Jager, Brenda CSNR:EX

From: McGuire, Jennifer ENV:EX
Sent: Monday, December 14, 2015 2:05 PM
To: Smith, Curtis ENV:EX
Subject: RE: For MoE review - MEM Mt.Polley materials

Just sent back to you….with comments

From: Smith, Curtis ENV:EX
Sent: Monday, December 14, 2015 11:44 AM
To: McGuire, Jennifer ENV:EX
Subject: RE: For MoE review - MEM Mt.Polley materials

Jennifer,

Just wanted to touch base on the status of these as MZ was asking about our preparation for the Chief Inspectors Report. I also sent off some proposed bullets to you on Friday as well that we'd share with MEM for their Issues Note.

Thanks,

Curtis Smith
Division Issues Manager
Environmental Protection Division
Ministry of Environment
Desk: 250-387-6002| Mobile: 250-580-1532

From: Smith, Curtis ENV:EX
Sent: Friday, December 11, 2015 4:24 PM
To: McGuire, Jennifer ENV:EX
Subject: RE: For MoE review - MEM Mt.Polley materials

Yes. Thanks.

From: McGuire, Jennifer ENV:EX
Sent: Friday, December 11, 2015 4:24 PM
To: Smith, Curtis ENV:EX
Subject: RE: For MoE review - MEM Mt.Polley materials

Yes – this weekend ok?

From: Smith, Curtis ENV:EX
Sent: Friday, December 11, 2015 4:22 PM
To: McGuire, Jennifer ENV:EX
Subject: FW: For MoE review - MEM Mt.Polley materials
Importance: High

Jennifer,

Jager, Brenda CSNR:EX

From: McGuire, Jennifer ENV:EX
Sent: Monday, December 14, 2015 2:04 PM
To: Smith, Curtis ENV:EX
Subject: RE: For MoE review - MEM Mt.Polley materials
Attachments: QA_top questions_MBB_Dec 11_2015_4pm jlm.docx; NR_BG_CIM report release_Dec 11 _2015_957 jlm edit.docx

I have inserted comments into both docs.

JLM

From: Smith, Curtis ENV:EX
Sent: Friday, December 11, 2015 4:22 PM
To: McGuire, Jennifer ENV:EX
Subject: FW: For MoE review - MEM Mt.Polley materials
Importance: High

Jennifer,

Have just received MEM's Mt. Polley materials for the Chief Inspector's Report. Can you review please?

Thanks,

Curtis Smith
Division Issues Manager
Environmental Protection Division
Ministry of Environment
Desk: 250-387-6002| Mobile: 250-580-1532

From: Cotton, Brian GCPE:EX
Sent: Friday, December 11, 2015 4:21 PM
To: Smith, Curtis ENV:EX
Subject: For MoE review - MEM Mt.Polley materials
Importance: High

They haven't asked for review of the NR but I included it so Jennifer could take a look. What they want is additional info for answers to Q's 8,9, and 10 in the QA doc. I see they've already added a few response bullets to each question but have asked for further input.

Thanks,
Brian

Chief Inspector of Mines Investigation on Mount Polley
Top 15 Q & A and Key Messages
December 10, 2015
-DRAFT-

Key Messages

Government Response:

- In response to the findings and recommendations of the Chief Inspector of Mines Investigation into the tailings storage facility at Mount Polley Mine in August government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.
- The chief inspector's investigation was the largest and most complex of its kind in more than a century of regulated mining in British Columbia.
- What we've learned from this investigation is that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow.
- We are taking action to reduce this risk. Work is already underway to change the regulatory framework and formalize best practices for the mining industry so that tailings storage facilities in British Columbia are among the safest in the world.
- The Chief Inspector made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry.
- The recommendations will be incorporated into the code review launched this fall and addressed by spring 2016.
- In addition, to further strengthen compliance and enforcement in B.C.'s mining industry, government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act.
- The Province will also establish a dedicated compliance and enforcement team within the Ministry of Energy and Mines to ensure the ministry has the resources it needs to fully implement and address these regulatory changes.

Chief Inspector of Mines Investigation Findings:

- Earlier this year, the independent panel investigation into the TSF breach concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design.
- The chief inspector of mines (CIM) investigation team, which conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989, agreed with this conclusion. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.
- However, the CIM investigation concluded other contributing factors in the TSF breach included an insufficient site investigation and foundation studies by Mount Polley Mine Corporation (MPMC) and its Engineer of Record (EoR), inadequate water management at the mine site, over-steepened slope geometry and an open and unfilled sub-excavation at the toe of the dam that contributed to lowering the margin of risk and resulted in the breach.
- The CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

Chief Inspector of Mines Investigation on Mount Polley
Top 15 Q & A and Key Messages
December 10, 2015
-DRAFT-

Q & A

1. Why weren't charges laid against the company?

- The CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

- Earlier this year, the independent panel investigation into the TSF breach concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design. The chief inspector of mines (CIM) investigation team, which conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989, agreed with this conclusion. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.

- However, the CIM investigation concluded other contributing factors in the TSF breach included an insufficient site investigation and foundation studies by Mount Polley Mine Corporation (MPMC) and its Engineer of Record (EoR). The investigation also determined inadequate water management at the mine site, over-steepened slope geometry and an open and unfilled sub-excavation at the toe of the dam contributed to lowering the margin of risk and exacerbated the resulting damages when the breach occurred.

2. What's the point of having penalties in place if you can't move forward with charges?

- First, I want to be very clear on this, the CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

- Secondly, the CIM and the independent panel investigations both confirmed that on multiple occasions MEM posed questions to the company and its engineers of record regarding the characterization of the foundation, the TSF slope geometry and the adequacy of the beaches. In all instances MEM's concerns were either discounted by the engineers of record, or MEM received assurances from the professional engineers that there were no dam stability concerns.

- The CIM investigation also determined there is a need to address the current gap in the existing penalty structures and we plan to take the necessary steps to provide MEM inspectors with the tools they need for a more robust enforcement and compliance structure.

- To further strengthen compliance and enforcement in B.C.'s mining industry, government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. The proposed legislation would give ministry staff the power to issue penalties for non-compliance violations and increase financial penalties from the current maximum of $100,000 to $1 million and prison terms from one year to three years.

3. Will you implement all of the recommendations from the Chief Inspector of Mines?

- All recommendations directed to government will be addressed. These will be incorporated into the code review launched this fall and all recommendations specific to TSF design, operation and management will be addressed by spring 2016. The remaining recommendations will be addressed through the ongoing code review and legislative and policy changes. We anticipate this work will be complete by the end of 2017.

- We will work with industry and the professional organizations to ensure recommendations specific to them are implemented.

- This includes work the Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

- What we've learned from this investigation is that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow.

- We are taking action to reduce this risk. Work is already underway to change the regulatory framework and formalize best practices for the mining industry so that the factor of safety for tailings storage facilities in British Columbia is the best in the world.

- The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry.

4. Given the findings of this investigation, how can you expect British Columbians to have any confidence the way that Imperial Metals runs its operations? Further, how can you expect British Columbians to have any faith that government is ensuring mining companies in this province are following best practices and complying with regulations? (Also in technical Q4)

- B.C. has never before seen the size and scale of a Mount Polley tailings dam failure, but once is too often.

- Given the additional reviews and inspections, including third-party reviews, undertaken at all mines with TSFs following Mount Polley, I'm confident that the industry is operating in a responsible manner.

- But, there are a number of hard-learned lessons that have come to light as a result of the Mount Polley incident. And while we can't turn back the clock, we are taking action to tackle these issues head-on.

- To that end, we are taking the necessary steps to provide MEM inspectors with the tools they need for a more robust enforcement and compliance structure.

- To further strengthen compliance and enforcement in B.C.'s mining industry, government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. The proposed legislation would give ministry staff the power to issue penalties for non-compliance violations and increase financial penalties from the current maximum of $100,000 to $1 million and prison terms from one year to three years.

5. Government has said it is taking steps to improve compliance and enforcement including the creation of a new compliance and enforcement team. Does this mean you didn't have enough staff to ensure the industry was complying with regulations?

- No. The independent panel and the CIM investigations both determined that no amount of inspections by MEM staff would have been able to identify all of the factors that caused the breach. Further, the independent panel expressed confidence in the Ministry's geotechnical inspectors and their work as regulators.

- In 2010 and 2011, there was a drop off in the number of geotechnical inspections completed by inspectors in the mining division.

- This reduction was a result of declining revenues following the economic downturn as well as a high turnover of professional engineering and geotechnical staff.

- Following the election of Premier Christy Clark, government increased funding to the resource ministries. As a result, geotechnical inspections increased to 26 in 2012, 31 in 2013, and 35 in 2014 as resources were re-focused and additional staff were hired.

- Since 2012, the Ministry of Energy and Mines has conducted 30 geotechnical inspections on average per year at both operating and closed mine sites throughout the province.

- This is a significant increase from the average of 20 from 2002 – 2011.

6. Why are sections of appendix 3 in the Chief Inspectors investigation severed?

- As I'm sure you're aware, a third independent investigation into the cause of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

- As that investigation is still ongoing, some parts of the appendix were redacted under section 15 of the Freedom of Information and Protection of Privacy Act – as being potentially harmful to an active investigation.

7. If the report was completed on November 30, why did you wait two weeks before releasing it?

- As minister, I needed time to review the report with ministry executive so that we could fully understand the findings and respond appropriately to the chief inspector's recommendations.

Water Management

8. According to the investigation, water management was one of the conditions that was a big factor in the TSF breach. Why didn't the Ministry of Environment authorize the mine to discharge water?

- The Mount Polley Mine initially operated from August 1997 to September 2001 without a permit to discharge mine contact water to the receiving environment. The mine was placed into care and maintenance from September 2001 to March 2005, and was re-opened in March 2005. During the care and maintenance period there was an allowance for a small discharge to the Edney Creek drainage.

- In 2010 Mount Polley Mining Corporation initiated a permit amendment to enable discharge to Hazeltine Creek. Mount Polley Mining Corporation's permit (11678) under the Environmental Management Act was subsequently amended in November 2012 to allow a seasonal discharge (April – October, annually) of up to 1.4 million m3/yr of dam filtered mine water from the tailings pond to Hazeltine Creek.

- In October 2013, Mount Polley Mining Corporation initiated a permit amendment process to get authorization for the discharge of 3,000,000 m3/year of reverse osmosis treated ditch water to Polley Lake. The Ministry of Environment received the final application for the permit amendment on July 9th, 2014 to increase discharge of treated effluent, and the necessary accompanying reports to support the amendment were submitted July 11th, 2014.

- In September 2014 the application for reverse osmosis treatment was withdrawn and Mt Polley initiated consideration of a short term discharge permit application to discharge up to 9,000,000 m3/yr of treated effluent to Quesnel Lake via (non-fish bearing) Hazeltine Creek with requirements for plans to develop a more permanent long term water discharge management system.

9. The Independent Panel report and the Chief Inspector of Mines investigation both identify water management as a factor that needs to be addressed in order to avoid TSF failures. What is government doing to reduce the length of time it takes for mines to get the necessary permits for water discharge?

- In response to the Chief Inspector of Mines recommendations around regulatory integration, we will review the permitting processes, objectives and standards for the ministries of Energy and Mines, and Environment with the goal of better aligning these and, where possible, streamlining the permitting processes.

- The goal is to ensure we meet our shared objectives – environmental protection, worker health and safety, facilities integrity – while improving our processes and reducing duplication.

10. To remove the issue of water management, why won't government move to requiring dry-stack technology for tailings storage as recommended by the independent panel? (Q27 technical)

- The independent panel recommended the adoption of best available technology, including filtered tailings (dry stack) technology where appropriate. The panel also noted that there are circumstances where other technologies are more appropriate due to the need to neutralize chemicals in the tailings or challenges with dewatering the tailings.

- We are committed to implementing the recommendations of the independent panel and the chief inspector of mines.

- Based on the recommendations developed by the Code Review committee this government will make the necessary changes to the code to address the recommendations from the panel and the chief inspector.

Professional Reliance

11. This investigation found government questioned some of the mines actions and decisions around design and construction of the TSF but these were discounted by the engineers of record. Based on these findings, is government going to move away from the professional reliance model? (Q45, 46 technical)

- No. British Columbia and other provinces in Canada and countries around the world have a long history of using professional reliance.

- And it makes sense - a "one size fits all" approach of prescriptive design requirements can have a negative impact on the ability of engineers to develop new and innovative designs that improve safety and reduce the risk of failure.

- That said, we are committed to implementing the recommendations of the independent panel and the chief inspector of mines. These will be implemented as part of the ongoing code review.

- This includes work the Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

- Additionally, the Canadian Dam Association is defining the roles and responsibilities of the Engineer of Record as it applies to dam design and the transfer of duties.

Mount Polley Application to Return to Full-Production

12. What impact will the investigation findings have on MPMC's application to return to full-production using the tailings storage facility (TSF)?

- That is something that the statutory decision makers will determine as part of the application review process.

- As I'm sure you are aware, Mines Act permitting decisions are made by the Chief Inspector of Mines, or delegate, and are statutory decisions – completely independent of any political influence.

- I know that the application has been received and staff with the ministries of Energy and Mines and Environment, along with representatives from the Soda Creek and Williams Lake Indian Bands, and the community of Likely, must complete a technical screening review of the application before it can move forward.

- A key component of the application includes the company's proposal to use the existing TSF for tailings storage going forward if the application is approved.

- Geotechnical engineers at MEM are currently assessing the adequacy of the TSF design and associated best management practices as part of that technical screening process.

13. What assurances do you have that the TSF won't fail again in the future?

- At this point, the mine is not authorized to use the TSF. The mine has submitted a permit application and there is a very thorough technical screening and review as part of that process.

- As I said, as part of the technical screening, geotechnical engineers at MEM are currently assessing the adequacy of the TSF design and associated best management practices.

- Once the technical screening review is complete, the company will be asked to address any information gaps and then the Cariboo regional mine development review committee (MDRC) will be asked to complete a detailed technical review of the permit amendment application.

- Based on the technical review, the MDRC chair will provide recommendations to the statutory decision makers at the ministry of Energy and Mines.

- Mines Act permitting decisions are made by the Chief Inspector of Mines, or delegate, and are statutory decisions – completely independent of any political influence.

14. We've heard from the company that by April 2016 they will max out the total amount of ore they are currently permitted to process and have to suspend operations. What are you doing to ensure operations continue at the mine and 100s of workers aren't laid-off?

- To be frank, the ball is in MPMC's court on this. The company is well-aware of its current permit conditions. It is also aware of the steps it is required to take as part of the permit application process in order to continue operations.

- MPMC has submitted an application for amendment to its Mines Act permit to allow the mine to continue operations beyond the parameters authorized under its restricted re-start. This application was received on Nov. 6.

- Staff with the ministries of Energy and Mines and Environment, along with representatives from the Soda Creek and Williams Lake Indian Bands, and the community of Likely, must complete a technical screening review of the application before it can move forward.

- A key component of the application includes the company's proposal to use the existing TSF for tailings storage going forward if the application is approved.

- Geotechnical engineers at MEM are currently assessing the adequacy of the TSF design and associated best management practices as part of that technical screening process.

- Once the technical screening review is complete, the company will be asked to address any information gaps and then the Cariboo regional mine development review committee (MDRC) will be asked to complete a detailed technical review of the permit amendment application.

- Based on the technical review, the MDRC chair will provide recommendations to the statutory decision makers at the ministry of Energy and Mines.

- Mines Act permitting decisions are made by the Chief Inspector of Mines, or delegate, and are statutory decisions – completely independent of any political influence.

15. What's government doing to address the long-term water treatment and discharge requirements for the mine?

- The company is required to have its long-term water treatment and discharge proposal to government by June 30, 2016.

- Once government has received the company's proposal, it will be subject to the same formal technical screening and review process just like any other proposal.

- The final decision will be up to the appropriate statutory decision makers.

BRITISH COLUMBIA

NEWS RELEASE

For Immediate Release
[release number]
[Date]

Ministry of Energy and Mines

Government takes action on Chief Inspector of Mines Recommendations

VICTORIA – In response to the findings and recommendations of the Chief Inspector of Mines Investigation into the tailings storage facility at Mount Polley Mine in August 2014 , Energy and Mines Minister Bill Bennett announced today that government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.

Earlier this year, the independent panel investigation into the TSF breach concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design. The chief inspector of mines (CIM) investigation team, which conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989, agreed with this conclusion. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.

However, the CIM investigation concluded other contributing factors in the TSF breach included an insufficient site investigation and foundation studies by Mount Polley Mine Corporation (MPMC) and its Engineer of Record (EoR). The investigation also determined inadequate water management at the mine site, over-steepened slope geometry and an open and unfilled sub-excavation at the toe of the dam contributed to lowering the margin of risk and exacerbated the resulting damages when the breach occurred.

The CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry. Government has accepted all of the recommendations and will ensure they are implemented. Key recommendations include:

- All mines with TSFs will be required to have a designated mine dam safety manager and a designated individual to oversee the mine's water balance and water management plan.
- Mines with TSFs will be required to have water management plans designed by a qualified professional.
- Independent technical review boards will be required for all mines with TSFs.

