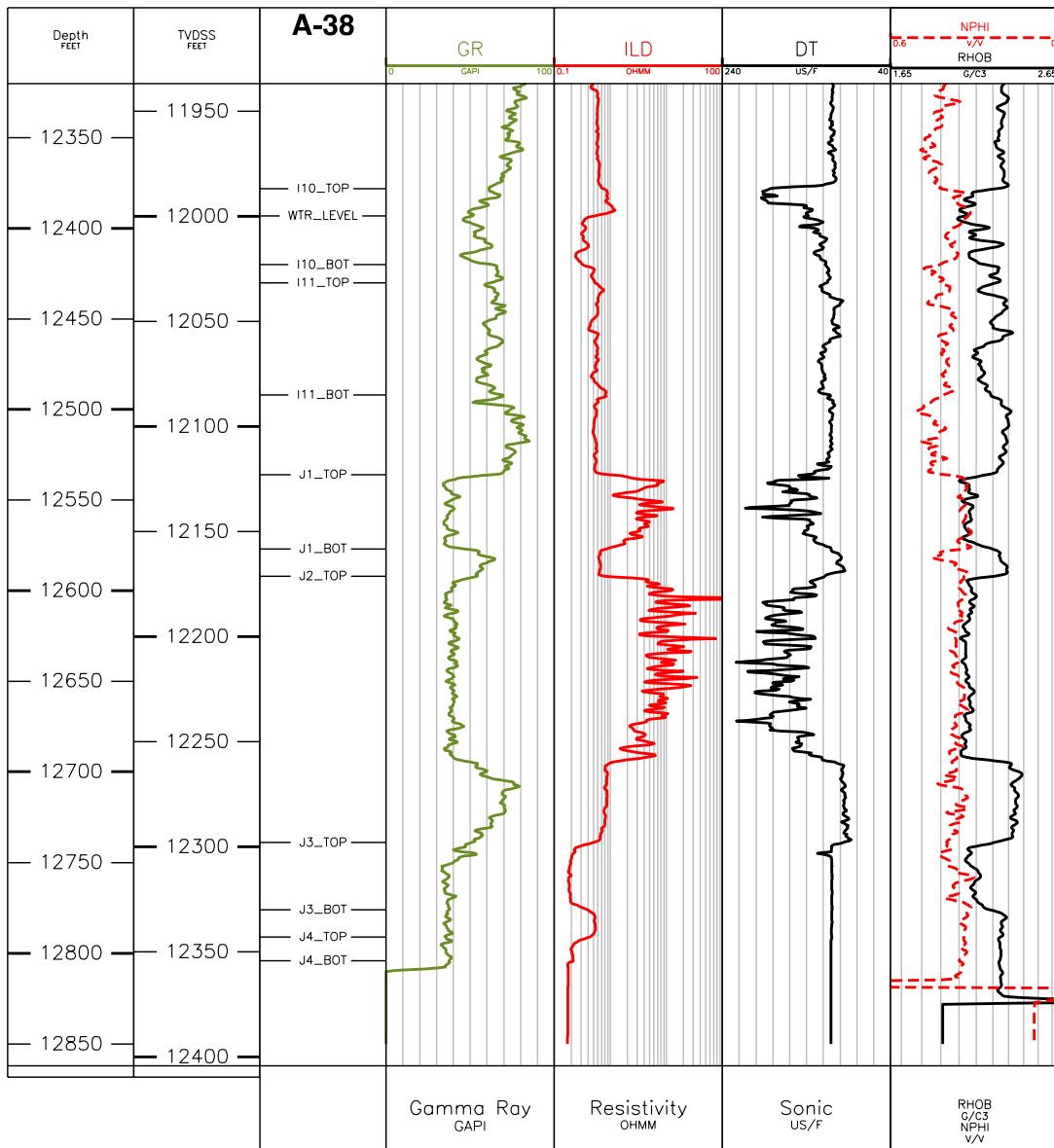
## A-37 Welltie



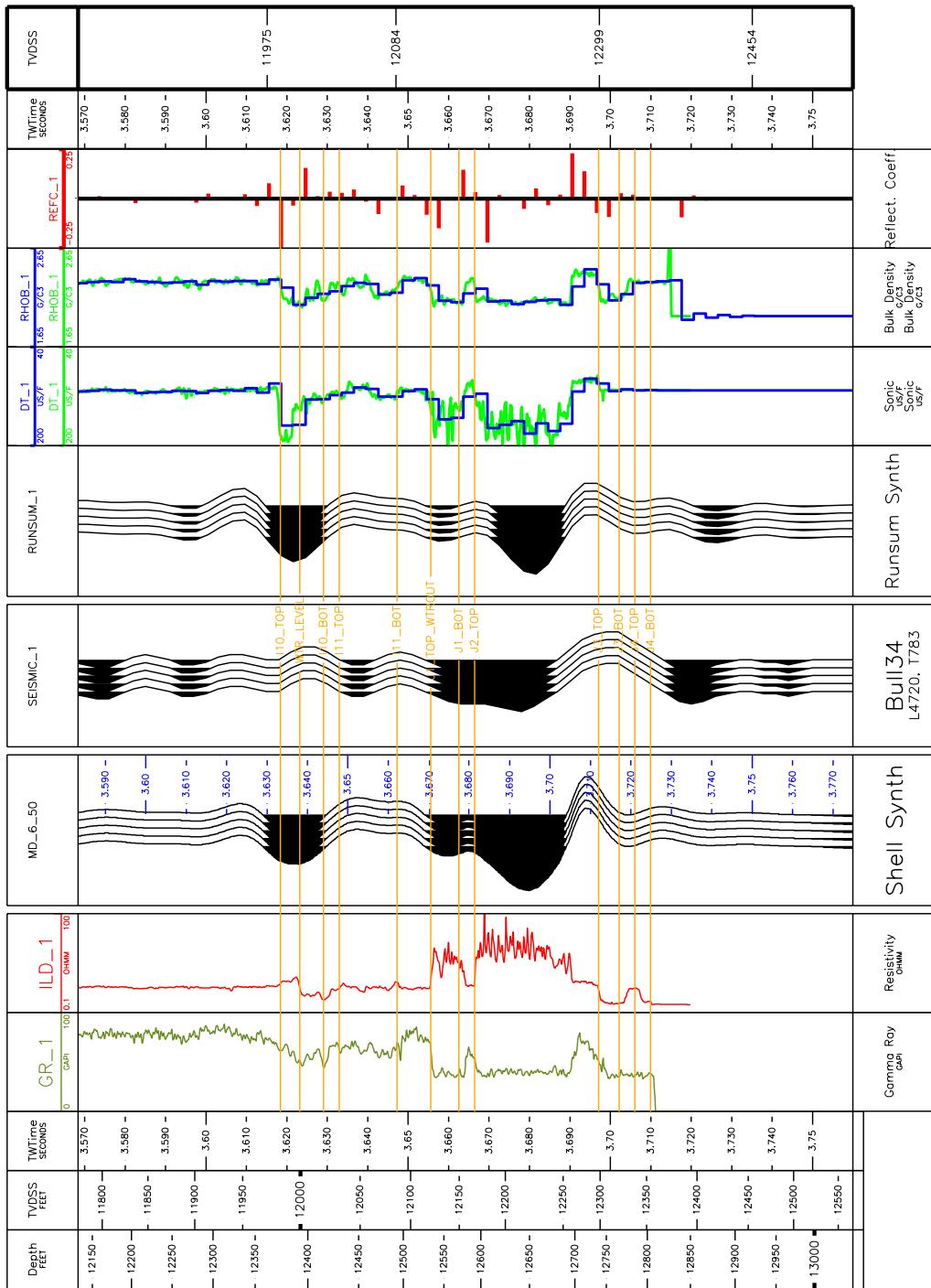
## A-37 Geco Survey (1995) Trace



