

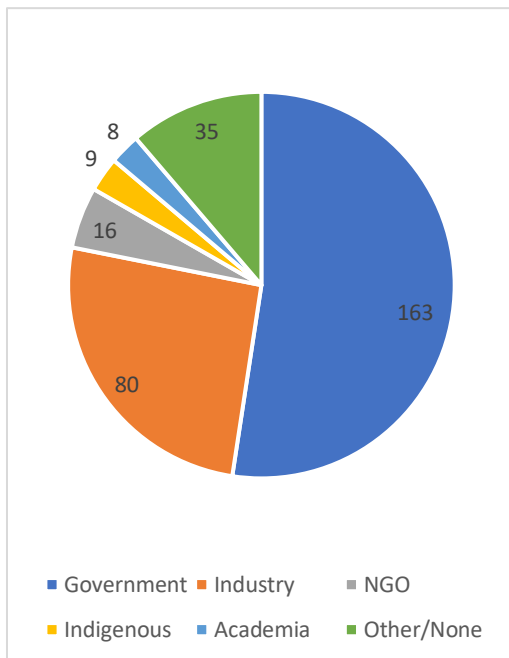
1st Annual Orphaned and Abandoned Mines Workshop

What We Heard: Open-Door Sessions

Context

On October 11 and 12, 2023, the Canadian Minerals and Metals Plan (CMMP) Secretariat and the Task Team on Environment under the Mines Intergovernmental Working Group (Mines IGWG) hosted the virtual **1st Annual Orphaned and Abandoned Mines (OAM) Workshop**.

The annual workshops build on over two decades of collaboration through the National Orphaned/Abandoned Mines Initiative (NOAMI), which was dissolved in 2022 after determining that it successfully met its original objectives. In its place, annual working-level workshops will be held to facilitate information sharing, diverse and inclusive engagement, and broad collaboration on both emerging and persistent challenges related to orphaned and abandoned mines by bringing governments, practitioners, industry, Indigenous Peoples, environmental non-government organizations, and academics together.



The theme of the workshop was **Targeted Land Use Planning through Collaboration and Innovation**, and included sessions focused on land use planning and design, collaboration with communities, particularly the historical relationship with Indigenous Peoples, innovative approaches, and environmental considerations.

The workshop was well-attended. Over 311 representatives from governments, industry, Indigenous organizations, non-government organizations, and academics registered and approximately 150 participants attended each day. Participants were fully engaged throughout the workshop and asked thoughtful questions and offered insightful and relevant questions and comments.

This report captures key takeaways and areas for future collaboration on OAM identified during the workshop, followed by a summary of the discussion during each session. The report will be published on the MinesCanada website.

Key Takeaways

- Several approaches are emerging for adaptive, integrated, multi-disciplinary mine restoration, as revealed by Viridis Terra and Landform Design.
- We need to plan ahead for the future and have both a proper site assessment and a clear understanding of what the land use will be after the site is remediated, who will use it, and their plans for the general area.
- We need to close and reclaim mines with an open mind to leverage opportunities for innovation and value creation.

- True collaboration is needed in successful reclamation. It helps to create assets and economic opportunities from those sites. Greater effort is needed to improve collaboration, community involvement, and consent in the context of OAM.
- Building the capacity for reclamation and end-use is important for those who work on abandoned mines, including greater investment in R&D and support to scale-up innovative approaches.
- Allocating sufficient resources for reclamation remains a significant challenge.
- There are no perfect solutions, but actions are needed. Stakeholders look to governments to lead by example and reclaim the largest OAM sites.
- Stakeholders continue to seek a clear commitment as to who will be responsible for OAM reclamation. This includes clear timelines and reality checks to hold companies accountable to what they claim they will do in order to prevent additional mines from being orphaned or abandoned.
- Data and information sharing on best practices and lessons learned is an important opportunity to advance collaborative work on OAM. This includes information sharing among governments as well as with industry, local communities, and other partners and stakeholders.
- The need for collaboration and information sharing to address common OAM issues underscores that this work is a truly Pan-Canadian initiative.

Day 1: October 11

Mini Presentations / Panel Discussion: Pathways to OAM Land Use Planning

Moderated by Fannie Desrosiers (WSP Canada), the session examined a variety of planning pathways for OAM sites and included presentations from Martin Beaudoin-Nadeau and Alexandre Couturier-Dubé of Viridis Terra and Tom Hainey from the Town of Atikokan.