- Establish a dedicated investigation, compliance and enforcement team within the Ministry of Energy and Mines lead by a new Deputy Chief Inspector of Mines. This team will provide additional support and oversight of existing ministry investigation, compliance and enforcement functions.
- To strengthen records management and improve openness and transparency around design, construction and operation, government will establish a formal documentation management system for all TSF from development to post-closure.
- Foster innovations in the mining sector that improve current technologies in tailings processing, dewatering and discharge water treatment.

All recommendations directed to government will be incorporated into the code review launched this fall. Recommendations specific to TSF design, operation and management will be addressed by spring 2016. The remaining recommendations will be addressed through the ongoing code review and legislative and policy changes. Government will also work with industry and the professional organizations to ensure recommendations specific to them are implemented. It is anticipated this work will be completed by the end of 2017.

In addition, to further strengthen compliance and enforcement in B.C.'s mining industry, government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance violations and increase financial penalties from the current maximum of $100,000 to $1 million and prison terms from one year to three years.

The Mount Polley Mining Corporation continues to make progress on remediation of areas damaged by the breach. To date, the company has spent nearly $70 million stabilizing Hazeltine Creek and remediating the surrounding area. MPMC is also responsible for the $2.6 million in costs associated with the independent panel investigation.

Quotes:

Minister of Energy and Mines Bill Bennett –

"What we've learned from this investigation is that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow.

We are taking action to reduce this risk. Work is already underway to change the regulatory framework and formalize best practices for the mining industry so that the factor of safety for tailings storage facilities in British Columbia is the best in the world.

The chief inspector's investigation was the largest and most complex of its kind in more than a century of regulated mining in British Columbia. I want to thank the chief inspector and his investigation team for all of their tremendous work."

Chief Inspector of Mines Al Hoffman –

"We conducted a very thorough and in-depth examination of the Mount Polley Mine Corporation's actions from its initial site investigations 26 years ago to present. Through our investigation we determined that while the mine did not contravene any existing regulatory requirements, its management and operational practices failed in a number of areas such as water management and misplaced confidence in the TSF design.

My recommendations address these issues and will strengthen British Columbia's regulatory framework and build a safer, more sustainable industry in B.C.

Learn More:
A copy of the Chief Inspector of Mines investigation is available here:

Four backgrounders follow.

BACKGROUNDER

Findings of the Chief Inspector

The Chief Inspector of Mines for British Columbia has completed a 16-month-long investigation into the Aug. 4, 2014 tailings pond breach at the Mount Polley Mine near Likely, B.C. The CIM investigation team consisted of the Chief Inspector of Mines, Primary Investigator, File Coordinator, information analysts, technical writer, geotechnical engineers, geoscientists and hydrologists from Klohn Crippen Berger, and two former RCMP superintendents. The team was supported throughout the investigation by staff with the Ministry of Energy Mines.

The investigation determined Mount Polley Mining Corporation (MPMC) and its engineering consultants did not fully recognize and manage geotechnical and water management risks associated with the design, construction, factor of safety and operation of the tailings storage facility.

The following is a summary of the chief inspector's findings:

- At approximately 11:40 pm on Aug. 3, 2014 a section of the Mount Polley Mine tailings storage facility (TSF) perimeter embankment failed and slumped roughly five metres. Water in the impoundment almost immediately overtopped the slumped crest. The failure led to a major and ongoing erosion breach at approximately 1:08 am on Aug. 4, 2014, which released tailings and process water into the environment beyond the mine site.

- The mechanism of the structural failure was due to a lightly overconsolidated glaciolacustrine clay unit (UGLU) approximately 10 metres below the dam's foundation. This clay layer was not properly identified and accounted for in the design of the structure.

- The investigation found that Mount Polley Mining Corporation and the engineers of record did not conduct adequate studies and site investigations of the perimeter embankment foundation. This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for foundation investigations.

- To address this issue, the Association of Professional Engineers and Geoscientists of B.C. is developing professional practice guidelines for dam site characterization assessments for release in spring 2016. The guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

- Because the UGLU was not properly identified, it was not correctly factored in when determing the strength of the dam foundation. As a result, the structural failure occurred

because of two additional conditions that contributedto the dam failure. One was an over-steepening of the downstream slope of the dam, coupled with the constructed height. The other was an unfilled sub-excavation for a buttress foundation at the toe of the embankment at the site of the failure.

- Neither of these conditions contravened existing regulatory requirements. The steepness of the downstream slope was approved by the engineer of record to meet Canadian Dam Association (CDA) guidelines for safety, and the sub-excavation was in general conformance with the design intent.

- The structural failure of the embankment combined with the condition of the tailings pond — with insufficient beaches and too much supernatant water — led to an erosional failure of the embankment, that rapidly widened into a complete breach and resulted in the release of tailings and water into the surrounding environment. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam. The condition of the tailings pond alone would not have resulted in a breach.

- These conditions occured because MPMC failed to effectively manage water at the mine site and in the TSF. An adequate water management plan did not exist, there was no qualified individual responsible for water balance in the TSF, and MPMC did not adequately characterize the risk of surplus supernatant water, which had been compounding since the mine reopened in 2005.

- This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for water management for mine sites.

- There is a need for the Regulator (MEM) to formalize professional reliance guidelines for tailings storage facility design, construction and management in legislation, regulation and-or the Health, Safety and Reclamation Code for Mines in British Columbia.

BACKGROUNDER

Chief Inspector of Mines recommendations

The Chief Inspector of Mines for British Columbia has completed a 16-month long investigation into the August 4, 2014 tailings pond breach at the Mount Polley Mine near Likely, B.C. Based on the findings of this investigation, the chief inspector has made 19 recommendations in seven categories directed toward the mining operator – Mount Polley Mining Corporation (MPMC) – mining industry, professional organizations and the regulator – Ministry of Energy and Mines (MEM).

All recommendations directed to government will be incorporated into the code review launched this fall. Recommendations specific to TSF design, operation and management will be addressed by spring 2016. The remaining recommendations will be addressed through the ongoing code review and legislative and policy changes. Government will also work with industry and the professional organizations to ensure recommendations specific to them are implemented. It is anticipated this work will be completed by the end of 2017.

This includes work the Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

Recommendations for the mining operator:

1. **Proponent Governance**
    - Mine dam safety manager – any mine with a tailings storage facility (TSF) should have a qualified individual designated as a mine safety manager responsible for oversight of planning, design, operation, construction and maintenance, and surveillance of the TSF, and associated site-wide water management. (Aligns with independent panel recommendation)
    - Water balance management – water management and water balance issues for mining projects must be designed by a qualified professional. (Aligns with independent panel recommendation)
    - TSF operations manual – mine manager should ensure the operation, maintenance and surveillance manual (OMS) required by the Code for all impoundments adheres to applicable CDA and MAC guidelines.
    - Mine emergency response plan – mine manager must ensure that the Mine Emergency Response Plan (MERP) adheres to applicable regulations, is maintained on a regular

basis for currency, incorporates appropriate response measures to emergencies including those involving the TSF, and is written and distributed in such format as to serve as a procedural guide during an emergency or other event.

- Risk recognition and communication – all mine personnel have a role to play in recognizing and reporting risk conditions, especially those that could affect health, safety and environmental protection; and should be educated in the recognition of conditions and events that could impact TSF safety or contravene applicable permit conditions and regulations.

Recommendations for the mining industry:

2. TSF Design

- Tailings storage and water management systems and structures should be designed for worker and public safety and the protection of the environment. (Aligns with independent panel recommendation)
- Mines with impoundments should each develop independent technical review boards (ITRB) to provide additional perspectives on site investigation, site selection, design, construction, maintenance, operations, surveillance, water management and closure. (Aligns with independent panel recommendation)

Recommendations for professional organizations:

3. Professional and Association Standards

- The Association of Professional Engineers and Geoscientists of BC (APEGBC), The Mining Association of Canada (MAC), and the Canadian Dam Association (CDA) should update and strengthen guidelines and standards of practice including those specific to TSF design and management, dam safety and construction. (Aligns with independent panel recommendation)
- The Regulator should consider and incorporate as appropriate guidelines from these external associations as applicable and consistent with MEM objectives. (Aligns with independent panel recommendation)

Recommendations for the Regulator:

4. Regulator Functions

- The regulator should undertake a comprehensive review of the Code to ensure that the lessons learned and recommendations from this report are fully considered and appropriately incorporated.
- The regulator should ensure a perspective that spans the life of the mine be considered for Mines Act permit applications, while acknowledging that the nature of mining frequently requires changes to the life-of-mine plan. (Aligns with independent panel recommendation)
- The Regulator must enhance its investigative capacity, as well as its ability to exercise its existing compliance and enforcement authority under the Mines Act and Code. A

supported director equivalent position specific to investigation, compliance and enforcement should be established to evaluate and oversee these roles. To increase compliance and achieve greater safety at mines, a full range of regulatory tools, such as incentives, administrative penalties, outside agency collaboration and other best practices should be considered. (Aligns with independent panel recommendation)

- A regulatory dam safety manager position dedicated to the coordinated regulatory oversight of tailings dams should be established. (Aligns with independent panel recommendation)
- The Ministry of Energy and Mines (MEM) should conduct an internal review of operational and business practices.

5. **Strengthening Records Management**
   - To support long-term integrated decision making by the regulator, MEM should establish a formal documentation management system for all mines from development to post-closure. This system will provide greater openness and transparency of MEM decisions.

6. **Regulatory Integration**
   - Government should review the Ministries of Environment and Energy and Mines and look for opportunities where processes and standards can be aligned to support timely and effective outcomes that meet agency objectives (environmental protection, worker health and safety, facilities integrity).
   - Government should review MEM and MOE permitting processes and look for opportunities to integrate and align them as appropriate to avoid duplication and increase efficiencies.

7. **Fostering Innovation:**
   - MEM, the industry, professional organizations, and educational institutions should continue to seek new collaborative opportunities to foster education. This initiative could include the availability of standards for education to better define the knowledge, skills, and abilities for various accountabilities within mining; and to increase the knowledge base, information sharing, and innovation.
   - Government and industry should support research and development efforts to improve tailings processing, dewatering, and discharge water treatment technologies. (Aligns with independent panel recommendation)

BACKGROUNDER

Mount Polley Mine tailings storage facility construction chronology

The Mount Polley Mine tailings storage facility (TSF) was designed to be built and permitted in stages over the life of the mine, with each stage driven by a number of variables, including mine plan, milling process water requirements, storage capacity for tailings, and storage capacity for mine-influenced water. The stages were also dependent on a sufficient supply of construction materials (quarry or run-of-mill rock) as well as construction capacity, including adequate time in a construction season and logistics limitations such as equipment availability or weather constraints.

The Ministry evaluated and issued permits under the *Mines Act* for each successive stage of construction. Periodic inspections by MEM geotechnical inspectors were conducted at the site.

Chronology of construction stages:

Stage 1a to 931 metres – 1995-1996. The initial Mines Act permit for Mount Polley Mine, issued Aug. 3, 1995, approved the construction of a starter dam for the TSF to an elevation of 931 metres, an embankment with a maximum height of 11 metres.

Stage 1b to 934 metres – 1996-1998. The planned raise to an elevation of 934 metres was approved on Sept. 23, 1996.

Stage 2 – 1998-2000. An application for a *Mines Act* permit amendment to raise the dam to 940 metres was approved on April 7, 1998.

Stage 3 – 2000-2001. Stage 3 was approved on Jun. 13, 2000, allowing a raise to 944 metres. An additional Mines Act permit amendment application for Stage 3, to increase the raise to 945 metres, was approved May 30, 2001.

Care and Maintenance – 2001- 2005. Mine operations were suspended in October 2001 and the mine was placed in care-and-maintenance status. Over the course of the closure, substantial water accumulated in both the pits and the TSF.

Stage 4 – 2005-2006. A restart permit was issued May 4, 2005. The accompanying application to raise the dam to 948 metres was approved on May 25, 2005.

Stage 5 – 2006-2007. An application for a Stage 5 raise of the dam to 951 metres was approved on Aug. 2, 2006.

Stage 6a – 2007-2008. The Stage 6 raise planned for an elevation of 958 metres was issued a Mines Act permit amendment on Feb. 9, 2008, and resulted in a raise to 954 metres.

Stage 6b – 2009-2011. The second year of construction completed the Stage 6 raise to 958 metres.

Stage 7 – 2011-2012. An amendment application to raise the dam to 960.5 metres was approved Aug. 15, 2011.

Stage 8 – 2012-2013. The application for the Stage 8 raise to 963.5 metres was approved on Jun. 29, 2012. In the same construction season, an additional application amending the Stage 8 raise to 965 metres was approved Oct. 15, 2012.

Stage 9 – 2013-2014. The application for a Stage 9 raise to 970 metres was approved Aug. 9, 2013.

Stage 10 (Planned) – 2014. A Stage 10 design was produced, and a Mines Act permit amendment application was submitted, but no Stage 10 raise was commenced due to the failure of the TSF embankment. The Stage 10 raise was planned to achieve a crest elevation of 972.5 metres, raise the buttress along the main embankment and add a buttress along the full length of the perimeter embankment.

BACKGROUNDER

Government response to Mount Polley Mine tailings storage facility breach

On Aug. 4, 2014, a large and unprecedented breach occurred at the Mount Polley Mine tailings storage facility. Government took immediate steps to respond, addressing health and safety concerns and initiating three investigations.

Water sampling by Ministry of Environment (MOE) staff began on the evening of Aug. 4, 2014, and remains ongoing. The drinking water ban was lifted by Interior Health for Quesnel Lake, outside the immediate area of impact -100 m from the mouth of Hazeltine Creek, on Aug. 13 2014. To date, MOE has taken over 190 water samples and continues to monitor impacts on fish. MOE's sampling is in addition to the more than 3,800 water samples taken by the Mount Polley Mining Corporation.

As part of the pollution abatement order issued by MOE on Aug. 5, 2014, the Mount Polley Mine Corporation was ordered to take immediate action to stop the further release of mine tailings into nearby waterways and to submit environmental impact assessments and clean-up action plans to the ministry, including plans to stabilize Hazeltine Creek.

In December2014, the Ministry of Energy and Mines (MEM) approved an amendment to the Mount Polley Mine Corporation Mines Act permit to allow the company to begin repairs of the breach in its tailings storage facility dam. This work was completed in April 2015.

Throughout the response and remediation process, government and the Mount Polley Mining Corporation have held regular community meetings to keep residents up to date on efforts to address the breach and related issues. To date, more than 20 community meetings have been held for residents of Likely, Williams Lake and members of the Soda Creek Indian Band (Xats□ull First Nation) and Williams Lake Indian Band.

Since the August 2014 failure of the tailings pond at Mount Polley Mine, the provincial government has continued to oversee all environmental remediation work undertaken by the Mount Polley Mining Company. Phase 1 of this work, which focused on stabilizing Hazeltine Creek so it would be safe over the winter months and through the higher water flows from spring freshet, is now complete. To-date, the company has spent nearly $70 million on remediation work.

Phase 2 of the remediation and restoration will run through summer of 2016 and beyond. It will focus on repairing impacts of the breach, and will also have active participation from area First Nations and local communities.

On June 5, 2015, Mount Polley Mining Company (MPMC) released their Post Event Environmental Impact Assessment Report which provides detailed information on the physical,

chemical and biological impacts of the spill and will inform future work in the area. This document is available at http://www.env.gov.bc.ca/eemp/incidents/2014/mount-polley/.

On Jan. 30, 2015, the Independent Expert Engineering Investigation and Review Panel delivered a Final Report on its investigation into the cause of the failure of the tailings storage facility at the Mount Polley Mine. The report also included the release of 35,000 pages of documentation related to the panel's investigation. The panel concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in its original design and made seven recommendations to prevent such incidents in the future.

Government committed to implement all of the panel's recommendations and on June 24, 2015, Energy and Mines Minister Bill Bennett appointed a Code Review Committee pursuant to section 34 of the Mines Act to determine how best to implement the panel's recommendations.

On July 9, 2015, statutory decision makers with the ministries of Energy and Mines and Environment conditionally authorized the Mount Polley Mine Corporation to begin restricted operations. The amended Mines Act permit authorizes the company to operate at roughly half the rate of normal operations. The permit does not provide authorization for use of the tailings facility during the operation. Mount Polley Mine will use Springer Pit, an existing open pit on the mine site, to manage the tailings.

On Nov. 30, 2015, the Province approved Mount Polley Mining Corporation's application for a short-term permit to treat and then discharge water outside of the mine site. The permit is needed because it is estimated that, under normal precipitation conditions, water levels in Springer Pit will reach permitted capacity in April 2016.

Mount Polley Mine Corporation must submit a long-term water treatment and discharge plan to government by June 30, 2016 in order to continue operations.

A third independent investigation into the cause of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

Contact:

Jake Jacobs
Media Relations
Ministry of Energy and Mines
250-952-0628

Jager, Brenda CSNR:EX

From: McGuire, Jennifer ENV:EX
Sent: Monday, December 14, 2015 2:10 PM
To: Smith, Curtis ENV:EX
Subject: RE: Mt Polley Chief Inspector's Report release on Dec 17th

See edits made to bullets below.

From: Smith, Curtis ENV:EX
Sent: Friday, December 11, 2015 2:31 PM
To: McGuire, Jennifer ENV:EX
Subject: FW: Mt Polley Chief Inspector's Report release on Dec 17th

Jennifer,

I've prepared these bullets re: Chief Inspector's Report release. These will go into MEM's Issues Note for Mt. Polley. Pulled info from bullets Hubert supplied to Mark this week. Heads up that our MOE issues note on current status of Mt. Polley will be updated and headed your way for approval as well.

