

NORTHERN LIFEBLOOD

FACT SHEET

Empowering Northern Leaders to Protect the Mackenzie River Basin from the Risks of Oil Sands Development

The Heart of Canada's North

The Mackenzie River Basin has sustained people and an abundance of flora and fauna for millennia — long before this land was called a country, let alone split into provinces and territories. Today, its rivers and streams cross several political boundaries, covering the northern half of Alberta, parts of British Columbia, Saskatchewan and the Yukon, and most of the Northwest Territories.

The aquatic value of the basin is widely recognized; indeed, there are few natural areas in the world that are comparably pristine or ecologically significant. The basin's streams and rivers collectively transport more than half of the fresh water that flows into the Arctic Ocean from Canada.

Following the Flow: Upstream Risks to the Basin

All of the Mackenzie River Basin's streams and rivers ultimately feed into the Mackenzie River and flow North to the Arctic Ocean. Therefore, whatever happens to the Athabasca River, the Peace River, the Slave River and dozens of others ultimately happens to the Mackenzie River Basin itself. And while the Mackenzie Basin's northern waters are still abundant and supporting a diversity of life, concern is increasing about what's going on upstream.

Oil sands development threatens critical headwaters

In the Peace and Athabasca watersheds, oil sands development threatens both water quality and quantity. Of all the upstream industrial activities,¹ oil sands activity merits special attention as it is rapidly growing in critical headwaters of the broader Mackenzie River Basin and uses significant amounts of water, while leaving behind toxic sludge. Oil sands development also results in land disturbance and air pollution.

For every barrel of bitumen (a tar-like heavy oil) that is mined, between two and four barrels of fresh water are required to extract the bitumen from the sand. This water is largely taken from the Athabasca River. After being used, the water is too contaminated to go back into the river and ends up in toxic man-made lakes (tailings lakes) that currently occupy an area 1.5 times the size of the City of Vancouver.



Roland Lines, Pembina Institute
The Mackenzie River Basin accounts for about one-fifth of Canada's land mass and consists of six major sub-basins.

1 Additional upstream uses include hydroelectric dams, agriculture, forestry and sawmills, pulp and paper mills, and coal and uranium mining.

