

# THE VANCOUVER SUN

## **Vaughn Palmer: A ‘dangerous game’ at Mount Polley preceded disaster, according to senior engineer**

**‘Remember, if they lose the dam, the mine can’t operate anyways’**

By Vaughn Palmer, Vancouver Sun columnist February 2, 2015 9:41 PM



*An aerial view of a barely visible excavator atop the Mount Polley tailings dam gives an idea of the size of the storage pond. The dam gave way near the town of Likely, B.C., on Aug. 5, 2014, polluting nearby waterways and lakes. Photograph by: JONATHAN HAYWARD , THE CANADIAN PRESS*

**VICTORIA — The ill-fated tailings dam at Imperial Metals’ Mount Polley mine was an improvised work in progress, built higher every year to hold back the growing volumes of water behind it.**

“For years, dam raising had managed to stay one step ahead of the rising water,” wrote a trio of engineering experts in a report on the dam breach released Friday. “But on May 24, 2014, the water caught up.”

The spur was a heavy run-off from an abnormally high winter snow pack, followed by torrential rains. With the rising waters in the tailings pond threatening to over-top the dam itself, the mine operator put out a call on the 25th to AMEC, its engineering firm of record.

After arriving on the scene the following day, geotechnical engineer Dmitri Ostritchenko found plenty of cause for concern: wet spots on the embankment, seepage here and there, and a pond almost level with the core of the dam.

Two days later he reported by email to the company’s senior geotechnical engineer, Andrew Witte, that the situation had not much improved. “At the end of the day, the freeboard level is basically zero,” wrote the on-site engineer, referring to the gap between the water level and the crest of the dam.

Despite some effort to reduce the amount of water behind the dam, tailings were still being added to the pond because the mine was continuing to operate. “Basically there has not been much (de-watering),” he wrote, “as they are still focused on making sure the mine can operate.”

This was too much for Witte. The safe operating standard was nine tenths of a metre of freeboard at bare minimum. Mining operations had to take a back seat until that was restored. He directed Ostritchenko to remind the company of its obligations.

“Under this type of scenario they are supposed to stop discharging tailings and focus on de-watering to get 0.9 metre of freeboard again,” wrote the senior engineer. “If they are not removing water, they are in direct contravention of (what the province) expects.

“That is a dangerous game to play and we need to make sure that our ass is covered by telling them to pump water out of the tailings storage facility. We cannot support the ‘just keep operating in the danger zone attitude.’ Remember, if they lose the dam, the mine can’t operate anyways.”

They didn’t lose the dam — not then, anyway. That wouldn’t happen for another 10 weeks.

Instead, the rising water, the precarious state of the dam, and the urgings of the engineering firm galvanized the mine operator into action. The embankment was topped up, the water drained, and the situation stabilized by the end of May.

Still, it was a near-run thing. A near “over-topping failure” and “potential breach” of the dam, according to the report from the trio of experts.

They also highlighted factors that contributed to the near-miss. The climate model for the dam neglected to consider a worst-case weather scenario. “They did not account for specific wet year conditions.”

The amount of water stored in the tailings pond had increased 10-fold to 10 million cubic metres in just four years. Yet the company had only just obtained a permit for a treatment plant that would allow the release of three million cubic metres of water a year. “It is not clear to the panel why it took so long.”

Another area of concern was the failure to maintain a separating barrier of tailings — known as a “beach” — to prevent erosion of the earthen embankment from the rising water behind it.

Critically important because the structure was not designed as a water-retaining dam, though increasingly that is what it was doing. The report is replete with references to “chronic problems with maintaining the tailings beach.”

Key documents related to the concerns about the beach, and others connected to the near-over-topping of the embankment, were among the dozens excluded from the public record when the report was released Friday.

The exclusions were made at the request of the two continuing investigations into the dam failure, one by the provincial inspector of mines, the other by provincial conservation officers. Each may result in recommendations for charges.

Even with the exclusions, the engineering panel had plenty to say about the sorry state of affairs that preceded the dam failure last August.

The root cause was an undetected flaw under the section that breached. But overly steep slopes on the embankment, neglected beaches, inadequate safety margins, ad hoc planning, and the hefty volume of water behind the dam all contributed to making the failure much worse than it needed to be.

“The panel was disconcerted to find that, while the Mount Polley tailings dam failed because of an undetected weakness in the foundation, it could have failed by over-topping, which it almost did in May 2014. Or it could have failed by internal erosion, for which some evidence was discovered.

“Clearly, multiple failure modes were in progress, and they differed mainly in how far they had progressed down their respective failure pathways.”

Mount Polley was not a story of one flaw that went undetected for years with nothing to be done about it. Rather, it was characterized by a pattern of dubious behaviour, margins of safety that skirted the edge of the cliff, little thought of worst-case scenarios, all factors in a disaster waiting to happen.

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