If asked about limited water discharge due to requirement to meet water quality objectives:

- The company's permit under the *Environmental Management Act* was amended in November 2012 to allow a seasonal discharge (April – October, annually) of up to 1.4 million cubic meters per year of dam filtered mine water from the tailings pond to Hazeltine Creek.
- The company's annual report from 2011 indicated that that the flow rate from the tailings storage facility would be approximately 630,000 to 1,260,000 cubic meters per year.
- Further, the low dilution flow available in Hazeltine Creek further restricted the possible untreated discharge volumes and winter low flows were too low to allow discharge during winter months which would be protective of the environment and human health.

If asked about permitting delays:

- The mine operated from August 1997 to September 2001 without a permit to discharge mine contact water into the environment, and the mine was place into care and maintenance from September 2001 to March 2005.
- In 2010 the company submitted a permit amendment to enable discharge to Hazeltine Creek. The company had initiated discussions to amend the permit in late 2006.
- In October 2013, the company initiated a permit amendment process to enable the discharge of 3,000,000 m3/year of treated ditch water to Polley Lake, the ministry received the final application for the permit amendment on July 9th, and the necessary reports to support the amendment were submitted July 11th, 2014.
- In September 2014, the July 2014 application was withdrawn and Mt Polley initiated consideration of a short term discharge permit application to discharge up to 9,000,000 m3/yr of treated effluent to Quesnel Lake via (non-fish bearing) Hazeltine Creek with requirements for plans to develop a more permanent long term water discharge management system.
- In addition to the permitting activity there was a compliance inspection in May 2014 that found water levels to be too high in the Tailings Storage Facility (inadequate freeboard) and the company was directed to return levels to the minimum 1.0 m plus freeboard required. 1.0m plus freeboard was achieved in June 2014.

From: Cotton, Brian GCPE:EX
Sent: Friday, December 11, 2015 12:06 PM
To: Smith, Curtis ENV:EX
Subject: FW: Mt Polley Chief Inspector's Report release on Dec 17th

Just a heads-up on this one. MEM is supposed to be sending over all their communications materials by end of day and we are being asked to fill in blanks from MOE perspective and have it signed off and back to them by end of day Monday. We'll also need to update our bigger Mt. Polley IN with any pertinent MoE info that comes out of this.

From: Zacharias, Mark ENV:EX
Sent: Thursday, December 10, 2015 9:29 AM
To: Shoemaker, Wes ENV:EX
Cc: ENV Ministerial Assistants; Crebo, David GCPE:EX; Cotton, Brian GCPE:EX; McGuire, Jennifer ENV:EX; Bunce, Hubert ENV:EX
Subject: Mt Polley Chief Inspector's Report release on Dec 17th

Good morning:

This is scheduled for release on the 17th. Jennifer will work with GCPE to ensure that MoE is prepared.

Regards,

Mark Zacharias | Assistant Deputy Minister
Environmental Protection Division, Ministry of Environment
5th Floor, 2975 Jutland Road | Victoria, BC | V8W 9M1 | 250.356.0121 | 250.415.6466

Where ideas work

Jager, Brenda CSNR:EX

From: McGuire, Jennifer ENV:EX
Sent: Monday, December 14, 2015 3:38 PM
To: Smith, Curtis ENV:EX
Subject: RE: For Approval: Bullets for Chief Inspectors Report

Ok
JLM

From: Smith, Curtis ENV:EX
Sent: Monday, December 14, 2015 3:28 PM
To: McGuire, Jennifer ENV:EX
Subject: For Approval: Bullets for Chief Inspectors Report

Jennifer,

Mark asked for some revisions and clarity to the WQ/discharge bullets. I worked with Hubert to refine, for approval.

If asked about limited water discharge due to requirement to meet water quality objectives:

- The company's permit under the *Environmental Management Act* was amended in November 2012 to allow a seasonal discharge (April – October, annually) of up to 1.4 million cubic meters per year of dam filtered mine water from the tailings pond to Hazeltine Creek.
- The company's annual report from 2011 indicated that that the flow rate from the tailings storage facility could be approximately 630,000 to 1,260,000 cubic meters per year.
- The flows were required to be dam filtered as that provided the best quality discharge flows.
- Further, the low dilution flow available in Hazeltine Creek further restricted the possible discharge volumes and winter low flows were too low to allow discharge during winter months which would be protective of the environment and human health.
- These restrictions on the discharge were in place to ensure that water discharged would achieve BC Water Quality Guidelines at the edge of the initial dilution zone.

From: Zacharias, Mark ENV:EX
Sent: Friday, December 11, 2015 2:20 PM
To: Smith, Curtis ENV:EX
Subject: FW: Bullets for this afternoon's call

From: Bunce, Hubert ENV:EX
Sent: Tuesday, December 8, 2015 1:25 PM
To: Zacharias, Mark ENV:EX
Cc: Morel, David P MEM:EX; McGuire, Jennifer ENV:EX
Subject: Re: Bullets for this afternoon's call

Second sentence should say "2011 annual report

Sent from my iPhone

On Dec 8, 2015, at 1:21 PM, Bunce, Hubert ENV:EX <Hubert.Bunce@gov.bc.ca> wrote:

Knight & Piesold estimated the drainage flow from the TSF in the technical assessment at a flow range of between 550000 m3 and 1.6 million m3 per year. The seepage rate estimated from the MPMC 2011 annual report In addition low dilution flow available in Hazeltine Cr. further restricted the possible discharge volumes as discharge could not exceed 35% of natural stream flow. Winter low flows were so low that there were inadequate levels of dilution to allow discharge during winter months

Flows were to be dam filtered as this provided the best quality flows

The quality and quantity restrictions were include to achieve BCWQG at the edge of the IDZ

Hubert

Sent from my iPhone

On Dec 8, 2015, at 12:08 PM, Zacharias, Mark ENV:EX <Mark.Zacharias@gov.bc.ca> wrote:

Hubert can you advise on David's question?

Thx, MZ

From: Morel, David P MEM:EX
Sent: Tuesday, December 8, 2015 11:13 AM
To: Zacharias, Mark ENV:EX
Subject: RE: Bullets for this afternoon's call

One thing to check into is that (I think) by issuing the permit for dam filtered water, it effectively limited the discharge far below the 1.4 million m3/yr not that much water can be dam filtered. Why was there a requirement for dam filtered and why seasonal may be raised. Both effectively reduced amount of water discharged.

I think the answer is along the lines of this is what was necessary to be protective of environment and fish but not sure.

David

From: Zacharias, Mark ENV:EX
Sent: Tuesday, December 8, 2015 11:03 AM
To: Morel, David P MEM:EX
Subject: Bullets for this afternoon's call

- The Mount Polley Mine operated from August 1997 to September 2001 (without a permit to discharge mine contact water to the receiving environment). The mine was placed into care and maintenance from September 2001 to March 2005, and was re-opened in March 2005. Currently the mine life is expected to extend to at least 2020. During the care and maintenance period there was an allowance for a small discharge to the Edney Creek drainage.

- In 2010 Mount Polley Mining Corporation initiated a permit amendment to enable discharge to Hazeltine Creek. Mount Polley Mining Corporation's permit

(11678) under the *Environmental Management Act* was subsequently amended in November 2012 to allow a seasonal discharge (April – October, annually) of up to 1.4 million m3/yr of dam filtered mine water from the tailings pond to Hazeltine Creek.

- In October 2013, Mount Polley Mining Corporation initiated a permit amendment process to get authorization for the discharge of 3,000,000 m3/year of reverse osmosis treated ditch water to Polley Lake. The Ministry of Environment received the final application for the permit amendment on July 9th, 2014 to increase discharge of treated effluent, and the necessary accompanying reports to support the amendment were submitted July 11th, 2014.

- In September 2014 the application for reverse osmosis treatment was withdrawn and Mt Polley initiated consideration of a short term discharge permit application to discharge up to 9,000,000 m3/yr of treated effluent to Quesnel Lake via (non-fish bearing) Hazeltine Creek with requirements for plans to develop a more permanent long term water discharge management system.

- In addition to the permitting activity there was a compliance inspection in May 2014 that found water levels to be too high in the Tailings Storage Facility (inadequate freeboard) and the company was directed to return levels to the minimum 1.0 m plus freeboard required. 1.0m plus freeboard was achieved in June 2014.

Mark Zacharias | Assistant Deputy Minister
Environmental Protection Division, Ministry of Environment
5th Floor, 2975 Jutland Road | Victoria, BC | V8W 9M1 | 250.356.0121 | 250.415.6466

Popowich, Tracy CSNR:EX

From: Bunce, Hubert ENV:EX
Sent: Monday, December 14, 2015 3:26 PM
To: Smith, Curtis ENV:EX
Subject: RE: Bullets for Chief Inspectors Report

See minor edits, italics is explanation of word removal not intended to be included

Hubert Bunce
A/Director, Mount Polley
Environmental Protection, Regional Operations
ph (250) 751-3254 fax (250) 751-3103
2080A Labieux Road
Nanaimo BC V9T 6J9

EP Mount Polley Website ***http://www.env.gov.bc.ca/eemp/incidents/2014/mount-polley/***

From: Smith, Curtis ENV:EX
Sent: Monday, December 14, 2015 3:14 PM
To: Bunce, Hubert ENV:EX
Subject: FW: Bullets for Chief Inspectors Report
Importance: High

Hi Hubert,

I'm working on some bullets for ff asked about limited water discharge due to requirement to meet water quality objectives in prep for the chief inspector's report release. Can you review and ensure I've captured the info you provided below accurately and add anything else that should be included?

- The company's permit under the *Environmental Management Act* was amended in November 2012 to allow a seasonal discharge (April – October, annually) of up to 1.4 million cubic meters per year of dam filtered mine water from the tailings pond to Hazeltine Creek.
- The company's annual report from 2011 indicated that that the flow rate from the tailings storage facility ~~would~~ could be approximately 630,000 to 1,260,000 cubic meters per year.
- The flows were required to be dam filtered as that provided the best quality discharge flows.
- Further, the low dilution flow available in Hazeltine Creek further restricted the possible ~~untreated~~ *passage through ground provides filtration and adsorption (forms of treatment)* discharge volumes and winter low flows were too low to allow discharge during winter months which would be protective of the environment and human health.
- These restrictions on the discharge were in place to ensure that water discharged would achieve BC Water Quality Guidelines at the edge of the initial dilution zone.

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Sent: Friday, December 11, 2015 2:20 PM
To: Smith, Curtis ENV:EX
Subject: FW: Bullets for this afternoon's call

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Sent: Tuesday, December 8, 2015 1:25 PM
To: Zacharias, Mark ENV:EX
Cc: Morel, David P MEM:EX; McGuire, Jennifer ENV:EX
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> > ---
> >
> > **From:** Morel, David P MEM:EX
> > **Sent:** Tuesday, December 8, 2015 11:13 AM
> > **To:** Zacharias, Mark ENV:EX
> > **Subject:** RE: Bullets for this afternoon's call
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> > **Sent:** Tuesday, December 8, 2015 11:03 AM
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Mark Zacharias | Assistant Deputy Minister
Environmental Protection Division, Ministry of Environment
5th Floor, 2975 Jutland Road | Victoria, BC | V8W 9M1 | 250.356.0121 | 250.415.6466

Crozier, Bev ENV:EX

From: Crebo, David GCPE:EX
Sent: Wednesday, December 16, 2015 8:30 PM
To: ENV Ministerial Assistants; Zacharias, Mark ENV:EX; McGuire, Jennifer ENV:EX; Shoemaker, Wes ENV:EX
Cc: Murphy, Bernadette GCPE:EX; Cotton, Brian GCPE:EX; Karn, David GCPE:EX
Subject: Fw: FYI - CIM investigation report - comms materials and PPT - 16 Dec 15
Attachments: Event Itinerary Only_CIM Report Announcement_16_Dec_2015_355pm.docx; QA_CIMInvestigationReport_Technical_Dec 16_2015_649pm.docx; KM_MLA Chief Inspector of Mines Investigation_Dec 16_2015_639pm.docx; NR_BG_CIM report release_Dec 16_2015_651pm.docx

Importance: High

FYI - Final comm materials for tomorrow's Mt Polley report from Chief Inspector mines.

Dave Crebo
Communications Director
Ministry of Environment
(250) 812-5747 - cell

From: Gilmore, Dan GCPE:EX <Dan.Gilmore@gov.bc.ca>
Sent: Wednesday, December 16, 2015 7:11 PM
To: Crebo, David GCPE:EX; Leslie, Lisa GCPE:EX
Cc: Harbord, Chris GCPE:EX; Murphy, Bernadette GCPE:EX; Haslam, David GCPE:EX
Subject: FW: FYI - CIM investigation report - comms materials and PPT - 16 Dec 15

FYI materials for tomorrow's announcement.

Cheers,
Dan

Dan Gilmore
Communications Manager
Ministry of Energy and Mines
Office: 250-952-0667
Cell: 250-213-2302

Time	Event Itinerary
10:00 a.m.	David Morel, Assistant Deputy Minister, MEM to brief First Nations stakeholders via telephone conference prior to event
12:00 p.m	Chief Inspector of Mines (CIM) and technical panel members arrive at the Legislature Proceed to the Minister Bennett's office for preparations • Al Hoffman (CIM) • Harvey McLeod, Panel Member (VP Klohn Crippen Berger engineers) • Doug Kiloh, Panel Member (Former RCMP superintendent) TBC • Cheryl Pocklington (Senior Inspector of Mines) • Haley Kuppers (MEM Provincial Health and Safety Specialist) **Opportunity to see the Press Theatre set-up and test power point presentation
	MEM briefing takes place in Minister's Office with: • Hon. Bill Bennett, Minister of Energy and Mines • Al Hoffman, Chief Inspector and Executive Director, Health & Safety, MEM • David Morel, Assistant Deputy Minister, MEM
12:30 p.m.	Media begin to enter press theatre in Victoria GCPE Events Lead on hand as of 12:15 p.m. to assist
12:45 p.m.	Technical Panel Members are escorted to the Press Theatre by Glen Plummer – Al Hoffman, Harvey McLeod and Doug Kiloh seated at table beside podium. Cheryl Pocklington and Haley Kuppers seated at table at the back of the theatre.
12:55 p.m.	Minister Bennett is escorted to the Press Theatre
1:00 p.m.	Podium into place with BC podium sign. CIM Investigation Report cover slide onto LCD screen Welcome by David Haslam, Communications Director, MEM. • David will explain the format – Minister Bennett will introduce panel, CIM will present findings and recommendations and Minister Bennett will provide concluding remarks, after which David will moderate questions from media to Minister Bennett, CIM and technical panel members
1:02 p.m.	David Haslam to introduce Minister Bennett
1:05 p.m.	Minister Bennett provides opening remarks and CIM and technical panel members. CIM PowerPoint Presentation loaded onto LCD screen
1:15 p.m.	Al Hoffman, CIM, presents findings and recommendations and Harvey McLeod will speak to the geotechnical findings. (Al Hoffman will need laser pointer. Cheryl Pocklington will run PPT slideshow.)
1:35 p.m.	CIM presentation concludes – distribute media package and report – web

	page can go live and media package can get electronic distribution.
1:40 p.m.	Minister Bennett provides government response to recommendations and concluding remarks from the podium
1:50 p.m.	Minister Bennett, CIM and technical panel take questions from media—moderated by David Haslam Note: there will be a dial in and there will be questions from media from across the province
2:10 p.m.	Questions conclude. Event ends.

Chief Inspector of Mines Investigation on Mount Polley
Questions and Answers
December 10, 2015
- DRAFT -

Key Messages

Government Response:

- In response to the findings and recommendations of the Chief Inspector of Mines Investigation into the tailings storage facility at Mount Polley Mine in August government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.
- The chief inspector's investigation was the largest and most complex of its kind in more than a century of regulated mining in British Columbia.
- We've learned from this investigation that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow to allow for an unknown factor, the layer of unstable soils below the dam embankment.
- We've also learned that weak practices on the mine site increased the risk of dam failure and exacerbated environmental consequences from the breach.
- This is unacceptable. My commitment is to implement all recommendations, work with the MABC and MAC, the APEGBC and the CDA to ensure that risk of dam failure is reduced by better regulations, better policies and better professional guidelines.
- The Chief Inspector made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry.
- Many of these recommendations will be addressed through the review of the code. Government will also work with industry and the professional organizations on implementing the other recommendations. It is anticipated this work will be completed by spring 2017.
- Other actions will be taken to strengthen government's compliance and enforcement of mining. Minister Bennett plans to introduce legislation in 2016 to add administrative penalties under the Mines Act.

