

Project Profile

Project Name:	Towards Optimizing Well Plug and Abandonment in British Columbia through Data Analytics, Field Investigations and Predictive Modelling
Project Number:	ES-Wells-2021-02
Proponent:	Institute of Geoenergy Engineering, Heriot Watt University
Funding Envelope:	Engineering and Safety Research—Wells, Facilities, Other
Timeframe:	January 1, 2021, to December 31, 2021

Project objectives

The objectives of this project are to evaluate historic well plug and abandonment (P&A) performance to provide increased knowledge for optimizing ongoing and future P&A costs and performance—considering the following:

- How and where has longer-term (i.e. greater than Certificate of Restoration time scales) performance of P&A been assessed and by what methods?
- How have varying P&A configurations performed with time?
- What factors contribute to optimal or sub-optimal performance?
- Can we predict performance to support a risk-based P&A design with lower cost?

Project description

This project will involve collecting and analyzing regulatory data on existing P&A'd wells and their performance. This data will include publically available datasets with respect to approximately 7,000 P&A'd wells in British Columbia and approximately 170,000 in Alberta. Field investigations will assess short term performance of P&A in B.C. as part of the Certificate of Restoration (COR) process. Data gained will provide new insights on P&A performance over longer timescales than assessed before. This information will contribute towards optimizing forthcoming P&A activities and in particular look to identify strategies to maximize integrity while minimizing costs.

Project approach

The project will involve the following three phases over the 12 month project:

1. Collate and analyze existing regulatory P&A data in B.C. and Alberta—using publically available datasets and recently acquired data from aerial surveys that focused on qualitatively measuring methane emissions. Any ground investigations recently performed will also be collected and analyzed.
2. Field assessment of key P&A performance in B.C.—selecting and visiting 30 sites in northeast B.C. to assess P&A performance. Surficial and shallow soil gas field measurements will be taken along with physical soil gas samples.

3. P&A performance modelling and optimization—formulating, validating and calibrating numerical models of P&A energy wells relevant to BC (e.g., dimensions, plug placement type, thickness, reservoir conditions) for use in estimating future performance and ways to reduce costs while maximizing integrity.

Project deliverables

The deliverables from this project include the following:

1. Final report—describing the enhanced understanding of existing P&A performance and aiding the development of best practice engineering guidelines for ongoing P&A activities.