3rd Annual Orphaned and Abandoned Mines Workshop

What We Heard Report: Public Event

The **3rd Annual Orphaned and Abandoned Mines Workshop – Public Event** was held on November 5, 2025, bringing together federal, provincial, and territorial representatives, Indigenous leaders and communities, industry, academia, NGOs, and other practitioners. Co-hosted by the Canadian Minerals and Metals Plan (CMMP) Secretariat and the Task Team on Environment under the Mines Intergovernmental Working Group (Mines IGWG), the annual orphaned and abandoned mines (OAM) workshops build on more than two decades of collaboration through the National Orphaned / Abandoned Mines Initiative (NOAMI), which was dissolved in 2022 after determining that it had successfully met its objectives.

This public event provided an opportunity for all OAM stakeholders to share information and best practices, discuss priority issues, and foster collaborative relationships to advance the remediation and restoration of OAM and to prevent future ones across Canada. This year's theme, **Tackling Common Challenges and Barriers Together**, explored topics relevant to successful remediation of OAM, including overcoming challenges and barriers through an examination of a successful project; the role of information and data sharing; funding opportunities and partnerships; and building strong, collaborative, and effective partnerships.

The event began with introductory remarks by Director General Amanda Wilson on Canada's leadership and challenges in OAM remediation, followed by a presentation that explored innovative approaches to site restoration and mineral recovery. Next, a presentation series explored the value of information and data sharing to remediation projects. The final session of the day was a panel discussion on funding opportunities and partnerships. About **275 participants** attended who were fully engaged, asked thoughtful questions, and offered insightful and relevant comments.

This report captures key themes and insights, and areas for future collaboration on OAM-related issues identified during the event.

Please note: The summaries presented in this report represent the variety of perspectives and expertise heard during the 3rd Annual OAM Workshop. The input presented in this report has not been adjusted outside of the requirement to categorize the range of ideas discussed under the strategic directions. Statements made in this document are not consensus-based and should not be viewed as such. The ideas and views compiled in this document are from the Workshop presentations and discussions and do not necessarily represent the views of Natural Resources Canada, the Intergovernmental Working Group on the Mineral Industry or its individual members.

Key Themes and Insights

- Remediation is an opportunity to restore ecosystems, build public trust, create jobs, encourage innovation, and advance reconciliation. It is also an opportunity to both create economic pathways and reduce the global footprint of consumption and waste through the recovery of critical and other minerals and metals and their integration into the circular economy.
- Remediation is not just about cleaning up the past; it's about shaping a more sustainable, inclusive, and resilient future for Canada's mining sector.
- Key challenges include securing funding, regulatory barriers, meaningful Indigenous engagement, and climate-related risks, especially in northern regions.
- Inclusive and collaborative partnerships among governments, industry, Indigenous communities, and other stakeholders are essential.
- Partnerships can help to align resources efficiently to maximize expertise, create innovative solutions, and foster trust and inclusivity by leveraging diverse perspectives and technical skills that enable comprehensive strategies.
- Reflecting Indigenous perspectives early in the process of land use planning and restoration efforts and co-developed planning provides an important way to foster reconciliation.
- Indigenous communities may have very different ideas than governments and industry of what remediation is and looks like. Collaboration on a tailored approach for each site that integrates local knowledge can help address OAM challenges more effectively and contribute to momentum for community-driven outcomes.
- Regeneration's Hedley Mariposa Flats Project was highlighted as an example of how re-mining legacy sites can deliver economic viability and environmental benefits.
- Recovery of metals and minerals from legacy sites offers a faster and potentially more sustainable alternative to greenfield mining.
- Data and information sharing underpin success; advanced tools, such as GIS mapping, remote sensing, and integrated data platforms improve planning and monitoring of remediation projects, enable better decision-making and transparent communication, improve efficiency and trust, and strengthen working relationships between various actors.
- Accurate cost estimation, transparent reporting, and long-term monitoring that ensures adaptive planning and addresses evolving environmental liabilities are crucial for effective liability management and risk reduction.
- Governments and industry must collaborate to create clear regulations, reduce financial risks, and ensure sustainability.
- Innovative funding models such as upfront closure funding and restoration credits can reduce liabilities and incentivize reclamation.
- Sustainability and traceability are driving consumer demand for responsibly sourced materials, creating market drivers for remediation and new opportunities.

