



CONTACT: [ipm@innovatecalgary.com](mailto:ipm@innovatecalgary.com) • 403.284.6400

## JAGD: New Well Design & Thermal Recovery Method for Enhanced Recovery from Heavy Oil and Bitumen Reservoirs

TECH ID #: 729.1

### Background

Heavy oils and bitumens of the Western Canadian oil sands reservoirs (Peace River, Athabasca, and Cold Lake) are severely biodegraded and exhibit complex fluid viscosity and chemical compositional gradients at the reservoir scale. Recent studies have demonstrated that such compositional gradients, particularly variations in viscosity, may significantly impact production rates and ultimate recovery and should be considered in well design, recovery method selection and optimization of production strategies to maximize production and minimize costs.

While several methods to recover heavy oil and bitumen are available, there is a market need for more thermally efficient and cost-effective in situ recovery technologies. One such technology, J-well And Gravity-Assisted Steam Stimulation (JAGD) takes advantage of common vertical and horizontal changes in oil viscosity to enhance production from reservoirs. JAGD can be used for efficient recovery of heavy oil and oil sands bitumen from reservoirs with vertical gradients in oil mobility.

JAGD technology would benefit recovery in your leases in two main phases:

- Phase 1: cold production from low viscosity portion of reservoir
- Phase 2: thermal production by adding a J-oriented production well, converting the top well to a steam injector, and inserting a re-positional packer into top well to place steam and control steam conformance zone

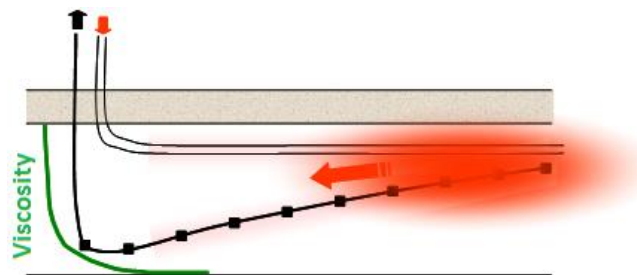


Fig. 1 – JAGD Diagram



## Areas of Application

- Reservoirs with horizontal wells currently using conventional cold production or have low production due to high bitumen viscosity
- JAGD technology can be applied to reservoirs completed for cold production for follow-up secondary recovery of remaining bitumen and heavy oil, which is in low bitumen saturation and/or high bitumen viscosity portions of the reservoir
- The process is also applicable as a primary thermal recovery technique
- JAGD cuts through mud/shale layers and is applicable to poorer quality reservoirs containing these layers or other steam barriers

## Competitive Advantages

- Higher recovery from reservoir beyond cold production recovery
- Cost savings in drilling because only one additional well is required (by using the cold production well as the steam injector)
- Efficient steam delivery to toe of the injector which is commonly long (> 2 km) such that chamber growth occurs along the full length of the horizontal steam injector well
- Easy control of the breakthrough of steam and water into the production well by using a novel steam trap procedure
- Ability to cut across shale or other steam barriers for improved steam delivery through the reservoir and thus increased recovery
- Reduced cSOR compared to SAGD

## Intellectual Property Status

- [US 8,065,624](#) - Issued
- [CA 2,593,585](#) – Issued