The Impact of Today's Decisions on an Uncertain Tomorrow:

Climate Adaptation in the Mining Sector

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Canada

Mining in Ontario

41
Active Mines

$13.5B
Mineral Production

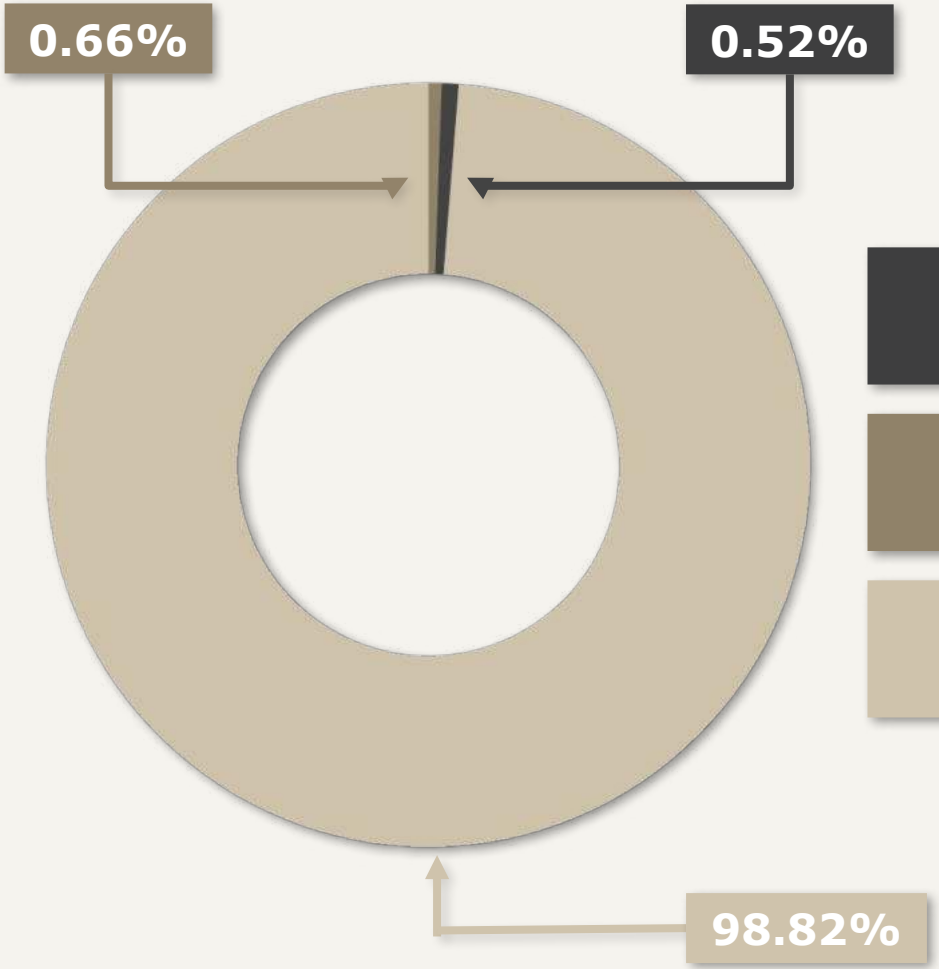
24%
Canadian Investments

47,000
Jobs Created

Life Stages of Mines

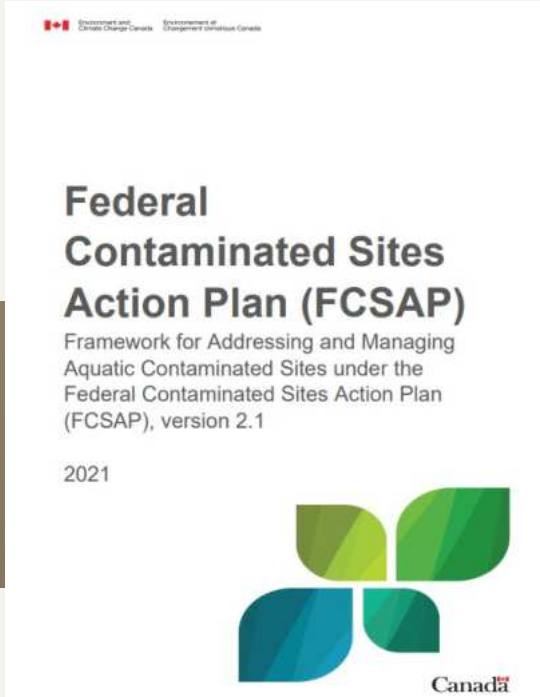
Post-Closure Stage

- Also known as the **"Long-Term Monitoring (LTM)"** or **"Perpetual Care (PC)"** stage among different interested groups or organizations.
- Describes everything that happens once mines have been formally closed (e.g., perpetual impacts, land-use constraints, relationships, etc).