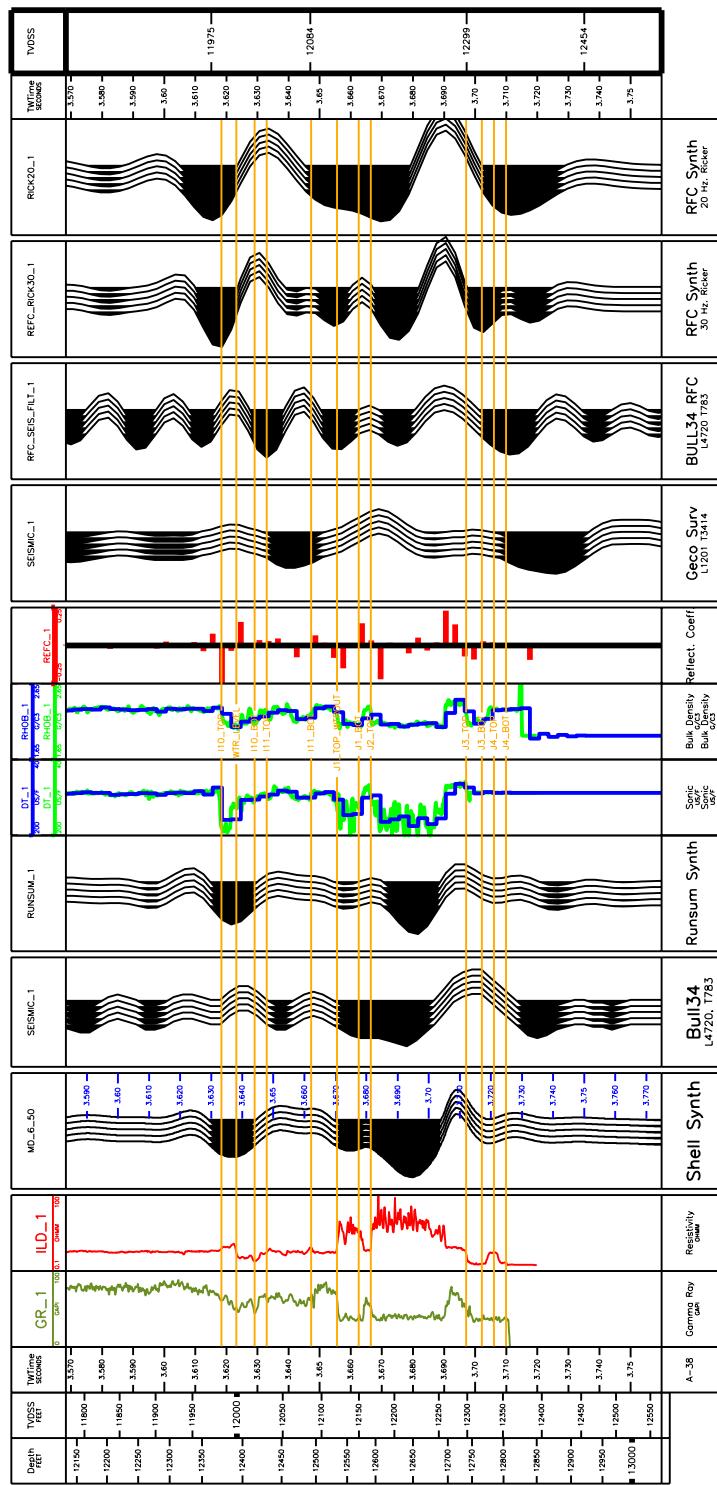
## A-38



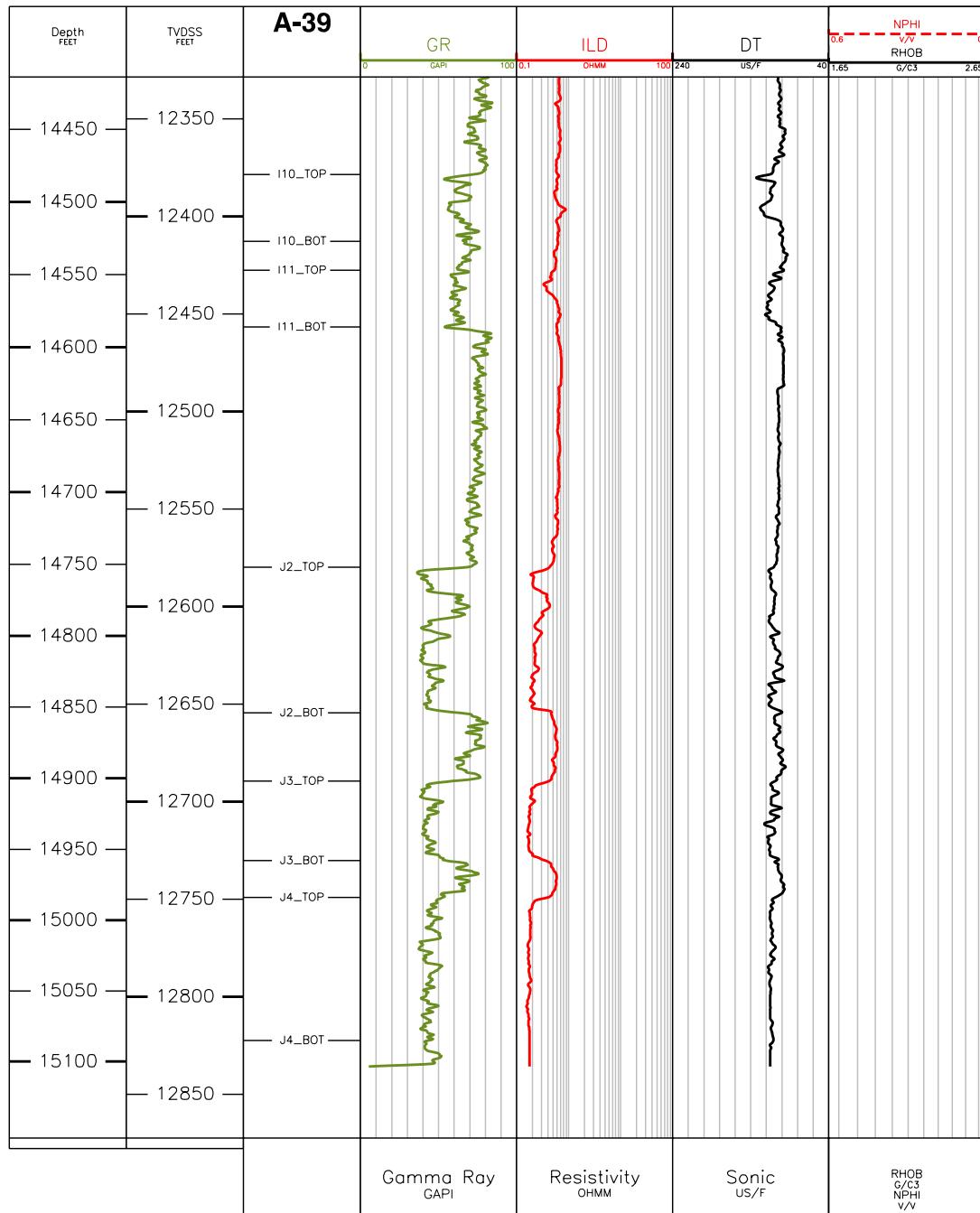
## A-38 Welltie



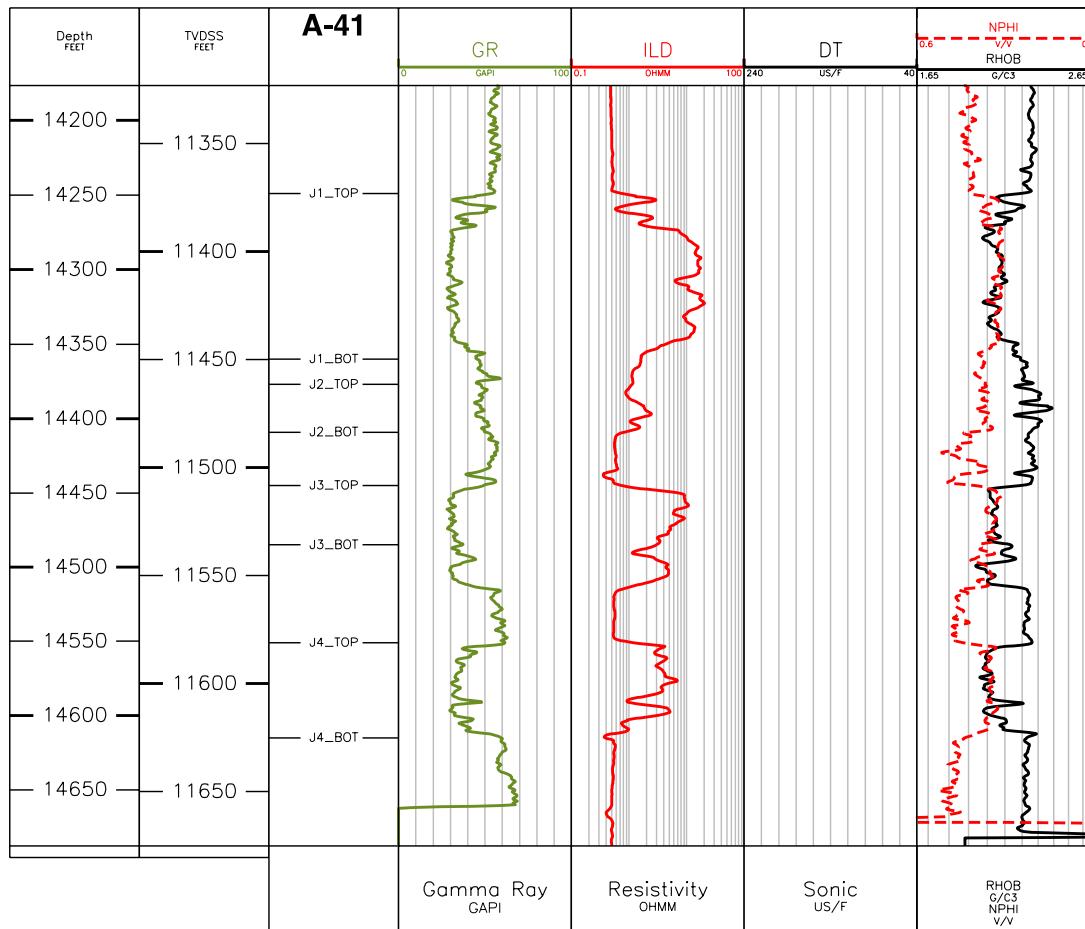
