

Well Planning Services



Understanding and predicting the **pore pressure** and potential for **overpressure** in the subsurface is a key element when **designing wells**, whether exploring for **hydrocarbons** or **geothermal** energy, or when **decommissioning**. An informed pore pressure prediction allows understanding of:

- The drilling window, helping to design casing and mud-weight programmes to safely and efficiently drill the well, avoiding flow into the borehole.
- Key risks which may be issues in the well, where to expect them and what the magnitudes of pressure may be.

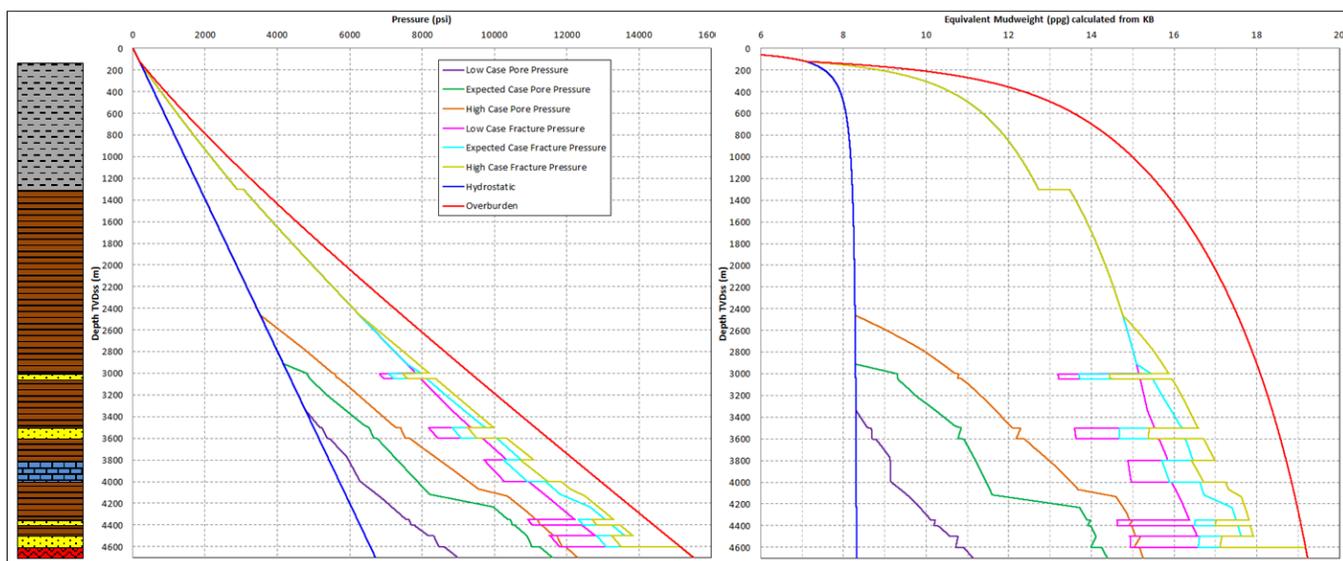
Geologically, understanding of overpressure distribution in reservoirs can also:

- Provide evidence of overpressure compartments, and therefore which faults may or may not be sealing.
- Identifying hydrodynamic aquifer flow, which can tilt hydrocarbon-water contacts, and therefore effect the volume of hydrocarbon that may be held in a trap.
- Allowing estimates of seal breach risk by contrasting overpressure with fracture pressure.
- Identifying areas of potentially enhanced porosity (overpressure in reservoirs aids porosity retention).

Calderdale Geoscience offer a full Well Planning service with deliverables as follows:

- Pore Pressure (Low Case, Expected Case, High Case)
- Fracture Pressure (Low Case, Expected Case, High Case)
- Overburden Pressure
- Hydrostatic Pressure
- Full set of presentation material
- Word reporting (if required).

Well Planning



To find out more about this service, Calderdale Geoscience, and for enquiries about quotes please contact:
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Or visit www.calderdalegeoscience.co.uk



Key questions we aim to answer in order to define the pore pressure and fracture pressure at a prospect



What do offset wells tell us?

