



# Safe pipelines, safe products

Pipelines are the safest, most efficient, and most environmentally responsible method of transporting the hydrocarbon-based products that we all use. At Enbridge, we invest heavily in leading-edge tools, technologies, and strategies – and closely monitor the products we transport – to ensure our pipelines operate safely, reliably, and in an environmentally responsible manner.

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## **How do you know your pipelines are safe?**

We use advanced inspection techniques, around-the-clock monitoring, and leading-edge technology to ensure the fitness of our pipelines.

## **What do you move through your pipelines?**

The products we transport, including crude oil, natural gas, condensate and natural gas liquids (NGLs), must meet rigorous quality standards established by regulators. We strictly enforce these standards.

## **How can I be sure Canada's pipeline system is safe?**

Canada has had rigorous pipeline rules and guidelines in place for more than 60 years – leading to one of the most highly regulated, and safest, pipeline industries in the world.

## **Do you keep in touch with first responders?**

Independent scientific studies report, unequivocally, that product from the Canadian oil sands has no internal corrosivity risk. We wouldn't risk our infrastructure investment if it did.



### Seeking 100 per-cent safety

Over the past decade, through 2019, we've transported more than 27.2 billion barrels of crude oil and liquids, with a safe delivery record of 99.99976%. But we know that's not good enough. Our goal – simply, unequivocally – will always be zero incidents.

### Safe pipelines

Enbridge's multi-layered approach to safety includes rigorous design and construction standards, robust pipeline maintenance, inline inspections, leak detection, valve placement, 24/7 system monitoring, and emergency response.

Preventing incidents before they occur is a critical component of Enbridge's ongoing commitment to safety. This means recognizing conditions that have been known to cause failures in the past – including third-party excavation damage, external corrosion, and cracking or denting – and then working to minimize the risk. It also means adopting the most advanced leak prevention technologies available, following environmentally sound construction practices, and taking a proactive approach to training, inspection, testing, and repair.

As part of our prevention strategy, we regularly use inline inspection tools that allow us to monitor the health of our pipeline systems from the inside out. Our prevention activities also include anti-corrosion coatings, cathodic protection (application of a low-level electrical current), interior cleaning of

pipes, aerial and ground patrols, and field excavation inspections – otherwise known as preventative maintenance digs.

Our Pipeline Control Center also monitors our system, using both human and automated resources, on a continuous, 24/7 basis. We monitor our pipelines for possible leaks using numerous methods, each with a different focus and each using different technology, resources, and timing. Together, these methods provide overlapping and layered leak detection capabilities.

In 2019, we spent more than US\$1.36 billion (C\$1.76 billion) on programs that help us maintain fitness and detect leaks across our North American pipeline operations.

### Safe products

The products we move – crude oil, natural gas, condensate, NGLs – must meet rigorous quality specifications as filed with the Canada Energy Regulator (CER) and the U.S. regulator. We can only carry products that meet these specifications. Every batch of product entering the Enbridge Mainline system is tested by our lab technicians to ensure it meets quality specifications for viscosity, density, temperature, volatility, and sediment-and-water content – and are strictly enforced. Enbridge transports oil that comes from both conventional and unconventional production, including the Canadian oil sands, via our Mainline system to refineries across North America.

We have been transporting crude oil from Canada's oil sands region since 1968. There is nothing new about transporting this form of crude oil, otherwise known as diluted bitumen ("dilbit").

It would be completely illogical for an operator to risk its massive investment in pipeline infrastructure by transporting products with significant corrosion risk to pipeline steel. And in recent years, independent scientific studies have unequivocally reported that dilbit carries no internal corrosivity risk. In fact, Enbridge has **never experienced an internal corrosion failure** on our Mainline pipeline system.

### Safe regulatory environment

Extensive regulation, at both the federal and provincial level, ensures the safe operation of Canadian pipelines. Canada has had pipeline rules and guidelines in place for more than 60 years – leading to one of the most highly regulated, and safest, pipeline industries in the world.

All aspects of the lifecycle of a pipeline – from design and construction, to operation, to decommissioning – are strictly regulated by multiple agencies and government departments tasked to ensure Canada's pipelines are operated safely, responsibly, and in the public interest. Pipelines that cross provincial or federal boundaries are regulated by the federal government, primarily under the authority of the CER.