eReport

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ANLEC R&D Report Summaries

The following reports are available from the ANLEC R&D website:

Precipice Sandstone outcrops provide accurate measurements for reservoir modelling.

This is the first time that data gathered from the outcrop will be directly relevant to the construction of a static geological model that can be up-scaled to a regional model. This project was designed to develop analogues or conceptual sedimentary models from outcrops of the Precipice Sandstone, and to obtain measured parameters on architectural elements and their sedimentary facies which will assist in modelling the flow units that floor the Surat Basin. A series of virtual 3D outcrop scale grid models were produced that capture the sedimentological fabric and texture observed in the outcrops. The project provides a detailed model of the internal architecture of the Precipice Sandstone that will influence its behaviour as a reservoir including detailed facies descriptions and associations as well as their geometries that will be useful as analogues to control the assignment of reservoir properties within grid models.

Full report: Outcrop analogue models of the Precipice Sandstone.

Scoping study of options for low cost SO_x removal for post combustion CO_2 capture.

This project delivered a comprehensive technical and economic assessment of various smaller scale de-SO_x Flue-Gas-De-sulfurisation (FGD) technologies for CCS integration.
The presence of SO_x in the flue gas increases the solvent degradation rate, solvent loss and decreases CO_2 absorption rate. Removing SO_x emissions at a small scale need not incur the higher costs of available commercial solutions. This project evaluated alternative cost-effective and water-efficient processes for reducing SO_x in the flue case, suitable for Australian power plants which have a limited water availability. The analysis identified options that were water efficient, compact in design, well proven and compatible with plans for post combustion capture and storage in the Surat Basin.

Full report: Scoping study of technological options for smaller scale SO_x treatment.

Feasibility of monitoring an injected CO_2 plume at the South West Hub project site.

This study assessed the capability of different kinds of monitoring technology for mapping the movement of injected CO_2 over time in the South Perth Basin. Following a literature review, researchers updated the geological model based on a 3D seismic and ran reservoir simulations of various injection scenarios. They developed a geomechanical model for assessing the potential magnitude of ground surface uplift and conducted feasibility studies for both interferometric synthetic aperture radar (InSAR) and seismic monitoring. Researchers concluded that pressure monitoring, seismic surveys, gravity, magneto-telluric and electromagnetic methods are all suitable technologies with various sensitivity, accessibility and cost effectiveness.

Full report: Feasibility of monitoring an injected CO_2 plume at the South West Hub project site.

Research delivers more information on structure of the Lesueur storage complex.

This project delivers more information on the structure of the Lesueur storage complex, on which data was previously sparse. Researchers looked at the diagenetic history of the sediments and how this affected pore space and subsequent injectivity and storage potential. They studied the current and past nature of the formation fluids and reservoir compartmentalisation between the different fault blocks. Seismic constraints on the petrophysical character of the Lesueur Sandstone was also studied, along with geomechanical properties of the storage reservoir and overlying units. Researchers concluded that investigations, in areas including sedimentary facies, reservoir diagenesis and formation salinity, identified no issues that might suggest postponing or cancelling further investigations around the feasibility of the South Perth Basin geosequestration site.

Full report: The Lesueur: Deposition, Rocks, Facies, Properties.

Environmental influences on the Yalgorup in the Southern Perth Basin and its impact on CO_2 migration.

The Yalgorup, in the Southern Perth Basin, is a possible multi-barrier unit for mobile CO_2. It is made up of sedimentary units of low permeability clay-rich beds, interpreted as floodplain over bank deposits such as swamps, paleosols or crevasse splay environments and high permeability interbedded fluvial sands. This report presents the results of petrography and laboratory-based measurements that characterise microstructural properties, and the porosity and permeability, on ten Yalgorup Member samples in the South West Hub area of the Perth Basis. Among the main

conclusions drawn by researchers is that swamp facies have the best potential for barriers, containing high abundance of kaolinite, low porosity and permeability, small pore throats, and low density of micro-cracks.

Full report: Core characterisation from the main facies in the Yalgorup Member.

ANLEC R&D is a member of the following IEA implementing agreements. For access to their reports, please contact admin@anlecrd.com.au

IEA Clean Coal Centre Reports

Dooley, B., & Mason, P. (2018). "Supply chain costs of biomass cofiring".

Wiatros-Motyka, M., & Nalbandian-Sugden, H. (2018). "NOx control for high ash coals".

Lockwood, T. (2018). "Overcoming barriers to carbon capture and storage through international collaboration."

Carpenter, A. (2018). "Wastewater regulations and issues for coal fired power plants."

Zhang, X. (2018). "Coal and stationary fuel cells."

Sloss, L. (2017). "Environmental and other effects of coal mining and transport."

IEAGHG R&D Program Reports

- *Enabling CCS Clusters*
- *CO_2 Storage Efficiency in Deep Saline Formations – Stage 2*
- *5th Cost Network Meeting Proceedings*
- *Effects of Plant Location of Plant Location on the Costs of CO_2 Capture*