

## **The prospectivity for CO<sub>2</sub> storage in the Mesozoic formations of the Petrel Sub-basin (Bonaparte Basin): results from a regional-scale geological assessment**

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A regional assessment of the Petrel Sub-basin has identified Mesozoic formations highly prospective for CO<sub>2</sub> storage. The CO<sub>2</sub> storage play comprises the Lower to Middle Jurassic Plover Formation and Lower Cretaceous Sandpiper Sandstone reservoirs, which are sealed by the Late Jurassic Frigate Formation and Cretaceous Bathurst Island Group respectively; the latter forming the regional seal.

The study comprised a sequence stratigraphic approach through the integration of biostratigraphic, well log and seismic data to produce a new stratigraphic framework. Lithological, laboratory, petrophysical and seismic data were utilised to identify facies, with a focus on reservoir quality and sealing capacity for geosequestration. It was concluded that the reservoirs were generally good quality and across the basin overall there were effective seals. A series of palaeogeographic maps summarise this geological and geophysical data, which was utilised for geological models and 3D dynamic simulation models. A fault study and geological modelling indicate that major faults do not affect the containment prospects of the total storage play; this conclusion can also be applied to salt diapirism.

This multi-disciplinary geological assessment has identified several CO<sub>2</sub> storage prospects due to their good reservoir and sealing potential, which will be described in this presentation.