

The Mining Association
of Canada | L'association minière
du Canada

Mining Association of Canada Initiatives on Tailings Management

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ABOUT THE MINING ASSOCIATION OF CANADA (MAC)

THE WINDS OF CHANGE.

Nickel, steel-making coal, copper and zinc are all critical to the efficiency of the turbines and towers of today's wind farms. Canada is one of the world's top mining countries, and our minerals and metals are found in products of all kinds.

MINING.CA

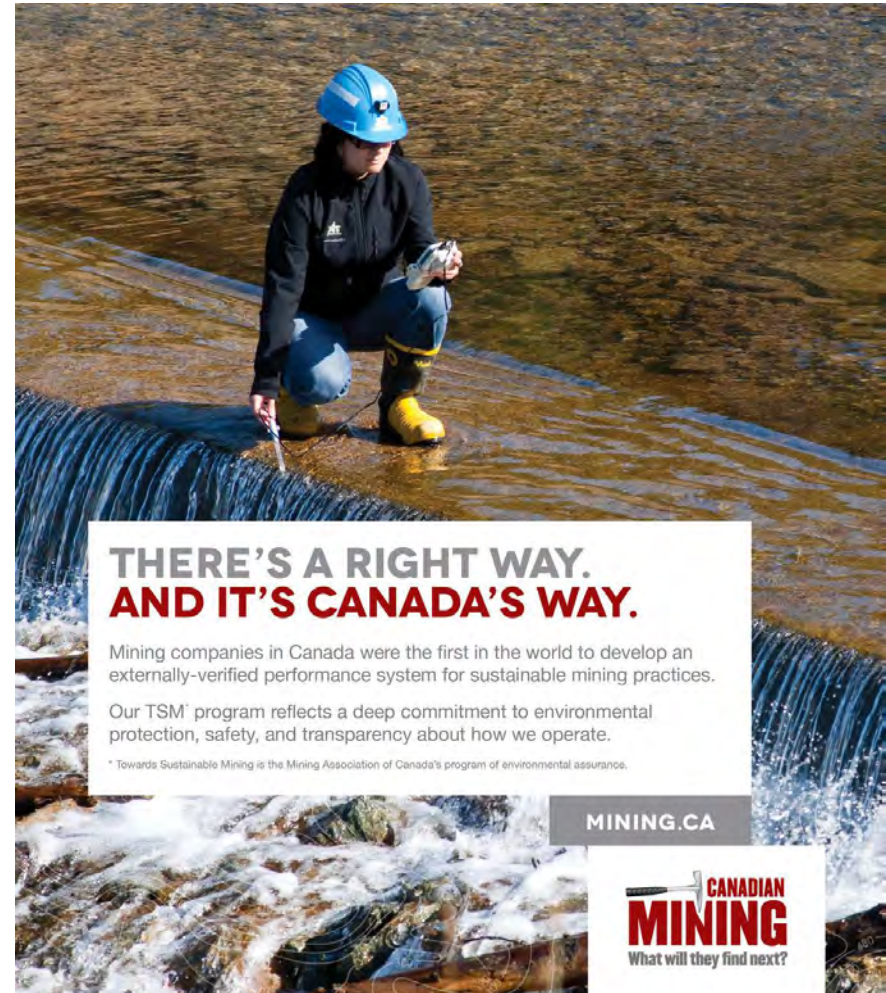
CANADIAN MINING
Part of just about everything.

A message from the Mining Association of Canada.

- ◆ Established in 1935, MAC
 - ◆ promotes industry nationally and internationally
 - ◆ works with governments on policies affecting the sector
 - ◆ educates the public on mining
- ◆ Members engaged in mineral exploration, mining, smelting, refining and semi-fabrication
- ◆ Members account for most of **Canada's production of** metals and major industrial minerals
- ◆ Associate members comprise a wide range of services and equipment supplied to the mining industry

MAC established TSM program in 2004. Objective is to enable mining companies to **meet society's needs for minerals, metals and energy products** in the most socially, economically and environmentally responsible way. **TSM's** core strengths are:

- ◆ **Accountability:** assessments conducted at facility level – only program in the world to do this in our sector
- ◆ **Transparency:** annual reporting against 23 indicators with independent verification
- ◆ **Credibility:** ongoing consultation with a national Community of Interest Advisory panel to improve industry performance and shape TSM for continual advancement



- ◆ TSM has a series of protocols and frameworks to drive performance in the following areas:
 - ◆ Aboriginal and community outreach
 - ◆ Energy and GHG emissions management
 - ◆ Tailings management
 - ◆ Biodiversity conservation management
 - ◆ Safety and health
 - ◆ Crisis management
 - ◆ Mine closure
 - ◆ Water
- ◆ Participation in TSM is mandatory for all MAC members for their operations in Canada
 - ◆ Many also apply TSM at their operations in other countries

- ◆ MAC established the Tailings Working Group (TWG) in 1996
 - ◆ consists of representatives of MAC members and associate members
- ◆ Driver at that time was a number of high profile tailings dam failures internationally
 - ◆ recognition that tailings are a business risk which needs to be managed
- ◆ First edition of *A Guide to the Management of Tailings Facilities* published in 1998



