An Overview of Saleski: The First SAGD Project in Carbonates

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Summary

It has been 25 years since Unocal's experiment with using steam in vertical wells to extract bitumen from the Grosmont dolomites at Buffalo Creek (T87-88, R 19W4). Much has happened since then including developments in horizontal drilling and more favourable oil prices. Next winter Laricina will commence operation of a two well pair SAGD pilot in the Grosmont at Saleski (Section 26, T85 R19W4) with our partners, OSUM Corporation. This presentation will provide an overview of the Saleski SAGD project.

Many disciplines must come together to create such a project. One is favourable geology. The Grosmont Formation contains one of the world's largest accumulations of bitumen. The uppermost two units, the Grosmont C and D, contain the bulk of the reserves and typically have 20m and 30m, respectively of net pay in the near vicinity of the pilot. The porosity averages between 22 and 25% porosity and can exceed 40%. Permeability is highly variable. Matrix permeability ranges from 50mD to tens of Darcies with an overprint of intense vertical fracturing that significantly augments it. While the reservoir is very heterogeneous in small scale, the layered nature of the reservoir units makes for regularity and predictability at a field scale. (Barrett, Wilde and Connelly, 2009; Barrett and Hopkins, 2009; Hopkins and Barrett, 2009; Hopkins and Barrett, 2008).

Engineering analysis has concluded that the overlying, thicker Grosmont D reservoir would be the first interval to be targeted. The two well pairs are being drilled this winter. They are 800m long, 90m apart and injectors have a 6m standoff to producers. A total of six observation wells have been drilled along the two horizontal well paths for the purpose of monitoring steam plume development by pressure and temperature measurements. Each horizontal well will be equipped with a slotted liner that is designed to maximize production and limit the production of fines from the reservoir.

The construction of an all-weather road will allow construction of steam facilities to commence this spring. This facility will be capable of generating 45 million BTUs of heat and creating 544 m3/day of steam (80% quality) for the SAGD operation. A source of abundant water is required. Wells are being drilled into the Grand Rapids sand to provide a water source for steam generation.

Oil sands operations are closely regulated by the province. Laricina submitted an application for an 1800 bbl/day (bitumen extraction) project at Saleski in January of 2008 and obtained approval in July, 2009. This application required approvals from Alberta Environment and the ERCB to ensure that such things as air quality, wild life water resources and stakeholder concerns are protected and bitumen resource is conserved.

References

Barrett, K.R., and J.C. Hopkins, 2009, Stratiform Carbonate Breccias of the Grosmont Formation, Alberta, Part A, CSPG Convention Abstract.

Barrett, K.R., Wilde, K.N. and M.E. Connelly, 2009, Reservoir Heterogeneity of a Carbonate Bitumen Reservoir: Grosmont Formation, Saleski, Alberta: Abstract in proceedings of Gussow Conference, Banff Alberta, October, 2009.

Hopkins, J.C. and K.R. Barrett, K.R., 2009, Stratiform Carbonate Breccias of the Grosmont Formation, Alberta Part B: Petrography and Origin, CSPG Convention Core Conference Abstract.

Hopkins, J.C. and K.R. Barrett, 2008, Reservoir Units Within a Multi-Layered Dolostone Formation: Grosmont Formation, Saleski, Alberta, 2008; 2008 CSPG Convention Abstract.