

# Intergrated analysis to understand the role of faults in groundwater movement

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## Methods

Hydraulic head is a specific measurement of liquid potential energy relative to a geodetic datum from petroleum wells and groundwater monitoring bores in Gloucester basin, NSW. Hydraulic head contours, involve fault interpretation from seismic data and TDS contours, were built on horizontal planes and cross sections to estimate fault sealed capacity.

## Results

Hydraulic head analysis showed groundwater on each layer group 1-6 (Figure 1, a) flow horizontally to the middle of basin discontinued by certain fault segments. In vertical, the opposite hydraulic head gradients showed in Waukivory area on each side of particular fault segment locations inferred a chimney of general permeability enhancement. Comprehensive account of TDS distribution (Figure 2, b) and hydraulic head distribution in Stratford area gave a probability of lack of across fault flows around TMB04 area and an upward flow through an undiscovered conduit fault near Stratford 7.

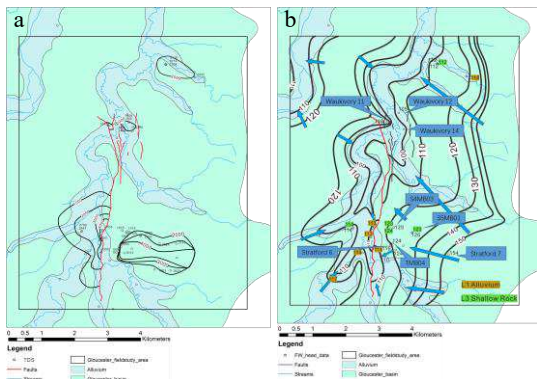


Figure 1: a, TDS distribution in shallow units.

b, Hydraulic head distribution in Layer 1-6

## Conclusion

Hydraulic head analysis is a good tool for evaluating fault property characteristics, which shows how groundwater flow directly near fault and makes up for accuracy of seismic interpretation partially. High TDS value, indicating upward flow, enhanced understanding of faults.