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NEW TECHNOLOGY FOR OIL AND GAS FROM TAR SANDS (TECHNOLOGY N-SOLV)

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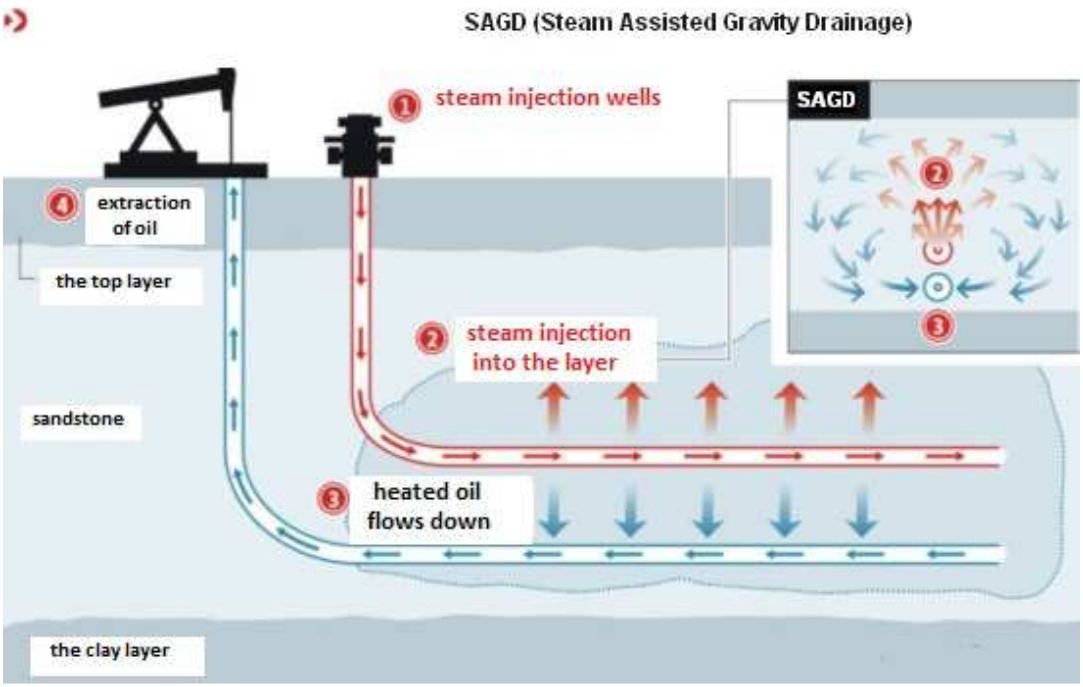
Due to high oil prices, and a general decline of world oil reserves structure, more and more attention is paid to the development of new production technologies of hard-hydrocarbons extraction. In Canada bitumen oil reserves exceed the oil reserves of Saudi Arabia. In this country the technology of tar sands development is being developed.

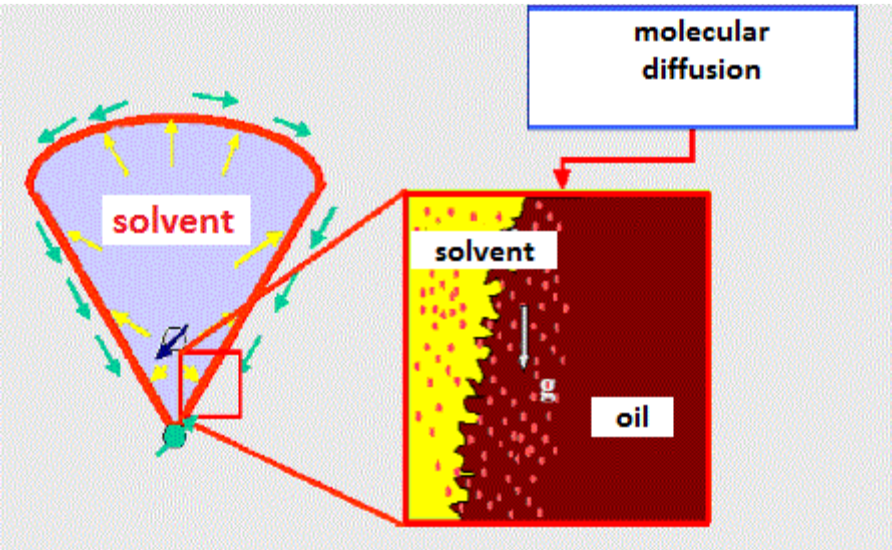
One of the ways that became a tradition is extraction of tar sands from an open pit followed by treatment with hot water to separate oil from it. Another commercially successful way, is the SAGD method, which involves drilling pairs of horizontal wells and steam injection into the well located in the formation 5 meters above the other (SAGD: upper horizontal well is used for steam flooding and creating of high temperature vapor chamber. The process begins with the stage of the prehating, during which (a few months) the steam circulations in both wells. Thus due to conductive heat transfer there is a heating of a formation area between the production and injection wells. Oil viscosity is reduced in this area, providing hydrodynamic connection between the wells.

At the main production stage the steam injected into the injection well. The injected steam, due to the difference of densities makes its way to the top of the producing formation, creating the steam chamber increase in size. At the surface of the division between the vapor chamber and cold net oil thickness there is a continuos heat exchange process, whereby the steam condenses into water and heated together with oil flows down to a producing well under the influence of gravity.