Chief Inspector of Mines Investigation on Mount Polley
Questions and Answers
December 10, 2015
- DRAFT -

Key Messages

Chief Inspector of Mines Investigation Findings:

- The CIM report found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises.
- The chief inspector also found other factors including the slope of the perimeter embankment, inadequate water management, insufficient beaches and a sub excavation at the outside toe of the dam exacerbated the collapse of the dam and the ensuing environmental damage.
- While the breach would not have occurred had it not been for the undetected glaciolaucustrine layer of soils, the consequences of the breach were made worse by the other factors.
- Although operations on the mine site were not in contravention of any regulation, the CIM found that the mine failed to operate using best available practices.
- The chief inspector of mines (CIM) investigation team conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989. This is the largest and most complex investigation and analysis ever done in BC.
- The CIM found that the mine and its engineers employed weak practices on the mine site and many recommendations go to new standards and guidelines to improve these practices. Weak practices, however, do not constitute a legal contravention of existing mining legislation.
- The CIM, with advice from the Ministry of Justice, did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, the chief inspector of mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.
- The Conservation Officer Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

Chief Inspector of Mines Investigation on Mount Polley
Questions and Answers
December 10, 2015
- DRAFT -

Q&A

Chief Inspector of Mines Investigation

1. **Why are no charges being laid?**

   The CIM found that the mine and its engineers employed weak practices on the mine site and many recommendations go to new standards and guidelines to improve these practices. Weak practices, however, do not constitute a legal contravention of existing mining legislation.

   The CIM, with advice from the Ministry of Justice, did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, the chief inspector of mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

   The CO Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

2. **How did the Chief Inspector of Mines come to this decision?**

   After much review and careful consideration of the information collected in the course of this investigation, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there was not sufficient evidence of an offence under the Act, Mines Regulation, Mines Act Permit M-200 and-or the Health, Safety and Reclamation Code for Mines in British Columbia to warrant the submission of a Report to Crown Counsel.

3. **What did the CIM investigation find? What were the overall causes for the breach and who is ultimately responsible?**

   The CIM report found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises. The chief inspector also found other factors including the slope of the perimeter embankment, inadequate water management, insufficient beaches and a sub excavation at the outside toe of the dam exacerbated the collapse of the dam and the ensuing environmental damage.

   While the breach would not have occurred had it not been for the undetected glaciolaucustrine layer of soils, the consequences of the breach were made worse by the other factors. Although operations on the mine site were not in contravention of any regulation, the CIM found that the mine failed to operate using best available practices.

   The CIM found that the mine and its engineers employed weak practices on the mine site and many recommendations go to new standards and guidelines to improve these practices. Weak practices, however, do not constitute a legal contravention of existing mining legislation. The CIM, with advice from the Ministry of Justice, did not find sufficient evidence that Mount Polley Mining Corporation

contravened existing regulatory requirements. Based on these findings, the chief inspector of mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

The Conservation Officer Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

4. **The CIM investigation concluded the sub-excavation was a factor in the failure of the dam. Why didn't the independent panel identify the sub-excavation as a factor?**

Both investigations identified the sub-excavation. The CIM investigation team identified additional information through interviews and geotechnical analysis, which provided a much more defined picture of what the excavation was and how it related to the failure.

5. **What's the point of having penalties in place if you can't move forward with charges?**

First, I want to be very clear on this, the CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

Secondly, the CIM and the independent panel investigations both confirmed that on multiple occasions MEM posed questions to the mine and its engineers of record regarding the characterization of the foundation, the TSF slope geometry and the adequacy of the beaches. In all instances MEM's concerns were either discounted by the engineers of record, or MEM received assurances from the professional engineers that there were no dam stability concerns.

The CIM investigation also determined there is a need to address the current gap in the existing penalty structures and we plan to take the necessary steps to provide MEM inspectors with the tools they need for a more robust enforcement and compliance structure.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

The Province will also establish a dedicated compliance and enforcement team within the Ministry of Energy and Mines to ensure the ministry has the resources it needs to fully implement and address these regulatory changes.

6. **Given the findings of this investigation, how can you expect British Columbians to have any confidence the way that Imperial Metals runs its operations? Further, how can you expect British**

Columbians to have any faith that government is ensuring mining companies in this province are following best practices and complying with regulations?

B.C. has never before seen the size and scale of a Mount Polley tailings dam failure, but once is too often.

There are a number of hard-learned lessons that have come to light as a result of the Mount Polley incident. And while we can't turn back the clock, we are taking action to tackle these issues head-on.

To that end, we are taking the necessary steps to provide MEM inspectors with the tools they need for a more robust enforcement and compliance structure.

To further strengthen compliance and enforcement in B.C.'s mining industry, government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

7. **Will you implement all of the recommendations from the Chief Inspector of Mines?**

My commitment is to implement all recommendations, work with the MABC and MAC, the APEGBC and the CDA to ensure that risk of dam failure is reduced by better regulations, better policies and better professional guidelines.

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry.

Many of these recommendations will be addressed through the review of the code. Government will also work with industry and the professional organizations on implementing the other recommendations. It is anticipated this work will be completed by spring 2017.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

8. **If MPMC is not being charged, doesn't that mean they are not being held accountable for this breach?**

The CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

The environmental damage that resulted from the failure is not covered under MEM legislation or regulations. However, the Conservation Officer Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

That being said, as a result of the breach, MPMC has spent nearly $70 million to date on remediation efforts including stabilizing Hazeltine Creek and remediating the surrounding area.

Additionally, the mine was shut down from August 4, 2014 to late July 2015, impacting the company's income and stock prices.

9. What about the crack in the dam – did that cause the breach?

The crack in the dam identified in 2010 was approximately 700m away from the site of the breach. The crack was addressed and recommendations were made to the mine by the Engineer of Record. Following this, no further issues were identified at this location.

Earlier this year, the independent panel investigation into the TSF breach concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design.

The chief inspector of mines (CIM) investigation team, which conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989, agreed with this conclusion. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.

10. Did the investigation find that inspectors or the Ministry were at fault?

No. The CIM found that the Regulator (inspectors and ministry) play an important role in compliance and enforcement, but cannot assume responsibility for neither the design of engineered structures such as tailings storage facilities nor construction oversight by approving or improving upon the work of the design engineers.

I'd also point out that this is very much the same conclusion reached by the independent panel in its investigation.

The independent panel even went further and expressed confidence in the Ministry's geotechnical inspectors and their work as regulators.

Investigation Overview

11. What were the objectives of the investigation?

The Chief Inspectors investigation mandate included determining the root and contributory cause(s) of the event and preparing findings to address the accountability of the industry, the Regulator, engineering practices, and any other contributors to the event.

The investigation team also made recommendations for regulatory changes to British Columbia and the mining community to reduce the risk of such an event occurring again.

12. How long did the investigation take?

The investigation took approximately 16 months to complete.

The investigation team conducted a very thorough and in-depth examination of the Mount Polley Mine Corporation's actions from its initial site investigations 26 years ago to present. This included conducting over 100 interviews and reviewing over 100,000 pages of documents going back to 1989.

The CIM investigation team consisted of the Chief Inspector of Mines, Primary Investigator, File Coordinator, information analysts, technical writer, geotechnical engineers, geoscientists and hydrologists from Klohn Crippen Berger, and a retired RCMP inspector. The team was supported throughout the investigation by staff with the Ministry of Energy Mines.

13. How much did this CIM investigation cost??

The investigation cost $2.6 million.

14. Who is paying for the CIM investigation?

The Chief Inspector of Mines has a statutory obligation to investigate incidents that cause personal injury, loss of life or property or environmental damage at mine sites such as the Mount Polley breach. All costs for such statutory investigations are generally managed within the ministry budget.

15. How many MEM staff were involved in the investigation?

The Chief Inspector, two full time Inspectors of Mines and two full time information analysts were dedicated to the investigation. Support for the team included geotechnical engineers, permitting personnel, quaternary geologist, administrative and file management support.

The Chief Inspector of Mines has a statutory obligation to investigate incidents that cause personal injury, loss of life or property or environmental damage at mine sites such as the Mount Polley breach. All costs for such statutory investigations are generally managed within the ministry budget.

16. Who were the seven members of the investigation team?

The members and roles of the investigation team include:

- Al Hoffman, Chief Inspector of Mines: Commander of Investigation
- Haley Kuppers, Provincial Health and Safety Specialist: Primary Investigator
- Cheryl Pocklington, Senior Inspector of Mines, Ergonomist: File Coordinator

- Harvey McLeod, Vice President Klohn Crippen Berger, Geotechnical Eng: Geotechnical Engineer, Investigator
- Doug Kiloh, retired RCMP superintendent detective: Case manager, gatekeeper legal and Conservation Officer Service Liaison
- Keith Elwood, professional technical writer: Investigation Report Writer
- Naomi Hemphill: Information Analyst
- Matthew Parent: Information Analyst

17. This investigation carved out a great deal of MEM staff time, did this result in fewer inspections at other mines?

No. MEM conducted 1,227 inspections in 2014. 225 of these inspections took place at operating metal and coal mines, up from 145 in 2013.

18. What processes were used during the investigation?

The investigation adopted principles of major case management to organize the structure and decision making process of the investigation team. These are the same principles used by law enforcement for major investigations. For example, the investigation into Swissair Flight 111 crash near Peggy's Cove, Nova Scotia in 1998 followed the principles of major case management.

The RCMP supplied a relational database, which was implemented to manage, index and reference documentation in MEM's possession.

The investigation team also utilized a Root Cause Analysis Tool (RCAT) supplied by National Aeronautical and Space Administration (NASA) to assist with the formal, objective and structured analysis of all information collected through the investigation.

Geotechnical investigation was carried out by Klohn Crippen Berger including:

- Field observation and a drilling program.
- Laboratory analysis of drill-core samples;
- Investigation of the failure and events and conditions prior to the failure.

The investigation team gathered information and conducted approximately 100 interviews with Mount Polley mine employees and management, and their parent company Imperial Metals Corp; with the various engineering consultants (Knight Piesold, AMEC, BGC); internal MEM personnel; as well as members of the public and FN communities.

19. Why did the investigation take so long to complete?

This investigation was the largest and most complex of its kind in more than a century of regulated mining in British Columbia, and we wanted to ensure that it would be managed appropriately. The investigation team conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989.

There were a number of phases to the investigation, starting with information gathering and interviewing, geotechnical forensic investigation, analysis of the facts and information, and the writing of the report.

Additionally, it was important to maintain, throughout the investigation, accurate and effective records management, and the independent conduct of the investigation in order to meet legal requirements for final decision and disclosure.

20. Why are sections of appendix 3 in the Chief Inspectors investigation severed?

As I'm sure you're aware, a third independent investigation into the cause of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

As that investigation is still ongoing, some parts of the appendix were redacted under section 15 of the Freedom of Information and Protection of Privacy Act – as being potentially harmful to an active investigation.

21. If the report was completed on November 30, why did you wait two weeks before releasing it?

As minister, I needed time to review the report with ministry executive so that we could fully understand the findings and respond appropriately to the chief inspector's recommendations.

22. What is the difference between the Chief Inspector of Mines investigation and the Conservation Officer Service investigation:

The Chief Inspector of Mines and Conservation Officer Service investigations were conducted independently of each other in order to ensure integrity and separation.

The authorities of these investigations are different, Chief Inspector of Mines investigation is pursuant to Section 7 of the Mines Act, and Conservation Officer Service investigation is pursuant to the Federal fisheries act, and Environmental Management Act.

The independent investigation being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP is still ongoing.

Permit Conditions and Inspections

23. Why didn't MEM identify the issues that led to the structural failure before the breach happened?

MEM did identify these issues and raised them with MPMC and its engineers of record. The EoRs reassured ministry staff and the responses to MEM concerns were provided by professional engineers.

Concerns raised by senior geotechnical engineer Chris Carr regarding glaciolacustrine deposits noted in borehole GW96-1A were discounted first by Knight Piesold (KP) and later by AMEC as not being applicable to the foundation within the dam footprint. MEM relied on the Engineer of Records' (both KP's and AMEC's) professional assessment of the significance of the UGLU encountered.

24. Would more inspections have prevented this failure?

It was determined by the Expert Panel, as well as the CIM investigation, that no inspections by MEM staff would have been able to identify all of the factors that caused the breach.

In 2014, prior to the breach in August, there were eight health and safety inspections completed by MEM staff and in 2013 there were 11 health and safety inspections. A geotechnical inspection was completed in Sept. 2013 and another geotechnical inspection was scheduled for Sept. 2014.

25. Why were there no geotechnical inspections from 2009-2011?

In 2010 and 2011, there was a drop off in the number of geotechnical inspections completed by inspectors in the mining division.

This reduction was a result of declining revenues following the economic downturn as well as a high turnover of professional engineering and geotechnical staff.

Following the election of Premier Christy Clark, government increased funding to the resource ministries. As a result, geotechnical inspections increased to 26 in 2012, 31 in 2013, and 35 in 2014 as resources were re-focused and additional staff were hired.

Since 2012, the Ministry of Energy and Mines has conducted 30 geotechnical inspections on average per year at both operating and closed mine sites throughout the province.
This is a significant increase from the average of 20 from 2002 – 2011.

26. Government has said it is taking steps to improve compliance and enforcement including the creation of a new compliance and enforcement team. Does this mean you didn't have enough staff to ensure the industry was complying with regulations?

No. The independent panel and the CIM investigations both determined that no amount of inspections by MEM staff would have been able to identify all of the factors that caused the breach. Further, the independent panel expressed confidence in the Ministry's geotechnical inspectors and their work as regulators.

In 2010 and 2011, there was a drop off in the number of geotechnical inspections completed by inspectors in the mining division.

This reduction was a result a high turnover of professional engineering and geotechnical staff.

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Since 2012, the Ministry of Energy and Mines has conducted 30 geotechnical inspections on average per year at both operating and closed mine sites throughout the province.
This is a significant increase from the average of 20 from 2002 – 2011.

27. The investigation shows a geotechnical inspection was carried out in September 2013 and no significant issues were found. When was the next geotechnical inspection for the mine scheduled for?

The next scheduled geotechnical inspection for Mount Polley was to occur in September 2014.

28. How often are geotechnical inspections of TSFs conducted? Is there a schedule such as once a year?

On average, geotechnical inspections are scheduled for major mines on an annual basis.

Water Management

29. According to the investigation, water management was one of the conditions that was a big factor in the TSF breach. Why didn't the Ministry of Environment authorize the mine to discharge water?

The Mount Polley Mine initially operated from August 1997 to September 2001 without a permit to discharge mine contact water to the receiving environment. However, a permit was issued in May 1997 authorizing the discharge of tailings to the TSF. The mine was placed into care and maintenance from September 2001 to March 2005, and was re-opened in March 2005. During the care and maintenance period there was an allowance for a small discharge to the Edney Creek drainage.

In 2010 Mount Polley Mining Corporation submitted a permit amendment to enable discharge to Hazeltine Creek. Mount Polley Mining Corporation's permit (11678) under the Environmental Management Act was subsequently amended in November 2012 to allow a seasonal discharge (April – October, annually) of up to 1.4 million cubic metres per year of dam filtered mine water from the tailings pond to Hazeltine Creek.

In October 2013, Mount Polley Mining Corporation initiated a permit amendment process to get authorization for the discharge of 3,000,000 cubic metres per year of treated ditch water to Polley Lake. The Ministry of Environment received the final application for the permit amendment on July 9th, 2014 to increase discharge of treated effluent, and the necessary accompanying reports to support the amendment were submitted July 11th, 2014.

In September 2014 the application was withdrawn and Mt Polley initiated consideration of a short term discharge permit application to discharge up to 9,000,000 cubic metres per year of treated effluent to Quesnel Lake via (non-fish bearing) Hazeltine Creek with requirements for plans to develop a more permanent long term water discharge management system.

In addition to the permitting activity there was a compliance inspection in May 2014 that found water levels to be too high in the Tailings Storage Facility (inadequate freeboard) and the mine was directed to return levels to the minimum 1.0 m plus freeboard required. 1.0m plus freeboard was achieved in June 2014.

30. The Independent Panel report and the Chief Inspector of Mines investigation both identify water management as a factor that needs to be addressed in order to avoid TSF failures. What is government doing to reduce the length of time it takes for mines to get the necessary permits for water discharge?

In response to the Chief Inspector of Mines recommendations around regulatory integration, we will review the permitting processes, objectives and standards for the ministries of Energy and Mines, and Environment with the goal of better aligning these and, where possible, streamlining the permitting processes.

The goal is to ensure we meet our shared objectives – environmental protection, worker health and safety, facilities integrity – while improving our processes and reducing duplication.

31. To remove the issue of water management, why won't government move to requiring dry-stack technology for tailings storage as recommended by the independent panel?

The independent panel recommended the adoption of best available technology, including filtered tailings (dry stack) technology where appropriate. The panel also noted that there are circumstances where other technologies are more appropriate due to the need to neutralize chemicals in the tailings or challenges with dewatering the tailings.

We are committed to implementing the recommendations of the independent panel and the chief inspector of mines.

Based on the recommendations developed by the Code Review committee this government will make the necessary changes to the code to address the recommendations from the panel and the chief inspector.

Recommendations

32. How do the CIM recommendations relate to the Expert Panel recommendations?

While the Chief Inspector's Investigation was conducted in isolation from that of the Independent Expert Panel, a number of recommendations from both investigations overlap.

The Chief Inspector's recommendations align with the Expert panel with regards to oversight of TSFs and water management and defining role of the mine dam safety manager, and EoR. Also, the incorporation of BAP and BAP in TSF designs.

33. Moving forward, will implementing the recommendations give the Ministry more options for compliance and enforcement of Orders?

The Chief Inspector recommended a review of compliance and enforcement function, including capacity and regulatory tools, which will increase compliance and achieve greater safety at mines, improve industry practices, and lead investigations in the future.

