

Yukon mining disasters and the legacy left behind

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I had a great trip to Yukon last month. The territory is very prospective with several known mineral deposits. Many are in fairly close proximity to each other. Challenges for mine development include power and other infrastructure. However, in our view, these challenges are not insurmountable.

This is the first of two articles that we will publish regarding the trip. This report will address the big challenge of Yukon's environmental legacy left behind by some major mining disasters. The second article will be about our impressions of the Yukon's prospectivity and mining company stories.

We came back from our first real trip to the Yukon impressed with its investment opportunities. We have invested in two companies since we returned. However, before we write about any companies we are going to write on the environmental legacy issues that haunt Yukon, its people and to some degree, now me. It is hurting investment there and, in our view, more has to be done by the mining industry and regulatory authorities to make sure no major disasters happen again.

We have long had a sensitivity to environmental issues. I was disinvited from being on a gold mining company board 20 years ago, because the CEO became annoyed with my verbal and written environmental concerns with its flagship project. In 2012, we wrote a letter to Banro Gold's CEO about our concerns with ~~its~~the Twangiza mine's tailings dam in the DRC which we ~~had~~ visited. We have been involved in meetings organized by the Church of England's ~~Investor~~ Mining and Tailings ~~Safety~~ Initiative that was launched after the 2019 Brumadinho tailings disaster in Brazil. We have also had calls with Canadian regulatory authorities where we have argued for disclosure of an Engineer of Record and Independent Reviewer of all tailings dams of every Canadian listed company. The letter we wrote to the Canadian Securities Administrators is on our website.

A financial report on Yukon's government website: [24 25 Public Accounts Government of Yukon0002TYCACWUF.cvw](#) shows a list of environmental liabilities totaling \$180 million as at March 31, 2025, including \$48 million for the Minto mine. However, the liabilities that dwarf everything in Yukon history are the Faro lead zinc mine (not on that list) that was operated intermittently from 1969 to 1998 and the Eagle gold mine that operated from 2019 to June 2024. We should note that the Yukon has had a lot of alluvial gold mining going on since the Klondike gold rush of the 1890's. Alluvial mining is effectively mining gravel~~s~~ and

is fairly benign to the environment. In contrast, hard rock mining can have a much bigger environmental impact if done improperly.

Faro Zinc Lead Mine 1969-1998

Faro was constructed by Cyprus Anvil Corporation which ran it through about 1982, when commodity prices tanked. It was reportedly the largest lead zinc mine in the world. Curragh Resources later acquired the property and restarted operations in 1986. The mine halted major operations in 1992. That year, Curragh had a disaster at its Westway coal mine in Nova Scotia. Curragh went bankrupt not long after. Another company later worked on restarting Faro but also went bankrupt. Faro was permanently closed in 1998.

According to a Canadian government website “Processing the valuable minerals at the mine left behind 70 million tonnes of tailings and 320 million tonnes of waste rock. This waste leaches metals and acid into the surrounding land and water, contributing to ongoing contamination.” According to a report by the Office of the Auditor General of Canada prepared in 2024 - **Contaminated Sites of the North**

<https://www.canada.ca/en/auditor-general/our-work/audit-reports/parl-cesd-202404-01-e.html>) about \$800 million had been spent on remedial and containment efforts to that time and the estimated discounted future remediation costs are \$5 billion! That \$ 5 billion is up over 28 times compared to the \$200 million estimate in 2002. \$5 billion is a huge liability for a territory with a population of less than 50,000. Faro’s remediation estimate is the largest in the report topping out the \$3.9 billion estimate for the Giant gold mine (closed in 2004) in Yellowknife, Northwest Territories (the territory neighboring Yukon) about 1000km east of Faro. Giant mine’s estimate is up 10x from a 2002 estimate of \$400 million. Giant’s environmental legacy is toxic arsenic waste that came from roasting gold ore containing arsenopyrite. Faro and Giant are the report’s two mega environmental cleanup sites in the north. Hopefully both of these estimates will turn out to be high.