## A-38 Geco Survey (1995) Trace



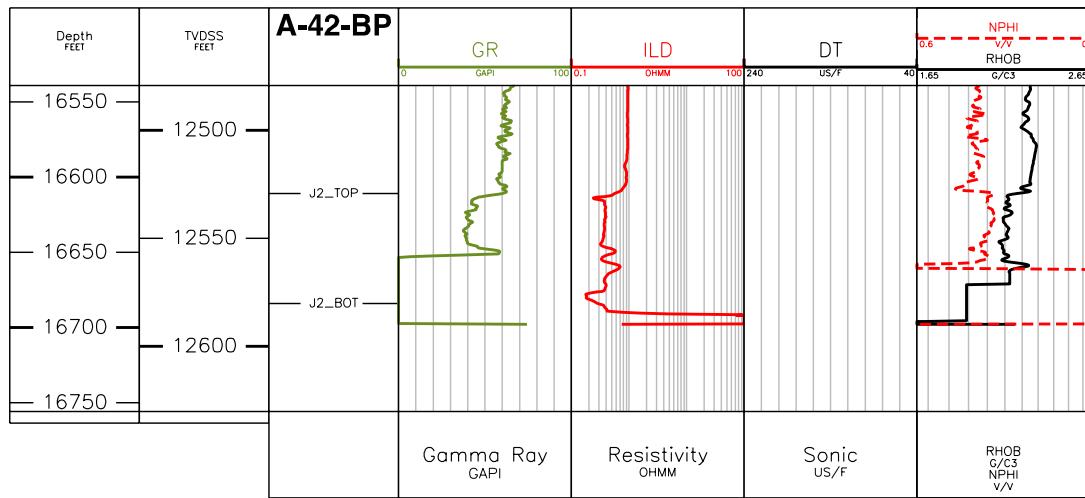
## A-39



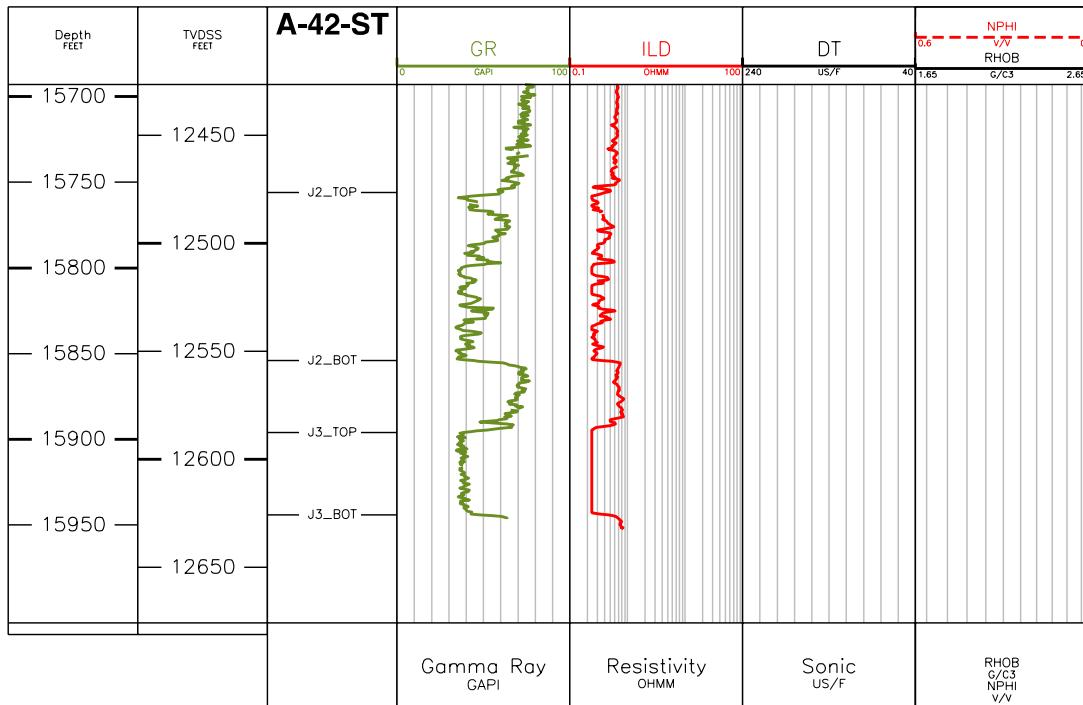