- ◆ TSM includes a tailings management component consisting of:
 - ◆ *TSM Tailings Management Protocol* (the Protocol)
 - ◆ launched in 2004
 - ◆ *A Guide to the Management of Tailings Facilities* (the Tailings Guide)
 - ◆ 1st edition 1998, 2nd edition 2011
 - ◆ *Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities* (the OMS Guide)
 - ◆ first published in 2003
 - ◆ *A Guide to the Audit and Assessment of Tailings Facility Management* (the Audit and Assessment Guide)
 - ◆ first published in 2009



- ◆ Contains five performance indicators designed to confirm whether a facility has implemented a system for responsible tailings management
- ◆ Refers to the three Guides providing more detailed requirements
- ◆ Facilities must conduct annual reviews of their management system and report results to the accountable executive officer
- ◆ TSM currently uses a 5 level rating scheme: C, B, A, AA and AAA

Tailings Management Indicators

Tailings management policy and commitment

Tailings management system

Assigned accountability and responsibility for tailings management

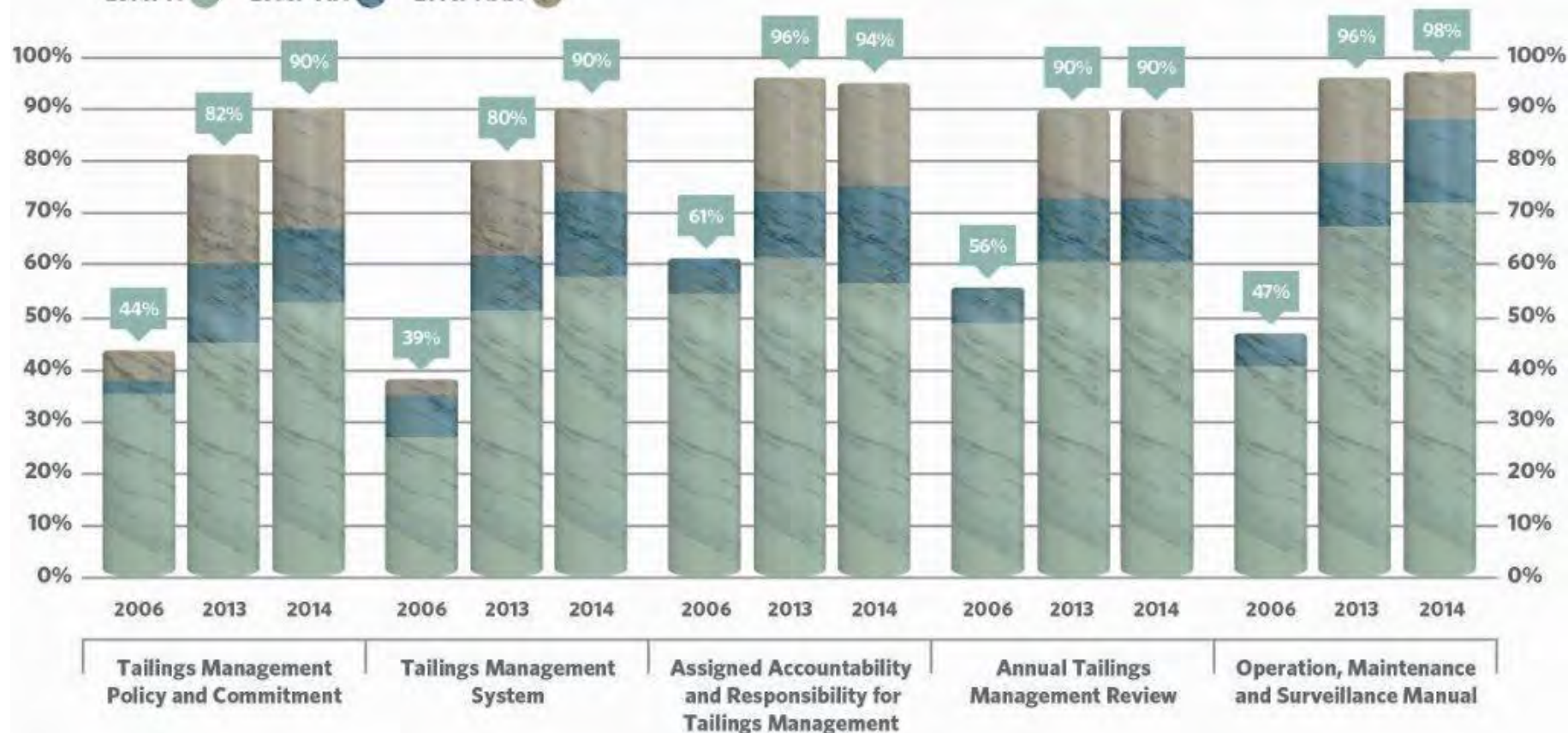
Annual tailings management review

Operation, maintenance and surveillance (OMS) manual



TAILINGS MANAGEMENT PERCENTAGE OF FACILITIES AT LEVEL A OR HIGHER 2006, 2013 AND 2014

Level A ● Level AA ● Level AAA ●



- ◆ August 2014: Mt. Polley tailings dam failure
- ◆ November 2014: Joint MAC/MABC workshop
- ◆ November 2014: MAC Board agreed in principle to independent review of tailings management component
- ◆ January 2015: BC appointed panel investigating Mt. Polley releases report
 - ◆ “**Corporations** proposing to operate a tailings storage facility (TSF) should be required to be a member of the Mining Association of Canada (MAC) or be obliged to commit to an equivalent program for tailings management, including the audit **function**”
- ◆ March 2015: MAC Board approved review, established Independent Tailings Task Force to conduct external review
- ◆ April 2015: MAC TWG initiated internal review

- ◆ TF asked to advise the MAC Board on potential improvements to the Protocol and three tailings management guides
- ◆ TF designed to be broad-based and seven members represented a variety of specialties and interests
 - ◆ specialists in engineering and geotechnical issues
 - ◆ First Nations representatives
 - ◆ environmental specialists
 - ◆ individuals with experience in executive management
- ◆ Report with 29 recommendations presented to MAC Board in November 2015

- ◆ **MAC Board committed to “expeditiously identify how best to integrate the recommendations of the report into TSM for implementation”**
- ◆ **Board Chair stated that “It is imperative that the industry continuously improves how it works to ensure the safe operation of its tailings facilities”**
- ◆ MAC Governance Team coordinating revision process
 - ◆ TWG: Tailings Guide and OMS Guide
 - ◆ TSM Initiative Leaders: Tailings Management Protocol
- ◆ Target: complete revisions to Protocol and Tailings Guide in early 2017



- ◆ TF recommendation: consider new criteria for Levels A, AA and AAA for each Indicator in Protocol, to increase the level of audit or assessment required to achieve each level
 - ◆ currently, no audit or external assessment required for Level A
 - ◆ audit or assessment required for AA and AAA
