REFLECTION

Promises, Promises … The Views of a Quesnel Lake Resident Ten Years after the 2014 Mount Polley Mine Disaster

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I HAVE BEEN A RESIDENT of Likely, British Columbia, for over twenty-five years. My home is situated on the shores of Quesnel Lake, about five kilometres (as the crow flies) from the Mount Polley Mine. I worked in mining for over forty-five years in numerous capacities, including as a researcher, mill operator, senior metallurgist, environmental superintendent, and consultant.

Given my history in the mining industry it should be clear that I am not against mining or the Mount Polley Mining Corporation (MPMC) in particular. I understand that society needs the many metals and products that come from mines. But, in a modern society that is aware of the continuing degradation of the natural environment, it is imperative that environmental protection be paramount in any decisions to operate a mine.

Last year around 4 August 2023, I wondered how many people even remembered that it was the ninth anniversary of the Mount Polley Mine dam breach. And now we have the tenth anniversary quickly approaching.

For me, it's hard to forget. It brings me back to the early-morning phone call from Likely Fire and Rescue on that day. Still half asleep, I was quickly told that the mine dam had breached overnight and that tailings were pouring into Quesnel Lake. The threat communicated over the phone was jarring: "Stop using the water, get your boat out of the lake, and be prepared to evacuate as the lake may flood!" Yikes!

I immediately stepped outside and could hear the roaring flow of water in the distance, like Niagara Falls. But in this case, it was just seven or so kilometres down Quesnel Lake from me at Hazeltine Creek. Double yikes!!

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At that moment, the immediate reality of the environmental risks that could be posed by mining operations became painfully clear to me, in this case to my neighbourhood, the pristine and remote waters of Likely and Quesnel Lake. Likely residents had always had concerns about the effect of the proposed Mount Polley Mine on Quesnel Lake. In fact, the community very strongly expressed its concerns about protecting Quesnel Lake water multiple times during the public consultations organized in the late 1980s and into the 1990s, when the MPMC was seeking initial operating permits for the mine. My wife and I attended one of these public meetings in Likely, as outsiders at the time, and the community hall was filled to capacity with locals strongly expressing their concerns. It was during these public consultations that the MPMC promised that there would be no discharge of water or mine effluent (i.e., the mine would have a negative water balance operation) and that the mine would never affect Quesnel Lake. These claims obviously satisfied the BC government regulators at the Ministry of Mines and Ministry of Environment as there was no requirement to monitor or sample Quesnel Lake during the mandated environmental baseline studies. In fact, after the disaster, both the regulators and the MPMC purportedly could not find a single adequate pre-breach full chemical analysis of Quesnel Lake to inform them during the post-breach technical assessments of water quality.[1]

The promise that Mount Polley's operations would not affect Quesnel Lake was broken. In the immediate aftermath of the worst mining disaster in Canada's history, many more promises were made to Likely residents:

1. British Columbia premier Christy Clarke, standing on the banks of Quesnel Lake in downtown Likely, promised environmental protection and accountability when she proclaimed:

   > This is a pristine resource for everybody … We are going to be with you, shoulder to shoulder, to do everything we can to return it to the real pristine beauty we all know this lake is for our province, because this is just such an incredible, incredible asset and so important to all of you.[2]

[1] Golder Associates, "Mount Polley Mine: Approach for Long Term Water Management Plan Development," 2015, https://imperialmetals.com/assets/docs/mt-polley/2015-03-20_MPM_LTWMPD.pdf.

[2] "Mount Polley Mine Spill: Water Quality Test Results within Drinking Guidelines." CBC News, 7 August 2014, https://www.cbc.ca/news/canada/british-columbia/mount-polley-mine-spill-water-quality-test-results-within-drinking-guidelines-1.2730042.