The Province will immediately take steps to establish a dedicated compliance and enforcement team within the Ministry of Energy and Mines. This team will provide additional support and oversight to existing ministry compliance and enforcement staff. Once in place, the team will consist of a new Deputy Chief Inspector of Mines for Compliance and Enforcement and up to four staff members. Along with overseeing compliance and enforcement across the ministry, the team's responsibilities will include:

- Developing and implementing an annual compliance and enforcement plan.
- Enhancing the framework and expertise for major investigations.
- Improving the compliance and enforcement tracking system.
- Coordinating compliance and enforcement with other government agencies and ministries.

To further strengthen government's compliance and enforcement of mining government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

34. Will implementing the recommendations prevent events like this?

We've learned from this investigation that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow to allow for an unknown factor, the layer of unstable soils below the dam embankment.

We've also learned that weak practices on the mine site increased the risk of dam failure and exacerbated environmental consequences from the breach.

This is unacceptable. My commitment is to implement all recommendations, work with the MABC and MAC, the APEGBC and the CDA to ensure that risk of dam failure is reduced by better regulations, better policies and better professional guidelines.

Many of these recommendations will be addressed through the review of the code. Government will also work with industry and the professional organizations on implementing the other recommendations. It is anticipated this work will be completed by spring 2017.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Minister Bennett plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting

down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

Operations at Mount Polley and Red Chris Mine

35. Why is Mount Polley mine being allowed to continue to operate considering the findings of this investigation?

The mine site is under close observation by MEM and MOE staff members. It was also important to the community to ensure that families were able to continue to support themselves, government also wanted to make sure a continuation of operations is done in a way that protects the environment.

The authorizations that have been granted to the mine have been subject to highly technical reviews by scientists, engineers, First Nations and community members in order to make sure things are done right.

And to be clear, the CIM investigation did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, along with legal advice provided throughout the investigation, the Chief Inspector of Mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

36. What impact will the investigation findings have on MPMC's application to return to full-production using the tailings storage facility (TSF)?

That is something that the statutory decision makers will determine as part of the application review process and I know the findings and recommendations from the independent panel and the chief inspector of mines investigations will be taken into consideration as part of the application process.

Mines Act permitting decisions are made by the Chief Inspector of Mines, or delegate, and are statutory decisions – completely independent of any political influence.

I know that the application has been received and staff with the ministries of Energy and Mines and Environment, along with representatives from the Soda Creek and Williams Lake Indian Bands, and the community of Likely, must complete a technical screening review of the application before it can move forward.

A key component of the application includes the mine's proposal to use the existing TSF for tailings storage going forward if the application is approved.

Geotechnical engineers at MEM are currently assessing the adequacy of the TSF design and associated best management practices as part of that technical screening process.

37. What assurances do you have that the Mount Polley Mine TSF won't fail again in the future?

At this point, the mine is not authorized to use the TSF. The mine has submitted a permit application and there is a very thorough technical screening and review as part of that process.

As I said, as part of the technical screening, geotechnical engineers at MEM are currently assessing the adequacy of the TSF design and associated best management practices.

Once the technical screening review is complete, the mine will be asked to address any information gaps and then the Cariboo regional mine development review committee (MDRC) will be asked to complete a detailed technical review of the permit amendment application.

Based on the technical review, the MDRC chair will provide recommendations to the statutory decision makers at the ministry of Energy and Mines.

Mines Act permitting decisions are made by the Chief Inspector of Mines, or delegate, and are statutory decisions – completely independent of any political influence.

38. We've heard from the mine that by April 2016 they will max out the total amount of ore they are currently permitted to process and have to suspend operations. What are you doing to ensure operations continue at the mine and 100s of workers aren't laid-off?

To be frank, the ball is in MPMC's court on this. The mine is well-aware of its current permit conditions. It is also aware of the steps it is required to take as part of the permit application process in order to continue operations.

MPMC has submitted an application for amendment to its Mines Act permit to allow the mine to continue operations beyond the parameters authorized under its restricted re-start. This application was received for screening on Nov. 6.

Staff with the ministries of Energy and Mines and Environment, along with representatives from the Soda Creek and Williams Lake Indian Bands, and the community of Likely, must complete a technical screening review of the application before it can move forward.

A key component of the application includes the mine's proposal to use the existing TSF for tailings storage going forward if the application is approved.

Geotechnical engineers at MEM are currently assessing the adequacy of the TSF design and associated best management practices as part of that technical screening process.

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Based on the technical review, the MDRC chair will provide recommendations to the statutory decision makers at the ministry of Energy and Mines.

Mines Act permitting decisions are made by the Chief Inspector of Mines, or delegate, and are statutory decisions – completely independent of any political influence.

39. What's government doing to address the long-term water treatment and discharge requirements for the mine?

The company is required to have its long-term water treatment and discharge proposal to government by June 30, 2016.

Once government has received the company's proposal, it will be subject to the same formal technical screening and review process just like any other proposal.

The final decision will be up to the appropriate statutory decision makers.

40. What are you doing to make sure this doesn't happen at Red Chris?

With respect to Red Chris mine, the tailings storage facility (TSF) at the mine has been the subject of three independent reviews to assess seepage and design considerations. The mine has also done an extensive review of their subsurface hydrogeology and has made adjustments as per third party review recommendations. The mine has successfully demonstrated to the Chief Inspector of Mines that the TSF has performed as designed.

Further, government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry. Government will be working to implement all of the recommendations. Key recommendations include:

- All mines with TSFs will be required to have a designated mine dam safety manager and a designated individual to oversee the mine's water balance and water management plan.
- Mines with TSFs will be required to have water management plans designed by a qualified professional.
- Independent technical review boards will be required for all mines with TSFs.
- Establish a dedicated compliance and enforcement team within the Ministry of Energy and Mines lead by a new Deputy Chief Inspector of Mines. This team will provide additional support and oversight to existing ministry compliance and enforcement staff.
- To strengthen records management and improve openness and transparency around design, construction and operation, government will establish a formal documentation management system for all TSF from development to post-closure.
- Foster innovations in the mining sector that improve current technologies in tailings processing, dewatering and discharge water treatment.

41. Why didn't MEM take steps to ensure the Mount Polley facility was designed properly and operated in accordance with that design?

I want to refer you back to the independent panel report for a moment. In that report, the panel was clear: MEM is the regulator, not the operator. As the regulator, MEM must rely on the expertise of the engineers who design these facilities.

As the panel stated in its report, "The Engineer of Record (EoR) is responsible for the overall performance of the structure as well as the interpretation of site conditions. The Regulator has to rely on the expertise and the professionalism of the EoR as the Regulator is not the designer."

The panel also said that it took them four months to really understand the cause and that no inspections could have detected this issue. And the panel expressed confidence in the Ministry's geotechnical inspectors and their work as regulators. The CIM investigation findings in this area agree with those of the independent panel.

42. If the TSF design included beaches, why weren't beaches properly established and maintained?

The dam was built in general conformance with the design, and it is the responsibility of the mine manager and engineer of record to ensure the facility is constructed and maintained in accordance with the design and approved permits.

MEM raised concerns regarding beach establishment on a number of occasions. In 2006, MEM requested MPMC provide specification of the minimum design beach width required for construction and operation of the TSF (see Section 6.8.4). The response, prepared by Knight Piesold for MPMC, claimed that there was no requirement for maintenance of continuous beaches.

As the independent panel stated in its report, "The Engineer of Record (EoR) is responsible for the overall performance of the structure as well as the interpretation of site conditions. The Regulator has to rely on the expertise and the professionalism of the EoR as the Regulator is not the designer."

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry. Government will be working to implement all of the recommendations. Key recommendations include:

- All mines with TSFs will be required to have a designated mine dam safety manager and a designated individual to oversee the mine's water balance and water management plan.
- Mines with TSFs will be required to have water management plans designed by a qualified professional.
- Independent technical review boards will be required for all mines with TSFs.
- Establish a dedicated compliance and enforcement team within the Ministry of Energy and Mines lead by a new Deputy Chief Inspector of Mines. This team will provide additional support and oversight to existing ministry compliance and enforcement staff.

- To strengthen records management and improve openness and transparency around design, construction and operation, government will establish a formal documentation management system for all TSF from development to post-closure.
- Foster innovations in the mining sector that improve current technologies in tailings processing, dewatering and discharge water treatment.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Government plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

43. The buttress excavation was open for almost eight months, why didn't MEM inspectors notice it?

There were no construction procedures supplied in the construction manual for the buttress excavation. The actual construction did not include provisions for inspection and backfilling, which would normally be included in construction procedures. The excavation was left unfilled from the date of its construction to the failure of the dam, approximately eight months.

The sub-excavation at the toe of the embankment did not constitute a contravention of the Regulatory Requirement because it was in general conformance with design, as signed by the EoR.

MEM will be implementing the recommendations within the CIM report in order to ensure that compliance of permit conditions is maintained throughout the life of the mines. This, along with recommended changes to the Code will ensure that these types of incidents do not happen again.

44. KP sent a letter to the Chief Inspector of Mines in 2011 when it stopped being the EoR at MPMC and raised some concerns about the TSF, what did you do?

Knight Piesold designed and oversaw construction of the Mount Polley tailings storage facility in the mid-1990s. The company chose not to bid on the contract in 2010 and AMEC took over as the engineer of record from Knight Piesold in 2011.

A change of Engineer of Record is not unusual in mining industry. Knight Piesold sent a letter to Imperial Metals and copied to Chief Inspector. In the letter, Knight Piesold stated: "the embankments and the overall tailings impoundment are getting large and it is extremely important that they be monitored, constructed and operated properly to prevent problems in the future."

This is a fairly standard letter to send when an engineer of record at a mine changes. It's sent to avoid future liability. By way of the letter, the outgoing engineers want the record to show that they gave a heads up to incoming engineers on what the focus should be.

45. Why was the original water balance so wrong?

The initial water balance was based on the mine operating in a net water deficit and a production rate of 13,425 tonnes per day (TPD). The calculation did not consider adequate long-term planning. Over the years the mine plans developed and as the mine footprint expanded water management requirements changed.

During care and maintenance, from 2001 to 2005, water accumulated on-site and was stored in the TSF and open pits. When the mine re-opened in 2005 water was transferred from the pits back into the TSF. Additionally, production levels in 2005 increased to approximately 18,000 TPD.

The responsibilities of water management shifted from the EoR to MPMC when the mine went into care and maintenance in 2001, and no qualified person was in an oversight position. Mount Polley management did not develop an adequate water management plan and did not adequately characterize the risk of surplus supernatant water in the TSF. There were a number of opportunities during that time that the mine could have but did not control the risk of surplus supernatant water. There was an ongoing need for the storage of surplus supernatant water and an inability to obtain the appropriate authorizations for water treatment and discharge to the environment.

46. Why didn't MEM take action when it became clear that water balance modeling was wrong?

Communications from MPMC and the EOR regarding TSF design during the permitting process did not identify water management issues.

Moving forward water management and operating freeboard are now recognized as opportunities for TSF designers to set quantifiable performance objectives (QPOs) which will be reviewed and considered by the Code review committee as well as incorporated into operations policies (permitting process).

47. Why did the overtopping earlier that year not trigger strong action from MEM about safety and mismanagement of the TSF?

The May 2014 overtopping was considered a dangerous occurrence (Part 1.7.3(2) of the Code), and MEM followed up to ensure appropriate response measures were taken by MPMC and their engineering consultant.

Minimum operating freeboard of 1.3 metres was re-established – freeboard is the distance between the surface of the water and the top of the dam – and MPMC and their engineering consultant completed embankment construction to address low points in the TSF.

48. Why was BGC Memo regarding buttress foundation preparation not provided to MEM?

MPMC was using two engineering consultants for various activities related the TSF. Mine management did not communicate with MEM all of the details regarding planning or activities of their consultants, and therefore was not aware and did not receive the project memo regarding foundation stripping requirements outlined by BGC. Mount Polley mine management did not provide sufficient oversight and management of the work.

The recommendation will require mine managers to assign a mine dam safety manager. The roles and responsibilities of the mine dam safety manager will be clearly defined by the Code review committee (with the support of MAC). A qualified individual in this role will be responsible for coordinating relevant parties involved with the TSF; ensuring appropriate approval of all activities has been obtained; and maintaining compliance with applicable permit conditions, Mines Act, and Code.

<u>Dam Safety Inspections and Tailings Storage Facilities - general</u>

49. What is different from the MP failure and the Brazil failure?

Until a full investigation into the breach at Brazil is completed, we cannot know what the differences are.

50. Was the tailings storage facility in Brazil the same as the one at Mount Polley and other mines in British Columbia?

Until a full investigation in the incident in Brazil is concluded, the full determination on any similarities with the site there cannot be determined. We can say that the mine in Brazil was not a copper mine.

51. You have done province-wide dam safety inspections (DSI) for all mines with tailings storage facilities and collected all this data. How can you ensure that this information will prevent this from happening again?

During the review of the DSIs from 2014, no immediate safety concerns were identified in the over 330 engineering documents submitted. Overall, there was good compliance with order and most engineering documents submitted were of high quality.

Additionally, the Code Review is looking at the Canadian Dam Association's guidelines in order to better ensure their suitability for tailings dams. This includes reviewing dam safety inspections and dam safety reviews and how they can be improved.

52. If it can happen in Brazil, in a large reputable company, what's preventing it from happening again here?

While eliminating risk is impossible, we can mitigate risk by taking steps to increase the safety and stability of the TSFs and dam structures in our province. The government has taken a number of steps to further understand the structures in our province.

Immediately following the release of the independent panel report and recommendations on the Mount Polley tailings storage facility failure, the Chief Inspector of Mines ordered 38 mines to undertake an assessment to determine if any of the dam(s) associated with their TSFs may be at risk due to:

- Undrained shear failure of silt and clay foundation (whether foundation materials similar to those at Mount Polley exist below any of their dams).
- Water balance adequacy (outline current and long-term water management plans).
- Filter adequacy (identify internal dam erosion prevention methods and other means to prevent piping and cracking)

This has been completed and no immediate safety concerns have been found. Additionally, under the order, mines were asked to provide a work-plan and schedule to address any information gaps identified during the assessment. Based on the reviews and findings provided by the professional engineers, 26 mines identified areas where more information should be compiled and all sites have committed to completing the work necessary – this work includes further analysis and information gathering on all three areas subject to the order (GLU, water balance and filter). The ministry will be following-up on the progress of these mines in January 2016.

Professional Reliance

53. Since the Expert Panel and the CIM identified that the site was not properly characterized by engineers, how are you going to make sure that the professional reliance model will be more effective in the future?

The Chief Inspector is recommending strengthening standards of practice and incorporating, as appropriate, guidelines from external associations including specific guidelines for foundation investigations. Strengthening standards of practice will enable better design, construction and operation of impoundments, improve governance, and establish benchmarks to evaluate these practices.

The Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

Additionally, the Canadian Dam Association is defining the roles and responsibilities of the Engineer of Record as it applies to dam design and the transfer of duties.

Administrative Penalties

54. What are administrative penalties (AMP)?

AMPs are financial penalties that may be imposed for noncompliance with a provision of a statute or regulation, with an order issued by a Ministry official or with the terms of an authorization issued under a statutory scheme.

For minor to moderate violations, AMPs can be more cost-effective and likely to result in a more timely response to non-compliance than court-imposed penalties.

55. Why look at bringing in Administrative Penalties?

The proposed changes would bring the Act in line with the other natural resource legislation, including the Environmental Management Act (EMA), the Forest and Range Practices Act (FRPA) and the Oil and Gas Activities Act (OGAA), all of which include AMPs.

Compliance and enforcement under the Mines Act has not been modernized and the current fines for prosecution date back to at least 1989.

56. How would this help for compliance issues?

Current compliance and enforcement tools under the Mines Act (Act) are limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, pursuing offence prosecutions that can lead to fines of up to $100,000 or to imprisonment for not more than one year, or both. Tools for less serious non-compliance are very limited.

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- In response to the findings and recommendations of the Chief Inspector of Mines Investigation into the tailings storage facility at Mount Polley Mine in August government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.

- The chief inspector's investigation was the largest and most complex of its kind in more than a century of regulated mining in British Columbia.

- We've learned from this investigation that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow to allow for an unknown factor, the layer of unstable soils below the dam embankment.

- We've also learned that weak practices on the mine site increased the risk of dam failure and exacerbated environmental consequences from the breach.

- The Chief Inspector made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry.

- Many of these recommendations will be addressed through the review of the code. Government will also work with industry and the professional organizations on implementing the other recommendations. It is anticipated this work will be completed by spring 2017.

- Other actions will be taken to strengthen government's compliance and enforcement of mining. Minister Bennett plans to introduce legislation in 2016 to add administrative penalties under the Mines Act.

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NEWS RELEASE

For Immediate Release
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Ministry of Energy and Mines

Government takes action on Chief Inspector of Mines' Recommendations

VICTORIA – In response to the findings and recommendations of the Chief Inspector of Mines (CIM) investigation into the tailings storage facility (TSF) at Mount Polley Mine in August 2014, Energy and Mines Minister Bill Bennett announced today that government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.

The CIM report found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises. The chief inspector also found other factors including the slope of the perimeter embankment, inadequate water management, insufficient beaches and a sub-excavation at the outside toe of the dam exacerbated the collapse of the dam and the ensuing environmental damage.

While the breach would not have occurred had it not been for the undetected glaciolaucustrine layer of soils (UGLU), the consequences of the breach were made worse by the other factors. Although operations on the mine site were not in contravention of any regulation, the CIM found that the mine failed to operate using best available practices.

