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Investor Brief

Canada's oil sands tailings reclamation: an unfunded liability?

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† Jodi, a brilliant and passionate advocate for the environment, passed away in November 2019. She is greatly missed.

Introduction

Canada's oil sands have been a source of energy, good employment, and economic profit for decades. Oil sands mining operations, however, have also been a source of massive amounts of fluid wastes, currently contained in tailings ponds located in northern Alberta.

Tailings ponds have been called a 'toxic legacy'. Since oil sands mining operations first began in the 1960s, the lack of treatment of fluid tailings has been recognized as one of the biggest challenges in oil sands development.¹ Despite the lack of an effective solution to process tailings and reclaim disturbed landscapes, oil sands mining projects were allowed to proceed and multiply. As a result, tailings ponds have grown exponentially over the last five decades.² In the last decade alone, the ponds have nearly doubled in volume from 732 billion liters in 2008 to 1.3 trillion liters; a globally unprecedented volume for any mining industry.³

Under current government legislation, land used for oil sands mining must be returned back to how it was before development, or 'equivalent land capability';⁴ through a process known as reclamation. Even with extensive industry investment in technologies to clean up tailings, each leading technology option still faces uncertainties in terms of its ability to not only effectively and efficiently treat tailings, but also to produce self-sustaining final ecosites. To date, only 0.1% of land disturbed by oil sands mining has been certified as reclaimed.⁵

Now, as the legal regime for environmental liabilities shifts in Canada under recent court decisions, the question of tailings pond safety and prospects for effective reclamation is once again on investors' radar.

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Ongoing environmental and social concerns

The oil sands mining process uses a substantial amount of hot water and chemical additives to produce fluid waste which is then deposited into human-made tailings ponds. These tailings ponds contain a host of toxic elements including heavy metals, arsenic, cyanide, phenols, and naphthenic acids. Unlike tailings produced in conventional mining operations, these tailings ponds generate a middle layer of suspended fine solids that are extremely slow and difficult to separate out; the process would take hundreds of years to occur naturally.⁶ This mid-layer of fluid tailings makes reclamation and clean up difficult for the industry.⁷

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- 1. Waste seepage.** Concerns among communities about seepage from the ponds into surrounding landscapes and water bodies have not been definitively confirmed, but exploratory research has indicated further study is necessary.⁸ The Secretariat of the Commission for Environmental Cooperation under NAFTA is currently preparing a factual record regarding assertions that Canada is failing to effectively enforce the federal Fisheries Act regarding alleged leaking from oil sands tailings ponds in Alberta.⁹
- 2. Impact on wildlife.** The ponds do not freeze over in the winter, which attracts wildlife and requires extensive deterrent systems. There have been very highly-publicized incidents where these deterrent systems have failed and resulted in large scale deaths of migratory ducks that died after landing in tailings ponds.¹⁰
- 3. Harmful air and greenhouse gas emissions.** Tailings ponds release a range of air pollutants that could be detrimental to human health, including volatile organic compounds (VOCs), hydrogen sulphide and nitrous oxides. Tailings ponds are also a significant source of methane and carbon dioxide emissions, two highly potent greenhouse gases (GHG), and could account for as much as 10% of total GHG emissions from oil sands mining.¹¹
- 4. Infrastructure failure.** While low probability, breached tailings dams could cause catastrophic impacts for both ecosystems and communities. A recent report from Canada's EcoFiscal Commission suggests that the current approach to liability management in the sector does not adequately account for this low probability but extremely high impact risk.¹²

5. Aboriginal and treaty rights. In 1986 Aboriginal and treaty rights including rights to hunt, fish, trap, and forage; travel across landscapes; transmit culture through generations; and, enjoy reserve and traditional lands were enshrined in Section 35 of the Canadian Constitution.¹³ As these rights rely on the availability of healthy land, clean water, and sufficient environmental resources, proper consultation and mitigation actions are necessary when industrial activities occur. Further, under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), states are obligated to take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the lands or territories of Indigenous peoples without their free, prior and informed consent. In addition, states are obligated to consult and cooperate in good faith with Indigenous peoples to obtain their free and informed consent prior to the approval of any project affecting their lands or territories.¹⁴ Aboriginal and treaty rights may be encroached upon by oil sands operations through ecosystem impacts, harmful emissions, and the risk of seepage and/or infrastructure failure of tailings ponds. Moreover, the industry's current plans to water cap enormous volumes of fluid tailings will permanently change natural landscapes. Aboriginal and Treaty Rights of future generations may be affected for centuries.



