

Mine water storage and land reclamation

The management of oil sands water is a complex, long-term challenge — and one of the biggest hurdles to reclaiming mine sites.

Oil sands companies are responsible for reclaiming the land they use, but the industry lacks the complete regulatory framework to allow the release of treated mine water. Without industry-specific guidance, oil sands operators have to keep storing their mine water indefinitely. As those water repositories continue to grow during operations and because of precipitation (which becomes mine water once landing on mining facilities), the land can't be fully reclaimed. Many other industrial and mining sectors already operate under established industry-specific guidance. Comparable guidance for releasing treated oil sands mine water does not yet exist.

Municipalities and other industries already release treated water in accordance with regulatory approvals.



GOLD MINES



IRON ORE MINES



DIAMOND MINES



COAL MINES



NICKEL MINES



COPPER MINES



PULP MILLS



LEAD/ZINC
MINES



PROCESSING PLANTS



GAS PLANTS



POWER PLANTS



MUNICIPAL
WASTEWATER



OIL SANDS

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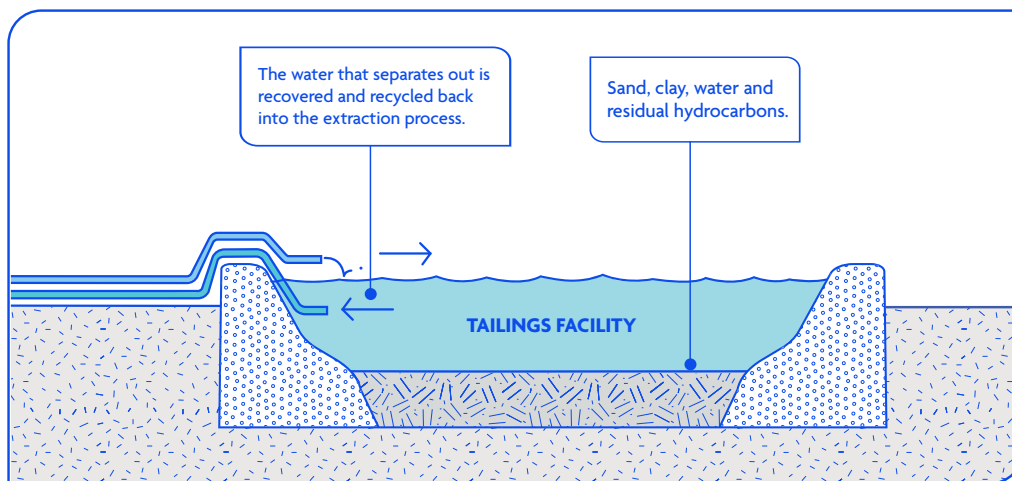
What is mine water?

An important aspect of water stewardship in oil sands operations is the management of mine water — water that has been used in mining or has come into contact with a mine. It includes process water, which is mainly recycled from and used in the bitumen extraction process, as well as groundwater removed from the mine pit prior to and during mining. Under current regulations, mine water also includes any precipitation that comes into contact with developed or reclaimed parts of the mine.

How is water used in mining operations?

During mining, shovels remove oil sands ore from the ground. Heavy haul trucks then transport the material to extraction facilities where the ore is broken down into smaller pieces and mixed with hot water to allow the bitumen to separate and be recovered.

After the bitumen is extracted, the leftover material — water, sand, clays, salts and trace hydrocarbons — is called tailings. This gets pumped into large containment areas called tailings facilities. The solid material from the tailings is used to backfill mines, reclaim terrain and build natural landscapes. The water that separates out from the tailings mixture is recovered and recycled back into the extraction process. In 2024, 78% of water used for oil sands mining was recycled water, according to the Alberta Energy Regulator.



The limits of long-term water storage

While industry recycles a significant share of its process water during active operations, that capability diminishes as mining declines. Once operations wind down, recycling is no longer a viable means of managing water stored on site, and volumes will continue to grow even after mining ends, largely due to precipitation.

Oil sands tailings facilities are not meant to be a permanent part of operations. However, because of a lack of regulatory approval to treat and release water to the environment (under stringent regulatory requirements), it must be stored, treated and managed on site indefinitely.

