Bitumen Transportation Bottleneck Solved? How Transporting Alberta's Solid Bitumen via Rail Compares to Pipelines

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In a scenario wherein after completion of the Trans Mountain Pipeline expansion (TMX), Canada builds no more oil pipeline capacity to tidewater, rail transportation becomes an increasingly essential transportation method. Bitumen is a highly viscous substance which needs the addition of diluent to help it flow, creating a product known as DilBit (~70% bitumen and 30% diluent). However, diluent presents more transportation challenges like decreased safety and transportation volume efficiency. This study considered removal of the diluent and shipping it as a non-diluted bitumen by rail, examining the question: "Is shipping Alberta's crude oil as a non-diluted 100% solid bitumen product using existing rail infrastructure a safer, environmentally responsible, and an economically viable option?"

This study examined the technical feasibility of some early-stage non-diluted bitumen by rail technologies like BitCrude in terms of transportation safety, short and long-term social cost-effectiveness, and potential to increase transportation volume efficiency.

It was determined that shipping non-diluted bitumen by rail is indeed more efficient than DilBit by rail - by volume. Also, if non-diluted bitumen were to spill, it would likely remain intact and float in salt water (Figure 1), meaning cleanup should be easier than with DilBit. Indigenous groups have shown significant interest in owning BitCrude containers that carry non-diluted bitumen, as coordinated through the Indian Resource Council. If non-diluted bitumen were to maintain its current non-hazardous goods status, it could easily integrate into existing rail infrastructure, being transported alongside other common goods. Over a 20-year period, transporting DilBit by pipeline is more economically efficient if 3% and 8% discount rates are assumed, while transporting non-diluted bitumen by rail becomes more efficient if a 13% discount rate is considered (Table 1). Hence, transporting non-diluted bitumen by rail is generally a safer and economically attractive option to help get Alberta bitumen to international markets.

Word Count: **300**

Footnotes:

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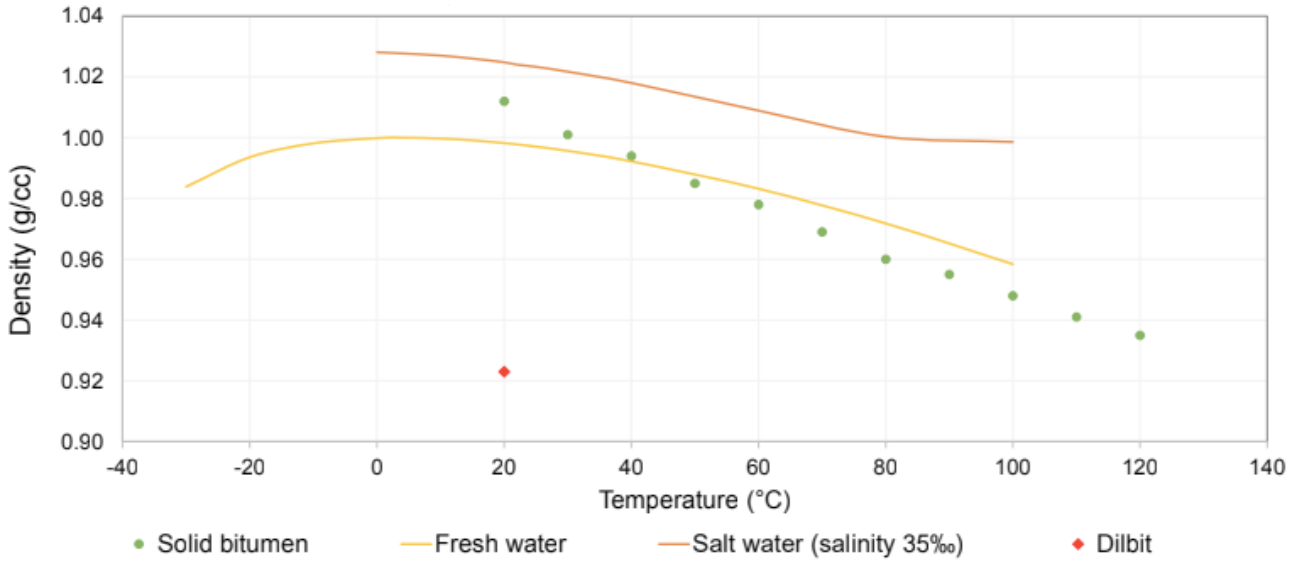

Figure 1. Comparison of viscosity and density differences between Dilbit, Solid bitumen, fresh water and salt water for floating and spill risk analysis.

Table 1. Summary of the major social costs and benefits associated with bitumen transport.

		Dilbit by pipeline (TMX)	Solid bitumen by Rail
	Route	Edmonton to port of Vancouver	Edmonton to port of Vancouver
Costs	Capital costs	$ 12.600 billon	$ 0.992 billion
	Operating costs per barrel	$ 1.13	$ 6.10
Benefits	Price uplift per barrel	$ 2.15	$ 2.10
	Netback per barrel	$ 5.50	$ 6.60
	Diluent penalty per barrel	$ 0.00	$ 7.10

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