Growth of the steam chamber continues until it reaches the roof of the formation whereupon it begins to expand outward. While this oil is in contact with the high temperature steam chamber).



There are also cold methods of bitumen extraction of bitumen, suggesting the processing of bitumen with a solvent in the reservoir instead of steam injection (VAPEX: by injection of solvent into the top of them, the camera creates a solvent (hydrocarbon solvents, including ethane, or propane). Oil is diluted by the solvent diffusion and it flows along the boundaries of the camera to a producing well under the influence of gravitational forces. Oil recovery ratio by this method reaches 60%, but production rates are extremely low).

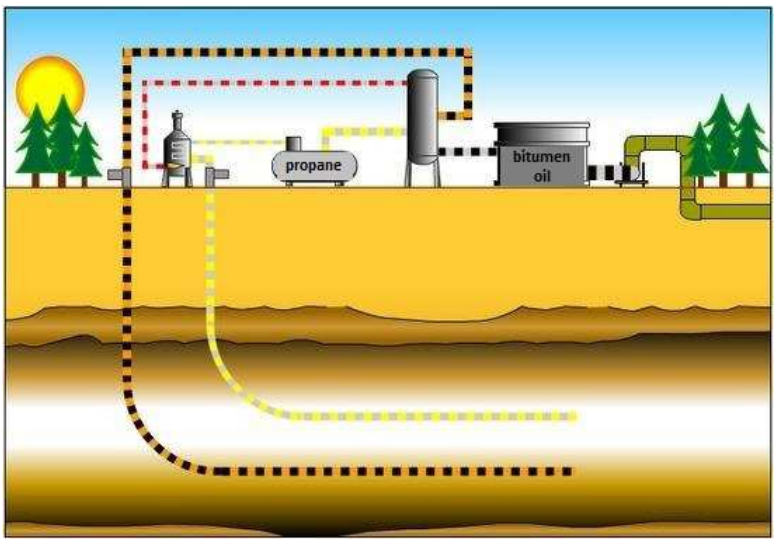


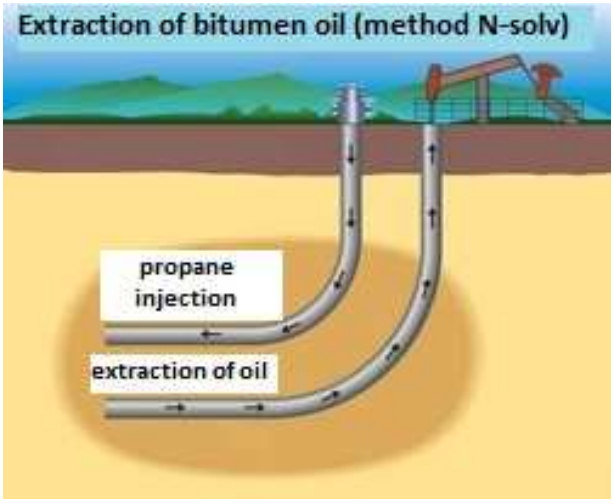
So, these methods have two limitations:

- A sufficiently high cost of obtained oil;
- Damage to the environment during production.

The new N-Solv technology representing a modified method of a solvent injection to reservoir, allows to increase production of oil from oil sands, oil reduce the cost of oil and minimize the environmental impact to a minimum.

In the technology of N-Solv a natural gas is used as a solvent (propane) which requires significantly less energy than steam. The solvent is heated to a low temperature (~ 50 ° C) and injected into the oil sand. The solvent decomposes bitumen, the heaviest components of bitumen remain underground, and the lighter oil and solvent suitable for reuse go upstairs. Moreover, the mass obtained is less viscous than in the traditional underground method, and it can be immediately transported by a pipeline.





The very idea of using gas as a solvent for oil extraction was proposed in the 70s of the last century. But because of the low rate of the bitumen dissolution process compared to the velocity of the gas in the reservoir, the technology was in applicable. The development of modern production technologies allowed to bring the idea to an implementable and commercially attractive method of the development.

Using the technology of horizontal drilling, adapted for the use in oil sands, has increased the area of the contact with the rock and thus accelerated the process of bitumen dissolution, as well as increased the rate of oil recovery. Upgrading the N-solv technology by heating the solvent and cleaning it of methane impurities significantly improved the efficiency of the process. It was found that the presence of methane in the formation significantly reduces the heat exchange process at the boundary of the solvent and bitumen. And the use of the pure solvent, heated to a moderate temperature provides a very efficient mechanism for removing methane from the reservoir.

Test technology Athabasca bitumen deposits showed a significantly higher efficiency of the N-solv method over the VAPEX method, and widely used SAGD method.

As a conclusion

The benefits of the N-solv technology.

N-Solv technology is a clean technology Bitumen development:

- There is no need to use water;
- Significantly reduces greenhouse gas emissions (85%);

The N-Solv technology provides practical applicability for the development of heavy oil deposits and natural bitumen:

- Starting of the production requires less investment;
- It does not require further modernization and adaptation;
- Requirements to the injection agent are lower than SAGD technology.

Application of the technology pays off faster with less risk. N-Solv technology remains commercially attractive at the oil price of about 30 dollars per barrel.

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