

BC MINING LAW REFORM



Waste Disposal & Management

University of Victoria Environmental Law Centre



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Introduction

The pressing need to improve tailings storage and waste management at BC mines became apparent on August 4, 2014. On that day, in one of the greatest environmental disasters in Canadian mining history, the Mount Polley Mine tailings pond dam collapsed—abruptly draining a massive volume of contaminated mining waste into Hazeltine Creek and Quesnel Lake. Seventeen million cubic meters of wastewater and eight million cubic meters of tailings blasted the stream below from five metres to 100 metres in width and deposited the waste into the salmon-spawning Quesnel Lake.¹ The incident forced a temporary drinking water ban for area residents and raised concerns about long-term impacts on fish, wildlife and Indigenous cultures.²

The government-appointed panel of independent expert engineers investigating the incident predicted that many similar events could be expected in the future. Noting the 123 active tailings dams across the province, the Expert Panel stated:

*If the inventory of active tailings dams in the province remains unchanged, and performance in the future reflects that in the past, then on average there will be two failures every 10 years and six every 30. In the face of these prospects, the Panel firmly rejects any notion that business as usual can continue.*³

Those 123 dams pose significant risks. A study that mapped potential paths of contaminants from dam failures at just 35 northern tailings ponds estimated that 33 Indigenous communities and 208 cities and settlements could be affected. In the study area, 80% of all chinook and sockeye salmon habitat lies downstream from a tailings facility—or requires migration through a potential contamination path.⁴ This risk to fish poses a particularly serious threat to Indigenous rights and the livelihoods of communities that depend on healthy fisheries.⁵

The Mount Polley disaster spotlighted BC's flawed rules governing mine tailing dams and offered an opportunity to make significant improvements. In January 2015, the Expert Panel concluded their investigation and issued a number of recommendations for change. While the BC government agreed to implement many of these recommendations,⁶ key Expert Panel recommendations have still not been fully implemented. Government has yet to adopt state-of-the-art standards for managing tailings and other mine wastes.⁷

This is not prudent, in light of potential consequences. One year after the Mount Polley disaster, a large tailings dam in Brazil collapsed. Brazil's government did not tighten regulations. In January 2019, yet another tailings dam in Brazil collapsed—this time leaving 110 people dead, 238 missing and an environmental disaster of "epic proportions."⁸

Reduce the number of existing tailings dams

The government's Expert Panel criticized construction of tailings water impoundments as "century old technology," and noted that "tailings dams...are unforgiving systems, in terms of the number of things that have to go right [for years]... Simply put, dam failures are reduced by reducing the number of dams that can fail."⁹

Therefore, the Panel called for action on the existing 123 active facilities, and recommended that government adopt best available technology to "reduce the number of tailings dams subject to failure."¹⁰ The Panel suggested that, "to meet safety goals," the Province should take steps to both reduce the failure frequency of active tailings dams (i.e. through best available technology), *as well as* "halve the active dam inventory from 120 to 60."¹¹ Unfortunately, there is no evidence to suggest the provincial government has a strategy in place to achieve that goal and eliminate anywhere close to half of the existing dams.¹² This must be remedied.

- 1. RECOMMENDATION: Establish a comprehensive plan to safely retire at least 60 active mine tailings dams, as recommended by government's Expert Panel.**

Move away from wet tailings impoundments

Currently, many mines in BC use the same type of waste storage facility that Mount Polley used. These wet tailings impoundments store water in massive disposal lakes, mixed with a cocktail of mine waste materials. In addition to suggesting that the number of active facilities be cut in half, the Expert Panel also recommended that government move to eliminate the use of this type waste storage facilities altogether. In line with its Best Available Technology recommendations, the Panel called on the province to "aggressively pursue" alternatives to wet tailings impoundments.¹³