Session 3 – Presentation: Advancing a global mine waste reprocessing and site restoration enterprise

Michael McPhie, M.Sc., QEP, Managing Director and Chief Projects Officer, and **Ayesha Ahmed**, Ph.D., Director, Site Evaluation and Advancement, Regeneration explored how Regeneration's innovative approach to site selection, technology application, partnership development, project execution, and restoration of historic mine sites is delivering near term production of precious, critical and rare earth minerals in Canada.

Regeneration is a metals recovery and restoration company that aims to transform environmental liabilities into economic and ecological opportunities. Their approach is based on recovering valuable metals from mine waste and using the proceeds to fund site restoration. This model addresses two critical challenges simultaneously: reducing long-term environmental risks and creating new sources of critical minerals essential for Canada's energy transition. It relies on partnerships with governments, Indigenous communities, and industry leaders. With key collaborators that include Rio Tinto, Apple, Mejuri, and Caterpillar, these partnerships provide technical expertise, financial support, and downstream markets for recovered materials.

Regeneration's strategy focuses on tailings and waste rock that contain residual metals such as gold, copper, cobalt, silver, zinc, and rare earth elements. Often overlooked in historic mining, these materials are now in high demand for clean energy technologies and advanced manufacturing, and their recovery from waste is faster and potentially more sustainable than greenfield mining.

The Hedley Mariposa Flats project in southern British Columbia demonstrates Regeneration's approach. A partnership between Regeneration, the Province of BC, and the Upper Similkameen Indian Band (USIB), the site is located on the traditional territory of the Band and has a long history of gold and cobalt mining. The province currently holds liability for the site. With an in-situ value of gold and cobalt within the mine waste materials of over $100M, Regeneration's goal is to recover a portion of these valuable metals and convert this liability into a profitable operation that funds full site restoration and provides material benefits to the USIB, the province and communities in the region.

The development process began with extensive stakeholder engagement. Before any technical work commenced, Regeneration convened meetings with Indigenous rights holders, provincial regulators, and engineering partners to establish a shared vision for the site. According to the company, this collaborative approach ensures that restoration plans align with cultural values and community priorities. Inclusive collaboration with Indigenous rights holders is framed as 'reconciliation in action', with Indigenous-led visions for land use and economic development.

Technological innovation is central to Regeneration's success. At Hedley, the company is testing advanced techniques such as slurry ablation, which uses high-pressure water jets to break down cemented aggregates and liberate fine mineral particles. Modular processing units are also being evaluated to reduce capital costs and enable rapid deployment. These units are designed for scalability and mobility, allowing Regeneration to replicate its model across multiple sites. Downhole X-ray fluorescence tools were employed during drilling to provide real-time geochemical data, accelerating resource modeling and reducing turnaround times.

Regeneration's model is focused as much on creating long-term environmental and social value as on mineral and metal recovery. By integrating restoration into the economic equation, the company aims to set a new standard for sustainable mining practices. Regeneration noted that this is demonstrating that legacy mines can be economically profitable while addressing environmental and health risks and aim to advance multiple sites to feasibility. The Hedley project, which is targeted for production by 2027, demonstrates that with the right mix of technology, collaboration, and policy support, OAM sites can be transformed from liabilities into assets that deliver ecological, cultural, and economic benefits.

