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| Title: Bentonite Plugs for low cost CCS well abandonment  Project Leader: | | Demo supported research: CTSCo |
| Project Number: *ANLEC TBD*  Status: *Under Development* | Commencement: 2018  Completion Year: | Total Budget:  ANLEC R&D Contribution: |

***The Context***

This project is aimed at supporting CO2 storage projects in Australian sedimentary basin, with initial emphasis on CTSCo Surat CCS demonstration project. The Surat CCS project proposes to source 180,000 tonnes of Greenhouse Gas Stream derived from a Huaneng PCC attached to the Millmerran Power Station in south eastern Queensland. The GHG Stream will be injected at 60,000 tonnes per annum for three years into the low salinity groundwater of the Precipice Sandstone. CTSCo will develop a Field Storage Plan for a demonstration site in EPQ10.

Current Queensland legislation requires the use of cement plugs for the abandonment of CCS wells. However, there is the potential for long term dissolution of those cement plugs by CO2 leading to CO2 leakage in the long term. An alternative is the use of bentonite as a lower cost plug option with high sealing-assurance. To provide assurance as well as fulfilling regulatory requirements, it will be be important to evaluate the suitability of bentonite as an effective abandonement plugs for long-term resistance to acidic/CO2 environment of CCS wells.

***Unknowns***

Suitability of bentonite as an alternative abandonement plugs for CCS wells under pressure, temperature and salinity condition of the Precipice sandstone across the Surat Basin

***Research Objective***

The objectives are;

* To evaluate the work done to date on the use of bentonite abandonment plugs for petroleum and CCS application.
* To verify suitability and long-term integrity of bentonite plugs as CO2 resistant alternative to cement for well abandoment.

***New Knowledge***

* Laboratory-based assessment of the chemical suitability of bentonite to act as an effective abandonment plug
* Pressure and temperature limitations on the application.
* Assessment of the requirement for novel hydration-delaying strategies for deep deployment of the method

***Milestones***

The project-work plan will be developed is organised around three project milestone objectives:

Milestone 1: Literature Review

* Review of the current status of bentonite as an abandonment plug for petroleum and carbon dioxide geosequestration.
* Review of current abandonment requirements under the Qld Greenhouse Gas Act and the Qld Petroleum Act.
* Preliminary assessment of the presently known constraints to the deployment of bentonite in the deepest part of the Surat Basin
* Recommendations for laboratory-scale testing of bentonite at the range of pressure, temperature etc. the Surat Basin (with input from CTSCo).

### Milestone 2: Conduct Laboratory Experiments

* Conduct laboratory experiments to verify suitability and long-term integrity of bentonite plugs as a CO2 resistant alternative to cement for well abandonment.

### Milestone 3: Final Report