Despite these post-Mount Polley recommendations, industry continues to propose—and government continues to approve—wet tailings impoundments. British Columbia is not currently doing enough to encourage and require dry disposal of mine waste—and these safer types of operations are seldom proposed by industry.¹⁴ There are a number of new and proposed mines throughout BC that plan to rely on wet tailings impoundments.¹⁵ For example, in northwest BC the new Red Chris mine and the proposed Schaft Creek, KSM, and Galore Creek mines all continue to rely on this problematic technology. Each of these mines is designed to generate far more waste than Mount Polley—six to 27 times more

tailings, by volume. Compounding the threats posed by their sheer size and use of risky technology is the fact that much of the wastes at these projects has a greater potential to generate acid drainage than at Mount Polley. The potential for higher toxicity in the waste means the impacts of a Mount Polley-type collapse could be much more severe.¹⁶

Although government has, since the 2014 Mount Polley disaster, responded with some improvements to mining rules (e.g., requiring that mines have an Engineer of Record, a tailings storage facility Qualified Person, and an Independent Tailings Review Board),¹⁷ the changes still fall short of what the Expert Panel recommended.¹⁸ Tailings storage facility expert Dr. David Chambers has noted that changes to BC's Mining Code in response to Mount Polley have not gone far enough to implement the tailings dam recommendations from the Expert Panel.¹⁹ Instead of moving to eliminate surface water impoundments, government is only requiring that companies "make efforts" to reduce water and "consider" progressive alternatives to water impoundments. As Dr. Chambers notes:

This leaves the door wide open for site-specific considerations, which inevitably will include cost, to trump real change to present practices... Other than the Code's requirement for an 'effort to reduce and remove water' and to 'consider' alternatives to water covers, the discussion in the Code is on how to manage saturated tailings, not on how to eliminate saturation.²⁰

While drier tailings management may not always be appropriate, it should be required whenever practicable and demonstrably safer than the risky wet-storage approach that the Expert Panel criticized.

2. RECOMMENDATION: Prohibit wet tailings impoundment unless it can be demonstrated through a risk assessment process that wet tailings impoundment poses less long-term risk (environmental, financial, and public safety) than a dry tailings approach.

3. RECOMMENDATION: Where wet tailings impoundments are in use, require dry closure (e.g. draining) when mining operations cease— unless it can be demonstrated through a risk assessment process that long-term maintenance of a wet tailings impoundment poses less risk (environmental, financial, and public safety).

Make safety the priority

Government's post-Mount Polley rule changes do not adequately address the Expert Panel's crucial recommendation that *safety*—not short-term cost—considerations must determine what type of tailings disposal is approved. The Panel noted that the main reason industry had not adopted a drystack/filtered tailings approach is because it would increase their costs. However, while this approach may be more costly than tailings ponds for companies to implement, it can result in lower long-term costs to the public by reducing the risk of catastrophic failures like Mount Polley.²¹ Therefore, the Panel recommended that financial feasibility studies for tailings storage approaches include long-term externalities (including environmental impacts) and full life-cycle costs that take into account the increased risks associated with massive tailings ponds and dams.²²

Unfortunately, when Dr. Chambers analyzed one new and three proposed mines in the northwest of the province, he concluded that *none* of them met the recommendations of the Expert Panel to reduce the risk of tailings dam failure and prioritize long-term public safety. Dr. Chambers concludes that the new BC rules do not make safety—as opposed to short term economic considerations—a paramount factor in decisions around what type of tailings storage approach will be approved.²³

4. RECOMMENDATION: Ensure that public safety, environmental safety, and economic safety are the determinative factors in governing what tailings disposal system will be implemented.

5. RECOMMENDATION: Require that financial feasibility studies conducted for proposed mines and waste disposal systems take into account the full long-term life cycle costs of facilities—and include externalities such as long-term costs/risks to the environment, industry and taxpayers, and public safety.

6. RECOMMENDATION: Require and apply the strictest and most rigorous standards when tailings dams are unavoidable.²⁴

Meet IRMA (Initiative for Responsible Mining Assurance) standards for waste management

Globally, some of the most practical and progressive environmental standards for mining are being developed in the IRMA certification process. Similar to the Forest Stewardship Council and Marine Stewardship Council, IRMA is working to establish a mine-level certification program for responsible mining. Under this initiative, environmental and human rights organizations are working with mining companies, labour unions, community organizations and downstream users of mining products to produce a set of standards that mining companies must meet if they want to be certified by IRMA. The aim is to create an independently verified, responsible mining assurance system that improves social and environmental performance—and to create value for those mines that take a lead in socially and environmentally responsible mining.