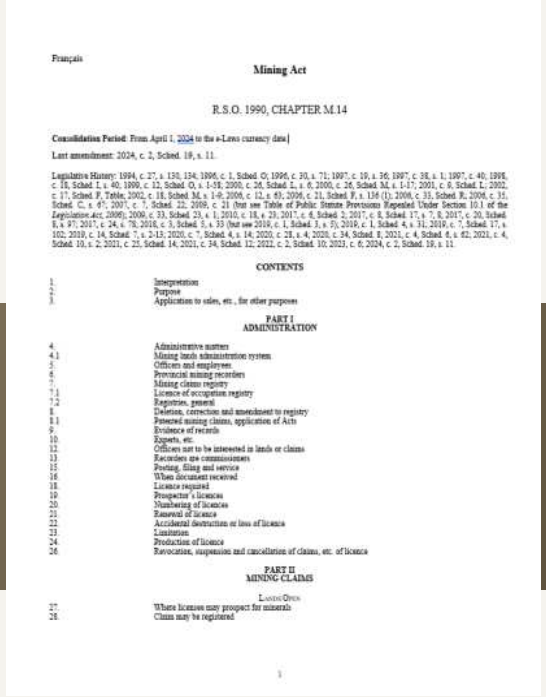
State of Ontario Mines

Upcoming	32
Active	41
Post-Closure	> 6100



10-Step Process

- Decision-making framework.



Part VII & O. Reg 35/24

- The Mine Rehabilitation Code.

Sch. 2, S. 1(d) & 18-25

- Decommissioning & abandonment.

Example Policy Frameworks

Climate Focus

Post-closure mining sites leave behind hazards whose potential to impact their surroundings are sensitive to environmental changes.

How Do We Account for Climate Change?

FCSAP

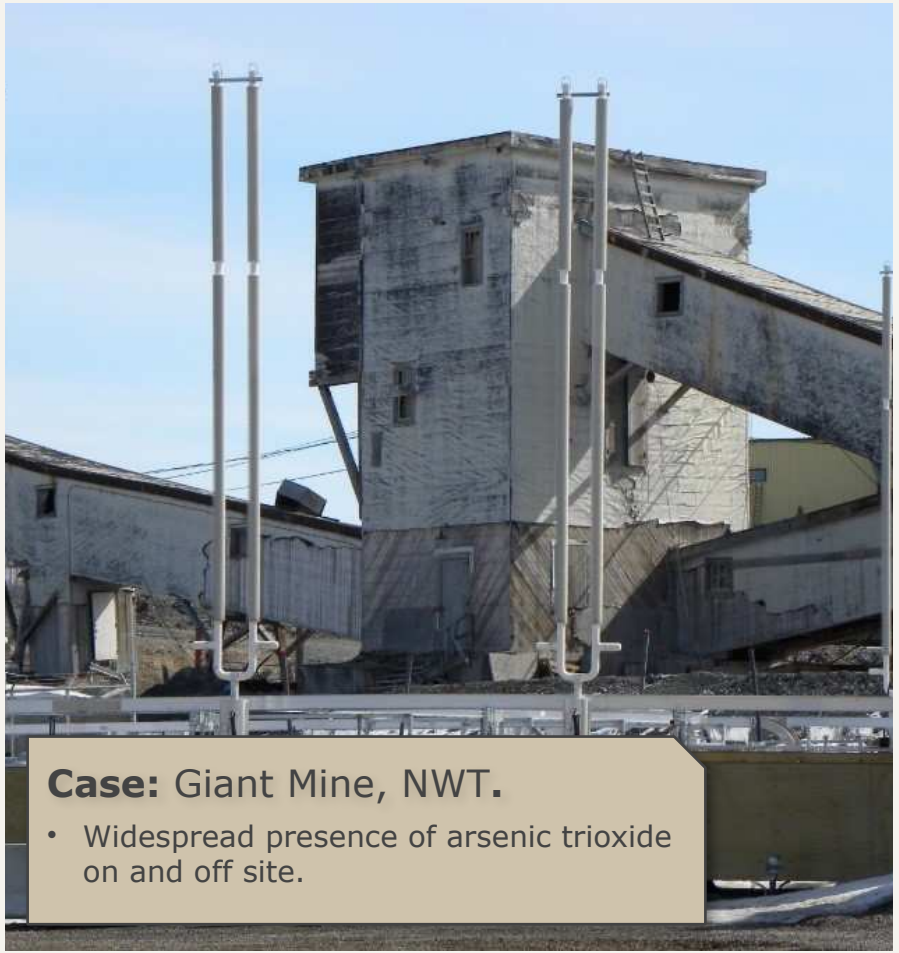
- Guidance document released in 2022.
- Step 10 – 1.5 pages of climate content.