The chief inspector of mines investigation team conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989. This is the largest and most complex investigation and analysis ever done in B.C.

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry. Government will be working to implement all of the recommendations. Key recommendations include:

- All mines with TSFs will be required to have a designated mine dam safety manager and a designated individual to oversee the mine's water balance and water management plan.
- Mines with TSFs will be required to have water management plans designed by a qualified professional.
- Independent technical review boards will be required for all mines with TSFs.
- Establish a dedicated investigation, compliance and enforcement team within the Ministry of Energy and Mines lead by a new Deputy Chief Inspector of Mines. This team will provide additional support and oversight of existing ministry investigation, compliance and enforcement functions.

- To strengthen records management and improve openness and transparency around design, construction and operation, government will establish a formal documentation management system for all TSFs from development to post-closure.
- Foster innovations in the mining sector that improve current technologies in tailings processing, dewatering and discharge water treatment.

Many of these recommendations will be addressed through the review of the Health, Safety and Reclamation Code for Mines in British Columbia. Government will also work with industry and professional organizations to implement the other recommendations. It is anticipated this work will be completed by spring 2017.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Bennett plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

The CIM found that the mine and its engineers employed weak practices on the mine site and many recommendations go to new standards and guidelines to improve these practices. Weak practices, however, do not constitute a legal contravention of existing mining legislation. The CIM, with advice from the Ministry of Justice, did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, the chief inspector of mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

The CO Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

Quotes:

Minister of Energy and Mines Bill Bennett –

"We've learned from this investigation that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow to allow for an unknown factor, the layer of unstable soils below the dam embankment. We've also learned that weak practices on the mine site increased the risk of dam failure and exacerbated environmental consequences from the breach."

"This is unacceptable. My commitment is to implement all recommendations, work with the MABC and MAC, the APEGBC and the CDA to ensure that risk of dam failure is reduced by better regulations, better policies and better professional guidelines."

Chief Inspector of Mines Al Hoffman –

"We conducted a very thorough and in-depth examination of the Mount Polley Mining Corporation's actions from its initial site investigations 26 years ago to present. Through our investigation we determined that while the mine did not contravene any existing regulatory requirements, its management and operational practices failed in a number of areas such as water management and misplaced confidence in the TSF design.

My recommendations address these issues and will strengthen British Columbia's regulatory framework and build a safer, more sustainable industry in B.C."

Learn More:
A copy of the Chief Inspector of Mines investigation is available here:
www.gov.bc.ca/mountpolleyinvestigation

Four backgrounders follow.

BACKGROUNDER

Findings of the Chief Inspector

The Chief Inspector of Mines for British Columbia has completed a 16-month-long investigation into the Aug. 4, 2014 tailings pond breach at the Mount Polley Mine near Likely, B.C. The CIM investigation team consisted of the chief inspector of mines, primary investigator, file coordinator, information analysts, technical writer, geotechnical engineers, geoscientists and hydrologists from Klohn Crippen Berger, and a retired RCMP investigator. The team was supported throughout the investigation by staff with the Ministry of Energy Mines.

The investigation determined that because of the undetected UGLU Mount Polley Mining Corporation (MPMC) and its engineering consultants did not fully recognize and manage geotechnical and water management risks associated with the design, construction, factor of safety and operation of the tailings storage facility.

The following is a summary of the chief inspector's findings:

- At approximately 11:40 pm on Aug. 3, 2014 a section of the Mount Polley Mine tailings storage facility (TSF) perimeter embankment failed and slumped roughly five metres. Water in the impoundment almost immediately overtopped the slumped crest. The failure led to a major and ongoing erosion breach at approximately 1:08 am on Aug. 4, 2014, which released tailings and process water into the environment beyond the mine site.

- The mechanism of the structural failure was due to a lightly over-consolidated glaciolacustrine clay unit (UGLU) approximately 10 metres below the dam's foundation. This clay layer was not properly identified and accounted for in the design of the structure.

- The investigation found that Mount Polley Mining Corporation and the engineers of record did not conduct adequate studies and site investigations of the perimeter embankment foundation. This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for foundation investigations.

- To address this issue, the Association of Professional Engineers and Geoscientists of B.C. is developing professional practice guidelines for dam site characterization assessments for release in spring 2016. The guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

- Because the UGLU was not properly identified, it was not correctly factored in when determining the strength of the dam foundation. As a result, the structural failure occurred

because of two additional conditions that contributed to the dam failure. One was an over-steepening of the downstream slope of the dam, coupled with the constructed height. The other was an unfilled sub-excavation for a buttress foundation at the toe of the embankment at the site of the failure.

- Neither of these conditions contravened existing regulatory requirements. The steepness of the downstream slope was approved by the engineer of record to meet Canadian Dam Association (CDA) guidelines for safety, and the sub-excavation was in general conformance with the design intent.

- The structural failure of the embankment combined with the condition of the tailings pond — with insufficient beaches and too much supernatant water — led to an erosional failure of the embankment that rapidly widened into a complete breach and resulted in the release of tailings and water into the surrounding environment. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.

- These conditions occurred because MPMC failed to effectively manage water at the mine site and in the TSF. An adequate water management plan did not exist, there was no qualified individual responsible for water balance in the TSF, and MPMC did not adequately characterize the risk of surplus supernatant water, which had been compounding since the mine reopened in 2005.

- This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for water management for mine sites.

- There is a need for the Regulator (MEM) to formalize professional reliance guidelines for tailings storage facility design, construction and management in legislation, regulation and-or the Health, Safety and Reclamation Code for mines in British Columbia.

BACKGROUNDER

Chief Inspector of Mines' recommendations

The Chief Inspector of Mines for British Columbia has completed a 16-month long investigation into the August 4, 2014 tailings pond breach at the Mount Polley Mine near Likely, B.C. Based on the findings of this investigation, the chief inspector has made 19 recommendations in seven categories directed toward the mining operator – Mount Polley Mining Corporation (MPMC) – mining industry, professional organizations and the regulator – Ministry of Energy and Mines (MEM).

Many of these recommendations will be addressed through the review of the code. Government will also work with industry and professional organizations to implement a number of other recommendations. It is anticipated this work will be completed by spring 2017.

This includes work the Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

Recommendations for the mining operator:

1. **Proponent Governance**
   - Mine dam safety manager – any mine with a tailings storage facility (TSF) should have a qualified individual designated as a mine safety manager responsible for oversight of planning, design, operation, construction and maintenance, and surveillance of the TSF, and associated site-wide water management (aligns with independent panel recommendation).
   - Water balance management – water management and water balance issues for mining projects must be designed by a qualified professional (aligns with independent panel recommendation).
   - TSF operations manual – mine manager should ensure the operation, maintenance and surveillance manual (OMS) required by the Code for all impoundments adheres to applicable CDA and MAC guidelines.
   - Mine emergency response plan – mine manager must ensure that the Mine Emergency Response Plan adheres to applicable regulations, is maintained on a regular basis for currency, incorporates appropriate response measures to emergencies including those involving the TSF, and is written and distributed in such format as to serve as a procedural guide during an emergency or other event.

- Risk recognition and communication – all mine personnel have a role to play in recognizing and reporting risk conditions, especially those that could affect health, safety and environmental protection; and should be educated in the recognition of conditions and events that could impact TSF safety or contravene applicable permit conditions and regulations.

Recommendations for the mining industry:

2. TSF Design

- Tailings storage and water management systems and structures should be designed for worker and public safety and the protection of the environment (aligns with independent panel recommendation).
- Mines with impoundments should each develop independent technical review boards to provide additional perspectives on site investigation, site selection, design, construction, maintenance, operations, surveillance, water management and closure (aligns with independent panel recommendation).

Recommendations for professional organizations:

3. Professional and Association Standards

- The Association of Professional Engineers and Geoscientists of BC, The Mining Association of Canada, and the Canadian Dam Association should update and strengthen guidelines and standards of practice including those specific to TSF design and management, dam safety and construction (aligns with independent panel recommendation).
- The Regulator should consider and incorporate as appropriate guidelines from these external associations as applicable and consistent with MEM objectives (aligns with independent panel recommendation).

Recommendations for the Regulator:

4. Regulator Functions

- The regulator should undertake a comprehensive review of the Code to ensure that the lessons learned and recommendations from this report are fully considered and appropriately incorporated.
- The regulator should ensure a perspective that spans the life of the mine be considered for Mines Act permit applications, while acknowledging that the nature of mining frequently requires changes to the life-of-mine plan. (Aligns with independent panel recommendation)
- The Regulator must enhance its investigative capacity, as well as its ability to exercise its existing compliance and enforcement authority under the Mines Act and Code. A supported director equivalent position specific to investigation, compliance and enforcement should be established to evaluate and oversee these roles. To increase compliance and achieve greater safety at mines, a full range of regulatory tools, such as

incentives, administrative penalties, outside agency collaboration and other best practices should be considered (aligns with independent panel recommendation).
- A regulatory dam safety manager position dedicated to the coordinated regulatory oversight of tailings dams should be established (aligns with independent panel recommendation).
- The Ministry of Energy and Mines should conduct an internal review of operational and business practices.

5. **Strengthening Records Management**
   - To support long-term integrated decision-making by the regulator, MEM should establish a formal documentation management system for all mines from development to post-closure. This system will provide greater openness and transparency of MEM decisions.

6. **Regulatory Integration**
   - Government should review the Ministries of Environment and Energy and Mines and look for opportunities where processes and standards can be aligned to support timely and effective outcomes that meet agency objectives (environmental protection, worker health and safety, facilities integrity).
   - Government should review MEM and MOE permitting processes and look for opportunities to integrate and align them as appropriate to avoid duplication and increase efficiencies.

7. **Fostering Innovation:**
   - MEM, the industry, professional organizations, and educational institutions should continue to seek new collaborative opportunities to foster education. This initiative could include the availability of standards for education to better define the knowledge, skills, and abilities for various accountabilities within mining, and to increase the knowledge base, information sharing, and innovation.
   - Government and industry should support research and development efforts to improve tailings processing, dewatering, and discharge water treatment technologies (aligns with independent panel recommendation).

BACKGROUNDER

Mount Polley Mine tailings storage facility construction chronology

The Mount Polley Mine tailings storage facility (TSF) was designed to be built and permitted in stages over the life of the mine, with each stage driven by a number of variables, including mine plan, milling process water requirements, storage capacity for tailings, and storage capacity for mine-influenced water. The stages were also dependent on a sufficient supply of construction materials (quarry or run-of-mill rock) as well as construction capacity, including adequate time in a construction season and logistics limitations such as equipment availability or weather constraints.

The ministry evaluated and issued permits under the Mines Act for each successive stage of construction. Periodic inspections by MEM geotechnical inspectors were conducted at the site.

Chronology of construction stages:

Stage 1a to 931 metres – 1995-1996. The initial Mines Act permit for Mount Polley Mine, issued Aug. 3, 1995, approved the construction of a starter dam for the TSF to an elevation of 931 metres, an embankment with a maximum height of 11 metres.

Stage 1b to 934 metres – 1996-1998. The planned raise to an elevation of 934 metres was approved on Sept. 23, 1996.

Stage 2 – 1998-2000. An application for a *Mines Act* permit amendment to raise the dam to 940 metres was approved on April 7, 1998.

Stage 3 – 2000-2001. Stage 3 was approved on Jun. 13, 2000, allowing a raise to 944 metres. An additional Mines Act permit amendment application for Stage 3, to increase the raise to 945 metres, was approved May 30, 2001.

Care and Maintenance – 2001- 2005. Mine operations were suspended in October 2001 and the mine was placed in care-and-maintenance status. Over the course of the closure, substantial water accumulated in both the pits and the TSF.

Stage 4 – 2005-2006. A restart permit was issued May 4, 2005. The accompanying application to raise the dam to 948 metres was approved on May 25, 2005.

Stage 5 – 2006-2007. An application for a Stage 5 raise of the dam to 951 metres was approved on Aug. 2, 2006.

Stage 6a – 2007-2008. The Stage 6 raise planned for an elevation of 958 metres was issued a Mines Act permit amendment on Feb. 9, 2008, and resulted in a raise to 954 metres.

Stage 6b – 2009-2011. The second year of construction completed the Stage 6 raise to 958 metres.

Stage 7 – 2011-2012. An amendment application to raise the dam to 960.5 metres was approved Aug. 15, 2011.

Stage 8 – 2012-2013. The application for the Stage 8 raise to 963.5 metres was approved on Jun. 29, 2012. In the same construction season, an additional application amending the Stage 8 raise to 965 metres was approved Oct. 15, 2012.

Stage 9 – 2013-2014. The application for a Stage 9 raise to 970 metres was approved Aug. 9, 2013.

Stage 10 (Planned) – 2014. A Stage 10 design was produced, and a Mines Act permit amendment application was submitted, but no Stage 10 raise was commenced due to the failure of the TSF embankment. The Stage 10 raise was planned to achieve a crest elevation of 972.5 metres, raise the buttress along the main embankment and add a buttress along the full length of the perimeter embankment.

BACKGROUNDER

Government response to Mount Polley Mine tailings storage facility breach

On Aug. 4, 2014, a large and unprecedented breach occurred at the Mount Polley Mine tailings storage facility. Government took immediate steps to respond, addressing health and safety concerns and initiating three investigations.

Water sampling by Ministry of Environment (MOE) staff began on the evening of Aug. 4, 2014, and remains ongoing. The drinking water ban was lifted by Interior Health for Quesnel Lake, outside the immediate area of impact – 100 m from the mouth of Hazeltine Creek, on Aug. 13 2014. To date, MOE has taken over 190 water samples and continues to monitor impacts on fish. MOE's sampling is in addition to the more than 3,800 water samples taken by the Mount Polley Mining Corporation.

As part of the pollution abatement order issued by MOE on Aug. 5, 2014, the Mount Polley Mine Corporation was ordered to take immediate action to stop the further release of mine tailings into nearby waterways and to submit environmental impact assessments and clean-up action plans to the ministry, including plans to stabilize Hazeltine Creek.

In December2014, the Ministry of Energy and Mines approved an amendment to the Mount Polley Mine Corporation Mines Act permit to allow the company to begin repairs of the breach in its tailings storage facility dam. This work was completed in April 2015.

Throughout the response and remediation process, government and the Mount Polley Mining Corporation have held regular community meetings to keep residents up to date on efforts to address the breach and related issues. To date, more than 20 community meetings have been held for residents of Likely, Williams Lake and members of the Soda Creek Indian Band (Xats'ull First Nation) and Williams Lake Indian Band.

Since the August 2014 failure of the tailings pond at Mount Polley Mine, the provincial government has continued to oversee all environmental remediation work undertaken by the Mount Polley Mining Company. Phase 1 of this work, which focused on stabilizing Hazeltine Creek so it would be safe over the winter months and through the higher water flows from spring freshet is now complete. To-date, the company has spent nearly $70 million on remediation work.

Phase 2 of the remediation and restoration will run through summer of 2016 and beyond. It will focus on repairing impacts of the breach, and will also have active participation from area First Nations and local communities.

On June 5, 2015, Mount Polley Mining Company (MPMC) released its Post Event

Environmental Impact Assessment Report which provides detailed information on the physical, chemical and biological impacts of the spill and will inform future work in the area. This document is available at http://www.env.gov.bc.ca/eemp/incidents/2014/mount-polley/.

On Jan. 30, 2015, the Independent Expert Engineering Investigation and Review Panel delivered a Final Report on its investigation into the cause of the failure of the tailings storage facility at the Mount Polley Mine. The report also included the release of 35,000 pages of documentation related to the panel's investigation. The panel concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in its original design and made seven recommendations to prevent such incidents in the future.

Government committed to implement all of the panel's recommendations and on June 24, 2015, Energy and Mines Minister Bill Bennett appointed a Code Review Committee pursuant to section 34 of the Mines Act to determine how best to implement the panel's recommendations.

On July 9, 2015, statutory decision-makers with the ministries of Energy and Mines and Environment conditionally authorized the Mount Polley Mine Corporation to begin restricted operations. The amended Mines Act permit authorizes the company to operate at roughly half the rate of normal operations. The permit does not provide authorization for use of the tailings facility during the operation. Mount Polley Mine will use Springer Pit, an existing open pit on the mine site, to manage the tailings.

On Nov. 30, 2015, the Province approved Mount Polley Mining Corporation's application for a short-term permit to treat and then discharge water outside of the mine site. The permit is needed because it is estimated that, under normal precipitation conditions, water levels in Springer Pit will reach permitted capacity in April 2016.

Mount Polley Mining Corporation must submit a long-term water treatment and discharge plan to government by June 30, 2016 in order to continue operations.

A third independent investigation into the cause of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

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NEWS RELEASE

For Immediate Release
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Ministry of Energy and Mines

Government takes action on Chief Inspector of Mines' Recommendations

VICTORIA – In response to the findings and recommendations of the Chief Inspector of Mines (CIM) investigation into the tailings storage facility (TSF) at Mount Polley Mine in August 2014, Energy and Mines Minister Bill Bennett announced today that government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.

The CIM report found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises. The chief inspector also found other factors including the slope of the perimeter embankment, inadequate water management, insufficient beaches and a sub-excavation at the outside toe of the dam exacerbated the collapse of the dam and the ensuing environmental damage.