- 7. RECOMMENDATION: Require that all mines in BC comply with the IRMA standards, or better, for Waste and Materials Management.²⁵**

Ban disposal of mine wastes into lakes, rivers or oceans

British Columbia still permits companies to discharge waste materials directly into lakes, rivers and oceans. This dumping of mine tailings, process water and waste rock into water bodies can damage aquatic life and ecosystems, and threaten drinking water and human health.

While companies may insist that disposal into a natural water body is necessary for a project to proceed, there is often a better approach. For example, when Taseko Mines first proposed an open-pit mine project near Williams Lake (Prosperity Mine), its project description included plans to drain nearby culturally and ecologically significant Fish Lake for use as a dump for waste rock.²⁶ Taseko told the federal environmental review panel that, based on its conclusions from "one of the most comprehensive alternatives assessments" ever undertaken, the destruction of Fish Lake for waste management "was the only viable option." Other methods were, according to the company, uneconomical and cost prohibitive.²⁷ However, after this proposal was rejected by the federal panel in 2010, Taseko Mines found another option, and came forward with a new proposal in 2011. This new proposal would preserve Fish Lake by "relocating the tailings storage facility 2.5 km upstream of the lake and by introducing a lake recirculation water management

scheme"—a new plan that apparently became economically viable after the original 2010 project rejection.²⁸

When natural water bodies are used for disposal of mining waste, reclamation may not be possible and the impacts can go on for decades. To protect against the significant public costs associated with long-term degradation of lakes, rivers and oceans, a number of jurisdictions have acted to restrict or prohibit the direct disposal of mine waste into these natural water bodies.²⁹ Similarly, the international Initiative for Responsible Mining Assurance (IRMA) will not certify mine sites that use river, submarine and lake disposal of mine waste materials under its Standard for Responsible Mining.³⁰

8. RECOMMENDATION: Prohibit disposal of mining wastes into rivers, lakes and oceans.

Endnotes

- 1 Auditor General of British Columbia, *An Audit of Compliance and Enforcement of the Mining Sector* (Victoria: Office of the Auditor General, 2016) at p. 66.
- 2 Ian Bailey, "Mount Polley Mine Still at Risk for Future Tailings Breach," *Globe and Mail* (2016 August 4).
- 3 Independent Expert Engineering Investigation and Review Panel, *Report on Mount Polley Tailings Storage Facility Breach* (Province of British Columbia, 2015) at p. 118.
- 4 Robyn Allan, *Toward Financial Responsibility in British Columbia's Mining Industry* (Union of BC Indian Chiefs, 2016) at p. 53.
- 5 As exemplified by the major losses suffered by First Nations deprived of access to the salmon runs impacted by the Mount Polley dam failure. See Ellen L. Petticrew et al., "The impact of a catastrophic mine tailings impoundment spill into one of North America's largest fjord lakes: Quesnel Lake, British Columbia, Canada" (Geophysical Research Letters, 2015). As documented by Amnesty International, several lawsuits have been filed by various First Nations for damage done to their fisheries and traditional uses, including *Tsilhqot'in National Government et al. v. Imperial Metals Corporation et al.*; *Chief Ann Louie and the Williams Lake Indian Band v. Mount Polley Mining Corporation et al.*; and *St'at'imc Chiefs Council et al. v. Mount Polley Mining Corporation et al.*; Amnesty International, "Mount Polley Litigation Summary" (2017).
- 6 For example, "on July 20, 2016, the Health, Safety and Reclamation Code for Mines in British Columbia was updated to increase design standards for tailing storage facilities (TSFs). These updates included the introduction of new criteria for steepness of dam slopes, earthquake and flood design; additional responsibilities for the engineer of record, and; the establishment of an Independent Tailings Review Boards;" The Environmental Law Club & Environmental Law Centre, *Digging up a Legislative History*, (Victoria: 2018) at p. 48, citing British Columbia, Ministry of Energy and Mines, "Government actions renew B.C. as a leader in mining" (February 28, 2017) at "Backgrounder 3," p. 8.
- 7 In addition to the deficient rules on tailings/waste management discussed below, Mount Polley Mine is still discharging effluent into Quesnel Lake over the opposition of local residents. Those residents are challenging the legality of BC's permit, arguing that management of the effluent falls far short of Best Achievable Technology.
- 8 Editorial Board, "Brazil's Lethal Environmental Negligence," *New York Times*, January 31, 2019.