## A-41



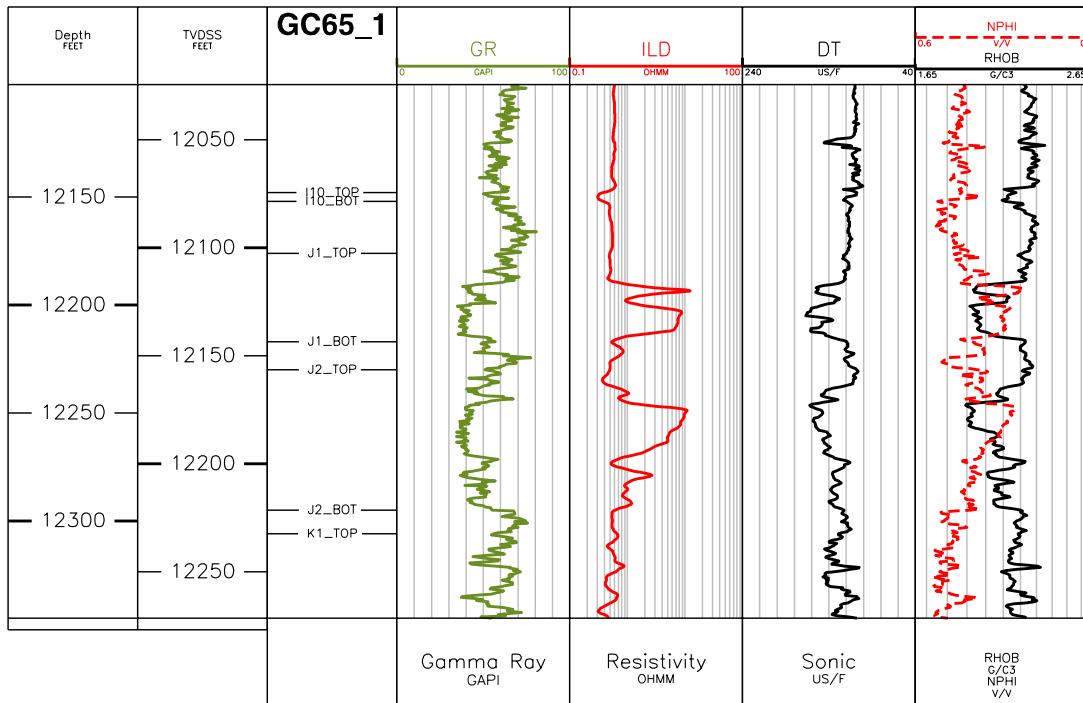
## A-42-BP



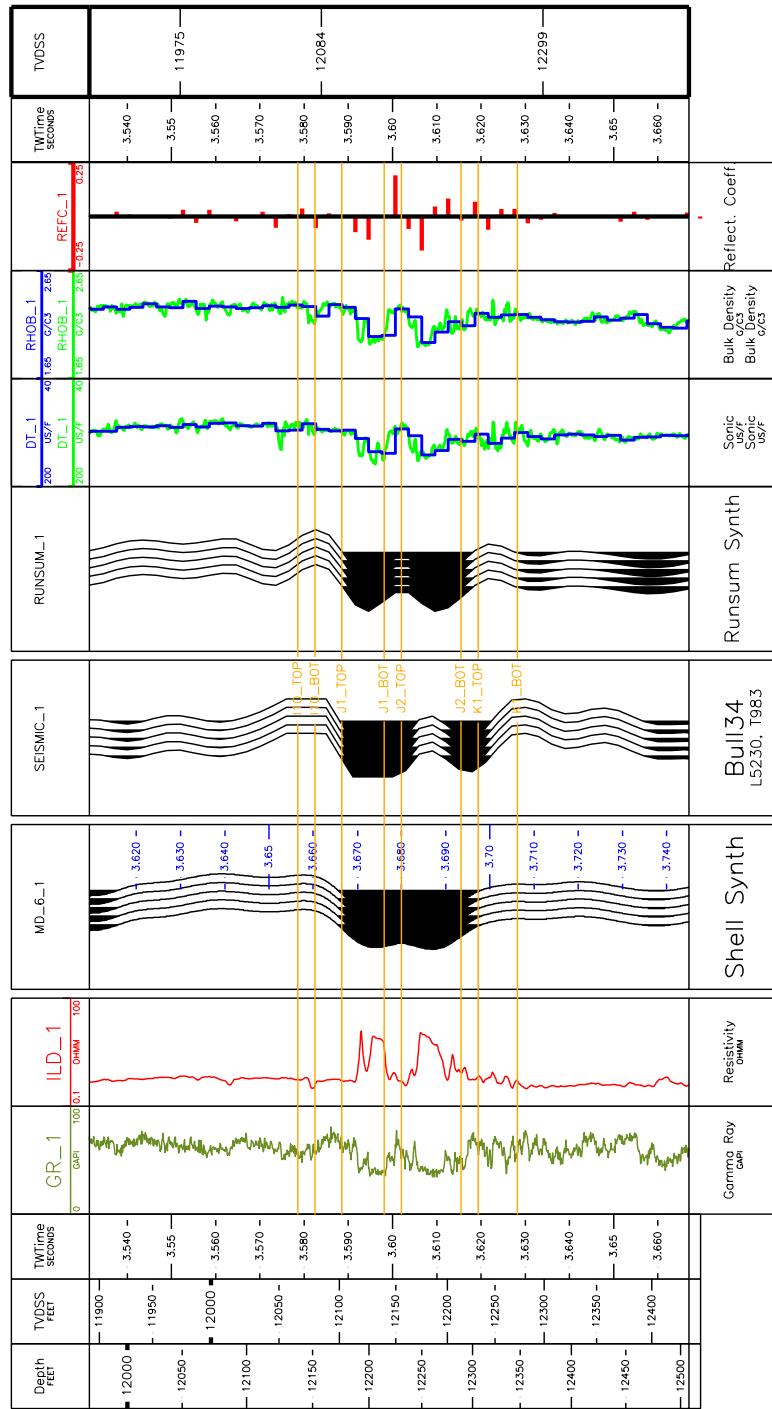
## A-42-ST



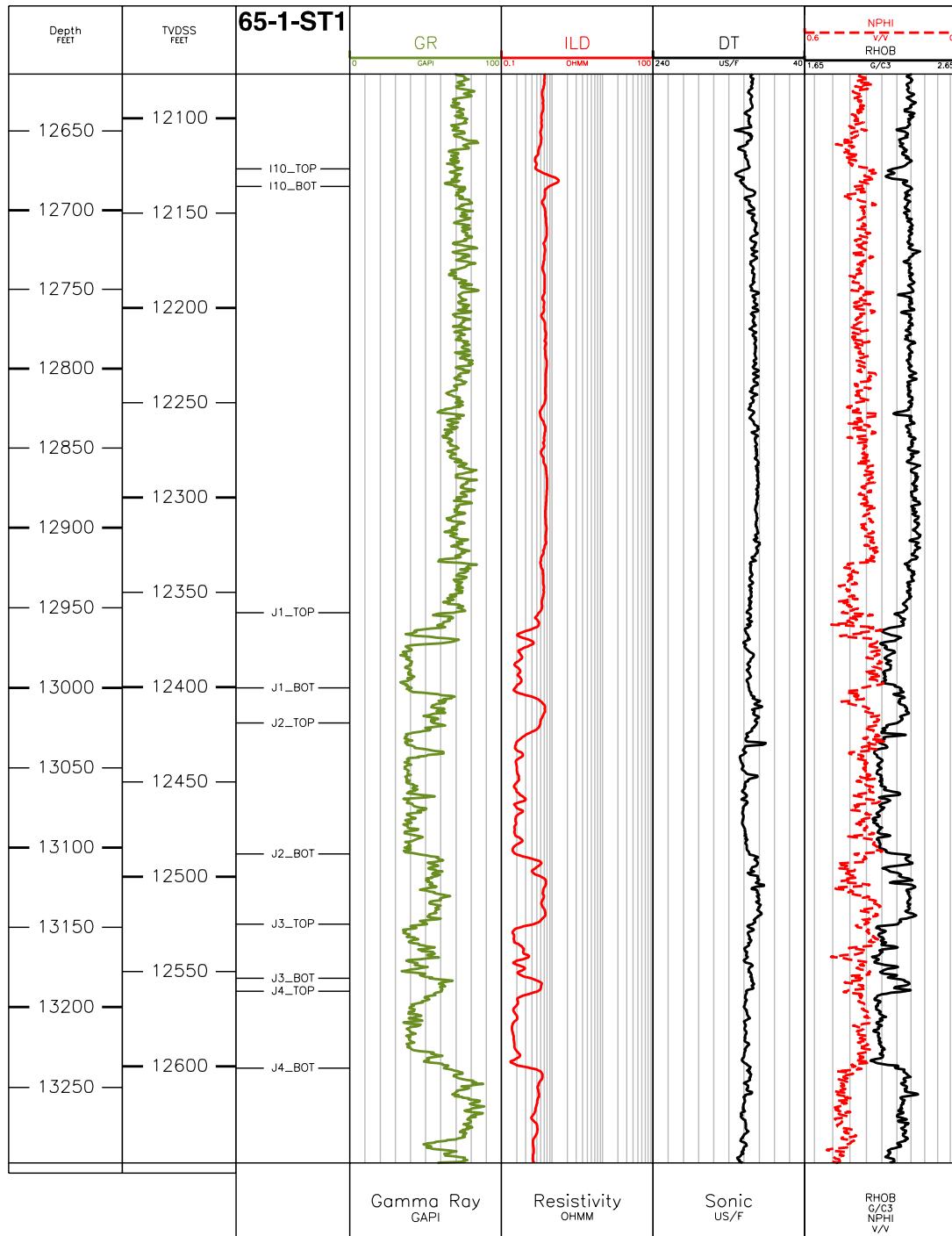