While the breach would not have occurred had it not been for the undetected glaciolaucustrine layer of soils (UGLU), the consequences of the breach were made worse by the other factors. Although operations on the mine site were not in contravention of any regulation, the CIM found that the mine failed to operate using best available practices.

The chief inspector of mines investigation team conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989. This is the largest and most complex investigation and analysis ever done in B.C.

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry. Government will be working to implement all of the recommendations. Key recommendations include:

- All mines with TSFs will be required to have a designated mine dam safety manager and a designated individual to oversee the mine's water balance and water management plan.
- Mines with TSFs will be required to have water management plans designed by a qualified professional.
- Independent technical review boards will be required for all mines with TSFs.
- Establish a dedicated investigation, compliance and enforcement team within the Ministry of Energy and Mines lead by a new Deputy Chief Inspector of Mines. This team will provide additional support and oversight of existing ministry investigation, compliance and enforcement functions.

- To strengthen records management and improve openness and transparency around design, construction and operation, government will establish a formal documentation management system for all TSFs from development to post-closure.
- Foster innovations in the mining sector that improve current technologies in tailings processing, dewatering and discharge water treatment.

Many of these recommendations will be addressed through the review of the Health, Safety and Reclamation Code for Mines in British Columbia. Government will also work with industry and professional organizations to implement the other recommendations. It is anticipated this work will be completed by spring 2017.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Bennett plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

The CIM found that the mine and its engineers employed weak practices on the mine site and many recommendations go to new standards and guidelines to improve these practices. Weak practices, however, do not constitute a legal contravention of existing mining legislation. The CIM, with advice from the Ministry of Justice, did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, the chief inspector of mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

The CO Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

Quotes:

Minister of Energy and Mines Bill Bennett –

"We've learned from this investigation that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow to allow for an unknown factor, the layer of unstable soils below the dam embankment. We've also learned that weak practices on the mine site increased the risk of dam failure and exacerbated environmental consequences from the breach."

"This is unacceptable. My commitment is to implement all recommendations, work with the MABC and MAC, the APEGBC and the CDA to ensure that risk of dam failure is reduced by better regulations, better policies and better professional guidelines."

Chief Inspector of Mines Al Hoffman –

"We conducted a very thorough and in-depth examination of the Mount Polley Mining Corporation's actions from its initial site investigations 26 years ago to present. Through our investigation we determined that while the mine did not contravene any existing regulatory requirements, its management and operational practices failed in a number of areas such as water management and misplaced confidence in the TSF design.

My recommendations address these issues and will strengthen British Columbia's regulatory framework and build a safer, more sustainable industry in B.C."

Learn More:
A copy of the Chief Inspector of Mines investigation is available here:
www.gov.bc.ca/mountpolleyinvestigation

Four backgrounders follow.

BACKGROUNDER

Findings of the Chief Inspector

The Chief Inspector of Mines for British Columbia has completed a 16-month-long investigation into the Aug. 4, 2014 tailings pond breach at the Mount Polley Mine near Likely, B.C. The CIM investigation team consisted of the chief inspector of mines, primary investigator, file coordinator, information analysts, technical writer, geotechnical engineers, geoscientists and hydrologists from Klohn Crippen Berger, and a retired RCMP investigator. The team was supported throughout the investigation by staff with the Ministry of Energy Mines.

The investigation determined that because of the undetected UGLU Mount Polley Mining Corporation (MPMC) and its engineering consultants did not fully recognize and manage geotechnical and water management risks associated with the design, construction, factor of safety and operation of the tailings storage facility.

The following is a summary of the chief inspector's findings:

- At approximately 11:40 pm on Aug. 3, 2014 a section of the Mount Polley Mine tailings storage facility (TSF) perimeter embankment failed and slumped roughly five metres. Water in the impoundment almost immediately overtopped the slumped crest. The failure led to a major and ongoing erosion breach at approximately 1:08 am on Aug. 4, 2014, which released tailings and process water into the environment beyond the mine site.

- The mechanism of the structural failure was due to a lightly over-consolidated glaciolacustrine clay unit (UGLU) approximately 10 metres below the dam's foundation. This clay layer was not properly identified and accounted for in the design of the structure.

- The investigation found that Mount Polley Mining Corporation and the engineers of record did not conduct adequate studies and site investigations of the perimeter embankment foundation. This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for foundation investigations.

- To address this issue, the Association of Professional Engineers and Geoscientists of B.C. is developing professional practice guidelines for dam site characterization assessments for release in spring 2016. The guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

- Because the UGLU was not properly identified, it was not correctly factored in when determining the strength of the dam foundation. As a result, the structural failure occurred

because of two additional conditions that contributed to the dam failure. One was an over-steepening of the downstream slope of the dam, coupled with the constructed height. The other was an unfilled sub-excavation for a buttress foundation at the toe of the embankment at the site of the failure.

- Neither of these conditions contravened existing regulatory requirements. The steepness of the downstream slope was approved by the engineer of record to meet Canadian Dam Association (CDA) guidelines for safety, and the sub-excavation was in general conformance with the design intent.

- The structural failure of the embankment combined with the condition of the tailings pond — with insufficient beaches and too much supernatant water — led to an erosional failure of the embankment that rapidly widened into a complete breach and resulted in the release of tailings and water into the surrounding environment. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.

- These conditions occurred because MPMC failed to effectively manage water at the mine site and in the TSF. An adequate water management plan did not exist, there was no qualified individual responsible for water balance in the TSF, and MPMC did not adequately characterize the risk of surplus supernatant water, which had been compounding since the mine reopened in 2005.

- This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for water management for mine sites.

- There is a need for the Regulator (MEM) to formalize professional reliance guidelines for tailings storage facility design, construction and management in legislation, regulation and-or the Health, Safety and Reclamation Code for mines in British Columbia.

BACKGROUNDER

Chief Inspector of Mines' recommendations

The Chief Inspector of Mines for British Columbia has completed a 16-month long investigation into the August 4, 2014 tailings pond breach at the Mount Polley Mine near Likely, B.C. Based on the findings of this investigation, the chief inspector has made 19 recommendations in seven categories directed toward the mining operator – Mount Polley Mining Corporation (MPMC) – mining industry, professional organizations and the regulator – Ministry of Energy and Mines (MEM).

Many of these recommendations will be addressed through the review of the code. Government will also work with industry and professional organizations to implement a number of other recommendations. It is anticipated this work will be completed by spring 2017.

This includes work the Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

Recommendations for the mining operator:

1. **Proponent Governance**
   - Mine dam safety manager – any mine with a tailings storage facility (TSF) should have a qualified individual designated as a mine safety manager responsible for oversight of planning, design, operation, construction and maintenance, and surveillance of the TSF, and associated site-wide water management (aligns with independent panel recommendation).
   - Water balance management – water management and water balance issues for mining projects must be designed by a qualified professional (aligns with independent panel recommendation).
   - TSF operations manual – mine manager should ensure the operation, maintenance and surveillance manual (OMS) required by the Code for all impoundments adheres to applicable CDA and MAC guidelines.
   - Mine emergency response plan – mine manager must ensure that the Mine Emergency Response Plan adheres to applicable regulations, is maintained on a regular basis for currency, incorporates appropriate response measures to emergencies including those involving the TSF, and is written and distributed in such format as to serve as a procedural guide during an emergency or other event.

- Risk recognition and communication – all mine personnel have a role to play in recognizing and reporting risk conditions, especially those that could affect health, safety and environmental protection; and should be educated in the recognition of conditions and events that could impact TSF safety or contravene applicable permit conditions and regulations.

Recommendations for the mining industry:

2. TSF Design

- Tailings storage and water management systems and structures should be designed for worker and public safety and the protection of the environment (aligns with independent panel recommendation).
- Mines with impoundments should each develop independent technical review boards to provide additional perspectives on site investigation, site selection, design, construction, maintenance, operations, surveillance, water management and closure (aligns with independent panel recommendation).

Recommendations for professional organizations:

3. Professional and Association Standards

- The Association of Professional Engineers and Geoscientists of BC, The Mining Association of Canada, and the Canadian Dam Association should update and strengthen guidelines and standards of practice including those specific to TSF design and management, dam safety and construction (aligns with independent panel recommendation).
- The Regulator should consider and incorporate as appropriate guidelines from these external associations as applicable and consistent with MEM objectives (aligns with independent panel recommendation).

Recommendations for the Regulator:

4. Regulator Functions

- The regulator should undertake a comprehensive review of the Code to ensure that the lessons learned and recommendations from this report are fully considered and appropriately incorporated.
- The regulator should ensure a perspective that spans the life of the mine be considered for Mines Act permit applications, while acknowledging that the nature of mining frequently requires changes to the life-of-mine plan. (Aligns with independent panel recommendation)
- The Regulator must enhance its investigative capacity, as well as its ability to exercise its existing compliance and enforcement authority under the Mines Act and Code. A supported director equivalent position specific to investigation, compliance and enforcement should be established to evaluate and oversee these roles. To increase compliance and achieve greater safety at mines, a full range of regulatory tools, such as

incentives, administrative penalties, outside agency collaboration and other best practices should be considered (aligns with independent panel recommendation).
- A regulatory dam safety manager position dedicated to the coordinated regulatory oversight of tailings dams should be established (aligns with independent panel recommendation).
- The Ministry of Energy and Mines should conduct an internal review of operational and business practices.

5. **Strengthening Records Management**
   - To support long-term integrated decision-making by the regulator, MEM should establish a formal documentation management system for all mines from development to post-closure. This system will provide greater openness and transparency of MEM decisions.

6. **Regulatory Integration**
   - Government should review the Ministries of Environment and Energy and Mines and look for opportunities where processes and standards can be aligned to support timely and effective outcomes that meet agency objectives (environmental protection, worker health and safety, facilities integrity).
   - Government should review MEM and MOE permitting processes and look for opportunities to integrate and align them as appropriate to avoid duplication and increase efficiencies.

7. **Fostering Innovation:**
   - MEM, the industry, professional organizations, and educational institutions should continue to seek new collaborative opportunities to foster education. This initiative could include the availability of standards for education to better define the knowledge, skills, and abilities for various accountabilities within mining, and to increase the knowledge base, information sharing, and innovation.
   - Government and industry should support research and development efforts to improve tailings processing, dewatering, and discharge water treatment technologies (aligns with independent panel recommendation).

BACKGROUNDER

Mount Polley Mine tailings storage facility construction chronology

The Mount Polley Mine tailings storage facility (TSF) was designed to be built and permitted in stages over the life of the mine, with each stage driven by a number of variables, including mine plan, milling process water requirements, storage capacity for tailings, and storage capacity for mine-influenced water. The stages were also dependent on a sufficient supply of construction materials (quarry or run-of-mill rock) as well as construction capacity, including adequate time in a construction season and logistics limitations such as equipment availability or weather constraints.

The ministry evaluated and issued permits under the Mines Act for each successive stage of construction. Periodic inspections by MEM geotechnical inspectors were conducted at the site.

Chronology of construction stages:

Stage 1a to 931 metres – 1995-1996. The initial Mines Act permit for Mount Polley Mine, issued Aug. 3, 1995, approved the construction of a starter dam for the TSF to an elevation of 931 metres, an embankment with a maximum height of 11 metres.

Stage 1b to 934 metres – 1996-1998. The planned raise to an elevation of 934 metres was approved on Sept. 23, 1996.

Stage 2 – 1998-2000. An application for a *Mines Act* permit amendment to raise the dam to 940 metres was approved on April 7, 1998.

Stage 3 – 2000-2001. Stage 3 was approved on Jun. 13, 2000, allowing a raise to 944 metres. An additional Mines Act permit amendment application for Stage 3, to increase the raise to 945 metres, was approved May 30, 2001.

Care and Maintenance – 2001- 2005. Mine operations were suspended in October 2001 and the mine was placed in care-and-maintenance status. Over the course of the closure, substantial water accumulated in both the pits and the TSF.

Stage 4 – 2005-2006. A restart permit was issued May 4, 2005. The accompanying application to raise the dam to 948 metres was approved on May 25, 2005.

Stage 5 – 2006-2007. An application for a Stage 5 raise of the dam to 951 metres was approved on Aug. 2, 2006.

Stage 6a – 2007-2008. The Stage 6 raise planned for an elevation of 958 metres was issued a Mines Act permit amendment on Feb. 9, 2008, and resulted in a raise to 954 metres.

Stage 6b – 2009-2011. The second year of construction completed the Stage 6 raise to 958 metres.

Stage 7 – 2011-2012. An amendment application to raise the dam to 960.5 metres was approved Aug. 15, 2011.

Stage 8 – 2012-2013. The application for the Stage 8 raise to 963.5 metres was approved on Jun. 29, 2012. In the same construction season, an additional application amending the Stage 8 raise to 965 metres was approved Oct. 15, 2012.

Stage 9 – 2013-2014. The application for a Stage 9 raise to 970 metres was approved Aug. 9, 2013.

Stage 10 (Planned) – 2014. A Stage 10 design was produced, and a Mines Act permit amendment application was submitted, but no Stage 10 raise was commenced due to the failure of the TSF embankment. The Stage 10 raise was planned to achieve a crest elevation of 972.5 metres, raise the buttress along the main embankment and add a buttress along the full length of the perimeter embankment.

BACKGROUNDER

Government response to Mount Polley Mine tailings storage facility breach

On Aug. 4, 2014, a large and unprecedented breach occurred at the Mount Polley Mine tailings storage facility. Government took immediate steps to respond, addressing health and safety concerns and initiating three investigations.

Water sampling by Ministry of Environment (MOE) staff began on the evening of Aug. 4, 2014, and remains ongoing. The drinking water ban was lifted by Interior Health for Quesnel Lake, outside the immediate area of impact – 100 m from the mouth of Hazeltine Creek, on Aug. 13 2014. To date, MOE has taken over 190 water samples and continues to monitor impacts on fish. MOE's sampling is in addition to the more than 3,800 water samples taken by the Mount Polley Mining Corporation.

As part of the pollution abatement order issued by MOE on Aug. 5, 2014, the Mount Polley Mine Corporation was ordered to take immediate action to stop the further release of mine tailings into nearby waterways and to submit environmental impact assessments and clean-up action plans to the ministry, including plans to stabilize Hazeltine Creek.

In December2014, the Ministry of Energy and Mines approved an amendment to the Mount Polley Mine Corporation Mines Act permit to allow the company to begin repairs of the breach in its tailings storage facility dam. This work was completed in April 2015.

Throughout the response and remediation process, government and the Mount Polley Mining Corporation have held regular community meetings to keep residents up to date on efforts to address the breach and related issues. To date, more than 20 community meetings have been held for residents of Likely, Williams Lake and members of the Soda Creek Indian Band (Xats'ull First Nation) and Williams Lake Indian Band.

Since the August 2014 failure of the tailings pond at Mount Polley Mine, the provincial government has continued to oversee all environmental remediation work undertaken by the Mount Polley Mining Company. Phase 1 of this work, which focused on stabilizing Hazeltine Creek so it would be safe over the winter months and through the higher water flows from spring freshet is now complete. To-date, the company has spent nearly $70 million on remediation work.

Phase 2 of the remediation and restoration will run through summer of 2016 and beyond. It will focus on repairing impacts of the breach, and will also have active participation from area First Nations and local communities.

On June 5, 2015, Mount Polley Mining Company (MPMC) released its Post Event

Environmental Impact Assessment Report which provides detailed information on the physical, chemical and biological impacts of the spill and will inform future work in the area. This document is available at http://www.env.gov.bc.ca/eemp/incidents/2014/mount-polley/.

On Jan. 30, 2015, the Independent Expert Engineering Investigation and Review Panel delivered a Final Report on its investigation into the cause of the failure of the tailings storage facility at the Mount Polley Mine. The report also included the release of 35,000 pages of documentation related to the panel's investigation. The panel concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in its original design and made seven recommendations to prevent such incidents in the future.

Government committed to implement all of the panel's recommendations and on June 24, 2015, Energy and Mines Minister Bill Bennett appointed a Code Review Committee pursuant to section 34 of the Mines Act to determine how best to implement the panel's recommendations.

On July 9, 2015, statutory decision-makers with the ministries of Energy and Mines and Environment conditionally authorized the Mount Polley Mine Corporation to begin restricted operations. The amended Mines Act permit authorizes the company to operate at roughly half the rate of normal operations. The permit does not provide authorization for use of the tailings facility during the operation. Mount Polley Mine will use Springer Pit, an existing open pit on the mine site, to manage the tailings.

On Nov. 30, 2015, the Province approved Mount Polley Mining Corporation's application for a short-term permit to treat and then discharge water outside of the mine site. The permit is needed because it is estimated that, under normal precipitation conditions, water levels in Springer Pit will reach permitted capacity in April 2016.

Mount Polley Mining Corporation must submit a long-term water treatment and discharge plan to government by June 30, 2016 in order to continue operations.

A third independent investigation into the cause of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

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BRITISH COLUMBIA

NEWS RELEASE

For Immediate Release
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Ministry of Energy and Mines

Government takes action on Chief Inspector of Mines' Recommendations

VICTORIA – In response to the findings and recommendations of the Chief Inspector of Mines (CIM) investigation into the tailings storage facility (TSF) at Mount Polley Mine in August 2014, Energy and Mines Minister Bill Bennett announced today that government will introduce new regulations and requirements that will make British Columbia a national and international leader in safety standards for tailings storage facilities.

