

The Uniqueness of Data Gathering during Drilling at a CCS Project Site – Example QUEST

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Summary

A key geological consideration in any carbon capture and storage (CCS) project is the identification of an appropriate injection reservoir and overlying seals. Other relevant and necessary data to gather include geochemical data of the injection target formation and overlying formations. Geochemical data are essential components of a Measurement, Monitoring and Verification plan, which is an integral part of a CCS project.

Introduction

In September 2012, Shell announced on behalf of the Athabasca Oil Sands Project venture (Shell Canada Energy, Chevron Canada Limited, Marathon Oil Canada Corporation) that the QUEST CCS project will be implemented. QUEST is the first large-scale commercial application of CCS technology at an oil sands operation, as its function is to reduce CO₂ emissions from the Scotford oil sand bitumen upgrader in Alberta, Canada.

Key Message

During drilling operations of CCS wells, one needs to consider the collection of both geological (e.g. reservoir properties) and geochemical data (e.g. fluid composition), with the latter being relevant to the entire stratigraphic column.

Example – Shell QUEST 2012-2013 drilling campaign

During Q4-2012 and Q1-2013, a number of wells were drilled for the Shell QUEST project. These included deep injection and monitoring wells (depth >1500 mBGL) and shallow groundwater monitoring wells (depth < 250 mBGL). Both geological and geochemical data were collected during the drilling campaign. A CCS project requires data to understand injection reservoir properties, such as porosity and permeability. Formation fluid compositional data, however, are equally important. This presentation will provide an overview of the samples and type of data collected while drilling QUEST wells with an emphasis on highlighting the reasons for why they were collected.

Conclusion

When drilling wells for a CCS project, one needs to consider the uniqueness of sample and data collection along the entire stratigraphic column encountered during drilling.

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