



# Engaging Indigenous Communities

## Building on Teck’s track record of meaningful engagement with Indigenous communities.

We engage respectfully and extensively with Indigenous Communities, and work to earn their trust and support. We know engagement is an ongoing process, and are fully committed to working alongside our community partners today, tomorrow, and for years to come.

### Addressing Indigenous community priorities and concerns

From the earliest stages of the Frontier project in 2008, we have engaged with Indigenous communities in the region to understand their priorities and respond to their concerns.

Consultation to date has included:

- community-level engagement
- technical reviews of Teck regulatory submissions
- Indigenous-led traditional land use studies and cultural impact assessments
- Discussion of environmental and social priorities

Input from these discussions has helped shape Frontier and led to a number of enhancements, including:

- a fly-in-fly-out program to provide access to employment opportunities for local communities
- revised tailings placement
- A proposed Access Management Plan for traditional land uses such as hunting and trapping

### Participation Agreements

We have signed formal Participation Agreements with numerous local Indigenous communities. These agreements identify economic and social benefits and opportunities – such as employment, contracting and training – and create a framework for long-term cooperation and communication.

### Engaging with non-Indigenous stakeholders

The project has undergone five rounds of regulatory and public review and is currently under review by a Joint federal-provincial Review Panel. Feedback from various stakeholders during the project review process has led to a number of revisions and improvements to the original project proposal, including reductions in the project footprint, GHG intensity, and water usage, among other improvements.

### Joint Federal-Provincial Review Panel Process Steps



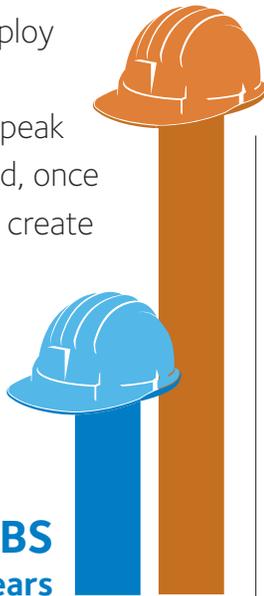


# Economic Contributions

Frontier will be a long-term source of jobs and economic opportunity for Alberta and for Canada.

## Job creation

Frontier will employ up to 7,000 workers during peak construction and, once operational, will create an estimated 2,500 ongoing, direct jobs for more than four decades.



**2,500 JOBS**  
for over 40 years

**7,000 JOBS**  
during peak construction

The fly-in and fly-out nature of Frontier will facilitate hiring from local communities like Fort Chipewyan. There will be a focus on developing training programs before construction even begins.

Frontier will also create opportunities for other local and regional businesses through procurement and service contracts.

## Opportunities for Indigenous Communities

Frontier will create significant benefits for local Indigenous communities by providing opportunities for jobs and training, new business opportunities, and other benefits.

We have signed numerous formal Participation Agreements with local Indigenous communities. These agreements identify economic and social benefits and opportunities, and set out a framework for long-term cooperation and communication.

## Payments to governments

Frontier represents a major long-term source of new revenue for Alberta and Canada to help fund services like healthcare and education.



Over its lifespan, it is estimated that Frontier will contribute \$55 billion in provincial royalties and taxes, \$12 billion in federal corporate income and capital taxes, and \$3.6 billion in municipal property taxes, supporting government investments in hospitals, schools and more.



# Environmental Responsibility: Greenhouse Gas Emissions

Frontier will incorporate industry-leading technologies to achieve Greenhouse Gas (GHG) emissions intensity of approximately one half of the oil sands industry average.

Frontier will be among the lowest GHG-intensity oil sands operations and will have a lower carbon intensity than about half of the oil currently refined in the United States.<sup>1</sup> It will use leading engineering design and best practices to ensure best in class performance in energy efficiency and GHG reduction. Some examples include:

### Cogeneration power

A cogeneration plant will provide Frontier's power needs. The system will capture waste heat and re-use it as energy for other areas of the project, improving efficiency and lowering overall emissions.

### Treatment plant

Frontier will use a paraffinic froth treatment process which is much less energy intensive and reduces the carbon intensity of the oil produced. The treatment facility will also maximize efficiency through use of heat exchangers.

### Haul truck efficiency

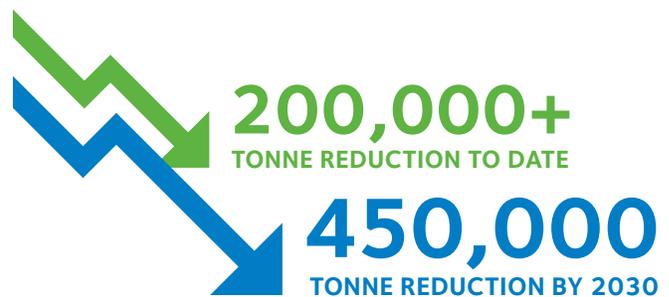
Enhanced haul truck fleet maintenance and dispatch systems will optimize fleet efficiency, reducing fuel consumption and emissions, similar to what Teck has done successfully at other operations.