- 9 Independent Expert Engineering Investigation and Review Panel, *Report on Mount Polley Tailings Storage Facility Breach* (Province of British Columbia, 2015) at pp. 119-120.
- 10 Independent Expert Engineering Investigation and Review Panel, *Report on Mount Polley Tailings Storage Facility Breach* (Province of British Columbia, 2015) at p. 122.
- 11 Independent Expert Engineering Investigation and Review Panel, *Report on Mount Polley Tailings Storage Facility Breach*, Appendix I, B.C. Tailings Dam Failure Frequency and Portfolio Risk, 5.3.3 Combined Approach (Province of British Columbia, 2015) at p. 11.
- 12 See Letter. David Chambers, Ph.D., Center for Science in Public Participation, "Comments on the Code Review Changes to Part 10, Mine Health Safety and Reclamation Code for Mines in British Columbia." Received by Secretariat for the Code Review (July 27, 2016) (Bozeman: Montana).
- 13 Independent Expert Engineering Investigation and Review Panel, *Report on Mount Polley Tailings Storage Facility Breach* (Province of British Columbia, 2015) at p. 125.
- 14 This is happening, in spite of the fact that the Panel stated that the Best Available Technology (BAT) recommendations could be accomplished through underground disposal, along with filtered (dry-stack) technology. Note, however, that BruceJack Mine on the Unuk watershed, under construction, is planning to backfill some of their tailings underground and cement pasting tailings to neutralize some of the acid. However, "due to space limitations," in addition to backfilling into the mine, the project would require "disposal into Brucejack Lake... throughout the mine life;" Canadian Environmental Assessment Agency, *Bluejack Gold Mine Project: Environmental Assessment Report* (Ottawa: 2015) at pp. 7, 12.
- 15 For other examples of continuing water impoundment systems, see the proposed Blackwater and Underground Kemess mine projects. Both propose conventional tailings management. Although the Kemess project proposes tailings to be deposited in an existing pit, it still requires a 35m high dam, similar to the dam at Mount Polley.
- 16 Letter. "Request for Establishment of a Judicial Commission of Public Inquiry to Rectify and Improve BC Mining Regulation." Calvin Sandborn & Kristy Broadhead. Received by the Honourable Christy Clark (8 March 2017) (Victoria: BC) at Appendix C. Note that under the Ministry's "Consequence of Failure Rating," Mount Polley was not in the category of most dangerous tailings dams. It was rated as having a "significant" consequence of failure—not as serious as the facilities rated as having "extreme," "very high," or "high" consequence of failure. See G. Hoekstra, "Little Impact was Expected from Mount Polley Dam Collapse: Failure Ranking," *The Vancouver Sun*. (2014, September 7).