Eagle Mine 2019-2024

In June 2024, Victoria Gold’s Eagle Mine heap leach pad experienced a disastrous slide. Per the Independent Review Board’s (“IRB”) (formed in late August 2024 by the Yukon government after the failure) report published on June 30, 2025, “approximately 11.3 million dry tonnes of leached ore plus the contained process solution slid, with about 1.8 million dry tonnes of that ore (plus its contained process solution) flowing over the crest of the dam”. Ore and cyanide process solution flowed about 1 km down to the Dublin Gulch Valley, contaminating local ground water and a local creek. As of mid-2025 contaminated solutions were still spilling into the environment. The disaster could have been worse. The slide happened during a shift change which may have saved lives.

According to the IRB's report **Victoria Gold Corp. Eagle Gold Mine June 2024 Heap Leach Failure** (https://www.pwc.com/ca/en/car/victoria-gold/assets/victoria-gold-117_020725.pdf), there were several reasons why the failure happened. The IRB concluded that the reasons for the failure was not one single event but a series of adverse conditions and events. Page 49 of the report lists 5 of the reasons for the failure:

1. Inadequate management of the variability within the ore deposit;
2. Impairment of the PLS (gold bearing pregnant leach solution) Collection System;
3. Oversteepening of the southwest slope;
4. Liquefiable conditions within the IHP (in heap pond) and in other areas of the heap (i.e. saturated contractive ore); and
5. Water accumulation due to bench irrigation during spring and summer.

The first of these may have been the most important. There were several other shortcomings mentioned in the report including the stacking of ore more than the 275 -days allowed. "In addition to the geomechanical causations, it was clear that there were actions and inactions on the part of Victoria Gold, and the various third parties contracted by the company, that directly or indirectly contributed to the failure".

After the slide, Victoria Gold, a single mine company, went bankrupt. There was \$104 million in surety bonds with the Government of Yukon, a much smaller amount than what it will take to complete the remedial work. Clean up at the mine has cost around \$300 million to March 2026, according to PricewaterhouseCoopers ("PwC"), the court appointed receiver, and is expected to go up to \$378 million by the end of September. The Yukon government has loaned PwC \$220 million to help pay for the cleanup. Estimates that we have heard to finish the cleanup range from \$150-200 million. Given the huge escalation in estimates from remediation at Faro and Giant as per above, our worry is that as more is known, the estimated costs will go up. However, given the limited 1.8 million tonne (see above) spill off the heap leach containment area, we are hopeful that any escalation of costs will be limited. Singapore based Boroo, a private investment company, is in the late stages of possibly buying the Eagle property, executing a cleanup plan and bringing it back into production. The hope is that remediation costs stay close to estimates and that Yukon will recover some or all of its remediation funding to date if the sale goes through.

We talked at length to Mark Smith, the lead author of the IRB Report, and a global authority on heap leach facilities. He is working with the University of Queensland Australia led group to bring in international guidelines and standards in heap leach design, construction and operation.

In addition to the many things in the IRB report the following four things strike us:

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First, there was no independent review board for the heap leach pad. Current tailings dams protocols do not cover heap leach pads. After the 2014 Mt. Polley Tailings failure in BC, the BC government began mandating independent review boards for all active tailings dams. That BC mandate drove most Canadian mining companies to follow that practice. Because the Eagle Mine had a heap leach operation versus a tailings dam, neither industry practice nor regulation required it to have an Independent Review Board. Proposed new guidelines for heap leach sites (see above) are expected to require that. Also, because Eagle was a heap leach site it escaped the investor focus of the Church of England's ~~Tailings~~ Mining and Tailings Safety investor initiative.

Second, we understand the Yukon government did not have, or hire, a heap leach expert to independently oversee the design, construction and operation of the heap leach. In my ignorance, I am surprised by this especially given the limited experience of heap leaching in Yukon. In Ghana, where I have spent time the last five years, I have commented that small scale miners without engineering depth are arguably riskier for the environment in developing countries than in developed countries because developed countries have more professional and experienced regulators. It looks like I am wrong. I believe that government agencies need to properly and independently monitor the waste rock, tailings and heap leach facilities and operations of mining companies. The cost of hiring an expert is immaterial to the cost of a potential disaster.