### Plant footprint

Frontier's efficient design results in a smaller footprint, which means less piping, reduced heat loss and fewer fugitive emissions during operations.

### Evolving technologies promise further improvements

As a member of Canada's Oil Sands Innovation Alliance (COSIA), Teck is partnering in a wide range of joint industry projects to identify additional GHG reduction technologies that may be appropriate for Frontier. Improvements from these emerging technologies could contribute to further reducing GHGs at Frontier.



### Teck's global commitment to GHG reduction

Teck is already among the lowest GHG-intensity miners globally and we will be applying that experience to Frontier. To date, we have reduced total GHG emissions across our mines by over 200,000 tonnes and we are working towards a 450,000-tonne reduction target by 2030.

*1: Based on Government of Alberta 2015 total oil sands production and greenhouse gas emissions; and data from IHS Energy for US production.*



# Innovation for Environmental Sustainability

Frontier will be among the most environmentally responsible oil sands developments ever built.

As the newest Alberta oil sands mine, Frontier will incorporate industry-leading technologies and best practices to minimize environmental impact and ensure environmentally-responsible operations.

**Our approach to environmental management for Frontier will be comprehensive, including:**



#### Water management

Frontier will have one of the lowest water use intensities in the industry. Approximately 90 per cent of all water used in processing at Frontier will be recycled, minimizing the needs for water withdrawals. Off-stream water storage will have the capacity to meet requirements for up to 120 days, meaning water withdrawals from the Athabasca River can be halted entirely during periods of seasonal low river flow.



#### Greenhouse Gases

The greenhouse gas emissions intensity of Frontier will be approximately one half of the oil sands industry average and will have a lower carbon intensity than about half of the oil currently refined in the United States.<sup>1</sup> As part of this, a cogeneration plant will provide power for the project, with the ability to capture and re-use waste heat, reducing overall GHG emissions.



#### Progressive Reclamation

We will reclaim land as mining progresses, in order to return it to a productive state faster. As a result, and as mining advances over the years, the actual footprint of active mining will be smaller than the total project area.



#### Tailings management

Frontier will incorporate leading-edge practices to manage tailings and create a safe and secure placement for tailings that remain. Centrifuges will de-water fluid fine tailings for placement in mined-out pits. This will eliminate the need for tailings dams post-closure and provide an additional level of security for tailings containment.



cosia®

CANADA'S OIL SANDS  
INNOVATION ALLIANCE

With 100 years of building and operating mines around the world, Teck brings considerable experience and expertise in responsible resource development to the Frontier project. We are also a founding member of Canada's Oil Sands Innovation Alliance, which allows us to tap into \$1.3 billion of shared research and practices from across the industry for use with Frontier.

<sup>1</sup>: Based on Government of Alberta 2015 total oil sands production and greenhouse gas emissions.



# Environmental Responsibility: Reclamation



Active mining area

Reclamation occurs as soon as active mining is done

Land is returned to a productive state while mining occurs elsewhere

The entire area is fully reclaimed within 15 years of mining completion at Frontier

## Progressive Reclamation: Restoring land at the same time as we mine.

Frontier will return land to a productive state soon after an area is mined, rather than waiting for all mining to be completed.

This means not only will land be restored more quickly, but the actual footprint of active mining at any given time will be smaller than the total project area.

Progressive reclamation will include both mining and tailings areas. It is expected that the entire area of operations – including mining and tailings areas – will be reclaimed within 15 years of the completion of mining at Frontier.



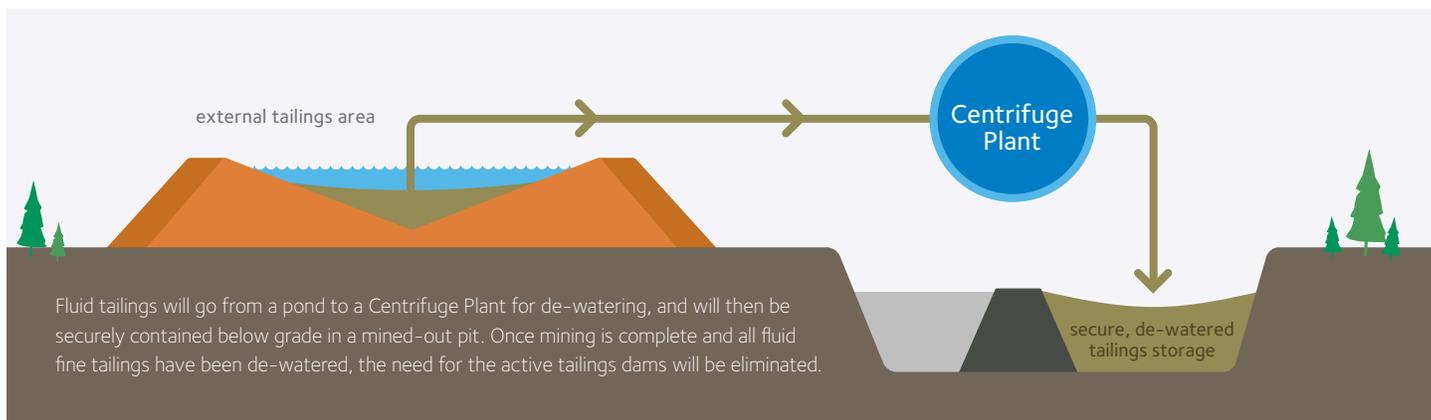
### Teck: A strong legacy of reclamation and site closure

The plan for progressive reclamation at Frontier builds on a 100-year tradition of responsible mine reclamation at Teck.