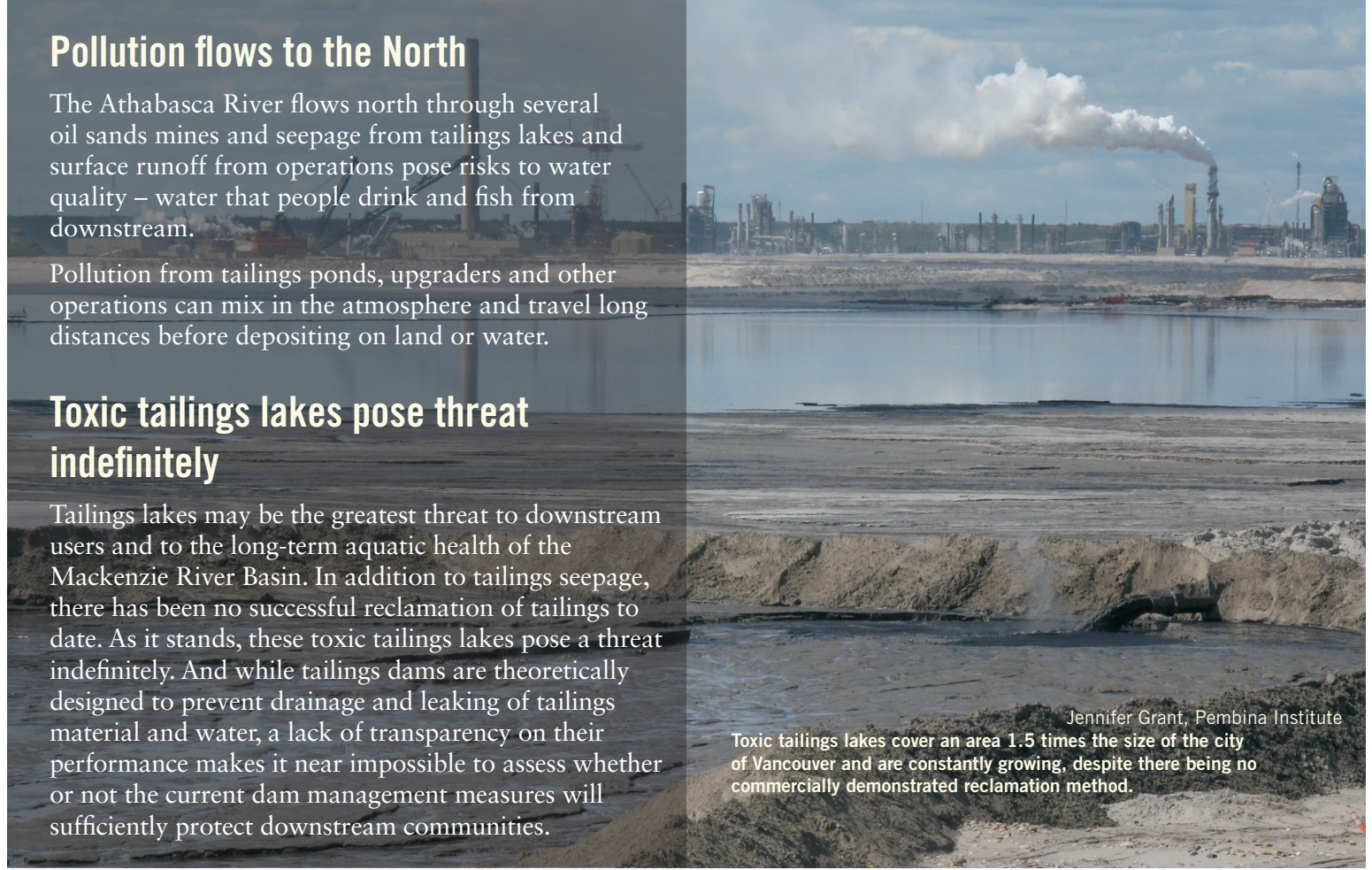
Pollution flows to the North

The Athabasca River flows north through several oil sands mines and seepage from tailings lakes and surface runoff from operations pose risks to water quality – water that people drink and fish from downstream.

Pollution from tailings ponds, upgraders and other operations can mix in the atmosphere and travel long distances before depositing on land or water.

Toxic tailings lakes pose threat indefinitely

Tailings lakes may be the greatest threat to downstream users and to the long-term aquatic health of the Mackenzie River Basin. In addition to tailings seepage, there has been no successful reclamation of tailings to date. As it stands, these toxic tailings lakes pose a threat indefinitely. And while tailings dams are theoretically designed to prevent drainage and leaking of tailings material and water, a lack of transparency on their performance makes it near impossible to assess whether or not the current dam management measures will sufficiently protect downstream communities.



Jennifer Grant, Pembina Institute
Toxic tailings lakes cover an area 1.5 times the size of the city of Vancouver and are constantly growing, despite there being no commercially demonstrated reclamation method.