Photo: Suncor by Jason Woodhead, Flickr

Current tailings management approaches

There is no technological fix, as of this writing, to effectively treat and dispose of oil sands fluid tailings.

Instead, most companies currently propose 'water capping,' an unproven approach to manage fluid tailings (see Box 1). No fluid tailings have been certified as reclaimed to date, and significant uncertainties remain as to whether and how companies will be able to address this ongoing technical and economic challenge in a safe, effective, and timely manner.

Box 1: **Water capping**

Water capping involves placing fluid tailings into old mine pits and permanently capping them with freshwater to create 'lakes' that will treat and store the waste in perpetuity.¹⁵ This method is largely untested, and there is no guarantee that it will permanently separate the tailings from the rest of the environment.¹⁶ Further, there is a lack of study on how creating over two dozen closure lakes will cumulatively impact the ecology of the region, in which deep, cold water bodies are not endogenous. While current regulations in Alberta require comprehensive contingency plans for any proposed water capped tailings, contingency plans submitted by industry since 2016 have been either missing entirely or extremely inadequate.



Photo: Syncrude, Mildred Lake Plant, wikipedia

Policy and regulatory

Current Canadian oil sands mining operations are primarily located in the Lower Athabasca Region of Alberta. Strategic policy direction on land use and development for this region are set out in the 2012-2022 Lower Athabasca Regional Framework.¹⁷ In 2015, the Government of Alberta released a Tailings Management Framework (TMF), setting out guidance for managing the accumulating oil sands tailings, and in 2016 the Alberta Energy Regulator (AER) released Directive 085 to implement the TMF.¹⁸

This directive replaced its predecessor, Directive 074, which was introduced in 2009 and set stricter standards for drying tailings as part of the reclamation process; however, none of the oil sands companies were able to meet these requirements. In 2013, Directive 074 was quietly suspended and eventually replaced by Directive 085, allowing companies more flexibility on how they define ‘treated’ tailings and what methods they propose to treat their tailings, which raises questions about the legitimacy of such labels.¹⁹

Companies’ Tailings Management Plans submitted to the AER leave many questions unanswered regarding technology development and deployment for tailings treatment and reclamation. The AER has acknowledged that water-capping technology has “a high degree of uncertainty and risk” and requires “further assessment, research and future policy.”²⁰ Because of this, the AER has prohibited the application of water capping fluid tailings until policies are better developed and requires operators who propose this approach to also provide viable alternative approaches.