- 17 Province of British Columbia, Ministry of Energy and Mines, Health, Safety and Reclamation Code for Mines in British Columbia (Victoria: 2017) at Part 10, But note that the TSF Qualified Person is employed by the company.
- 18 Letter. "Request for Establishment of a Judicial Commission of Public Inquiry to Rectify and Improve BC Mining Regulation." Calvin Sandborn & Kristy Broadhead. Received by the Honourable Christy Clark (8 March 2017) (Victoria: BC) at Appendix C.
- 19 Letter. "Request for Establishment of a Judicial Commission of Public Inquiry to Rectify and Improve BC Mining Regulation." Calvin Sandborn & Kristy Broadhead. Received by the Honourable Christy Clark (8 March 2017) (Victoria: BC) at Appendix C; and Ian Bailey, "Mount Polley Mine Still at Risk for Future Tailings Breach," *Globe and Mail* (August 4, 2016).
- 20 Letter. David Chambers, Ph.D., Center for Science in Public Participation, "Comments on the Code Review Changes to Part 10, Mine Health Safety and Reclamation Code for Mines in British Columbia." Received by Secretariat for the Code Review (July 27, 2016) (Bozeman: Montana) at p. 4.
- 21 See the discussion on perpetual water treatment below. Also see "Polluter Pays."
- 22 *Independent Expert Engineering Investigation and Review Panel, Report on Mount Polley Tailings Storage Facility Breach*, Province of British Columbia, 2015, pp. 123-125.
- 23 Letter. David Chambers, Ph.D., Center for Science in Public Participation, "Comments on the Code Review Changes to Part 10, Mine Health Safety and Reclamation Code for Mines in British Columbia." Received by Secretariat for the Code Review (July 27, 2016) (Bozeman: Montana) at p. 10.
- 24 For specific standards that could be applied, see: MiningWatch Canada submission to MNDM Draft Guidelines on Tailings Structures Safety, 27 February 2018, "Top 11 Practices To Avoid Mine Waste Failures"; MiningWatch Canada, "Are Catastrophic Failures and Mining Spills Preventable?" August 11, 2017; Ugo Lapointe, Mining Watch Canada submission Re: A New Mineral Resources Act for the Northwest Territories, addressed to Minister Wally Schumann, Government of the Northwest Territories, December 1, 2017, pp. 15-16; and 2016 *Site Characterization Guidelines for Dam Foundations* of the Association of Professional Engineers and Geoscientists of BC.
- 25 Initiative for Responsible Mining Assurance, *Standard for Responsible Mining IRMA-STD-001* (2018) at chapter 4.1.
- 26 Canadian Environmental Assessment Agency, *Report of the Federal Review Panel: Prosperity Gold-Copper Mine Project* (July 2, 2010) (CEAA Reference No. 09-05-44811) at p. 39.

- 27 Canadian Environmental Assessment Agency, *Report of the Federal Review Panel Prosperity Gold-Copper Mine Project* (July 2, 2010) at p. 34, 46, 5.4.2.1., online: <https://www.ceaa.gc.ca/050/documents/46911/46911E.pdf>.
- 28 Canadian Environmental Assessment Agency, *Report of the Federal Review Panel: New Prosperity Gold-Copper Mine Project* (October 31, 2013) (CEAA Reference No. 63928) at vii. See also Taseko Mines Limited February 21, 2011 news release stating that the new project design and waste management plans were enabled by "new longer-term price projections... [which] indicat[e] [that] both copper and gold prices would be much higher" than anticipated when previous designs were submitted; as documented by Matthew Burrows, "Taseko's revised Prosperity Mine project would save Fish Lake but destroy Little Fish Lake," *The Georgia Straight* (2011 March 5). Note also the example of the Kemess Mine expansion proposals, located 400 kilometres northwest of Prince George. In 2007, Northgate Mineral Corporation's Kemess Mine Expansion project, which included transforming Amazay Lake into a tailings pond—a culturally significant lake for the Tse Key Nay First Nation—was rejected on the basis of a significant adverse effects finding by a federal review panel. However, in 2014, the mine expansion project was revisited by a new proponent, AuRico Metals Inc., which submitted new project design plans. The plans included using an existing, retired open mine pit as the new project's tailings rock storage facility, as opposed to draining and eliminating Amazay Lake. This new proposal was approved by a ministers' decision in 2017; Environmental Assessment Office, *Kemess Underground Project: Assessment Report* (February 16, 2017).
- 29 Earthworks and MiningWatch Canada, *Troubled Waters: How Mine Waste Dumping is Poisoning our Oceans, Rivers, and Lakes* (2012) at pp. 1-4 and 10.
- 30 Initiative for Responsible Mining Assurance, *Standard for Responsible Mining IRMA-STD-001* (2018) at 4.1.8.1. Also, note that the new Brucejack Mine will dispose of mine wastes directly into the nearby lake: "Due to space limitations," in addition to backfilling into the mine, the Brucejack Mine project will require "disposal into Brucejack Lake... throughout the mine life;" Canadian Environmental Assessment Agency, *Bluejack Gold Mine Project: Environmental Assessment Report* (Ottawa: 2015) at pp. 7, 12.