- Load all offset well data and seismic: collate important information from well reports, digital logs, composite and mud logs.

What is the geological setting?

- Structure, deposition history, temperature, well correlation.

What mechanisms are generating pore pressure?

- Velocity-Density & Neutron-Density cross-plotting,.
- Effect on pore pressure prediction methods to use.

How are reservoir overpressures distributed?

- Fluid gradients and contacts.
- Identification of compartmentalisation, hydrodynamic flow.

What overburden pressures can be expected?

- Use offset well density logs.

Can shale pressure be predicted from logs?

- Velocity, density and resistivity data normal compaction trend analysis – calibration of results against drilling events.

Can shale pressure be predicted from seismic velocity?

- Assessment and calibration of seismic interval velocities.

What is the geological pressure model?

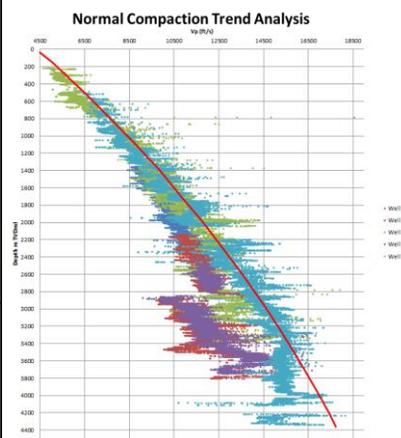
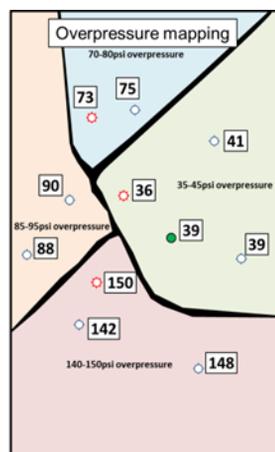
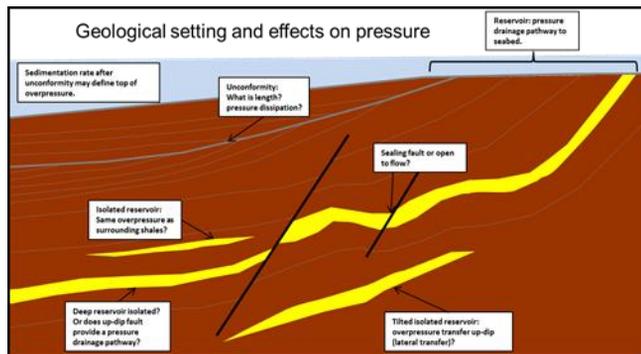
- Assimilate all observations into a model of pressure development: mechanisms, burial history, shale types, shale pressure vs. reservoir pressure.

What is the fracture pressure of the rocks?

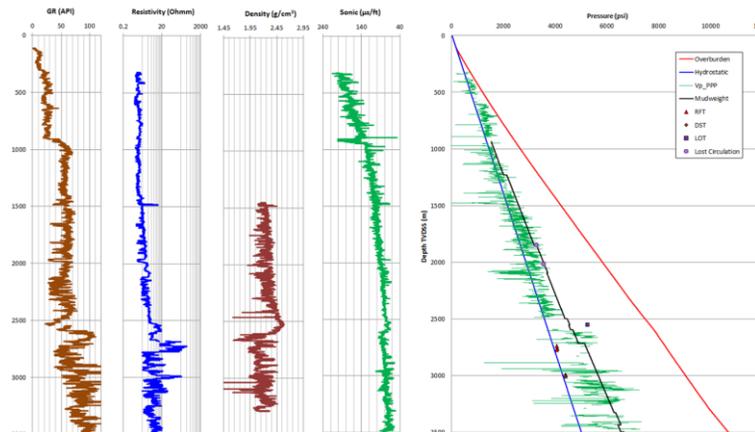
- Use of Leak-Off & Limit Tests and analysis using various fracture pressure methods.

How does the prospect structure and size effect pressure?

- Assessment of lateral transfer in the reservoirs.
- Calculation of buoyancy pressure from hydrocarbon.
- Seal capacity and risk of seal breach.



Shale Pore Pressure Prediction from logs



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