The Mining Rehabilitation Code

- "Climate" mentioned only for revegetation.

Impact and Environmental Assessments

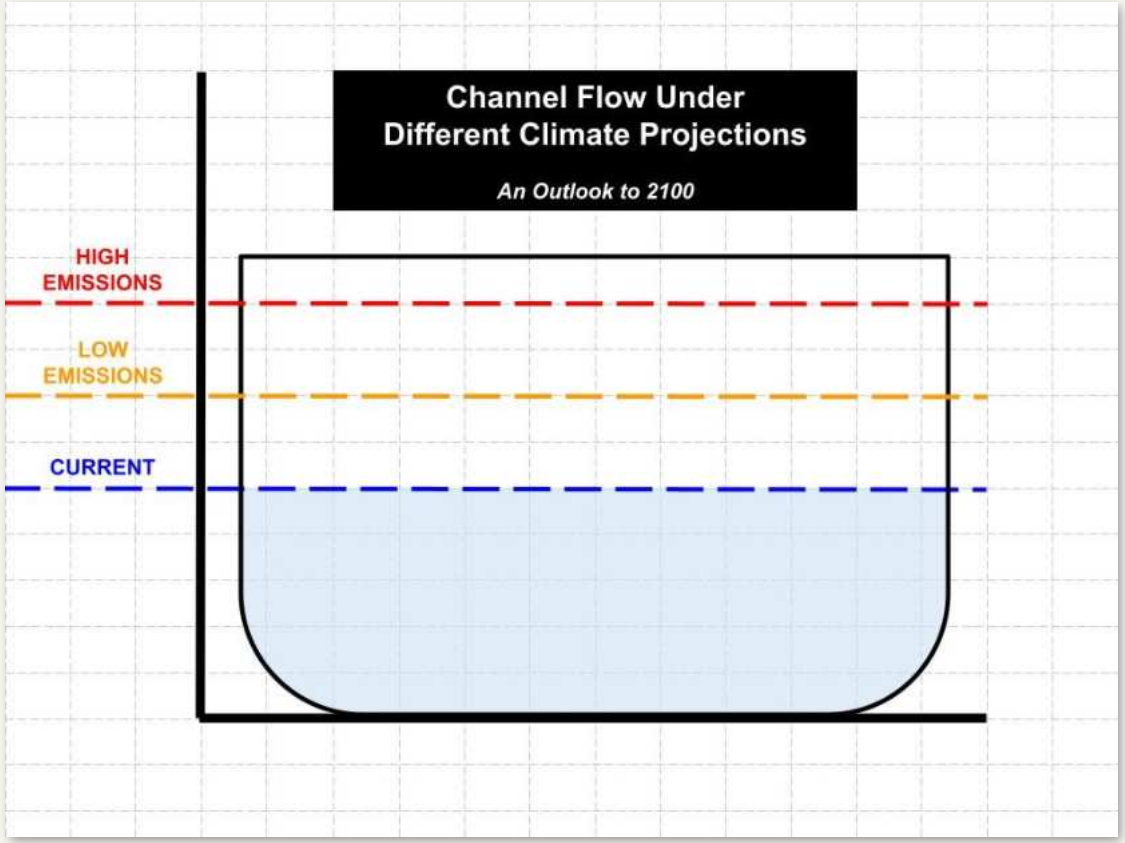
- Introduction of the climate lens in 2019.