2. President of Imperial Metals Corporation Brian Kynoch promised at public meetings in Likely that "the company accepts full responsibility for the breach" and that "he was committed to pay for the cleanup [of the breach]."[3]
3. Imperial Metals Corporation (IMC), and the environmental consultants it hired from Golder Associates (IMC's primary environmental consultant), promised to include local residents and other stakeholders in the decision-making process to select appropriate water treatment and discharge options to deal with the excess wastewater produced from future mining operations.[4] This was to be done to the community's satisfaction during a series of workshops and public meetings, prior to the mine applying for permits to recommence full mining operations.
4. Regulators with British Columbia's Ministry of Mines and Ministry of Environment promised and implied during public and technical meetings that they would protect the Quesnel Lake environment by incorporating resident concerns and suggestions into the conditions informing a new operating permit.

In actuality, political expediency, professional reliance, and regulatory capture ensured all of these promises were broken, except for one: the mine operations did resume.

It has been ten years since the Mount Polley Mine dam failure, and the mine has yet to be held accountable for the largest mine waste disaster in Canadian history. Even worse, the mine continues to pollute the once pristine waters of Quesnel Lake with its untreated mine effluent. This is because the Mount Polley Mine's water treatment plant only removes solids, not solubilized chemicals of concern such as metals and nutrients.

Regulatory capture and professional reliance continues to inform environmental decision-making processes in British Columbia. It appears to many that the primary goal of regulators is to ensure that mines such as the MPMC keep operating despite their negative impacts on the environment.

Following the breach, on 9 July 2015, the MPMC was granted a permit amendment (PE11678) to discharge up to 1.4 million cubic metres of basically untreated effluent into Hazeltine Creek, which flows directly

[3] "Mount Polley Mine Spill: Drinking-Water Ban Partially Lifted," CBC News, 8 August 2014, https://www.cbc.ca/news/canada/british-columbia/mount-polley-mine-spill-drinking-water-ban-partially-lifted-1.2731135.

[4] Golder Associates, "Mount Polley Mine."

Figure 1. Two 24-inch MPMC effluent pipelines entering Quesnel Lake near mouth of Hazeltine Creek (screenshot from video at www.ccql.ca).

into Quesnel Lake.[5] The permit was amended again on 29 November 2015, increasing the flow of untreated effluent to 9.5 million cubic metres annually into Hazeltine Creek.[6] Two years later, on 7 April 2017, a permit amendment granted the MPMC the ability to resume full operations and to discharge 10 million cubic metres of effluent annually directly via pipeline into Quesnel Lake.[7] Since that first post-breach permit amendment approval by the Ministry of Environment, the MPMC has been granted nine permit amendments. Most of these permit changes, requested by the MPMC due to conditions it considered "too onerous," weakened the protection of water quality in Quesnel Lake. The present permit to discharge into Quesnel Lake expires 30 June 2025.

Since 2017, the level of environmental monitoring and oversight has steadily been eroded as the Ministry of Environment approved the numerous reductions in Mount Polley's monitoring and reporting requirements. For instance, the MPMC now is only required to sample Quesnel Lake four times a year (down from weekly and monthly sampling in 2014), with the timing of these samples at the mine's discretion. Additionally, the MPMC is no longer required to sample along Quesnel River. This has led to the present situation, in which there are monitoring

[5] Ministry of Environment, "Amended Permit 11678," 7 September 2015, https://www2.gov.bc.ca/assets/gov/environment/air-land-water/spills-and-environmental-emergencies/docs/mt-polley/p-o-r/2017-04-07_pe11678.pdf.

[6] Ministry of Environment, 29 November 2015.

[7] Ministry of Environment, 7 April 2017, https://nrs.objectstore.gov.bc.ca/lteczn/5fa214dfcd5a007b47689cee/Effluent%20Discharge.pdf.

data gaps of the lake up to seven months during the winter, resulting in no record of what is occurring in the lake. How can the lake be protected when monitoring and reporting data for half a year or more are unknown?