# 65-1



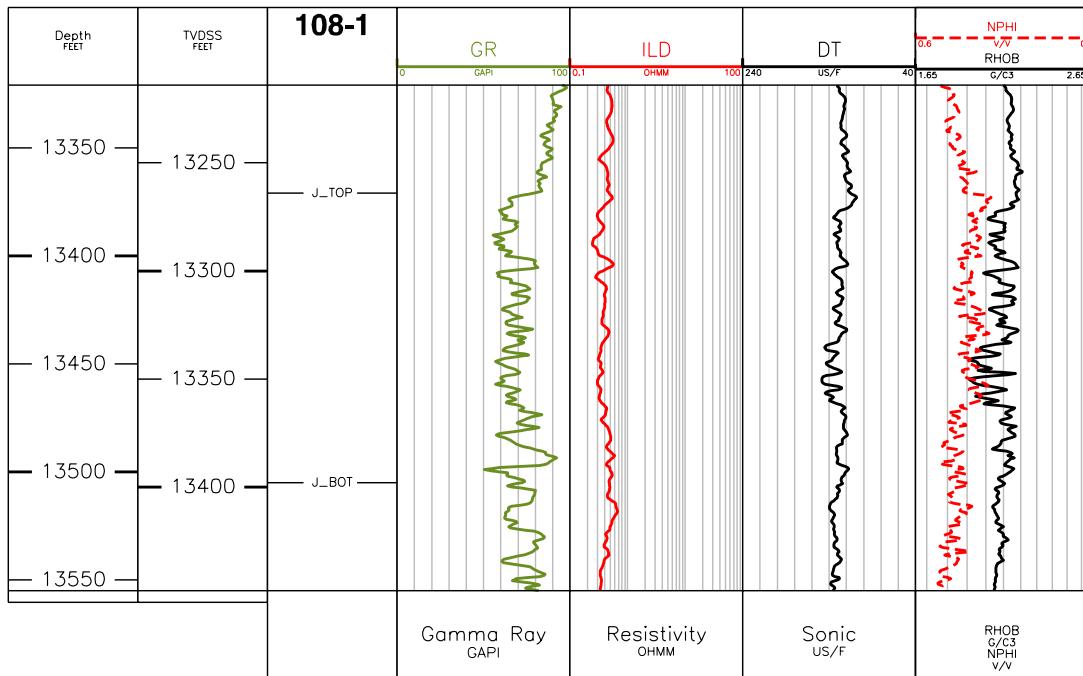
## 65-1 Welltie



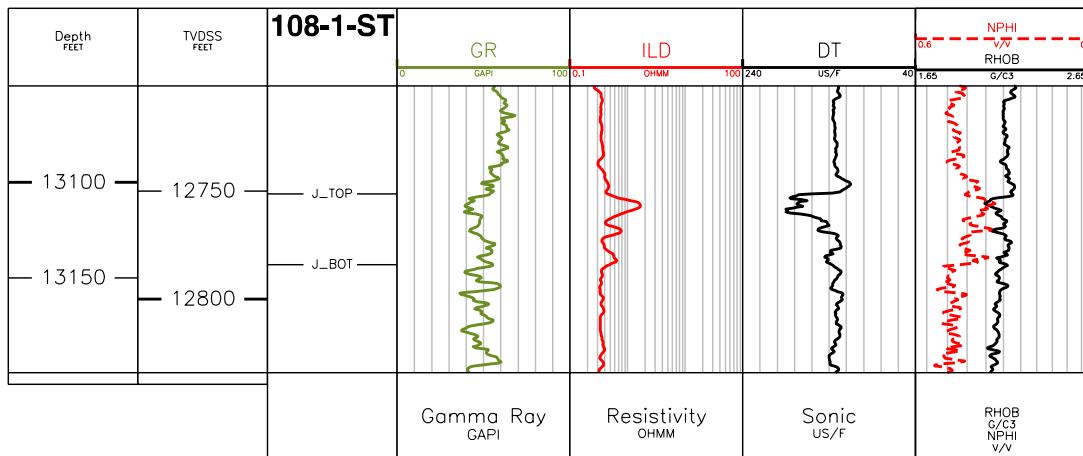
## 65-1-ST1



