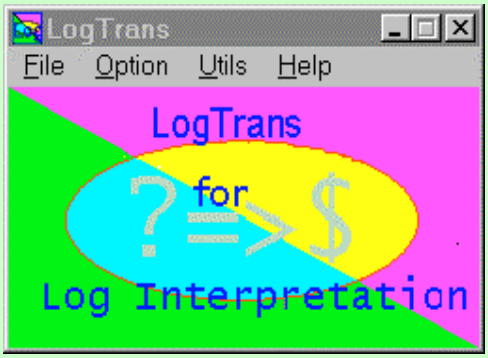
www.cmte.org.au

LogTrans

Automated Interpretation of Borehole Data

Fullagar Geophysics Pty Ltd

www.fullagargeophysics.com

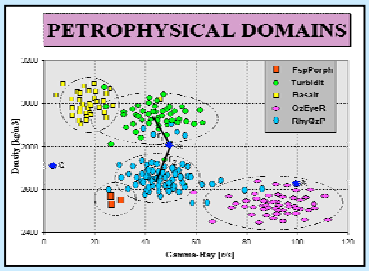


LogTrans is an automatic interpretation tool for geophysical borehole logs, developed by the Centre for Mining Technology & Equipment (CMTE), Brisbane, Australia. *LogTrans* performs rapid analysis of multi-parameter logs and expedites presentation of interpreted results in a form meaningful to mining engineers and geologists. It has been applied successfully to logging data sets collected from a number of Australian and overseas mines. Prediction accuracy in excess of 90% has been achieved in several cases. The key features of the program are

- Multi-log parameter discrimination
- Intuitive, fast & easy to use
- Adaptable for geological, geotechnical or geochemical interpretation
- Provision of a measure of confidence
- Optional stratigraphic constrains

LogTrans* procedure:** The algorithm exploits the contrasts in petrophysical signatures between different "classes" of rock. The classes may be distinguished by lithology, grade, mechanical properties, or any combination of characteristics. The ***LogTrans procedure entails two stages:

- ***Statistical characterisation***, involving determination of the centroids (means or medians) and ranges (standard deviations or spreads) of the distributions of each petrophysical logging parameter for each class, based on a representative control data set;
- ***Discrimination***, in which data points are assigned to the "nearest" control class in multi-parameter space.



(After Emilsson 1993 MSc thesis, Lulea University)

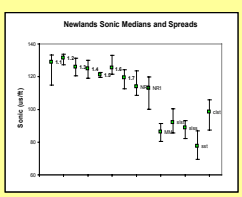
Case Study 1: Lithology and Coal Quality Interpretation

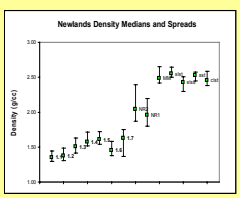
Newlands Coal Operation, Queensland.

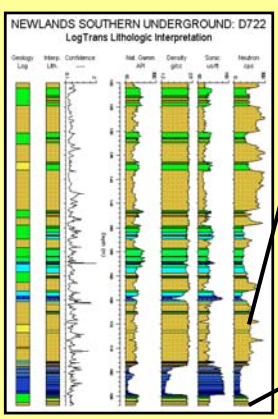
Resource: 186 million tonnes of steaming coal

Geology: The Upper Newlands Seam (UNS) is located within the middle Permian Rangal coal measures of the Northern Bowen Basin. The coal is hosted by a variably interbedded siltstone and sandstone. Seven plies (1.1-1.7) have been identified within the UNS, the lower 5 plies of which have a lower ash content and define the economic resource.

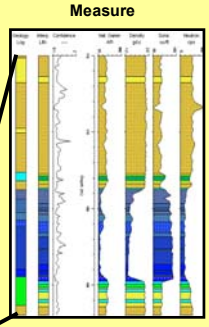
Interpretation: Discriminate low ash from higher ash plies, and interpret the cover sequence, based on gamma, density, sonic velocity, and neutron logs.







Zoomed Coal Measure



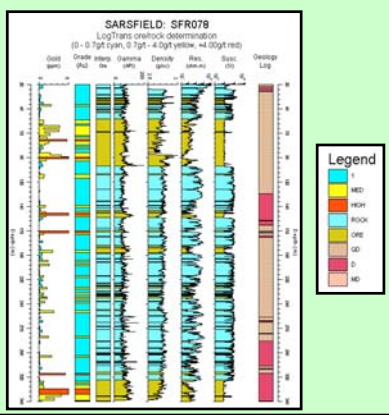
Case Study 2: Gold Ore Cutoff Prediction

Sarsfield – North East Queensland

Resource: 24.8 million tonnes @1.41 g/t gold.

Geology: Gold associated with sulphide (pyrite, pyrrhotite, chalcopyrite, sphalerite and arsenopyrite) in veins within tonalite. Magnetite-destructive wall rock alteration adjacent to the structures.

Interpretation: Waste discriminated from ore (>0.7 ppm Au) using gamma, density, resistivity, and susceptibility logs.



Further information

Peter Fullagar	Fullagar Geophysics Pty Ltd	tel: +61 7 3720 8321	email: fullagargeophysics@yahoo.com
Binzhong Zhou	CSIRO Exploration & Mining	tel: +61 7 3327 4630	email: binzhong.zhou@csiro.au