Recent application amendment submissions indicate that environmental monitoring and protection will continue to be eroded. On 5 December 2023, the MPMC submitted a joint application for both the Ministry of Mines's MEM M200 and the Ministry of Environment's MoE PE11678 permit amendments, to be reviewed simultaneously through a mine review committee (MRC). These amendments would support mine operations until at least 2032 (nine years into the future). But of course, as is common in many existing and past mine sites, it is likely that the mine could operate for decades beyond that as modern mine exploration continues to identify more ore reserves on the existing site.

The first draft of the joint application is a massive document over eight thousand pages long. It is very poorly laid out from a layperson's viewpoint (i.e., mine) because it is difficult to separate the amendments associated with each ministry. The mine and the Ministry of Environment are also in the middle of the bi-annual review of the Comprehensive Environmental Management Plan (CEMP), which provides operating guidelines for the management of environmental risks and monitoring at the mine site. As part of this review, the MPMC is again requesting further reductions in monitoring and sampling frequency, in this case for lake and stream biological parameters such as benthic invertebrates, fish, and sediment. Benthic organisms are very sensitive to changes in water quality and can be affected by increases in metals, such as copper and selenium, and in nutrients, such as phosphorus, nitrates, and sulphates. They are also the base of the aquatic food chain, and the contaminants can move up into the fish and those who consume the fish. This further erosion of monitoring is very concerning because, as described below, there are significant indications that the once pristine Quesnel Lake environment is degrading since the mine dam breach occurred, and the mine continues to discharge basically untreated effluent containing some elements that are hundreds of times higher than pre-breach levels.

The lack of environmental protection is noticeable through changes in Quesnel Lake. It appears to be deteriorating from its ultra-pristine oligotrophic status prior to the breach to a less pure mesotrophic state.[8]

[8] Trophic status refers to the overall level of biological productivity within a lake and is a key characteristic of water quality. Oligotrophic lakes such as Quesnel Lake have the least amount of biological productivity with good-quality water. Mesotrophic lakes have a moderate level of biological productivity with fair water quality. Eutrophic lakes have the highest amount of biological productivity, with poorer quality water.

There are two causes of this change. The first includes the surge of nutrients (phosphorus, nitrates, sulphates, etc.) dumped into Quesnel Lake by the breach. The second includes the discharge of nutrient-rich mine effluent over the last ten years. Independent research by University of Northern British Columbia (UNBC) researchers has shown that the lake continues to be negatively affected.[9] Yet both the Ministry of Environment and the mine downplay and ignore this information. For some reason, the science provided by the mine and its consultants is given more consideration than is independent and peer-reviewed research from UNBC scientists, a sure sign of professional reliance and regulatory capture. Why is this bias allowed to continue?

One notable example of the changes to Quesnel Lake includes elevated levels of phosphorus. Elevated levels of phosphorus have the potential to alter lakes. As noted in a 2 July 2013 Minnow Environmental Inc. letter to the MPMC about increasing nutrient levels in Polley Lake:

> An increase in phosphorus concentration above background levels has the potential to alter a lake's trophic status and dominant biota, decrease biodiversity, cause a decline in ecologically sensitive species/ increase in tolerant species, cause an increase in biomass, turbidity and organic matter, and cause an increase in oxygen consumption, potentially decreasing aqueous dissolved oxygen concentrations … Physicochemical and biological changes expected with this increase in trophic status include increased algal growth (particularly of blue-green algae), reduced water transparency, greater macrophyte growth, lower hypolimnetic dissolved oxygen, and possible changes in fish community composition.[10]

Historical data from the Department of Fisheries and Oceans indicate phosphorus levels of less that 2 micrograms per litre before

[9] P.N. Owens, E.L. Petticrew, S.J. Albers, T.D. French, B. Granger, B. Laval, J. Lindgren, R. Sussbauer, and S. Vagle, "Annual Pulses of Copper-Enriched Sediment in a North American River Downstream of a Large Lake following the Catastrophic Failure of a Mine Tailings Storage Facility," *Science of the Total Environment* 856 (January 2023): 158927, https://doi.org/10.1016/j.scitotenv.2022.158927; Gabrielle Lint, "Effects of Mount Polley Mine Spill Tailings on Impacted Lakes' Phosphorus and Chlorophyll-a Concentrations," paper presented at UNBC Research Week, Zoom, 2022, https://www2.unbc.ca/sites/default/files/sections/office-research-and-innovation/researchweek-thursdaymarch3rd2022v2.pdf.