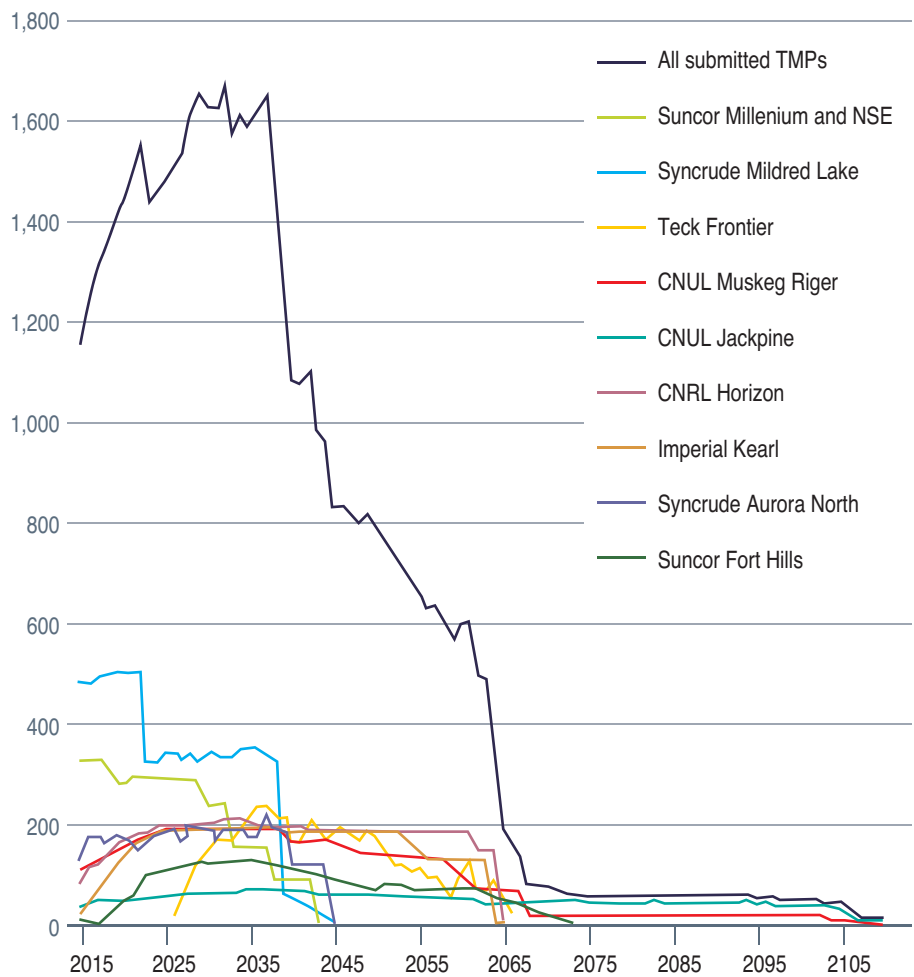
Nonetheless, the AER has approved or partially approved eight of the eight existing tailings management plans. Seven of the approved plans rely heavily on unproven water capping technologies without sufficient alternatives and/or contingency planning. Furthermore, many of these plans failed to comply with the requirements of Directive 085 (despite the flexibility of the Directive). Rather than denying non-compliant plans, the AER has issued approvals with dozens of onerous conditions for supplementary submissions and research requirements, and all mines are required to submit revised plans that include alternative treatment technologies (see Figure 1).

Figure 1. Use of water-capping technologies in Tailing Management Plans. Notes: Data compiled from AER State of Fluid Tailings Management for Mineable Oil Sands, 2017 and AER Decisions for Tailings Management Plans. Syncrude and Fort Hills are joint ventures that Suncor Energy Ltd holds over 50% ownership.

Total reported fluid tailings in 2017 (Mm ³)	Plan to water-cap fluid tailings deposits	Deadline to submit alternative treatment plan
Canadian Natural Resources Ltd. Horizon Mine		
114.5	Y	2025
Canadian Natural Upgrading Ltd. Muskeg River Mine		
116.6	Y	2018
Canadian Natural Upgrading Ltd. Jackpine Mine		
28.4	N	2022
Fort Hills Energy Corp. Fort Hills Mine		
N/A	Y	2026
Imperial Oil Resources Ventures Ltd. Kearl Oil Sands Mine		
41	Y	2027
Suncor Energy Inc. Millennium Mine		
300.3	Y	2023
Syncrude Canada Ltd. Mildred Lake Mine		
502.1	Y	2023
Syncrude Canada Ltd. Aurora North Mine		
136.9	Y	2023

Based on the sum of the plans approved, tailings volumes will continue to rise for a number of years, peaking in 2037 (Figure 2). While the figure also illustrates several sharp future drops in accumulated fluid tailings, in most cases these do not represent accelerated treatment or progressive reclamation. Rather, the sharp drops depict transfers of still-fluid tailings – in some cases treated by chemical processes, and in others entirely untreated – into empty mine pits where they will be capped with freshwater to form permanent lakes.

