Expression of Interest

Aquistore 2017

The PTRC is seeking potential vendors to provide a geochemical analysis of salt precipitation in the Aquistore CO_2 disposal well.

Project Description:

Aquistore is a CO_2 storage project with both commercial and research aims led by the Petroleum Technology Research Centre (PTRC). The project goal is to sequester carbon dioxide (CO_2) in a deep saline aquifer in the vicinity of Estevan, Saskatchewan. CO_2 injection commenced on April 16th, 2015 with over 100,000 tonnes injected to date. To operate this project efficiently, the wellbore must maintain its quality and sustain high injectivity levels. Since salt precipitation is known to pose issues with injectivity across different wells, Aquistore is seeking to find a vendor(s) capable of assessing the potential for, and/or understanding the causes of salt precipitation around the project's wellbore.

The CO_2 injection interval at the Aquistore site is the basal Cambro-Ordovician succession, which is encountered at a depth of approximately 3200 meters and is approx. 150 m thick. The injection intervals contain relatively-hot (~120C) and highly saline (320,000 mg/L) Sodium-Calcium-Chloride formation-fluids hosted in thick sandstone aquifers of the Deadwood and Winnipeg Formations. The injection horizon is overlain by the Icebox Member of the Winnipeg Formation, which is a regionally confining shale horizon.

Objectives of this Request for Expressions of Interest

Studies have shown that salt precipitation can take place due to dry-supercritical CO_2 ($scCO_2$) being injected into a brine-saturated saline aquifer. This salt precipitation can cause a reduction of permeability, thus having adverse effects on well injectivity and causing pressure build-up. Strong evidences of salt precipitation primarily have come from theoretical modelling and field observations of gas injections or storage.

A number of linked physio-chemical-thermal processes complicate CO_2 injection at the Aquistore site. Supercritical CO_2 is pumped down a 3350 m deep well that is variably perforated in four discrete zones over the bottom ~175 m of its length. The different injection horizons are predominately sandstone, with minor carbonates, and all host 320 g/L formation-fluids at a temperature of ~120 C. Injection of CO_2 is variable, with sustained periods of no injection.

This Request for Expression of Interest (RFP) is issued by PTRC to identify and select a vendor(s) to will develop a full proposal for a project to predict and/or confirm whether there is salt precipitation occurring near the wellbore at the Aquistore site. For the first Phase of the project the vendor(s) will investigate and evaluate whether there is injectivity loss caused by salt precipitation. This will involve developing a predictive geochemical model capable of handling the observed downhole pressure, temperature, formation-fluid composition, and reservoir lithology. Results of this modelling will be used to guide further work in the Aquistore project, and potentially lead to Phase 2. .

If warranted, the second Phase of the project will be to develop and test/evaluate a coupled geochemical-wellbore-reservoir model to investigate any salt-precipitation process that might occur within the wellbore or the formation as a result of CO_2 injection. Depending on the complexity of the project, this could potentially lead to Phase 3,

The third Phase of the project is to use the coupled geochemical-wellbore-reservoir model to develop a process for mitigating any potential barrier around the wellbore to improve storage, containment efficiency and injectivity of the well.

1) Capability. Please indicate the providers existing capability for dealing with the physio-chemical-thermal conditions of CO2 injection at the Aquistore site
2) Methodology. Briefly explain the proposed approach for addressing the overall objectives of Phases 1, 2, and 3 of the project.
3) Budget. Indicate the budget required for each of the three Phases.
4) Timeline. Indicate the proposed timeline for each of the three Project Phases.

It is anticipated that this expression of interest will lead to the identification of one or more Providers that will work with PTRC to develop a full proposal that will include detailed budgets, scope of work, deliverables, etc.

1. Submission

Submit this form as an attachment to admin@anlecrd.com.au

2. Project Details

Project Title (12 words maximum)	
Expected Duration	

3. Project Leader

Name			
Position			
Organisation			
Telephone		**Facsimile**	
Mobile		**Email**	

4. Cost Breakdown

Note: The budget estimate provided should account for PTRC's requested contribution as well as expected contributions from other partner organisations and internal funding.

Please provide estimate of expected cost:

Items	Cost: CDN
1. Labour	
2. Materials	
3. Documentation	
4. Travel	
Total	

5. Other required information (This section should not exceed 1- 2 additional pages of text)

Capability to conduct the proposed project

Research methodology

Timeline