

Canadian Oil Sands third largest proven crude oil reserve in the world:
168 billion barrels*.

- Challenges

- Low mobility (high viscosity) oil
- High water usage
- Energy intensity

- Current State

- Reservoirs < 80m deep are mined. Water usage ~ 2.5 barrels per 1 barrel of oil for ore processing
- Reservoirs > 80m deep produced via wells with viscosity reduction through steam heating

- Research opportunities

- Solvent-based processes to reduce water usage
- Nonthermal *in situ* production techniques

Crude Oil	Viscosity	Flow distance in 10 years*
Conventional	<100 cP	>500 m
Bitumen	10,000-5,000,000 cP	<5 m

* Assumes permeability of 15 Darcy and pressure drop of 2 MPa over 200 m



Oil Sands Mining

Steam Assisted Gravity Drainage