Wherever Teck operates, we focus on reclaiming the land for post-mining land uses and healthy ecosystems. We are pioneers in mining reclamation, and have led the research and development of industry's best practices and improved reclamation techniques.



# Environmental Responsibility: Tailings Management



Frontier's Tailings Management Plan uses leading-edge engineering and technology to ensure the highest degree of safety and security, and to allow for faster reclamation.

## Tailings de-watering

Centrifuges will extract water from fluid fine tailings held in ponds in the external tailings area. The de-watered tailings will then be placed below grade, in a mined-out pit serving as a dedicated disposal area. This will significantly reduce the volume of tailings in ponds during mine operations.

## Secure long-term containment

Post-closure, all remaining fluid tailings will be de-watered and contained below grade in the dedicated disposal area. At this point, the need for active tailings dams will be eliminated, providing an additional level of long-term security.

## Progressive reclamation during operations

The de-watering and in-pit storage of fluid tailings will also allow the progressive reclamation of the surface of the external tailings area to begin during active mining operations, rather than waiting until post-closure.

*Tailings are a by-product of the process used to extract bitumen from mined oil sands. Tailings consist of water, silt, sand, clay and residual bitumen.*



# Environmental Responsibility: Water



Frontier will apply industry best practices by minimizing water withdrawals and ensuring the protection of water quality in the region.

## Minimizing water usage

Frontier will have one of the lowest water use intensities in the industry, and will be designed to ensure that water withdrawals do not impact the Athabasca River:

**Low water use intensity:** Frontier water use intensity is expected to average 1.9 barrels of river water per barrel of bitumen, lower than the industry average of 2.5 barrels per barrel of bitumen.

**90 per cent of processing water will be recycled:** Additional water will be withdrawn from the Athabasca River only to compensate for losses through evaporation and tailings management.

**No water withdrawals during low flow periods:** The project's design incorporates sufficient off-stream water storage capacity to meet the site's water requirements for up to 120 days. This means that water withdrawals can be stopped entirely during seasonal low river flow periods.

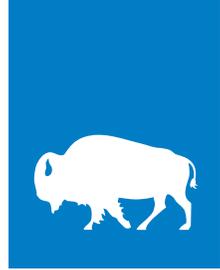
## Protecting water quality

The project will take a comprehensive approach to protecting groundwater and surface water quality in the region:

**Clean water will be diverted** around the mine during operations.

**De-watering of tailings** via a centrifuge plant will significantly reduce the volume of fluid tailings in ponds.

**A monitoring system and network of pumping wells** will surround the perimeter of the tailings area to capture and recycle any material that may seep from the ponds and a hydraulic barrier around the tailings area will be installed to ensure seepage control post-closure.



# Environmental Responsibility: Wildlife

## Frontier is taking the right steps to safeguard wildlife in the region.

We have conducted a comprehensive assessment of potential effects on fish, wildlife and their habitats during construction, operation and closure. The assessment focuses on 22 representative species, chosen for their importance, significance to Indigenous communities, and sensitivity. This work has helped us to identify mitigation measures to safeguard wildlife.



### Biodiversity and wildlife

Teck's vision is to achieve a net positive impact on biodiversity in the areas where we operate through mitigation, reclamation, conservation, and additional measures, so that habitat is actually enhanced once mining and reclamation are complete.

### Re-establishing habitat

Affected habitat will be reclaimed to generate a sustainable landscape designed to promote biological diversity. Mitigation measures will focus on re-establishing habitat through reclamation with forest vegetation and establishment of wetlands.

### Protecting wildlife

The project will incorporate measures to protect wildlife from potentially harmful interaction with project activities. For example, we will incorporate bird deterrent systems like radar monitoring to reduce the potential for tailings areas-waterfowl interactions, and will avoid brush-clearing during bird breeding periods.

### Health of fish populations

Safeguards will protect water quality, ecosystems and fish in watercourses and water bodies in the project area, and pit lakes will be able to support healthy, productive ecosystems. Project effects on fish habitat will be fully offset.

### The Ronald Lake Bison herd

We recognize the importance of the Ronald Lake Bison herd to Indigenous communities in the region. We have worked with government and local Indigenous communities to study the herd and support Alberta's development of a bison management plan. We also advocated for the recent listing of the Ronald Lake herd under the Wildlife Act, which has reduced hunting pressure. We are working with Indigenous communities and other partners to develop a project-specific bison management plan to reduce effects during operations. Once mining is complete, the reclaimed landscape will include high quality bison habitat.