



Government  
of Canada

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# Oil Sands

A strategic resource for Canada, North America and the global market

## Pipeline Safety

### Pipelines are the safest method of transporting oil and gas

Pipelines are the safest and most economical method of transporting large quantities of crude oil, including oil sands crude, and natural gas over long distances to Canadian and other markets. Spills, leaks and ruptures, although extremely unfortunate, are also extremely rare, representing only a tiny percentage of what is flowing through the pipelines. Between 2000 and 2011, 99.9996 percent of the crude oil and petroleum product transported on federally regulated pipelines moved safely.<sup>1</sup>

### Oil and gas has been safely transported by pipeline for decades

Pipelines have been used in Canada since 1853. The extensive pipeline grid of today began in the 1950s with major crude oil and natural gas finds in western Canada. Today there are an estimated 825 000 kilometres of transmission, gathering and distribution lines in Canada, which in 2011, transported approximately 5.3 trillion cubic feet of natural gas and 1.2 billion barrels of crude oil and petroleum products.<sup>2</sup>

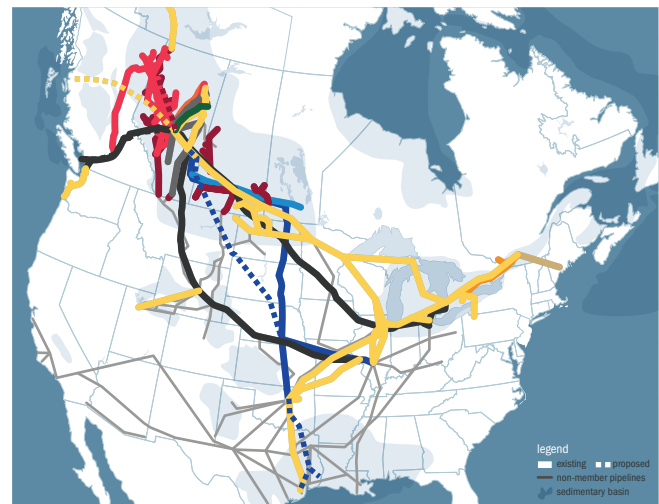
### A rigorous pipeline safety regime

Canada has a comprehensive and rigorous pipeline safety regime to ensure that pipelines are safe and to protect the environment and the public. This includes enforcement mechanisms and penalties administered by the National Energy Board (NEB).

<sup>1</sup> NRCan analysis based on data from the National Energy Board

<sup>2</sup> Canadian Energy Pipeline Association (CEPA)

### Crude Oil and Refined Petroleum Products Pipelines



Source: Canadian Energy Pipeline Association (CEPA), liquids pipeline grid, July 2012

The Government of Canada recently improved pipeline safety by granting the NEB new powers to fine individuals or companies who contravene NEB regulations or orders. The new rules provide penalties of up to \$25,000 per day for an individual or up to \$100,000 per day for any other party, such as a corporation, utility or municipality.

The NEB has been given an additional \$13.5 million over two years to increase the number of inspections for oil and gas pipelines by 50 percent and to double the number of annual comprehensive audits.

The NEB also has the authority to pursue proceedings that could result in a fine of up to \$100,000 and imprisonment for up to one year for summary conviction, or a fine up to \$1 million and imprisonment for up to five years for an indictable offence.

## Oil sands crude no more corrosive

Pipelines have been safely transporting oil sands-derived crude oil in Alberta for more than 30 years. During that time there has been no evidence of an increased risk of pipeline corrosion compared with other forms of crude.

Both scientific research and industrial experience have determined that crude oil from the oil sands is no more corrosive in transmission pipelines than other crudes.

ASTM International, an internationally recognized agency that develops standards tests, recently published *ASTM G205 - 10 Standard Guide for Determining Corrosivity of Crude Oils* for measuring the corrosivity of crude oil under pipeline conditions. Measurements obtained from these tests indicate that the corrosivity of oil sands-derived crudes is no different than that of other crudes.<sup>3</sup>

The NEB must give approval before crude oil, including oil sands-derived crude, can be transported through a transmission pipeline in Canada. To obtain NEB approval, the pipeline operator must identify product specifications such as the corrosive (water) and erosive (mud, sand) content of crude oils that can be shipped through the pipeline. The industry-established limit for the combined basic sediment and water content is 0.5 percent by volume. As a result, all crude oils in transmission pipelines have low corrosivity.

Crude oils, including oil sands-derived crudes, contain little or no carbon dioxide (CO<sub>2</sub>) or hydrogen sulphide (H<sub>2</sub>S). Furthermore, transmission pipelines typically operate well below 70°C. Consequently, naphthenic acid and sulphur compounds that can cause corrosion under refinery conditions (greater than 200°C) are very unlikely to cause corrosion in pipelines.

Pipelines that carry crude oil from the oil sands operate at approximately the same pressure levels as pipelines carrying other crude oils.

## Pipeline companies are responsible for all clean up and remediation costs

Canada functions under the “polluter pays” principle. This means the pipeline company is responsible for all costs to clean up a pipeline spill. Canada has no limit on the amount a company may be required to pay to clean up a spill. In addition to being financially responsible for clean up, the company may also be fined or be subjected to other enforcement actions.



Pipeline marker.  
Source: Courtesy of CEPA

<sup>3</sup> Natural Resources Canada (2012), *Corrosion Conditions in the Path of Bitumen From Well to Wheel*, [www.nrcan.gc.ca/minerals-metals/materials-technology/4542](http://www.nrcan.gc.ca/minerals-metals/materials-technology/4542)

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*Aussi disponible en français sous le titre : Sables bitumineux : La sécurité des pipelines*



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