Key questions from the audience focused on generative AI, regulatory barriers, economic viability, and collaboration:

- With respect to the use of generative AI in site screening and data analysis, Regeneration uses large language models to assist in summarizing global datasets and identifying high-potential sites, although detailed evaluation still requires fieldwork.
- Liability is a major regulatory barrier in the exploitation and reprocessing of waste, and further discussion focused on the need for liability transfer mechanisms and models such as the Good Samaritan legislation in the U.S. to enable private-sector participation without inheriting historical risks.
- Recovery is dependent on market viability, emphasizing the importance of downstream partnerships and policy incentives to support scaling.
- Other significant engagement includes with mining companies and associations, as well as with Indigenous partners to co-develop visions and ensure post-use planning reflects community priorities. Regeneration highlighted they are looking for partnership opportunities with a range of stakeholders.

Session 4 - Presentations: The value of information and data sharing to remediation projects

The session emphasized the critical role of data integration and transparent information sharing in advancing remediation projects. Presenters illustrated through concrete examples the importance of information and data sharing, the types of information and data are most useful to remediation planning and implementation, how sharing information and data has advanced remediation projects, and the importance of effective collaboration.

The session's presentations showcased how technology, transparent communication and processes, and accessible shared data can help make informed, sustainable decisions and underpin successful long-term remediation. The integration of GIS tools, comprehensive inventories, and stakeholder engagement are key strategies for improving efficiency, reducing risks, and unlocking new opportunities for sustainable mine closure.

Presentation 1: Hugh Carter, Senior Principal, Program Manager, WSP presented on "A tool for integration, collaboration, and knowledge sharing for complex projects – Giant Mine case study".

The Giant Mine Remediation Project is a multiple decades, multi-stakeholder and highly complex closure project and Canada's largest mine closure liability, which involves managing 237,000 tonnes of arsenic trioxide stored underground. The complexity of the Giant Mine, with its extensive underground workings, multiple tailings ponds, and numerous stakeholders, requires a robust system for collaboration and knowledge management. The project employs a GIS-based integration tool designed to consolidate regulatory, monitoring, design, and construction data into a single platform and can be used across multiple project phases. This tool enables real-time visualization of site conditions, construction sequencing, and monitoring installations, significantly improving efficiency and reducing duplication of efforts. It saves significant time and costs by simplifying information access.

The tool's scalability is a major advantage, allowing it to be applied to smaller sites as well as large-scale projects. Features include linking spatial data to permits, visualizing monitoring installations, and time-step construction sequencing. This improves regulatory compliance, risk management, and stakeholder communication.

The platform supports regulatory compliance by linking spatial data to permits and licenses, ensuring that all users access the same authoritative information. Monitoring data, including groundwater and geotechnical instrumentation, can be visualized alongside design elements, enabling proactive risk management. The time-step visualization feature is particularly noteworthy, as it allows stakeholders

to see how remediation activities will progress over time, facilitating better planning and communication.

Key questions from the audience focused on the value of tools like this and factors to ensure long-term sustainability of a digital platform:

- As a data access and collaboration tool, it helps consolidate information and bring stakeholders together around one dataset, which was crucial for effective risk assessment and project coordination.
- Sustainability depends on platform-independent data that adapts over time, strong data curation and conversion into base formats for tools like AI, and storing all data centrally for long-term integrity.

Presentation 2: Dustin Rainey, Director, Yukon Geological Survey presented on "Lessons in remediation communication".

Early, inclusive collaboration amongst governments, industry, NGOs, rights holders, and stakeholders is vital for effective communication in remediation projects. Restoration planning must begin with the end in mind: defining the desired post-closure state. Clear expectations need to be shared, understood, and managed, as success metrics are tied to expectations. Basic documentation, continuous record-keeping, and consistent and transparent communication are critical to building trust and continuity and ensuring accountability.

An exploration of various Yukon remediation projects illustrated that each site has unique environmental and social expectations, and that remediation outcomes vary widely depending on site conditions and historical impacts. For example, remediation of the Faro Mine requires perpetual water treatment due to acid rock drainage, and Clinton Creek's asbestos-related risks complicate remediation. Indigenous knowledge is important in shaping remediation strategies and collaborative approaches that respect cultural values and traditional land uses should play a significant role in planning. Rebuilding trust with First Nations requires time, consistency, and shared decision-making.