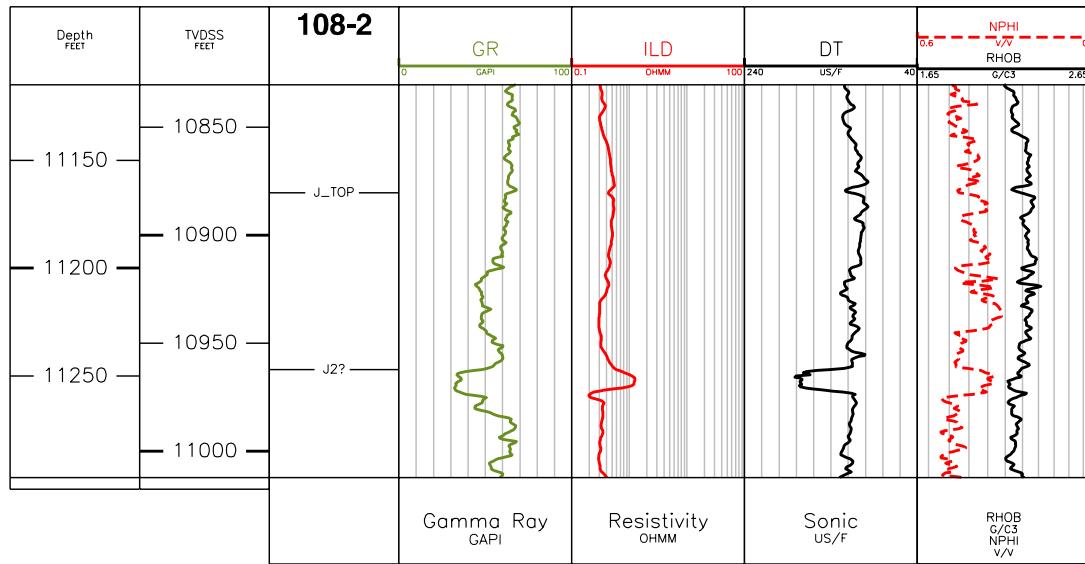
# 108-1



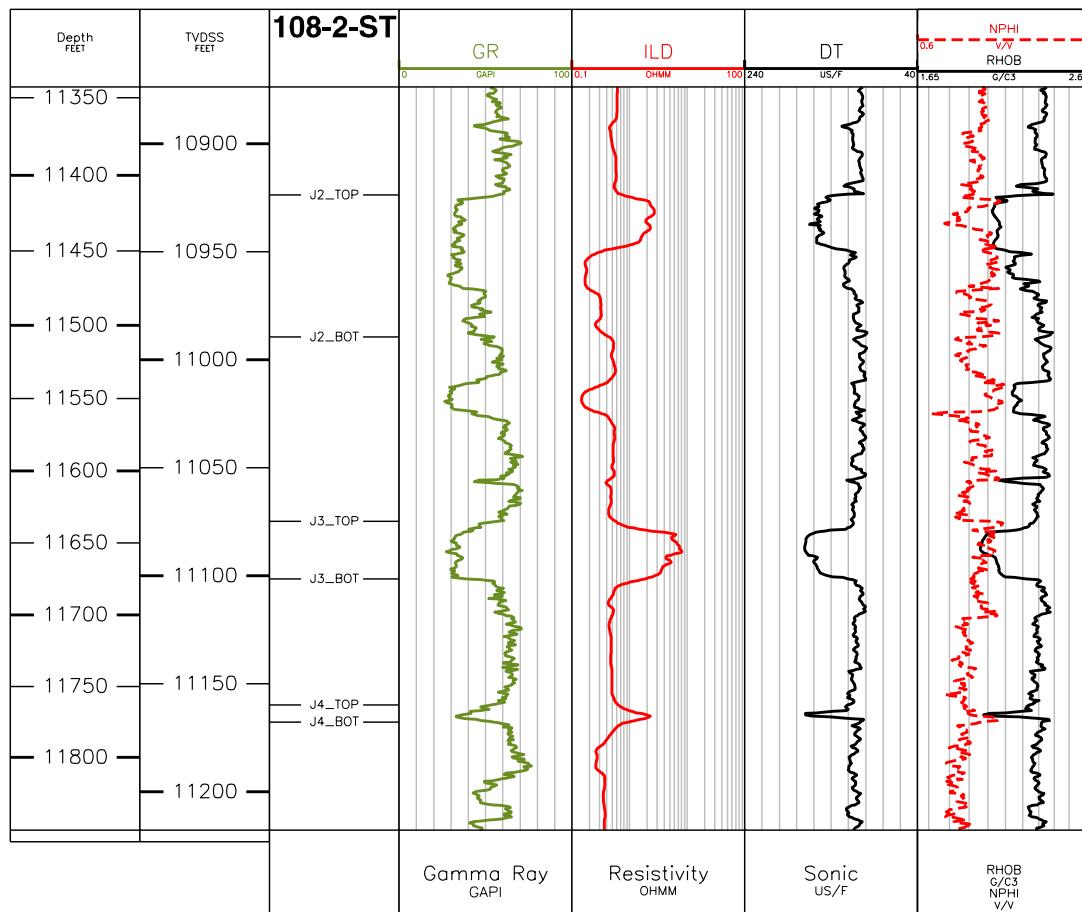
## 108-1-ST



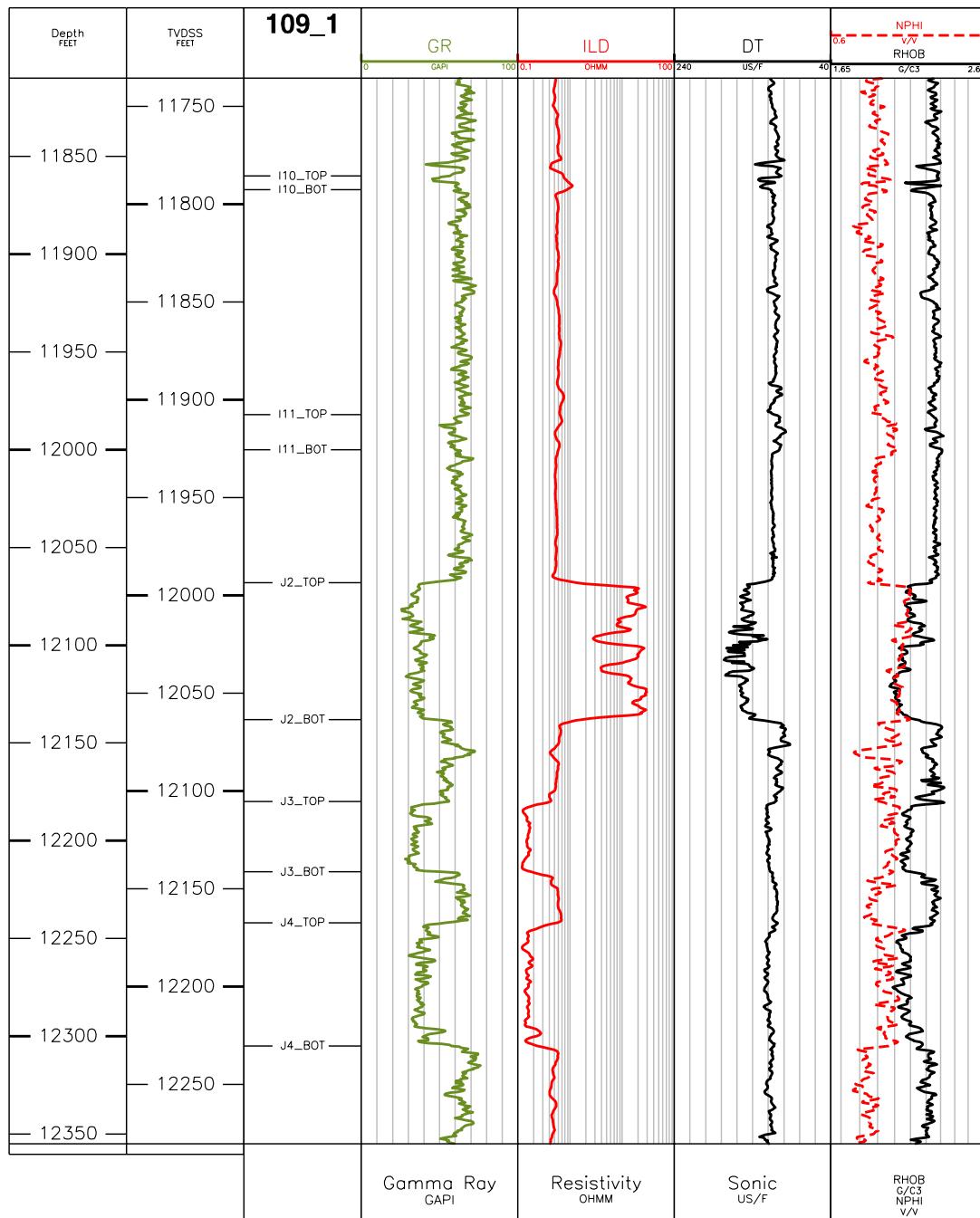
