

**AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003**

David Hodgetts¹, David Hodgson¹, Eirik Vik², Steve Flint¹, Nick Drinkwater³ (1) University of Liverpool, Liverpool, United Kingdom (2) Statoil, Trondheim, Norway (3) Schlumberger Cambridge Research, Cambridge, United Kingdom

A Reservoir Model of the Tanqua Karoo Turbidites, South Africa, from Digitally Mapped Outcrop Data

Building reservoir models from outcrop data presents many complications from both data collection and manipulation, through to the model building phase. A reservoir model using outcrop data from the Tanqua Karoo (Ecca Group) basin floor fans has been built from data collected via Differential GPS (DGPS) mapping and digital photogrammetry in combination with traditional geological field techniques. The study area is 20 by 40 km x 250 m and comprises five Permian turbidite fans. The stratigraphy is deformed by thrust faulting at a sub-seismic scale. Within the regional study area several smaller scale areas have been identified and mapped in detail, these are used to investigate the geometries of differing styles of turbidite channels, lobes and sheets. The more detailed models are essential for the extraction of statistical information that may be used in populating reservoir models for subsurface analogues. New methods for the modelling of turbidite geometries have been developed using proprietary reservoir modelling packages (Roxar's RMS and Technoguide's PETREL), supported by in-house software, based on forward modelling of turbidity current flow direction, intensity and degree of confinement. These integrated techniques have been used to generate two models, one being a stochastically generated model using existing modules within the reservoir modelling packages, and the second being a more deterministic model using newly designed methods. The final reservoir model uses an adaptive grid to overcome many of the resolution problems associated with traditional uniform of proportional thickness grid. The adaptive gridding method allows statistics to be extracted from the model without those statistics being biased by the grid size and geometry.