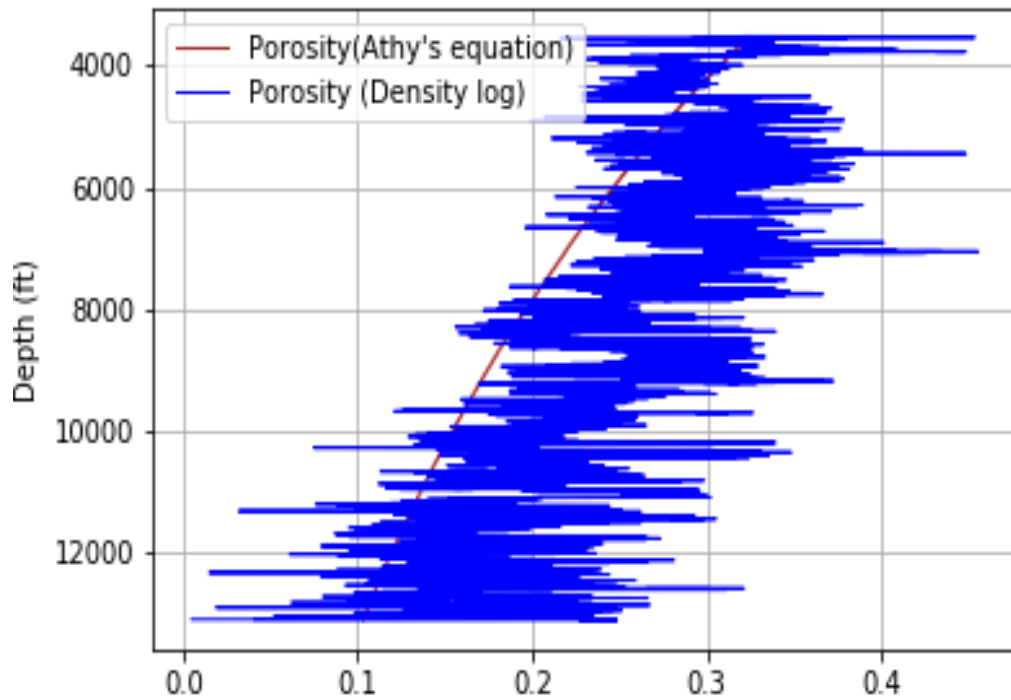


1. i. Porosity is calculated at each depth using the Athy's equation (see code).
 ii. Plot of theoretical compaction trend with porosity computed from density log. (See plot file for high resolution image)



- iii. Observing the porosity obtained from density log and the normal compaction trend, the overpressure starts from about 4800 ft downwards.
2. i. The pore pressure is estimated from Athy's equation using the following algebraic manipulations:

$$\phi = \phi_0 e^{-\beta \sigma'_v}$$

$$\frac{\phi_0}{\phi} = e^{\beta \sigma'_v}$$

$$\ln\left(\frac{\phi_0}{\phi}\right) = \beta \sigma'_v$$

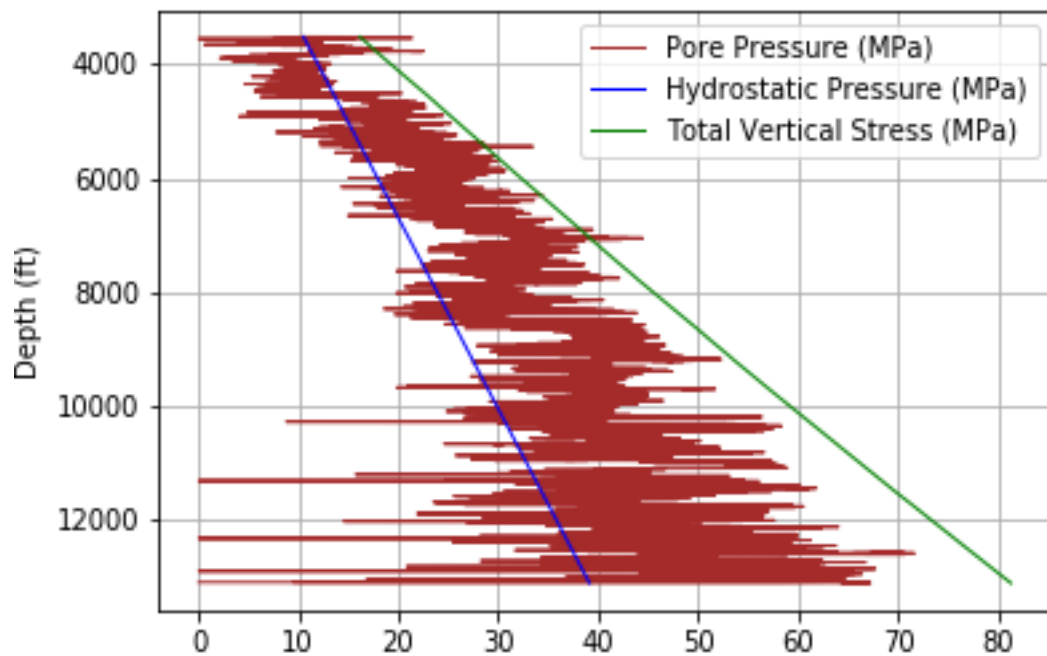
$$\frac{1}{\beta} \ln\left(\frac{\phi_0}{\phi}\right) = \sigma'_v$$

$$\frac{1}{\beta} \ln\left(\frac{\phi_0}{\phi}\right) = \sigma_v - P_p$$

$$\sigma_v - \frac{1}{\beta} \ln\left(\frac{\phi_0}{\phi}\right) = P_p$$

$$P_p = \sigma_v - \frac{1}{\beta} \ln\left(\frac{\phi_0}{\phi}\right)$$

- ii. Plot of the calculated pore pressure, hydrostatic pressure and total vertical stress. (See plot file for high resolution image)



- iii. At 10000 ft, the magnitude of over pressure is Pore pressure (10000 ft)-Hydrostatic pressure (10000 ft) = **8.034 MPa**.

3. i. Pore pressure calculated using the Athy's equation for Volve field using the equation obtained from 2. i. (see code).
- ii. Plot of the calculated pore pressure, hydrostatic pressure and total vertical stress.

