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Estimation of Vertical and Horizontal Permeability in the McMurray Formation of Foster Creek

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Summary

The Foster Creek project is the largest project in the Cenovus Energy Inc. (Cenovus) oil sands portfolio. The project is located on the Cold Lake Air Weapons Range, approximately 330 km northeast of Edmonton, Alberta. Foster Creek is operated by Cenovus FCCL Ltd.; ConocoPhillips has a 50 percent interest in the FCCL Partnership. There are six phases currently producing at Foster Creek, with two more under construction. The oil at Foster Creek is located about 450 metres below the surface in the McMurray Formation and requires steam-assisted gravity drainage (SAGD) bitumen recovery technology to drill and pump it to the surface.

While there are many parameters that affect the SAGD recovery predictions in oil sands, absolute permeability is the most important geological parameter. In this talk we present a general workflow used by Cenovus to calculate vertical and horizontal permeability in the McMurray Formation. The method is based on micro-modeling of high resolution micro-resistivity image data to calculate absolute permeability logs that are directly calibrated to core plug data. The workflow is further applied to four Foster Creek wells that are characterized by different facies, their sequences and interval lengths.

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