 - ◆ proceeding with implementation
- ◆ TF recommendation: remove Levels C and B. Those not at Level A in all Indicators would be required to develop action plans and timelines to achieve Level A
 - ◆ proceeding with implementation regarding action plans
 - ◆ agreement regarding Level C, still some discussion regarding Level B

- ◆ TF recommendation:
Bring all aspects of
community
engagement into a new
single indicator to
address Aboriginal and
community of interest
(COI) engagement
 - ◆ proceeding with
implementation



- ◆ Incorporate a risk-based approach as an integral element of the Tailings Guide, with tailings facilities managed commensurate with risks (physical and chemical) that they pose
- ◆ Risks should be identified, assessed and periodically re-assessed through all phases of the mine life-cycle, from planning through post-closure
- ◆ Controls critical to management of these risks should be implemented
- ◆ Performance against critical controls should be integral to the TSM audit and assessment process
- ◆ Non-conformances associated with critical controls would carry a greater weight in the TSM audit and assessment process compared to non-conformances not directly linked to risks posed by tailings facilities

- ◆ Revised Tailings Guide to address best available technologies (BAT) and best available practices (BAP) for tailings management, including:
 - ◆ alternatives to management of tailings as conventional slurry (e.g., filtered and thickened slurried tailings)
 - ◆ practices to reduce overall footprint of tailings facilities (e.g., in-pit disposal and underground backfilling)
 - ◆ co-management in a single facility of other wastes with tailings (e.g., waste rock and treatment sludge)
- ◆ Careful consideration to be given to defining terms BAT and BAP
 - ◆ recognize that selection of BAT/BAP is site-dependent
 - ◆ take into account environmental, social, closure and financial implications

- ◆ Revised Tailings Guide to require rigorous, transparent process (e.g., multiple accounts analysis) to select tailings management technologies and tailings facility location
- ◆ Should be greater consideration of closure objectives in the initial selection of technology and facility location
- ◆ TWG developing guidance on independent review of site investigation and selection, design, construction, operation, closure and post-closure of tailings facilities
- ◆ OMS Guide to be updated commensurate with changes in Tailings Guide and Task Force recommendations
- ◆ Goal is to raise the performance bar by making what a lot of mines are already doing standard practice across the industry

- ◆ Canadian Institute of Mining and Metallurgy
- ◆ Canadian Dam Association
- ◆ Association of Professional Engineers and Geoscientists of British Columbia
- ◆ Alberta Chamber of Mines
- ◆ International Council on Mining and Metals
- ◆ Review of the BC Mining Code
- ◆ TWG remaining apprised of there related activities and initiatives, and all have some direct involvement by TWG members
- ◆ Will seek potential opportunities for collaboration, should such opportunities arise

For more information on TSM:

<http://mining.ca/towards-sustainable-mining>

Task Force report:

<http://mining.ca/sites/default/files/documents/Report-TSM-Tailings-Review-Task-Force.pdf>

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