Controls on the Geometry, Stratigraphic Distribution and Quality of Coals of the Middle to Upper Jurassic Strata in Eastern Australia

Carmine Wainman, Ph.D. Candidate, Australian School of Petroleum, University of Adelaide. Supervisor: Prof Peter McCabe

Challenges

• The heterogeneous character of the Walloon Coal Measures makes regional correlations difficult, with impacts on exploration and understanding gas yields across the Surat Basin.

• Various stratigraphic frameworks are used by different groups (e.g. Coal Measures vs. Subgroup).

• Paleogeographic reconstructions of the Walloon Coal Measures are questionable without a reliable stratigraphic framework.

• Geologic controls on the formation of thin (0.4m), discontinuous (<10km) coal seams remain enigmatic.

Goals and Outcomes

• Date a series of ash fall tuffs from the Walloon Coal Measures in order to improve current understanding of regional chronostratigraphic relationships across the Surat Basin.

• To recalibrate palynostratigraphic and lithostratigraphic frameworks in eastern Australian basins to the International Geologic Time Scale.

• To construct a new, robust sequence stratigraphic framework for the Walloon Coal Measures as a basis for paleogeographic reconstructions.

• To determine the relative roles of subsidence and climate on coal formation in the Surat Basin.

Results as of December 2015

• 20 ash fall tuffs from 9 wells have yielded zircon suitable for dating. CA-TIMS (chemical abrasion thermal ionization mass spectrometry) dating techniques have been used to obtain U-Pb isotopic ages, ranging from 168.10 Ma to 149.83 Ma +/- 0.04 Ma.

• Ash fall tuffs can be correlated between wells on a regional scale using U-Pb isotope ages.

• Recalibrating the palynostratigraphic framework is ongoing, but proving challenging due to the paucity of key spore-pollen taxa.

• Subsidence curves produced.

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