Key questions from the audience focused on factors that determine success, aligning risk tolerance, and the applicability of these lessons:

- Success depends on stakeholder expectations, for example if a community can fish or pick berries again. These outcomes must be built into project design, monitored over time, and defined collaboratively to create measurable success criteria.
- Aligning expectations and risk perceptions early through collaboration, transparency, and inclusive stakeholder engagement helps build shared understanding and progress toward closure. Effective communication and collaborative approaches can be applied to other natural resource projects, such as in the oil sands.

Presentation 3: Bev Quist, Geoscientist, Abandoned Mines Branch, British Columbia Ministry of Mining and Critical Minerals, **Gavin C. Dirom**, President & CEO, Geoscience BC, and **Nicole D. Barlow**, Founder & CEO, Purple Rock Inc. presented on "Critical minerals and metals in BC mine tailings and waste rock".

The importance of data and inventories and the value of collaborative initiatives is exemplified by the inventory project that partnered the government of BC, Geoscience BC, and Purple Rock. The inventory identified that over half of the minerals on Canada's critical minerals list are present in BC. It supports critical mineral recovery initiatives by identifying tailings and waste rock with potential economic value. The project compiled waste rock and tailings data on over 1,000 disposal sites linked to 549 mineral occurrences into a searchable, spatial database, creating a geopackage with spatial layers, ranking systems, and queryable attributes. The GIS-based tool enable prioritization of sites based on factors such as deposit type, associated minerals, and available geochemical data inventory

and the methodology includes the digitization of historical data and linking metadata. The BC Abandoned Mines Branch uses the dataset to prioritize visits and respond to inquiries more efficiently.

Challenges include funding gaps for digitization and data curation and the need for standardized, clean data. The sustainability of digital platforms depends on adaptable, platform-independent data and strong curation. Integrated systems reduce mismatched risk tolerance across regulators, rights holders, and industry.

Tools can support rights holders in consultation and improve transparency for stakeholders.

Next steps include expanding the dataset to more than 1,100 sites, refining volume estimates using DEMs, digitizing historical geochemistry, and improve mapping. This initiative demonstrates how data-driven approaches can transform liabilities into assets, aligning environmental restoration with economic development.

Key questions from the audience focused on factors to ensure long-term sustainability of a digital platform, major barriers, and the role of government and industry in providing public data:

- Quality, standardized, clean, and structured data ensures usability and longevity.
- Funding and data quality remain the biggest challenges to building and maintaining effective databases. Data and the technical know-how exist, but resources are needed to digitize, structure, and publish it.
- Many historical records lack geochemical data and rarely use modern terminology like ‘tailings’ or ‘waste rock’.
- Governments have a responsibility to collect and share data to support cleanup and build social license.
- Industry feedback has been positive as companies are now able to retrieve information directly from the database.

Session 5 - Panel Discussion: Funding opportunities and partnerships

This session focused on innovative funding models and strategic partnerships to address financial barriers in orphaned and abandoned mine remediation.

Introduced and moderated by **Stephanie Green**, Mine Rehabilitation Program Coordinator, Mineral Development Branch, Ontario Ministry of Energy and Mines, the panel featured **Holly McHugh**, VP Sustainability & Social Impact, Mejuri, and **Julien S. Halfon**, Head of Corporate and Pensions Solutions, BNP Paribas Asset Management.

Stephanie Green began by highlighting two Ontario initiatives that align with the session’s focus of creating opportunities for partnerships between government and industry. The new *Recovery of Minerals Regulation* under the Ontario *Mining Act* is a mineral recovery permit that authorizes the extraction of residual minerals from tailings and other waste on abandoned mines. It provides a streamlined permitting process without a closure plan that allows recovery to occur faster. The other initiative is Voluntary Rehabilitation whereby individuals or organizations may choose to rehabilitate abandoned mines or hazardous mine features on Crown land in Ontario. This helps to reduce public health, safety, and environmental risk while reducing the need for public spending.

