



Tar sands (or oil sands) are a low-grade petroleum deposit, a very viscous mix of clay, sand, water and oil-rich bitumen (think asphalt).<sup>1</sup> Enormous tar sands deposits lie under Alberta, Canada's boreal forests. Canada has the third largest oil reserves in the world, behind only Saudi Arabia and Venezuela. Tar sands are the vast majority of that reserve.<sup>2</sup>

## **Q: HOW ARE TAR SANDS EXTRACTED AND PROCESSED INTO OIL?**

Tar sands are recovered in two ways, either by surface mining (strip or open pit mining) or by underground extraction. The most destructive method is surface mining. Companies clear cut the forest, bulldoze and remove the topsoil to get at the tar sands. Large hydraulic shovels dig and load the heavy soil onto enormous trucks. It is taken to an extraction plant, where a hot water process can recover about 75 percent of the bitumen. It takes about two tons of tar sands to get a barrel of oil.<sup>3</sup>

About 80 percent of Canada's tar sands are too deep for surface mining. Companies use steam injection or other techniques to liquefy it and force it to the surface. (Part of the challenge is reducing the tar sands' viscosity so it will flow upward.) This is more costly than surface mining because of energy and water use.<sup>4</sup>

## **Q: HOW MUCH OF MINNESOTA'S GAS COMES FROM CANADA?**

Minnesota gets the majority of its motor fuel from Canada (the rest comes from fracking in North Dakota.) Flint Hills in Rosemont, the largest of two Minnesota refineries, gets 80 percent of its crude oil from Canada. Flint Hills "supplies about half of Minnesota's motor fuel and 40 percent of Wisconsin's."<sup>5</sup>

## **Q: WHAT ARE THE ENVIRONMENTAL IMPACTS OF TAR SANDS MINING AND PROCESSING?**

### **GREENHOUSE GASES:**

Tar sands oil is far dirtier than conventional oil. It is about 20 percent more carbon polluting on a lifecycle basis than the average oil in the United States.<sup>6</sup> "A single open pit mine and its associated upgrading facility release as much carbon pollution each day as 1.35 million cars."<sup>7</sup>

## AIR POLLUTION:

The Alberta tar sands operation “is one of the most prolific sources of air pollution in North America, often exceeding the total emissions from Canada’s largest city,” according to Canadian scientists.<sup>8</sup> The pollutants are tiny particles created when chemical-laden vapors released during the mining and processing of bitumen react with oxygen in the air, transforming into solids that can drift on the wind for days.

## DESTRUCTION OF CANADA'S BOREAL FOREST:

Canada’s boreal forest stores more than 27 years worth of current global greenhouse gas emissions. “As of early 2013, mining operations had disturbed about 276 square miles of boreal forest in the region.” Some 1,100 square miles of boreal forest had been leased for tar sands surface mining and 13,700 square miles had been leased for underground mining.<sup>9</sup>

## WASTING AND CONTAMINATING WATER:

As of 2013, oil sands mining operations were licensed to divert 349 million cubic meters of water annually from the Athabasca River – twice the demand of the City of Calgary (population 1 million-plus). Less than 10% of the water approved for withdrawal is returned to the river. At least 90 percent of the water used for mining ends up in toxic tailings ponds. Migratory birds have to be scared off from the ponds with propane cannons and floating scare crows.<sup>10</sup>

## TREATY VIOLATIONS:

Beaver Lake Cree have documented 20,000 treaty rights violations from the tar sands expansion. Eighty percent of the traditional territories of the Athabasca Chipewyan First Nation and the Mikisew Cree First Nation in Canada are rendered inaccessible for periods of the year due to tar sands development.<sup>11</sup>

### For more information or to get involved:

- See the Sierra Club North Star Chapter website: <http://www.sierraclub.org/mn> and Facebook: SierraClubMN
- Attend one of the monthly “Beyond Oil and Tar Sands” volunteer committee meetings, fourth Tuesday of the month, 6:30 p.m. at the Sierra Club office, 2327 East Franklin Ave., Minneapolis. All are welcome!
- Request a Speaker on Line 3 for your organization or classroom. Contact Committee Coordinator Natalie Cook at [natalie.cook@sierraclub.org](mailto:natalie.cook@sierraclub.org) or 612-259-2445 with this, or for other questions.

<sup>1</sup> About Tar Sands, from 2012 Oil Shale and Tar Sands EIS Information Center, U.S. Dept. of the Interior Bureau of Land Management: <http://ostseis.anl.gov/guide/tarsands/>

<sup>2</sup> Top 10 countries with the world’s biggest oil reserves (2015) Global Europe Anticipation Bulletin (GEAB): <http://geab.eu/en/top-10-countries-with-the-worlds-biggest-oil-reserves/>

<sup>3</sup> About Tar Sands.

<sup>4</sup> In situ methods used in the oil sands, Regional Aquatics Monitoring Program (RAMP): <http://www.ramp-alberta.org/resources/development/history/insitu.aspx>

<sup>5</sup> Minnesota’s Petroleum Infrastructure: Pipelines, Refineries, Terminals; Minnesota House Research, October 2016: <http://www.house.leg.state.mn.us/hrd/pubs/petinfra.pdf>

<sup>6</sup> Enbridge Over Troubled Waters, Sierra Club: <http://80feetisenough.org/uploads/documents/Enbridge%20Over%20Troubled%20Water%20Report.pdf>

<sup>7</sup> All Risk, No Reward: the Alberta Clipper Tar Sands Pipeline Expansion, Sierra Club: <https://content.sierraclub.org/beyondoil/sites/content.sierraclub.org/beyondoil/files/AlbertaClipperReport.pdf>

<sup>8</sup> Oil sands found to be the leading cause of air pollution in North America, Globe and Mail, May 25, 2016: <http://www.theglobeandmail.com/news/national/oil-sands-found-to-be-a-leading-source-of-air-pollution-in-north-america/article30151841/>

<sup>9,10</sup> Oil Sands Fever: The Environmental Implications of Canada’s Oil Sands Fever: The Environmental Implications of Canada’s Oil Sands Rush, Pembina Institute: <https://www.pembina.org/reports/OilSands72.pdf>

<sup>11</sup> The Truth About Tar Sands: The Dirtiest Oil on Earth, Sierra Club: <http://content.sierraclub.org/beyondoil/tar-sands>