

Reservoir Characterization of the Jansz Gas Field, Northwest Shelf, Australia

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The Jansz Gas Field, discovered by the Jansz-1 well in 2000, lies in the Carnarvon Basin 250 km offshore from the northwest coast of Australia. The field covers approximately 2000km² in water depths ranging from 1100 to 1400 meters. The gas reservoir is an Upper Jurassic lower-shelf clay-rich sandstone, up to 50 meters in thickness, approximately 2800 meters sub-sea. Jansz gas is part of the Greater Gorgon deep water gas assets and is a focus for development activity to meet an expanding LNG market.

A detailed reservoir characterization study has provided the geocellular models required for reservoir simulation and optimized input to the field development plan. An integrated approach to subsurface reservoir analyses has allowed a range of reservoir uncertainty to be investigated, using a variety of geological scenarios.

A field appraisal program, including a 2900 km² 3-D seismic survey, three wells with 150 meters of core in the reservoir interval and a production test, was conducted from 2001-2005. The primary objective of the program was to determine the reservoir architecture and quality of the Upper Jurassic sandstone.

A chrono-stratigraphic framework for the reservoir interval was constructed using the 3-D seismic interpretation, wireline logs and biostratigraphic data. Several 3-D geologic models were built using this framework. Models were populated with lithofacies assemblages and porosity values using well control, geological concepts and a 3-D acoustic impedance volume. Permeability and water saturation were assigned using the lithofacies assemblage and porosity models, calibrated to wireline log and core data.