TOP 10 REASONS Why Oil Sands Tailings Pose a Threat to the Mackenzie Basin

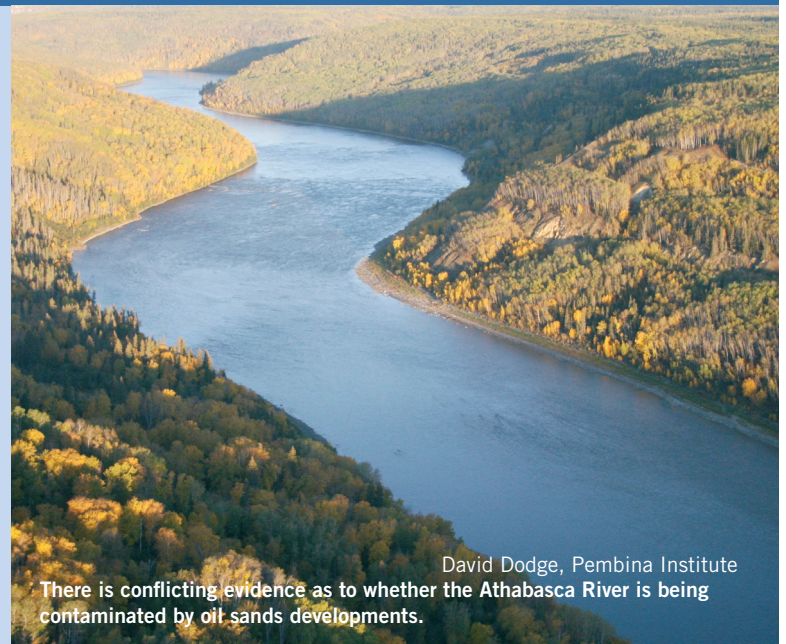
1. **Toxicity:** Tailings contain a host of toxins including oil and grease, naphthenic acids, cyanide, phenols and several metals such as arsenic, cadmium, chromium, copper, lead and zinc. A major concern associated with tailings containment is the migration of pollutants through the groundwater system, which can in turn leak into surrounding soil and surface water.
2. **Seepage:** Tailings lakes seep wastewater either into the groundwater below and/or around the containment dykes or tailings lakes. This could present water quality risks to downstream users.
3. **Size and future growth:** Tailings are stored in large settling basins, referred to as tailings lakes. Oil sands tailings lakes currently cover an area of 170 square kilometers. With the anticipated growth in oil sands development, comes growth in tailings waste; the volume of liquid tailings will grow 30% from 843 million cubic metres to more than 1.1 billion cubic metres in 2020.
4. **Risk of dam failure:** There are numerous risks to the structural integrity of tailings lakes containment structures, including seepage, the collapse of internal walls, frost effects on the foundations and the instability of partially reclaimed slopes. Historically, there have been at least three known major oil sands dam accidents. A tailings dam failure could be catastrophic to the basin.
5. **Impacts on wildlife:** Waterfowl and shorebirds depend on freshwater ponds for breeding, foraging and staging during their migration back to the North. Tailings lakes are mistaken as open water ponds by waterfowl. Birds may ingest the oil and their plumage may become oiled with waste bitumen making them unable to fly.
6. **Uncertain reclamation:** The reclamation of toxic tailings has not yet been demonstrated on a commercial scale. There is a risk that seeping tailings lakes will not be cleaned up and therefore present ongoing risks to the basin.

7. **Uncertain compliance with new regulations:** Oil sands companies submitted tailings management plans in 2009 to demonstrate how their operations would meet the new government rules (Directive 074). Out of nine plans submitted, only two will be in compliance. Government regulations are not yet resulting in improved tailings management and clean up.
8. **Reliance on “end pit lakes” for long-term reclamation:** A proposed long-term solution to toxic tailings reclamation is for mining companies to dump tailings waste into old mine pits and cap them with freshwater from the Athabasca River. There are at least 27 of these high-risk and experimental “end pit lakes” planned for the Athabasca Boreal region within the next 60 years. Plans include reclaiming the landscape to drain into these artificial lakes which, in turn, will discharge into the Athabasca River watershed and flow downstream into the Mackenzie River.
9. **Low transparency of tailings dam status and performance:** Documents relating to the status and performance of tailings pond dams and emergency planning are not publicly available. As such, it is difficult to assess whether or not the current dam management measures sufficiently protect downstream communities.
10. **Inadequate reclamation security system:** Due to a lack of transparency, it is uncertain as to whether or not Mackenzie River Basin residents and Canadians at large are financially protected from a major industrial accident. However, the Alberta Office of the Auditor General noted a suite of flaws with the current system, including inconsistencies in how financial security was posted and the use of outdated information to determine the estimated full cost of reclamation.