Because of the lack of release regulations, oil sands mining operations have some of the largest industrial water repositories in the world. Keeping this much water in permanent storage creates ongoing challenges for responsible mine reclamation. Land cannot be fully reclaimed while large volumes of mine water still require long-term containment.

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“We know the importance of the land and water to local communities. Our member companies are committed to working collaboratively with Indigenous communities, government and stakeholders to ensure that the water will be safely and effectively treated for release.”

-Kendall Dilling, President of Oil Sands Alliance

Proven technologies

Technologies exist today that are well understood, available and capable of effectively treating oil sands mine water. These technologies are not new, novel or untested, and they are commonly used to treat industrial water from other sectors.

Oil sands companies have invested in extensive environmental research, modeling and technology demonstrations for decades to understand how to best apply these technologies for the safe treatment and release of oil sands mine water.

Looking ahead

Water is a precious resource, and Canadians expect it to be managed responsibly. The oil sands industry continues to work with governments, regulators, Indigenous communities and other stakeholders to advance a framework for the safe release of treated mine water. Moving that work forward is an essential part of responsible and fully realized land reclamation.



Oil sands mine water
before and after treatment.

Misconceptions vs. facts

Misconception: Release is not necessary and oil sands mine water can be managed in different ways.

Fact: [Treated water release is necessary to support effective operations and mine reclamation.](#)

Once mining operations wind down, recycling is no longer a viable means of managing water stored on site, and volumes continue to grow largely due to precipitation. Alternatives, individually and collectively, are not sufficient to manage the volume of water needed to achieve reclamation. Treated mine water release is required in order to return the land to a self-sustaining boreal forest, as expected by industry and Canadians. Without treated water release, oil sands mines will see the continued accumulation of water (e.g., in the form of precipitation) even after operations are finished, which prevents full reclamation and the return of lands to Alberta and its communities.

Misconception: Treated water won't be safe.

Fact: [Water is treated in many industries to rigorous environmental standards in compliance with government regulations to enable safe release.](#)

Water release criteria are designed to protect human health and the environment. They are based on science, decades of research and international and federal (Canadian Council of Ministers of the Environment) guidelines. Industrial water is routinely treated and safely released to watersheds globally, across Canada and in Alberta using the same types of technologies proposed for use in the oil sands industry.

Misconception: Released water should be drinkable.

Fact: [Safe release supports a healthy aquatic wildlife environment.](#)

Human drinking water standards are not appropriate benchmarks for aquatic health, and they should not be used when assessing treated mine water for release. Rivers and other waterbodies are not safe to drink from because they carry bacteria, parasites and other naturally occurring contaminants. Oil sands mine water can be treated to ensure it's safe for aquatic and wildlife environments, even if it is not suitable for human consumption. Returned water will be monitored to verify that it will not adversely affect humans, wildlife or plant life.

Misconception: Oil sands mine water is different than other industry wastewater.

Fact: [Oil sands mine water is not unique compared to other industrial wastewaters — both in its constituents and in how it can be treated for release.](#)

The concentration of constituents in oil sands mine water, like organics, salt, suspended solids and metals, are within the range of other industrial wastewaters.

Misconception: Technologies for safely treating oil sands mine water don't exist.

Fact: [Technologies that can safely treat oil sands mine water exist and are in use today.](#)

Technologies exist today that are well understood, available and capable of effectively treating oil sands mine water. These technologies are not new, novel or untested and are commonly used to treat other industrial water.

Misconception: The Athabasca River is being polluted by oil sands operations.

Fact: [Based on decades of monitoring and analyzing water quality in the Athabasca River, a State of the Environment report concluded that “water quality didn't show a consistent pattern of change upstream and downstream of oil sands activities on the Athabasca River.”](#)

In 2025, the Oil Sands Monitoring Program released a report on the condition of surface water for rivers and streams in the oil sands region, focusing on two main areas: water quality (what is in the water) and water quantity (how much water there is). The work was shaped and directed by input from Indigenous, industry, and government partners involved in the Oil Sands Monitoring Program. The findings are based on extensive datasets and rigorous third-party analysis and provide important context for assessing existing statements about industry performance.

Learn more at

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