Figure 2. Projected fluid tailings growth from oil sands operator Tailings Management Plans. Adapted from Blum, J., Luker, M., Stuckless, D., MacDonald, G., and McNeill, J. (2018). Compliance with TMF Objectives: Fact or Fantasy? An Indigenous People’s Perspective. Presented at the International Oil Sands Tailings Conference. Oil Sands Tailings Research Facility. December 9-12.²¹



Investor risks and financial impacts

The uncertain state of oil sands tailings reclamation creates regulatory, reputational, and litigation risks for investee corporations that could impact investors' portfolios and shareholder value.²² These risks are compounded by factors such as continued growth in tailings volumes, the introduction of increasingly stringent regulatory and policy measures to tackle climate change, shifts in market demand and heightened public concern with environmental degradation.

One of the most important factors for investors to consider is the nature of the liabilities associated with tailings reclamation and how well companies are recognizing and managing these liabilities. Reclamation liabilities have the potential to significantly impact expenditures, the value of assets, access to capital, and the overall financial condition of a company, yet these liabilities are not sufficiently understood or reported.

For investors and other stakeholders, the biggest unanswered question is how reclamation obligations will be met – and by whom.

In a post-Redwater era, attention is focused on end-of-life obligations

The Supreme Court of Canada's recent decision on the *Alberta Redwater* case²³ is an important development with implications for the sector's end-of-life obligations.

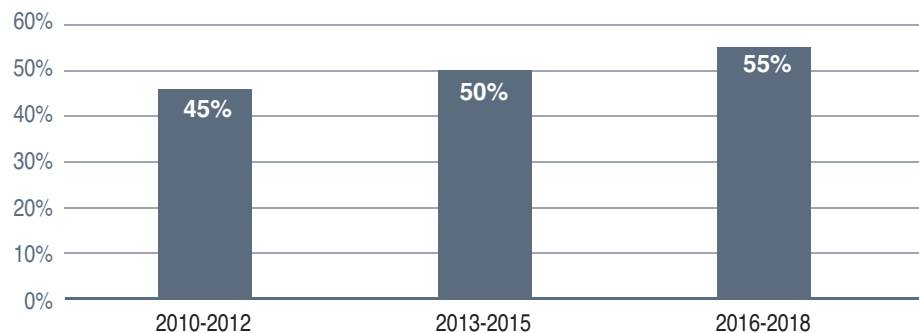
In early 2019, the Supreme Court ruled that in the case of an oil and gas company going bankrupt, environmental cleanup costs get priority over other creditors. The Supreme Court ruled that the environmental obligations actually take priority over any debt payments; specifically, reclamation costs should not be considered as a claim under bankruptcy law, but as a duty to the public as part of the company's license to operate.

Although this ruling does not deal with oil sands tailings directly, it has affirmed that environmental clean-up remains a top priority for the court regardless of a company's financial situation, with implications for both equity and fixed income investments. Going forward, oil and gas companies will likely undergo more stringent scrutiny and requirements from regulators and lenders, and could face higher costs of capital to account for the increased risk. Given that these companies finance a substantial portion of their business through debt, this is of concern for investors even in the short term when considering the oil and gas sector's access to capital.

Companies engaged in activities that result in large-scale landscape disruption (and therefore associated with larger reclamation obligations) such as oil sands mining face particularly high exposure to increased creditor scrutiny and/or more restrictive debt covenants. Looking at three of the largest oil sands companies' own assessments of their liabilities over the past decade reveals a steady growth in the long-term portion of

liability estimates, which includes asset retirement obligations (Figure 3). This increase in long-term liabilities highlights the need for these companies to clearly articulate how they are managing associated risks.

Figure 3. Long-term portion of total liabilities of major oil sands mining companies. Notes: Three year averages calculated using data compiled from Annual Reports of Suncor Energy, Canadian Natural Resources and Imperial Oil. Long term portion includes long-term debt, other long-term liabilities and provisions.