The CIM report found, as did the Independent Expert Panel in January, that the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in the design or in subsequent dam raises. The chief inspector also found other factors including the slope of the perimeter embankment, inadequate water management, insufficient beaches and a sub-excavation at the outside toe of the dam exacerbated the collapse of the dam and the ensuing environmental damage.

While the breach would not have occurred had it not been for the undetected glaciolaucustrine layer of soils (UGLU), the consequences of the breach were made worse by the other factors. Although operations on the mine site were not in contravention of any regulation, the CIM found that the mine failed to operate using best available practices.

The chief inspector of mines investigation team conducted approximately 100 interviews and reviewed over 100,000 pages of documents going back to 1989. This is the largest and most complex investigation and analysis ever done in B.C.

The CIM made 19 recommendations in seven categories directed toward the mining operator, the mining industry, professional organizations and the government regulator to prevent such incidents in the future and build a safer, more sustainable industry. Government will be working to implement all of the recommendations. Key recommendations include:

- All mines with TSFs will be required to have a designated mine dam safety manager and a designated individual to oversee the mine's water balance and water management plan.
- Mines with TSFs will be required to have water management plans designed by a qualified professional.
- Independent technical review boards will be required for all mines with TSFs.
- Establish a dedicated investigation, compliance and enforcement team within the Ministry of Energy and Mines lead by a new Deputy Chief Inspector of Mines. This team will provide additional support and oversight of existing ministry investigation, compliance and enforcement functions.

- To strengthen records management and improve openness and transparency around design, construction and operation, government will establish a formal documentation management system for all TSFs from development to post-closure.
- Foster innovations in the mining sector that improve current technologies in tailings processing, dewatering and discharge water treatment.

Many of these recommendations will be addressed through the review of the Health, Safety and Reclamation Code for Mines in British Columbia. Government will also work with industry and professional organizations to implement the other recommendations. It is anticipated this work will be completed by spring 2017.

Other actions will be taken to strengthen government's compliance and enforcement of mining. Bennett plans to introduce legislation in 2016 to add administrative penalties under the Mines Act. Compliance and enforcement tools under the Mines Act are presently limited to shutting down a mine through the cancellation of a permit, issuance of stop-work orders, or pursuing prosecutions. The proposed legislation would give ministry staff the power to issue penalties for non-compliance.

The CIM found that the mine and its engineers employed weak practices on the mine site and many recommendations go to new standards and guidelines to improve these practices. Weak practices, however, do not constitute a legal contravention of existing mining legislation. The CIM, with advice from the Ministry of Justice, did not find sufficient evidence that Mount Polley Mining Corporation contravened existing regulatory requirements. Based on these findings, the chief inspector of mines determined there were no actions that would warrant a report to Crown Counsel pursuant to the Mines Act.

The CO Service is still conducting its investigation into the Mt Polley accident. Their investigation is based on compliance with the Ministry of Environment legislation. It is possible that this investigation may find non-compliance that warrants a report to Crown Counsel.

Quotes:

Minister of Energy and Mines Bill Bennett –

"We've learned from this investigation that in the case of Mount Polley, the allowable margin of risk around the design, construction and management of the tailings storage facility was too narrow to allow for an unknown factor, the layer of unstable soils below the dam embankment. We've also learned that weak practices on the mine site increased the risk of dam failure and exacerbated environmental consequences from the breach."

"This is unacceptable. My commitment is to implement all recommendations, work with the MABC and MAC, the APEGBC and the CDA to ensure that risk of dam failure is reduced by better regulations, better policies and better professional guidelines."

Chief Inspector of Mines Al Hoffman –

"We conducted a very thorough and in-depth examination of the Mount Polley Mining Corporation's actions from its initial site investigations 26 years ago to present. Through our investigation we determined that while the mine did not contravene any existing regulatory requirements, its management and operational practices failed in a number of areas such as water management and misplaced confidence in the TSF design.

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BACKGROUNDER

Findings of the Chief Inspector

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The investigation determined that because of the undetected UGLU Mount Polley Mining Corporation (MPMC) and its engineering consultants did not fully recognize and manage geotechnical and water management risks associated with the design, construction, factor of safety and operation of the tailings storage facility.

The following is a summary of the chief inspector's findings:

- At approximately 11:40 pm on Aug. 3, 2014 a section of the Mount Polley Mine tailings storage facility (TSF) perimeter embankment failed and slumped roughly five metres. Water in the impoundment almost immediately overtopped the slumped crest. The failure led to a major and ongoing erosion breach at approximately 1:08 am on Aug. 4, 2014, which released tailings and process water into the environment beyond the mine site.

- The mechanism of the structural failure was due to a lightly over-consolidated glaciolacustrine clay unit (UGLU) approximately 10 metres below the dam's foundation. This clay layer was not properly identified and accounted for in the design of the structure.

- The investigation found that Mount Polley Mining Corporation and the engineers of record did not conduct adequate studies and site investigations of the perimeter embankment foundation. This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for foundation investigations.

- To address this issue, the Association of Professional Engineers and Geoscientists of B.C. is developing professional practice guidelines for dam site characterization assessments for release in spring 2016. The guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

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because of two additional conditions that contributed to the dam failure. One was an over-steepening of the downstream slope of the dam, coupled with the constructed height. The other was an unfilled sub-excavation for a buttress foundation at the toe of the embankment at the site of the failure.

- Neither of these conditions contravened existing regulatory requirements. The steepness of the downstream slope was approved by the engineer of record to meet Canadian Dam Association (CDA) guidelines for safety, and the sub-excavation was in general conformance with the design intent.

- The structural failure of the embankment combined with the condition of the tailings pond — with insufficient beaches and too much supernatant water — led to an erosional failure of the embankment that rapidly widened into a complete breach and resulted in the release of tailings and water into the surrounding environment. Two investigations have now confirmed the breach would not have happened if details of the clay layer had been fully understood and factored into the design of the dam.

- These conditions occurred because MPMC failed to effectively manage water at the mine site and in the TSF. An adequate water management plan did not exist, there was no qualified individual responsible for water balance in the TSF, and MPMC did not adequately characterize the risk of surplus supernatant water, which had been compounding since the mine reopened in 2005.

- This was not a contravention of any existing regulatory requirements as there were no specific guidelines or regulatory requirements in place for water management for mine sites.

- There is a need for the Regulator (MEM) to formalize professional reliance guidelines for tailings storage facility design, construction and management in legislation, regulation and-or the Health, Safety and Reclamation Code for mines in British Columbia.

BACKGROUNDER

Chief Inspector of Mines' recommendations

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Many of these recommendations will be addressed through the review of the code. Government will also work with industry and professional organizations to implement a number of other recommendations. It is anticipated this work will be completed by spring 2017.

This includes work the Association of Professional Engineers and Geoscientists of B.C. is undertaking to develop professional practice guidelines for dam site characterization assessments for release in spring 2016. Those guidelines will outline the standard of care and professional obligations professional engineers and geoscientists must uphold when conducting these assessments, and will define the roles and responsibilities of the various participants and stakeholders involved in this process.

Recommendations for the mining operator:

1. **Proponent Governance**
   - Mine dam safety manager – any mine with a tailings storage facility (TSF) should have a qualified individual designated as a mine safety manager responsible for oversight of planning, design, operation, construction and maintenance, and surveillance of the TSF, and associated site-wide water management (aligns with independent panel recommendation).
   - Water balance management – water management and water balance issues for mining projects must be designed by a qualified professional (aligns with independent panel recommendation).
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- Risk recognition and communication – all mine personnel have a role to play in recognizing and reporting risk conditions, especially those that could affect health, safety and environmental protection; and should be educated in the recognition of conditions and events that could impact TSF safety or contravene applicable permit conditions and regulations.

Recommendations for the mining industry:

2. **TSF Design**
   - Tailings storage and water management systems and structures should be designed for worker and public safety and the protection of the environment (aligns with independent panel recommendation).
   - Mines with impoundments should each develop independent technical review boards to provide additional perspectives on site investigation, site selection, design, construction, maintenance, operations, surveillance, water management and closure (aligns with independent panel recommendation).

Recommendations for professional organizations:

3. **Professional and Association Standards**
   - The Association of Professional Engineers and Geoscientists of BC, The Mining Association of Canada, and the Canadian Dam Association should update and strengthen guidelines and standards of practice including those specific to TSF design and management, dam safety and construction (aligns with independent panel recommendation).
   - The Regulator should consider and incorporate as appropriate guidelines from these external associations as applicable and consistent with MEM objectives (aligns with independent panel recommendation).

Recommendations for the Regulator:

4. **Regulator Functions**
   - The regulator should undertake a comprehensive review of the Code to ensure that the lessons learned and recommendations from this report are fully considered and appropriately incorporated.
   - The regulator should ensure a perspective that spans the life of the mine be considered for Mines Act permit applications, while acknowledging that the nature of mining frequently requires changes to the life-of-mine plan. (Aligns with independent panel recommendation)
   - The Regulator must enhance its investigative capacity, as well as its ability to exercise its existing compliance and enforcement authority under the Mines Act and Code. A supported director equivalent position specific to investigation, compliance and enforcement should be established to evaluate and oversee these roles. To increase compliance and achieve greater safety at mines, a full range of regulatory tools, such as

incentives, administrative penalties, outside agency collaboration and other best practices should be considered (aligns with independent panel recommendation).
- A regulatory dam safety manager position dedicated to the coordinated regulatory oversight of tailings dams should be established (aligns with independent panel recommendation).
- The Ministry of Energy and Mines should conduct an internal review of operational and business practices.

5. **Strengthening Records Management**
   - To support long-term integrated decision-making by the regulator, MEM should establish a formal documentation management system for all mines from development to post-closure. This system will provide greater openness and transparency of MEM decisions.

6. **Regulatory Integration**
   - Government should review the Ministries of Environment and Energy and Mines and look for opportunities where processes and standards can be aligned to support timely and effective outcomes that meet agency objectives (environmental protection, worker health and safety, facilities integrity).
   - Government should review MEM and MOE permitting processes and look for opportunities to integrate and align them as appropriate to avoid duplication and increase efficiencies.

7. **Fostering Innovation:**
   - MEM, the industry, professional organizations, and educational institutions should continue to seek new collaborative opportunities to foster education. This initiative could include the availability of standards for education to better define the knowledge, skills, and abilities for various accountabilities within mining, and to increase the knowledge base, information sharing, and innovation.
   - Government and industry should support research and development efforts to improve tailings processing, dewatering, and discharge water treatment technologies (aligns with independent panel recommendation).

BACKGROUNDER

Mount Polley Mine tailings storage facility construction chronology

The Mount Polley Mine tailings storage facility (TSF) was designed to be built and permitted in stages over the life of the mine, with each stage driven by a number of variables, including mine plan, milling process water requirements, storage capacity for tailings, and storage capacity for mine-influenced water. The stages were also dependent on a sufficient supply of construction materials (quarry or run-of-mill rock) as well as construction capacity, including adequate time in a construction season and logistics limitations such as equipment availability or weather constraints.

The ministry evaluated and issued permits under the Mines Act for each successive stage of construction. Periodic inspections by MEM geotechnical inspectors were conducted at the site.

Chronology of construction stages:

Stage 1a to 931 metres – 1995-1996. The initial Mines Act permit for Mount Polley Mine, issued Aug. 3, 1995, approved the construction of a starter dam for the TSF to an elevation of 931 metres, an embankment with a maximum height of 11 metres.

Stage 1b to 934 metres – 1996-1998. The planned raise to an elevation of 934 metres was approved on Sept. 23, 1996.

Stage 2 – 1998-2000. An application for a *Mines Act* permit amendment to raise the dam to 940 metres was approved on April 7, 1998.

Stage 3 – 2000-2001. Stage 3 was approved on Jun. 13, 2000, allowing a raise to 944 metres. An additional Mines Act permit amendment application for Stage 3, to increase the raise to 945 metres, was approved May 30, 2001.

Care and Maintenance – 2001- 2005. Mine operations were suspended in October 2001 and the mine was placed in care-and-maintenance status. Over the course of the closure, substantial water accumulated in both the pits and the TSF.

Stage 4 – 2005-2006. A restart permit was issued May 4, 2005. The accompanying application to raise the dam to 948 metres was approved on May 25, 2005.

Stage 5 – 2006-2007. An application for a Stage 5 raise of the dam to 951 metres was approved on Aug. 2, 2006.

Stage 6a – 2007-2008. The Stage 6 raise planned for an elevation of 958 metres was issued a Mines Act permit amendment on Feb. 9, 2008, and resulted in a raise to 954 metres.

Stage 6b – 2009-2011. The second year of construction completed the Stage 6 raise to 958 metres.

Stage 7 – 2011-2012. An amendment application to raise the dam to 960.5 metres was approved Aug. 15, 2011.

Stage 8 – 2012-2013. The application for the Stage 8 raise to 963.5 metres was approved on Jun. 29, 2012. In the same construction season, an additional application amending the Stage 8 raise to 965 metres was approved Oct. 15, 2012.

Stage 9 – 2013-2014. The application for a Stage 9 raise to 970 metres was approved Aug. 9, 2013.

Stage 10 (Planned) – 2014. A Stage 10 design was produced, and a Mines Act permit amendment application was submitted, but no Stage 10 raise was commenced due to the failure of the TSF embankment. The Stage 10 raise was planned to achieve a crest elevation of 972.5 metres, raise the buttress along the main embankment and add a buttress along the full length of the perimeter embankment.

BACKGROUNDER

Government response to Mount Polley Mine tailings storage facility breach

On Aug. 4, 2014, a large and unprecedented breach occurred at the Mount Polley Mine tailings storage facility. Government took immediate steps to respond, addressing health and safety concerns and initiating three investigations.

Water sampling by Ministry of Environment (MOE) staff began on the evening of Aug. 4, 2014, and remains ongoing. The drinking water ban was lifted by Interior Health for Quesnel Lake, outside the immediate area of impact – 100 m from the mouth of Hazeltine Creek, on Aug. 13 2014. To date, MOE has taken over 190 water samples and continues to monitor impacts on fish. MOE's sampling is in addition to the more than 3,800 water samples taken by the Mount Polley Mining Corporation.

As part of the pollution abatement order issued by MOE on Aug. 5, 2014, the Mount Polley Mine Corporation was ordered to take immediate action to stop the further release of mine tailings into nearby waterways and to submit environmental impact assessments and clean-up action plans to the ministry, including plans to stabilize Hazeltine Creek.

In December2014, the Ministry of Energy and Mines approved an amendment to the Mount Polley Mine Corporation Mines Act permit to allow the company to begin repairs of the breach in its tailings storage facility dam. This work was completed in April 2015.

Throughout the response and remediation process, government and the Mount Polley Mining Corporation have held regular community meetings to keep residents up to date on efforts to address the breach and related issues. To date, more than 20 community meetings have been held for residents of Likely, Williams Lake and members of the Soda Creek Indian Band (Xats'ull First Nation) and Williams Lake Indian Band.

Since the August 2014 failure of the tailings pond at Mount Polley Mine, the provincial government has continued to oversee all environmental remediation work undertaken by the Mount Polley Mining Company. Phase 1 of this work, which focused on stabilizing Hazeltine Creek so it would be safe over the winter months and through the higher water flows from spring freshet is now complete. To-date, the company has spent nearly $70 million on remediation work.

Phase 2 of the remediation and restoration will run through summer of 2016 and beyond. It will focus on repairing impacts of the breach, and will also have active participation from area First Nations and local communities.

On June 5, 2015, Mount Polley Mining Company (MPMC) released its Post Event

Environmental Impact Assessment Report which provides detailed information on the physical, chemical and biological impacts of the spill and will inform future work in the area. This document is available at http://www.env.gov.bc.ca/eemp/incidents/2014/mount-polley/.

On Jan. 30, 2015, the Independent Expert Engineering Investigation and Review Panel delivered a Final Report on its investigation into the cause of the failure of the tailings storage facility at the Mount Polley Mine. The report also included the release of 35,000 pages of documentation related to the panel's investigation. The panel concluded the dam failed because the strength and location of a layer of clay underneath the dam was not taken into account in its original design and made seven recommendations to prevent such incidents in the future.

Government committed to implement all of the panel's recommendations and on June 24, 2015, Energy and Mines Minister Bill Bennett appointed a Code Review Committee pursuant to section 34 of the Mines Act to determine how best to implement the panel's recommendations.

On July 9, 2015, statutory decision-makers with the ministries of Energy and Mines and Environment conditionally authorized the Mount Polley Mine Corporation to begin restricted operations. The amended Mines Act permit authorizes the company to operate at roughly half the rate of normal operations. The permit does not provide authorization for use of the tailings facility during the operation. Mount Polley Mine will use Springer Pit, an existing open pit on the mine site, to manage the tailings.

On Nov. 30, 2015, the Province approved Mount Polley Mining Corporation's application for a short-term permit to treat and then discharge water outside of the mine site. The permit is needed because it is estimated that, under normal precipitation conditions, water levels in Springer Pit will reach permitted capacity in April 2016.

Mount Polley Mining Corporation must submit a long-term water treatment and discharge plan to government by June 30, 2016 in order to continue operations.

A third independent investigation into the cause of the Mount Polley tailings pond breach is being led by British Columbia's Conservation Officer Service (COS), and assisted by Environment Canada, Department of Fisheries and Oceans Canada and the RCMP.

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