Third, the amount of the surety bond was small. Victoria Gold's reclamation bond was reportedly roughly \$105 million. This is a small amount compared to the current total estimated cleanup costs. Mining projects need a multiple of this amount as an environmental bond. Much higher bonding requirements are needed especially for smaller and single mine companies who can easily go bankrupt if a mine closes prematurely.

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Finally, heap leaching can be complicated. Up until 2024, there were few major heap leach environmental events that I could recall. Summitville in Colorado in the mid 1980's was a big one, but little since then. Then in 2024, we had two heap leach disasters: Victoria Gold's Eagle mine and SSR Mining's Çöpler mine in Turkey where nine workers died. Reading the IRB report on the Eagle mine, the many factors for the failure make the story complicated. For me understanding it is more complicated than it has been understanding tailings dam failures in the last 12 years. This means it is maybe harder for locals including First Nations in the Yukon to understand the risks for of a heap leach mine compared to a tailings dam.

Yukon Remedial Government Liability vs. Cumulative Historical Corporate Tax Revenue

We tried to find the cumulative corporate income taxes and royalties paid by mining companies to the Yukon and Federal governments going back more than 50 years. That proved difficult. Records for these payments are not all in the same place and it was hard to pull out the numbers related to mining. That has left us making rough estimates as to what that number may be. We have seen an unofficial but detailed mine by mine estimate of Yukon's 1886-2022 cumulative hard rock mining revenue prepared by a government office. In today's dollars that revenue number is approximately \$40 billion. Assuming this figure is in the ballpark, and assuming an average 30% before tax profit margin and a 30% combined federal/territory tax rate (including royalties), approximately \$3 billion in today's dollars has been generated to the Yukon and Federal governments. We think these rough estimates are likely generous. If we assume that the future discounted government funded remediation costs for all of Yukon's environmental cleanup sites are \$6 billion (\$5.8 billion past and future for Faro plus, say, \$0.2 billion for other mines including Eagle), then the total corporate taxes and royalties paid to date in today's dollars are only 50% of today's discounted (i.e. the npv of) government environmental liability for Yukon mining. In other words, the Yukon and Federal governments would have to pay \$2 out for every \$1 they ever received in corporate taxes and royalties.

Conclusion

Human errors of the kind that led to the Faro and Eagle mining disasters should never be allowed to happen again. In our view, following proper guidelines, establishing company funded independent review boards, having another separate government funded independent expert reviewer filing a public report annually, and having laws with real teeth, would go a huge way to making sure mining disasters like this won't happen again. The cost of such review boards and the government expert review are immaterial relative to the cost of an environmental incident. As is the case with the Church of England's Initiative, the investor community which we are a part of should be pushing for these things to happen. Beyond being the right thing to do, such efforts will help make our mining space and mining in the Yukon more investible.

The IRB that was formed after the Eagle Gold mine failure made a number of recommendations to reduce and eliminate potential future of such occurrences happening including changes to industry practices and improvements to regulatory processes. Some of these recommendations echo the sentiments we expressed years ago for tailings dams including having an independent technical review board from design to closure and having an Engineer of Record who can confirm that the design meets current practice and permit requirements.

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For many residents of the Yukon including the First Nations, Eagle's heap leach failure has brought another loss of trust in mining. It is not just about money. It is the contamination of their ancestral land and environment, real and perceived. Despite all of Prime Minister Carney's federal government fast track initiatives including with the Major Projects Office, permitting and project advancement in Yukon will likely be much slower than what would otherwise have been the case had Eagle not happened. Dawson City Mayor Stephen Johnson gave a speech on our second last night in town on July 14th. I will always remember the pain in his voice when he talked about the need for responsible mining. Mining's recent history in the Yukon was hurting him. He's not alone.

That said, we expect changes to be made to heap leach and other mining practices in Yukon that will help prevent the chances of future environmental disasters and allow trust to recover. We visited the Coffee heap leach project during our trip which was bought recently from Newmont by Talamore Mining. It has been studied for many years, has local First Nations support, and is expected to be fully permitted and construction ready in less than two years. Yukon needs investment. Permitting new projects will take time. However, while there is only one small hard rock mine operating in the Yukon today, we see a bright future in Yukon mining.