

Background: Oil Sands Tailings and Directive 074

Oil sands mining operations produce significant quantities of liquid waste materials called tailings. While oil sands companies are expected to reclaim liquid tailings, there has been 40 years of poor performance in addressing this long-term liability. The large inventory of liquid tailings requiring long-term containment has therefore been growing — in 2009, toxic tailings lakes covered 130 square kilometres (an area the size of the City of Vancouver).

In February 2009, the Alberta Energy Resources Conservation Board (ERCB) announced new rules to regulate the reclamation of tailings waste in response to growing concern about tailings from the public and regulators. The new regulations were announced in part because oil sands operators were not meeting targets set out in their original applications.

On September 30, 2009, oil sands mining companies submitted tailings management plans to the ERCB in accordance with *Directive 074: Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes*. The plans were to outline how the companies would start to reduce the growing legacy of toxic tailings waste from oil sands mining operations.



ERCB reports 720 million cubic metres of tailings volumes currently on the landscape. Photo: David Dodge, The Pembina Institute

Directive 074 Requirements

The ERCB requires operators to reduce toxic tailings by capturing or extracting the fine particles from the waste water and then storing the captured solids in disposal areas (see “Directive 074: Tailings Performance Criteria Initiative — FAQs” at www.ercb.ca/portal/server.pt/gateway/PTARGS_0_240_2568235_0_0_18/).

The ERCB directive requires the following:

1. Capture a minimum portion of fine particles from the tailings. The capture rate (defined as a percentage of total fine particles in the raw oil sands material) increases over three milestone years:
 - 20% by June 30, 2011
 - 30% by June 30, 2012
 - 50% by June 30, 2013
2. Create disposal areas to store the captured particles.
3. Ensure the disposal areas meet the ERCB’s minimum standards for “trafficability.”
4. Prepare annual plans and reports on tailings.

Tailings Plan Review

When the Pembina Institute and Water Matters conducted a review of the submitted tailings plans, they found that only two of nine projects would meet the requirements of the regulations to reduce toxic tailings starting in 2011. The proposals for the other seven projects would not meet the targets for reducing tailings by 2011. Some project proposals indicated they would not meet reductions until 2023, and would not meet rules for developing solid surfaces for over 40 years.

The following table provides a summary of company submissions with respect to compliance with ERCB rules for fine particle capture and deposit trafficability. For full assessments of individual company plans, please review the full report at www.oilsandswatch.org/pub/1934.

Oil Sands Operation	Submission meets fine particle capture requirements	Submission meets “trafficability” requirements
CNRL: Horizon	No	No
Imperial: Kearl	No	No
Shell: Muskeg River	No	No
Shell: Jackpine	No	No
Fort Hills Energy: Fort Hills	Yes	Yes
Suncor: Millennium and North Steepbank	Yes	Yes
Syncrude: Mildred Lake	No	No
Syncrude: Aurora North	No	No
Syncrude: Aurora South	No	No

What Are Tailings?

The oil sands extraction process results in the creation of tailings, which are a fluid mixture of water, sand, silt clay, unrecovered hydrocarbons and dissolved chemicals. Tailings are toxic and cannot be released into the environment. The sand and other coarse solids in tailings settle, but fine solids remain suspended in the water. These suspended fine solids (called “mature fine tailings”) are the main reason tailings lakes cannot be reclaimed. Extracting these particles reduces the volume of tailings going to tailings lakes. The extracted particles can be consolidated into a firm, “trafficable” substance to be stored in a disposal area. A trafficable surface is solid enough to allow for motorized traffic and eventual reclamation. To meet the ERCB requirements, the captured tailings have to be solid enough to allow a bulldozer, but not necessarily a wheeled vehicle, to travel over them.

Tailings Concerns

It is estimated that one and a half barrels of fluid tailings are created for every barrel of oil that is produced. The growing legacy of toxic tailing lakes on the landscape has many impacts:

- Tailings lakes pose an ongoing threat to surface water and groundwater through seepage.
- Tailings lakes could become a significant public liability if a company cannot cover the cleanup costs.
- Tailings lakes pose a mortality risk to waterfowl.