Beyond Borders: A Call for Federal Action

While the provinces manage their own water resources, the federal government has jurisdiction over cross-boundary waterways, as well as water in the Northwest Territories. Water management within the Mackenzie River Basin is therefore a shared responsibility.

Unfortunately, the current water management efforts in Alberta are not adequately protecting the basin. The federal government has failed to utilize or enforce federal laws designed to protect public health and the environment in the face of increasing oil sands development, even though concerns have been expressed by the scientific and non-governmental sectors, Aboriginal communities and the Northwest Territories government about the impact of oil sands development on Canada’s water resources.



David Dodge, Pembina Institute
There is conflicting evidence as to whether the Athabasca River is being contaminated by oil sands developments.

Inadequate Monitoring Prevents Progress

The need for continuous, consistent and holistic water monitoring programs to detect environmental changes and longer-term trends in the Mackenzie River Basin is widely supported and yet the monitoring occurring around and downstream of oil sands developments is inadequate. There is increasing independent evidence that oil sands activities are directly impacting water quality and quantity.

In Alberta, most of the responsibility for monitoring the effects of oil sands activity on aquatic

environments is funded by industry through the Regional Aquatics Monitoring Program, despite increasing concern about the program’s lack of scientific integrity, design and overall failure to incorporate a regional approach.

In addition, there is evidence that federal regulations protecting upstream waters are not being enforced; specifically the Federal Fisheries Act and the Canada Water Act are not being upheld in the face of increasing oil sands development.

Taking Action in the North

There are opportunities for both northern leaders and the federal government to proactively protect the Mackenzie River Basin.

Below are some ways northern leaders can take action. For full details on each point, see Chapter 4 of this fact sheet's accompanying report.

1. Call on the federal government to enforce existing federal laws. There is strong evidence that numerous federal laws have been violated in Alberta's oil sands. Northern leaders should demand that the federal government, as the principle water manager in the North, uphold its obligations.
2. Call on the federal government to ensure sufficient capacity exists to implement the Northwest Territories Water Strategy, a partnership led by the government of the Northwest Territories, the Government of Canada and Aboriginal governments in an attempt to ensure the waters that flow into, within or through the Northwest Territories are substantially unaltered in quality, quantity and rates of flow.
3. Call on the federal government to strengthen and implement the Mackenzie River Basin Transboundary Master Agreement, an agreement that makes provision for neighbouring jurisdictions to negotiate bilateral water management agreements.
4. Call on the Government of Canada to help reform water monitoring in the Mackenzie River Basin. In Alberta, the current monitoring program has been shown to be inadequate, inconsistent and based on limited data.
5. Actively participate in the regulatory approval process governing oil sands development. Members of the public can state their concerns about new projects as participants in a Joint Review Panel process for new oil sands projects.
6. Investigate the opportunities for legal action. Aboriginal groups may be able to pursue legal action based on their rights to water and fish outlined in land claim agreements.
7. File an environmental petition with the Federal Government. Individuals or groups can file a petition as a formal means to bring their concerns about water management in the basin to the attention of federal ministers and departments and to obtain a response to their concerns.
8. File a submission to the Commission for Environmental Cooperation. Northern leaders can demonstrate public engagement by filing a submission to the commission, a body focused on regional environmental concerns and the promotion of enforcement of environmental laws.
9. Create a transboundary community network. Communities in both Alberta and the Northwest Territories that are affected by oil sands development could form a network to help raise awareness of water concerns and support new ways of addressing water management challenges.



Courtesy, Jenny Adams

Top: The health of the Mackenzie Basin is vital to life in the North, yet it is not being adequately protected.

Jennifer Grant, Pembina Institute

Bottom: By taking action, northern leaders can help protect the Mackenzie, the lifeblood of the North.

Want More Information?

For more information download our full report at arctic.pembina.org. There you will find more materials on environmental issues in the Arctic, as well as on the oil sands and their impacts. This report was prepared by Jennifer Grant, Jennifer Dagg, Simon Dyer and Nathan Lemphers of the Pembina Institute. www.pembina.org