Key Points:

- Viridis Terra's approach is integrated at the landscape level and adapted to the differing conditions of each site, and includes an evaluation of native vegetation, engagement with the impacted First Nation community, and Research & Design to determine the best mix for the seed and soil.
- They are able to establish new ecosystems within 4-6 weeks.
- Climate change is a major challenge, and they restore both the mine and the whole landscape.
- Their approach creates private investor opportunities, helps to remove carbon, restores biodiversity. Doing so helps bring mining into net zero and nature positive.
- Atikokan worked with Ontario's Ministry of Environment and Ministry of Natural Resources to restore an Iron Ore Mine into the Charleson Recreation Area.
- Recreational user groups came together and applied for a grant and worked very closely with various ministries to determine what they could do and on the lands within municipal boundaries, as well as with insurance companies for people using the trails.
- From start to finish it took 2 years from table to shovels in the ground in 2016.
- The Charleson Recreation Area is now used for fishing, canoeing and paddleboarding, horses. Each user group has its own space on this site and is responsible for site maintenance.
- The economic impact of the Recreation Area has been positive for the community, as the town receives economic benefit from the events and ongoing use of the trails.

Presentation: Landform Design

The session included a presentation from Gord McKenna (McKenna Geotechnical Inc. and Landform Design Institute) and highlighted the importance of establishing clear goals and involving all relevant partners in OAM planning and provide an overview and examples of landform design as a method of implementing it at OAM sites.

Key Points:

- Landform design is an emerging, integrated, multidisciplinary process to successfully reconstruct mine land for positive reclaiming land that allows industry, regulators and communities to work together to manage costs and risks, minimize liability, and produce progressively reclaimed landscapes with confidence and pride.
- Done well, landform design leads to a positive mining legacy, and is a pillar of sustainable mining.
- Successful reclamation includes an integrated community, shared governance, and multidisciplinary landform design, and requires sign off by the mine, regulator, and the local community.
- Landform design is the same for OAM as for planned mines, mines in production, and closed mines, though it is more difficult since the OAM lacks good records and was likely built without closure plan that would assist with landform design.
- Other challenges include remoteness and lack of funding.
- Collaboration with Indigenous communities is absolutely critical, and members of these communities and governments should be an integral part of the design team. More work is needed to design “with” the communities instead of “for”.

Panel Discussion: Working Effectively, Achieving More

With opening remarks by Melanie Campbell and moderated by Jamie Kneen (MiningWatch), the session brought together diverse, experienced voices and views on the realities of working collaboratively on OAM sites to provide historical context, and share lessons learned and best practices. Panelists featured Jordan Peterson (Affinity North) and Nalaine Morin (Skeena Resources).

Key Points:

- It is important to acknowledge local histories and contexts in our conversations about working together to remediate OAM sites.
- Although closure and reclamation are the last phase of a mine site’s lifecycle, they are important phases, especially to local and Indigenous communities.
- The North is very different from the provinces. Provincial regulatory and legal frameworks for reclamation don’t always translate in the North.
- Indigenous people come from a perspective of stewardship: they aren’t anti-development but want it to be done in a good way.
- Communities should actively participate with companies to improve and advance mining projects. When engaged at an early stage, they can provide local and traditional knowledge, as well as help plan solutions for the social and environmental impacts of development.
- Good community relations also help build public trust, which can help advance projects and mitigate risks.
- More collaboration is taking place, but Free, Prior, Informed Consent is tricky with OAM as consent was never sought in the first place, but it can (and needs to) be done and can used to enhance partnership and accountability.

- OAM work should work towards re-establishing relationships with the land base. Consent, including in the context of OAM, plays a strong role in reconciliation.
- Reclamation processes need to include social and cultural aspects as well as the technical and physical aspects.
- Despite the improvements to date, several challenges remain for effectively engaging and working with local communities throughout the lifecycle of a mine.
- Capacity is an obstacle on all levels. It is a challenge for communities to keep up with federal expectation (critical mineral strategy, roundtables, etc.) and to have all the technical expertise, supplemental tools, and frameworks to fall back on during the decision-making process.
- Each region has its own national government and engagement process, so their guidelines should be followed rather than one developed by regulators.
- Some mines under care and maintenance return to operations, so some non-operating mines cannot be declared orphaned and abandoned as the owners are still there to achieve the care and maintenance level.