[10] Minnow Environmental Inc., "Appendix K: Phosphorous in Polley Lake Letter Report," in *Mount Polley Mining Corporation Annual Environmental and Reclamation Report*, 2013, 1–5, https://www.mountpolleyreviewpanel.ca/sites/default/files/background-documents/MPMC00175_2014-03_MPMC%202013%20Environmental%20and%20Reclamation%20Report%20Appendix%20K%20to%20X.pdf.

the breach.[11] Pre-breach phosphorus levels were recognized by the MPMC in the 2016 Long-Term Water Management Plan Technical Assessment Report (LTWMP TAR).[12] However, after the disaster the lake appears to have increased average levels of total phosphorus by up to 2.7 to 3.4 micrograms per litre by 2021, as determined by Gabrielle Lint's research at UNBC.[13] Recent MPMC quarterly report data show phosphorus levels were recorded up to 3.5 to 4 micrograms per litre, with some individual readings as high as 13.6 micrograms per litre.[14] As Gabrielle Lint notes, "the increases of total and total dissolved phosphorus are significant for a lake the size of Quesnel Lake given it has such a large volume (41.8 cubic kilometres)."[15]

This raises the following questions: What else has changed? What is going to be done about it? Residents who have lived in Likely for over fifty years have noticed significant deterioration of Quesnel Lake aquatic environment quality since 2014. Yet both the Ministry of Environment and the MPMC ignore this local knowledge. This is very ill advised considering the results of numerous UNBC and associated studies show surges of suspended solids from the deposited tailings are having negative impacts on benthic organisms and indications of rising copper, selenium, and nutrient levels may be leading to the declining trophic state of Quesnel Lake.[16]

The documented changes to Quesnel Lake suggest that environmental monitoring should be increased, not decreased, with minimum monthly sampling conducted along both Quesnel Lake and Quesnel River. Equally important is the implementation of measures to establish an *operational* mine water treatment plan. This should be initiated promptly *during continuing operations* to mitigate the adverse effects of the ongoing discharge of nutrient-rich untreated effluent from the Mount Polley Mine. Such measures are essential to minimizing environmental impacts throughout the operational lifespan of the mine, not only during closure and reclamation phases.

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[11] Daniel John Potts, "The Heat Budget of Quesnel Lake, British Columbia," University of British Columbia, 2002, https://dx.doi.org/10.14288/1.0063485.

[12] Golder Associates, "Mount Polley Mine."

[13] Lint, "Effects of Mount Polley Mine Spill Tailings."

[14] Mount Polley Mining Corporation, "Mount Polley Mining Corporation Permit 11678 Second Quarter 2023," 149–226; Mount Polley Mining Corporation, "Mount Polley Mining Corporation Permit 11678 Third Quarter 2023," 127–204.

[15] Gabrielle Lint, email message to author, 29 April 2024.

[16] Owens et al., "Annual Pulses of Copper-Enriched Sediment; Gregory G. Pyle, Raegan D. Plomp, Lauren Zink, and Jaimie L. Klemish, "Invertebrate Metal Accumulation and Toxicity from Sediments Affected by the Mount Polley Mine Disaster," *Environmental Science and Pollution Research* 29, no. 46 (2022): 70380–95, https://doi.org/10.1007/s11356-022-20677-1.

Figure 2. One of four diffusers discharging up to 10 million cubic metres annually of untreated MPMC effluent into Quesnel Lake (screenshot from video at www.ccql.ca).