Holly McHugh shared insights into Mejuri’s sustainability strategy and its flagship Salmon Gold initiative, developed in partnership with Regeneration. Regeneration produces Salmon Gold from mine waste to be used in jewelry while restoring salmon habitats and exemplifies how consumer demand for responsibly sourced materials can drive environmental restoration. Holly explained that Mejuri’s customers prioritize sustainability, with one in eight citing it as the primary reason for purchase. To

meet these expectations, Mejuri committed $1.5 million to support Regeneration's efforts to reprocess tailings and restore salmon habitats in Alaska and the Yukon. The project has already achieved measurable outcomes, including the restoration of over 1,650 meters of waterways and the return of multiple salmon species. Holly emphasized that these efforts not only reduce environmental liabilities but also create a transparent supply chain for traceable gold, addressing challenges associated with recycled gold and opaque sourcing practices. She also underscored the point that identifying buyers for recovered materials and future site users is the key to success.

Julien Halfon provided a financial perspective, highlighting the growing importance of decommissioning and long-term liability management. He noted that global environmental liabilities exceed $8 trillion, with mining accounting for a significant share. BNP advocates for upfront closure funding to reduce long-term liabilities and embed sustainability in investment strategies. Embedding sustainability into investment strategies transforms compliance into opportunity. Proactive funding strategies, such as establishing dedicated reserve funds early in a project's life cycle, spreads costs over time and reduces financial risk. He introduced the concepts of decommissioning bonds and restoration credits as tools to attract investment and incentivize sustainable practices. These instruments can enable companies to secure capital for remediation while delivering returns aligned with ESG objectives. Julien also underscored the role of investors and insurers in driving accountability, pointing out that robust data and transparent reporting are essential for securing stakeholder confidence.

The discussion explored regulatory barriers that hinder large-scale restoration, such as liability transfer challenges and the absence of frameworks for voluntary rehabilitation. Holly called for policies that enable restoration beyond baseline reclamation, including liability protections and incentives for re-mining critical minerals. She also advocated for the development of restoration credit systems in Canada, similar to carbon markets, to recognize and monetize ecological benefits. Julien echoed the need for regulatory innovation, emphasizing that tax incentives for remediation reserves could accelerate adoption and reduce reliance on public funds. He elaborated that partnerships with sovereign wealth funds and large investors enable systemic change.

Both panelists highlighted the importance of cross-sector collaboration, noting that successful projects require partnerships among industry, government, Indigenous communities, and NGOs. Holly described how Regeneration engages local stakeholders to co-design restoration plans that reflect cultural values and community priorities. She also emphasized that collaboration across industry, finance, and government is essential for scaling impact. Julien stressed that aligning financial mechanisms with social and environmental goals can transform remediation from a compliance obligation into an opportunity for value creation.

The panel discussion underscored that funding challenges, while significant, are surmountable through innovative financial instruments, supportive policies, and collaborative partnerships. By linking economic incentives to environmental outcomes, stakeholders can unlock new pathways for sustainable mine closure and contribute to broader climate and biodiversity objectives.

Key questions from the audience focused on incentives, partners missing from the conversation, Indigenous knowledge, OAM remediation opportunities, and Ontario's reclamation requirements:

- Strong incentives can move Canada toward sustainability, as seen in Australia over the last 5 years.
- More investors are needed to help with operational costs. Small-hold miners should be included as they are often more interested and better suited to re-mining than large players. And large mining companies with OAM sites on the debt side of their balance sheet who may want to get rid of them.

- Using generational knowledge is critical when restoring land to ensure its traditional use in the future. At Hedley, land use is not predetermined and Regeneration is deferring to the community on what restoration looks like.
- Canada has a sophisticated financial sector with powerful pension funds, a lot of experience in natural resource sector and existing infrastructure, technology, and a lot of interest in giving mining companies a social license to operate, all of which are assets to advance the remediation of OAM.
- While the mineral recovery framework in Ontario was launched in July 2025, there is a lot of interest but it's still too early to see any resulting change from that initiative.