Day 2: October 12

Presentation: The Potential of Innovation

Mini Presentations / Panel Discussion: Innovative Approaches

To set up the panel discussion that followed, the presentation by Alan Young (Materials Efficiency Research Group) and Malcolm Shang (ArcelorMittal) examined the importance of innovative approaches in impact reduction and the opportunity for value creation in relation to mine tailings management and sought to better understand how circular economy concepts can be applied to efficiently address the combination of technical, policy, and market challenges. Alan Young moderated a panel discussion featuring Olenka Forde (Regeneration), Malcolm Shang (ArcelorMittal), Bryan Tisch (CanmetMINING), and Julie Deriaz (CanmetMINING).

Key Points:

- Value can be created, and our approaches can be transformed by making a paradigm shift away from a liability/harm-reduction perspective toward a perspective of value creation.
- There is strong potential from a systems approach about how mindsets are already changing, thanks to a convergence of market demand, land-use pressures, technological progress, and policy evolution. There is now a larger demand for secondary resources in addition to primary resources.
- It doesn't cost anything to undertake a paradigm shift.
- What is needed is to challenge our way of thinking, open our minds into what is possible, and be open and be willing to work across industries - not just the materials but in the sites themselves.
- There are many opportunities for innovation and great examples are emerging: green energy generation from closed mine sites, materials can be used for infrastructure in regions and help improve economies post-closure.
- There are also opportunities for new partnerships and addressing past legacies.
- Challenges for continued innovation include lack of available data and reserves.
- Some companies do re-mining and others do reclamation, but Regeneration does both by using technological innovation to restore sites and reduce liabilities while producing community and environmental value as well as climate-positive minerals needed for the energy transition.

- Regeneration has a social and environmental purpose, which is ideal for dealing with issues of legacy mine sites.
- Industrial Ecology and Symbiosis is based on the idea that human ecosystems can work similarly to natural ecosystems. Waste is a resource for other processes. Innovation is found at intersection between disciplines and industries.
- The way we currently approach tailings is costly on all sides.
- Some of the 250M tonnes in tailings produced annually may contain critical minerals, presenting an opportunity to address OAM, improve the sustainability of mining and establish a circular economy for mining, and form part of the solution to supply minerals that are critical for our clean energy transition.
- A major obstacle to addressing the issue is a lack of tailings data, pointing to the need for a national tailings site inventory and to identify sampling techniques for determining whether a tailings site could have critical minerals.

Panel Discussion: Environmental Considerations for Land Use Planning

Moderated by Tara Shea (Mining Association of Canada), the session explored the importance and challenges of environmental considerations in the context of land use planning at OAM sites.

Panelists included Patrick Chevalier (CanmetMINING), Skye Muirhead and Alexey Klyashtorin (Saskatchewan Research Council).

Key Points:

- OAM environmental issues relate to acidic drainage, metal leaching, contamination of receiving environment, but there are also public health and safety concerns, financial issues, and community issues.
- These issues are also relevant to global targets, such as those in the Kunming-Montreal Global Biodiversity Framework.
- Practices are evolving not just in environmental, but also in social inclusion.
- Environmental and social concerns are intertwined, and local and Indigenous communities must be engaged in planning for these sites.
- The National Orphaned/Abandoned Mines Initiative (NOAMI) produced several useful tools and documents to prevent future abandonment, and the national inventory of orphaned and abandoned mines inventory relied on NAOMI data.
- Addressing OAM sites is costly: over \$1B was spent on OAM sites since 2002.
- Project CLEANS ("Cleanup of Abandoned Northern Sites) was established in 2007 to clean up 37 abandoned uranium sites in Northwestern Saskatchewan near Lake Athabasca, funded by Saskatchewan and the federal government.
- The Gunnar Mine and Mill Site (abandoned in 1964) is considered the most complicated site in Canada, with environmental issues including ambient radiation, radioactive dust, Petroleum hydrocarbons (PHC), metals and acid drainage in soil, surface water, and groundwater, asbestos in buildings, and physical hazards, like waste rock piles, mining and mill debris, deteriorating infrastructure, mine headframe/openings.
- All land use designs need to include considerations for potential extreme weather events due to climate change.