The lack of environmental protection and monitoring makes it clear that the mine, for its own benefit, is controlling the science behind the spill. This was and is clear through the MPMC's public consultation process. During the Option Analysis exercise in 2015–16, the MPMC promised a program of roundtables and meetings to work with communities on an equally agreeable option for water treatment and effluent discharge. It even provided an "independent facilitator" to assist. After the third meeting, held at the Sugar Cane Hall of the Williams Lake Indian Band, there was a sudden dead silence from the company. A month or so later, I asked the lead Imperial Metals consultant on hand at the public meeting in Likely what was happening, and she replied that the company cancelled the exercise as it was not hearing what it wanted to hear from the public. In other words, the community participants did not support the mines pre-determined treatment option of discharge into and dilution by Quesnel Lake. The "independent facilitator" was never heard from again.

Another, more recent, example occurred at a quarterly Public Liaison Committee (PLC) meeting. In January 2023, scientists from UNBC were scheduled to present some of their environmental research to the PLC. However, the presentation was suddenly cancelled, with the MPMC explaining that the scientists decided to withdraw their participation. Missing from this explanation was the true reasoning behind this withdrawal: UNBC scientists were required to submit the presentation

ahead of time to the MPMC for review and approval. When UNBC scientists refused to adjust their independent and peer-reviewed research to MPMC specifications, the MPMC cancelled the presentation. By not engaging with the scientific community in an open and public manner, the MPMC is preventing a full, balanced, and thorough discussion of environmental impacts, and the regulators perpetuate this by refusing to abandon the professional reliance upon which they rely.

I was hopeful that, through the MRC, the PLC, and the CEMP regulatory processes, Quesnel Lake could be protected, stopping the continued degradation of its water quality and benthic environment. Indeed, this was the hope of many who have either submitted comments to the MPMC and regulators via email or at public consultation meetings. Unfortunately, this is not occurring. Instead, as noted above, the mine tends to either spin, filter, or minimize public comments to its advantage. Because of this, the impact of public engagement is negligible. In the first frantic years following the dam breach, local residents were allowed to participate in the technical permitting process associated with the "joint" MRC; however, unfortunately, present public participation in the MRC on the part of local affected people has been denied. It is my observation, and appears to many in the public, that most basic permit decisions and ground rules are predetermined and agreed to in private meetings held between the MPMC and government regulators prior to their presentation for "public consultation." Consequently, as local stakeholders are denied participation in this initial process, this significantly reduces the serious consideration of their concerns. As a colleague recently mentioned, the smoke and mirrors of government and industry continues.

Unfortunately, when I look back at recent mining history, all I see are examples of mining companies polluting and not protecting the environment. The MPMC, for example, relies on Quesnel Lake to dilute its effluent in order to meet BC Water Quality Guidelines instead of using the site-specific guidelines that protect our waterways. It would be so much more satisfying if I could look forward to mining companies who pro-actively minimized their impact. The MPMC could have done this by implementing site-specific criteria for water treatment technology that reduced its effluent to pre-breach Quesnel Lake natural background levels.

Former premier Christie Clark promised to return Quesnel Lake to its "real pristine beauty."[17] However, history and our experience following

[17] "Mount Polley Mine Spill," CBC News, 7 August 2014.

Figure 3. One of four diffusers discharging MPMC effluent 45 and 50 metres below surface of Quesnel Lake (screenshot from video at www.ccql.ca).

the Mount Polley disaster has shown that government and regulators are not interested in ensuring environmentally protective mining operations. When there are unknowns in the equation, which is more often than not, they have refused to use the precautionary principle when setting standards and issuing permits. Instead, they use the industry's preferred adaptive management protocol, which relies on trying to fix a problem after it has occurred and the damage has been done. The mining industry, the government, and regulators have a significant history of ignoring public concerns and preferring the status quo of *using the environment* to further the operation of mines and other industries rather than truly *protecting the environment*. Dependence on regulatory capture and professional reliance ensures that the regulators will continue to break the direct and implied promises that would actually protect the environment.

It is time to stop the continuing degradation of Quesnel Lake, but, frankly, I lack confidence that the regulators will protect the environment and expect that regulatory capture will continue to favour industry. To reiterate, mining is important to society, but responsible mining is even more important as it is needed to protect the future of the environment.