## 108-2



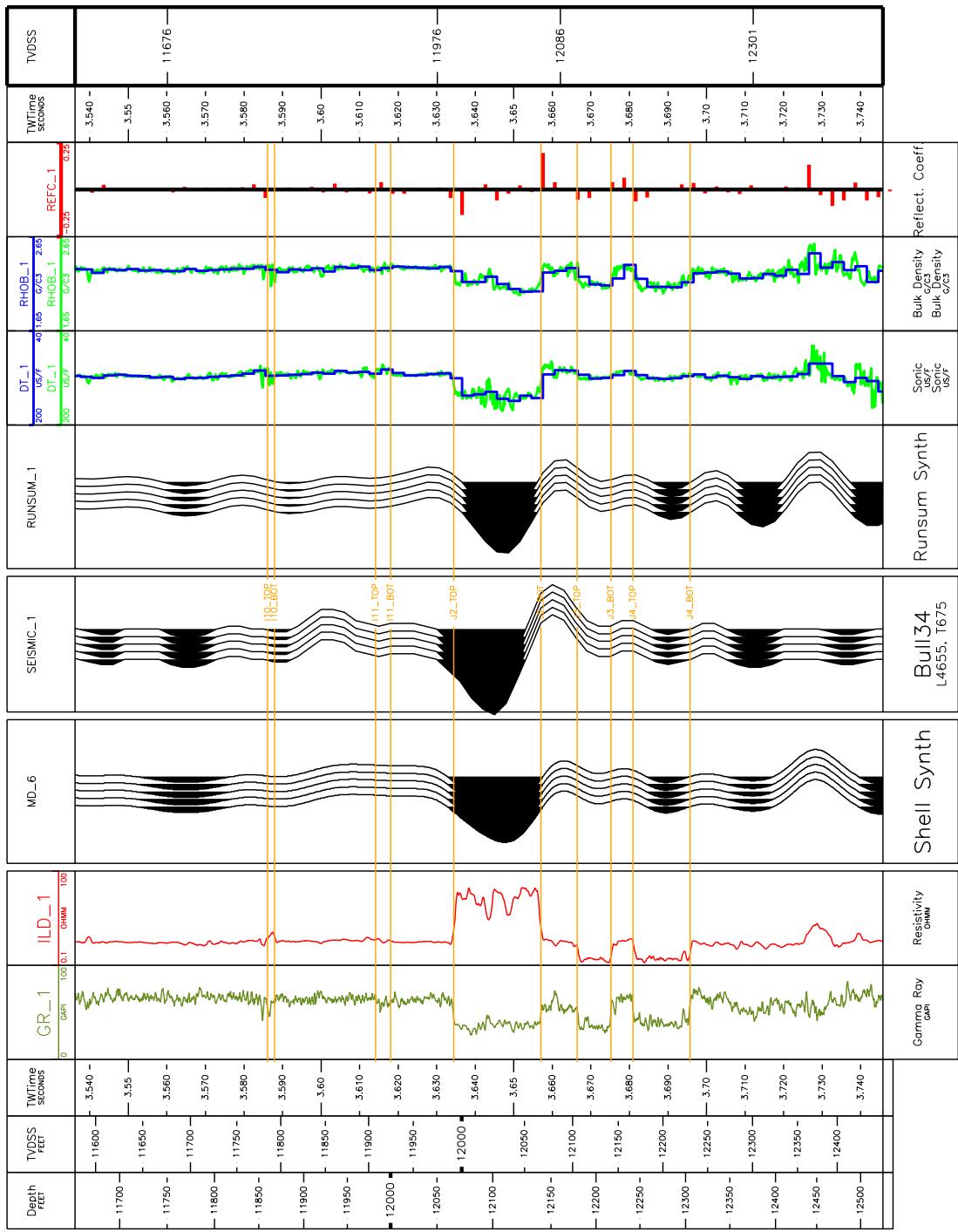
## 108-2-ST



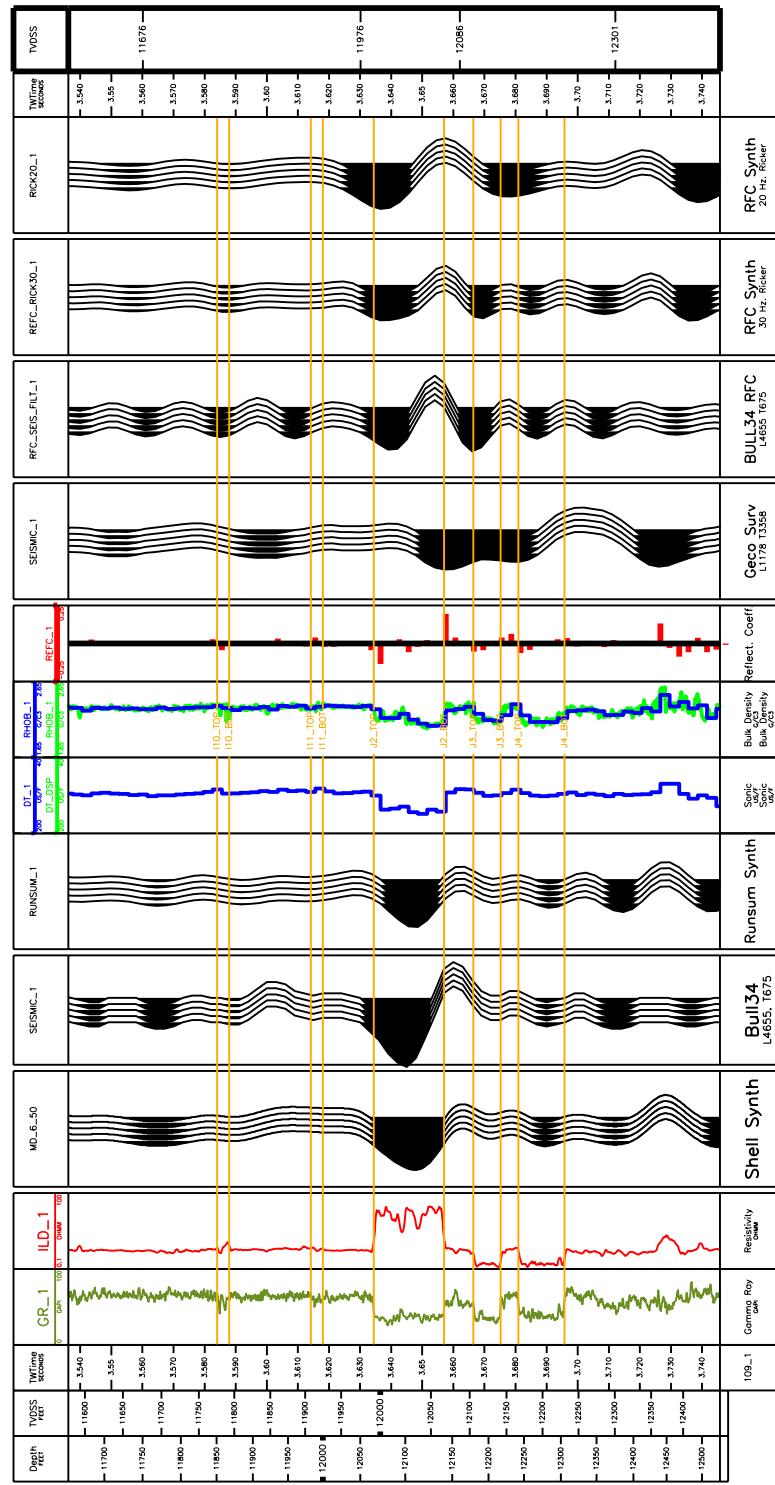
# 109-1



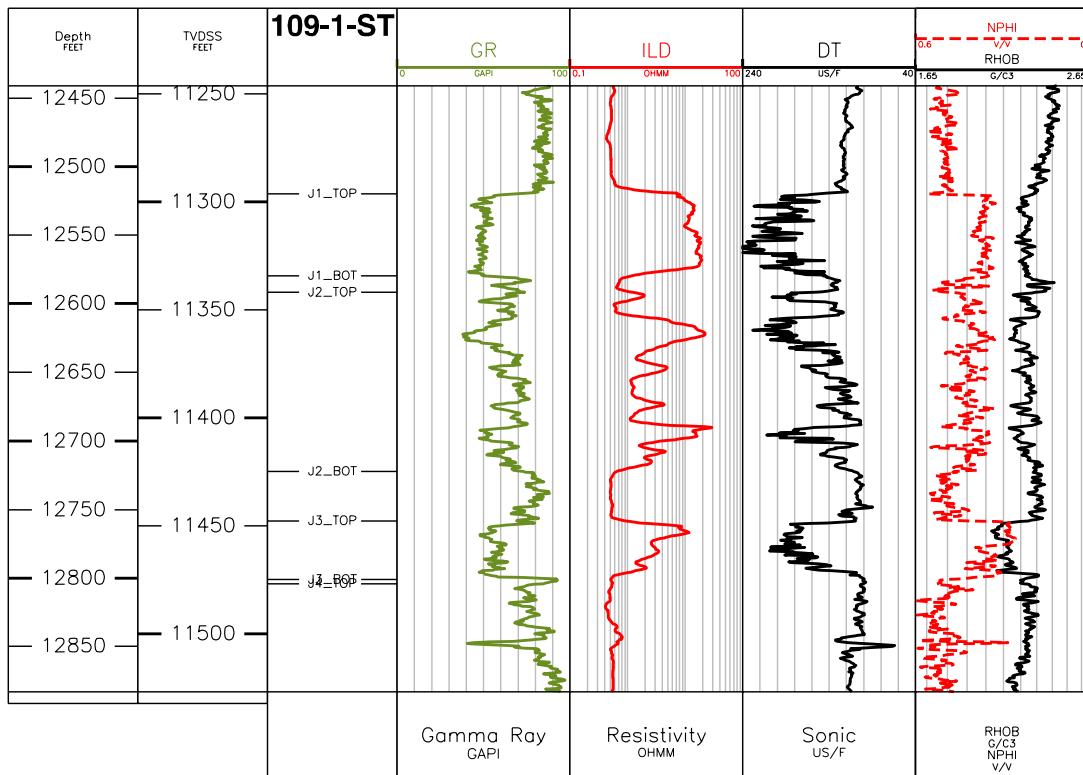