Corporate disclosures lack robust discussion of risks

Canadian companies are required to disclose information about asset retirement obligations (AROs) and environmental liabilities where they are deemed material to investors.²⁵ This includes a “*comprehensive discussion of commitments, events or uncertainties, including AROs, that are reasonably likely to have an effect on the issuer’s business*” in the Management Discussion and Analysis (MD&A).

In practice, what companies disclose on this topic is limited, and follows a narrow conception of risk that may not reflect long-term investors’ interests. In part this is because continuous disclosure regulations are based on a legal definition of “materiality” that may discount future liabilities too greatly, a gap that should be taken into account by any investor with a long-horizon view. In a review of recent company disclosures, we observed that there is a recognition that liabilities related to tailings reclamation exist, but disclosures vary regarding the degree of acknowledgement of risks associated with these liabilities, and are generally lacking in their discussion of implications for the business. It is unclear the degree to which companies have stress-tested, for instance, the impact of higher reclamation requirements or liabilities on their expenditures, capital requirements and financing structure.

Company reclamation plans hold sizeable uncertainties around timing, technologies and capital spending

There is a high degree of uncertainty surrounding the size of the liabilities that companies face, and the amount of capital required from companies to fulfil reclamation obligations. Internal AER presentations have estimated that the value of financial liabilities for oil sands mining (most of which relates to tailings) could be as high as \$130 billion, whereas companies' calculations of their own mining liabilities add up to only \$28 billion.²⁶ While it is ultimately unclear what different underlying assumptions have led to this large discrepancy in estimation of liabilities, the costs at both ends of the range are large enough to have material implications for a company's balance sheet and financial solvency.

Further to company-level risk, there is a systemic threat that the industry cannot support such large financial liabilities. The Alberta government currently only holds less than \$1 billion in liability security from oil sands companies through its Mine Finance Security Program,²⁷ leaving the vast majority of reclamation costs hanging in the balance; an AER presentation recently referred to this as an "increasingly underfunded liability."²⁸

Are companies adequately assessing and mitigating these risks?

The large discrepancy in estimates of the cost of liabilities, coupled with weak discussion of risks in company filings, suggests that companies' consideration of reclamation costs may not fully take into account the evolving nature of the risks associated with reclamation. The Redwater ruling places the obligation for clean-up squarely with the company, yet it is not clear that companies are adequately planning to meet such obligations. This observation is consistent with a wider trend of a bias towards underreporting remediation costs that has been identified in the global mining sector.²⁹



Photo: Oil sands | by Eryn Rickard, Flickr

Conclusion: Addressing reclamation liabilities

Since the onset of oil sands mining operations, successive regulatory bodies have allowed tailings to accumulate without any proven means of remediation, trusting that future technologies will arise to dig the province out of its growing environmental liability. Those future technologies may or may not be discovered; but in the meantime those growing liabilities cannot be safely ignored.

Investors and creditors will need to factor these liabilities into valuations and credit risk models – preferably assisted by improved disclosure from companies themselves – and make responsible decisions based on a full assessment of the long-term environmental, social and financial impacts of poor tailings management. If the Redwater decision did anything, it was to indicate that clean-up costs must be paid by someone, and investors and creditors cannot assume that those costs can (or should) be carried by the public.

In order to effectively address environmental concerns and tailings pond risks, investors should also voice their support for a stable and effective policy and regulatory environment that offers clear incentives for responsible tailings management and reclamation, including:

- A requirement to assess and meaningfully mitigate potential impacts on Aboriginal and Treaty Rights;
- Policies and regulations to set clear and precise targets for tailings treatment, as well as realistic timelines for tailings reclamation;
- Prioritization of technologies for reclamation that could lead to terrestrial landscapes, as opposed to permanent lakes; and
- Revising Alberta's Mine Financial Security Program to ensure that the program meets its objective to reduce liabilities by incenting progressive reclamation and manage the risk in the event that approval holders cannot meet their obligations.

Endnotes

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