Case: Giant Mine, NWT.

- Widespread presence of arsenic trioxide on and off site.

Resulting Post-Closure Regime



Current Techniques

- Standard climate risk assessment frameworks (e.g., PIVEC).
- Project future using a local climate data and global emissions scenarios.
- Long-term outlook → 2100

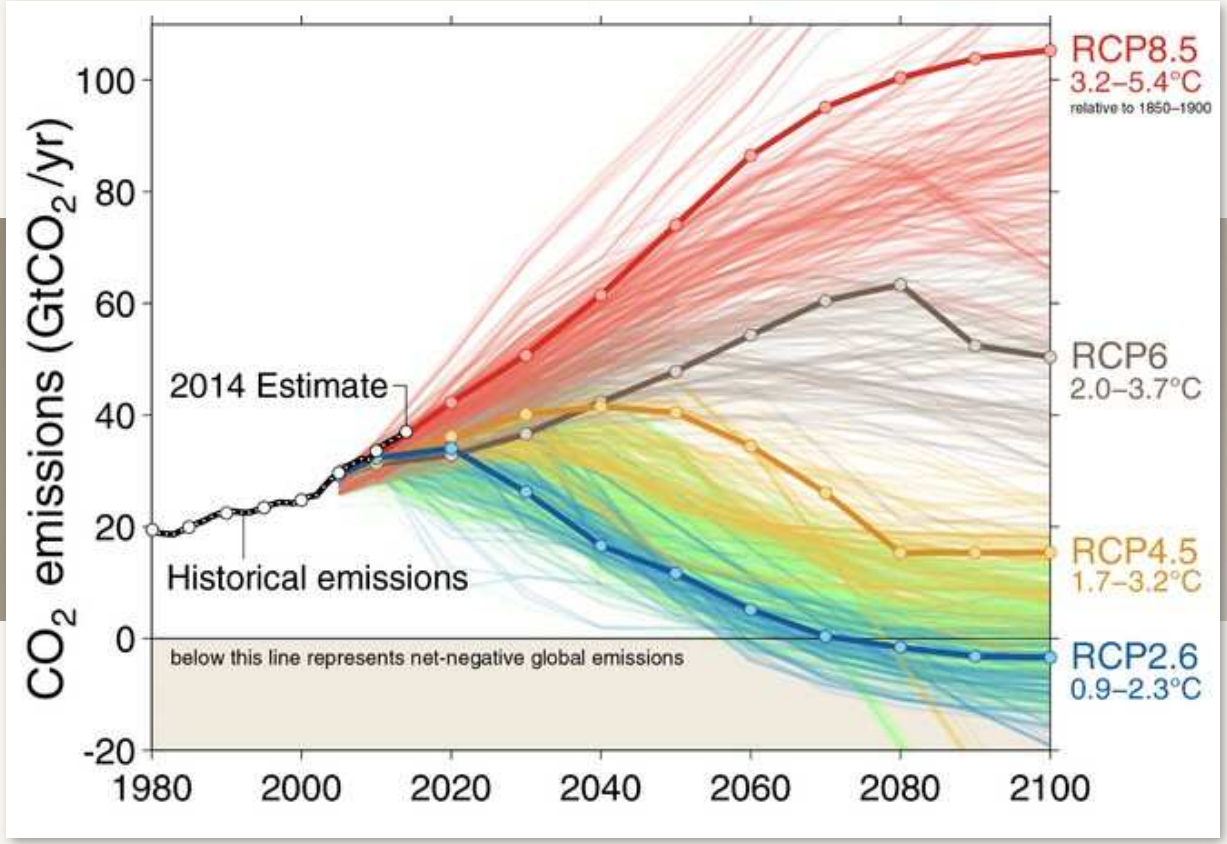
Critiques

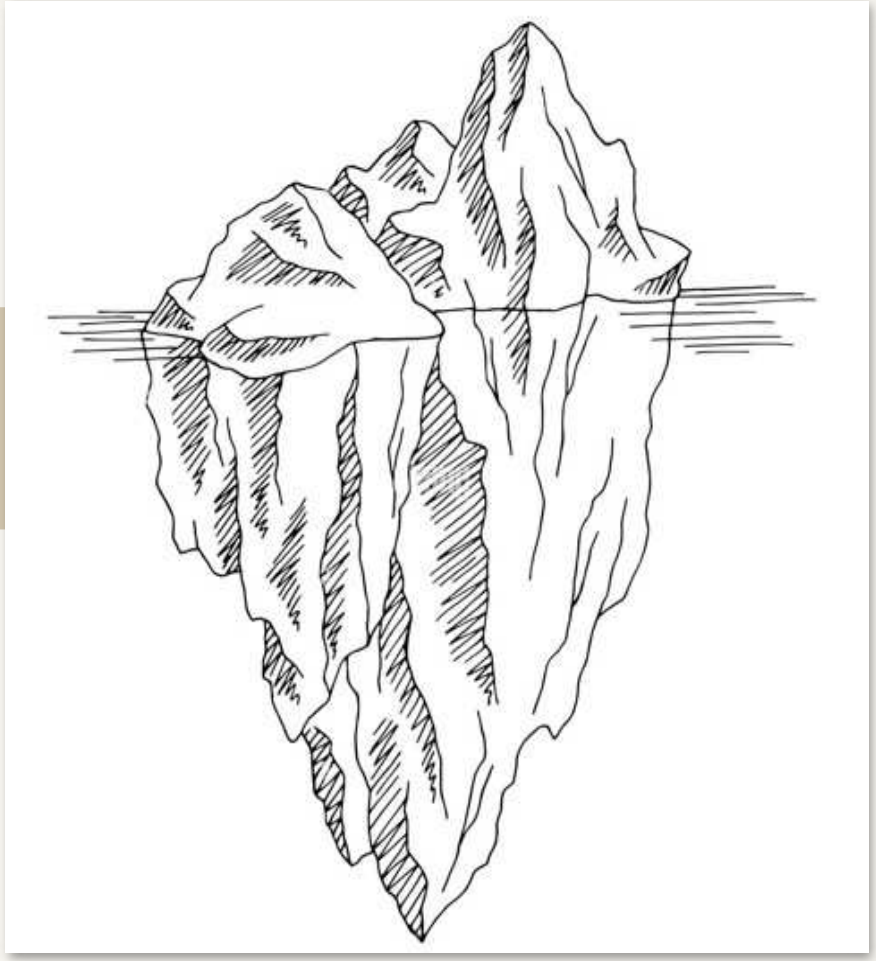
- Highly focused on single-scenarios.
- Application of global emissions scenarios to a hyper-local context.
- **"Long-term" is not long enough**.

Acknowledging Uncertainty

"[We] must find effective ways to convey the complexities and uncertainties of climate data, ensuring that it is both comprehensive and practical for …. decision-making processes".

Matte et al. (2024)





Planning for Forever

Unexplored Uncertainties:

- Governance
- Legal Obligations
- Future Needs
- Funding
- Communication
- Etc.

An Unprecedented Problem

- Contaminants and other mining-related hazards will present risks that persist in perpetuity.
- The oldest known human structures have stood for ~11,000 years.
- **Lessons to Be Learned:** First permanent storage facility for nuclear fuel waste → Olkiluoto, Finland.

Upcoming Project Activities

The goal of this research is to develop a process to assess mine closure and post-closure plans for their long-term climate change readiness and adaptability.

Phase I

- **Objective:** Characterizing the state of the industry.
- **Design:** Literature review and self-completed questionnaires.

Phase II

- **Objective:** How to implement adaptive strategies.
- **Design:** Workshops, focus groups, and semi-structured interviews.

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GIANT MINE Oversight Board

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THANK YOU

Interested in project updates?
Keep up with Trennon Wint:

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