# 109-1 Welltie



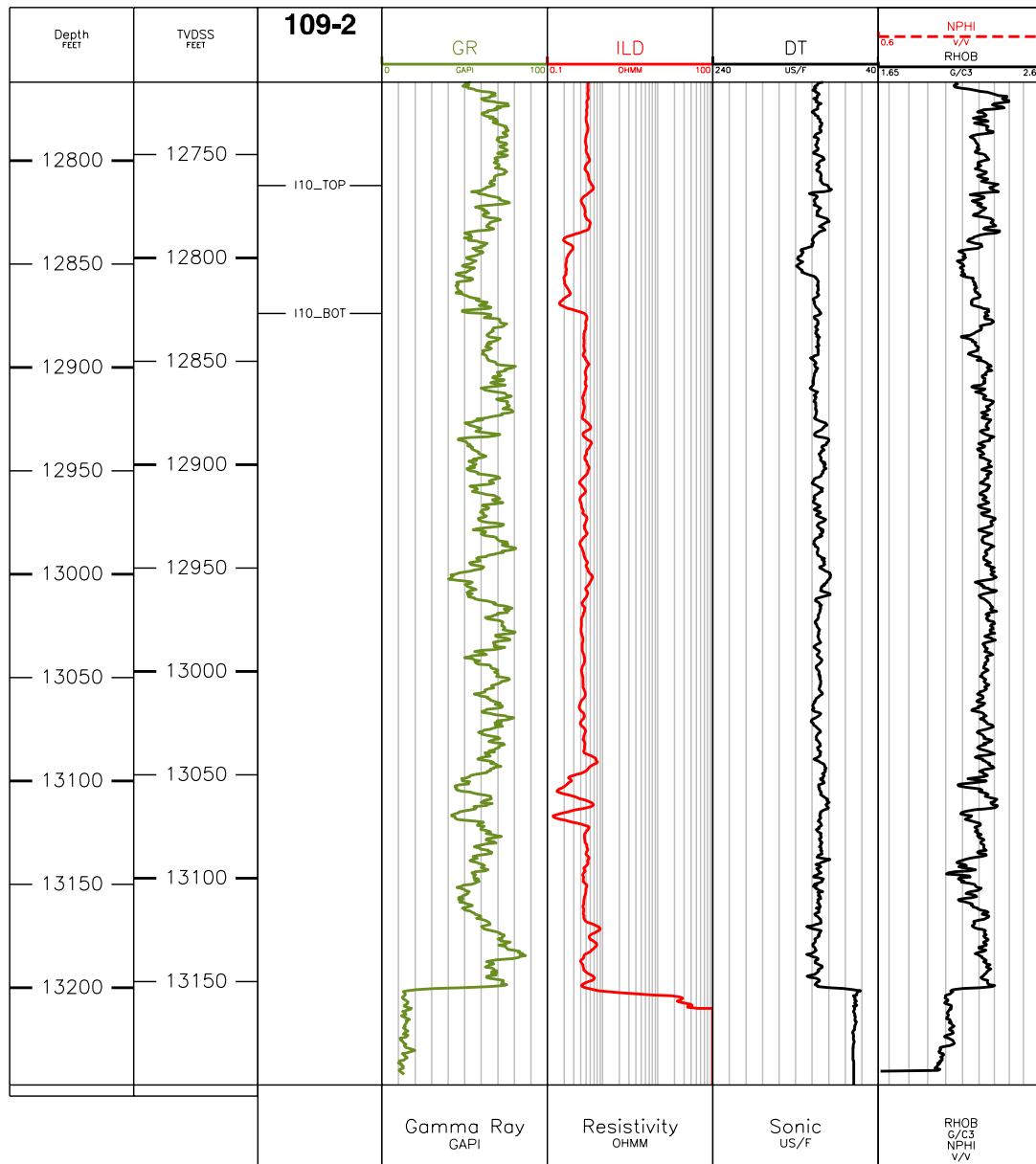
## 109-1 Geco Survey (1995) Trace



# 109-1-ST



## 109-2



## 109-2 Welltie

