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Balancing expectations and community views: a case study from Cobalt, Canada

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Abstract

International good practice for closure demands that sites are made safe and stable, and are protective of human health and the environment, and that the views of local communities and stakeholders are incorporated. Closure risk management, for threats and opportunities, must be appropriate to the site context and characteristics, and stage of the mine life. However, closure risk management from a mining perspective can be at odds with local stakeholders' views, especially if the community has a strong sense of place or a predefined post-mining vision.

Proactive and ongoing engagement is necessary to understand these views and inform rehabilitation and closure activities. Social values can be complex; entwined in environmental values, history, local and regional context, experiences and economic characteristics which vary across the individuals, community, government and time. To achieve positive outcomes, engagement needs to be meaningful and responsive, and balance what is needed for risk management with community and stakeholder aspirations.

This is a case study into the challenge of balancing different expectations. The Town of Cobalt in Ontario, Canada, was the location of a silver mining boom in the early 20th century, with the last mine closing in 1989. The silver mining boom was chaotic by today's standards and left a legacy of more than 900 historical mining hazards and features entwined with the town and across the local area. Cobalt is passionate about its long mining history, and the Cobalt Historical Society and Cobalt Mining Museum aim to preserve and promote the mining heritage of the area. This paper describes the unique challenges involved with this rehabilitation project, the site-specific processes adopted to manage closure risk while balancing community views, the benefits of different types of engagement and the lessons learned that can be of benefit to closure planning more broadly.

Keywords: *expectations, engagement, communities, risk management, legacy*

1 Background

Mine closure practices have been evolving since the environmental awareness of the 1960s. Fundamental concerns for protection of the environment and human health remain and are now augmented with incorporating the views of local communities and stakeholders to mitigate long-term negative social risks (Demajorovic et al. 2022). A suite of guidance for internal good practice now exists to support these goals, including guidance for governments (Asia-Pacific Economic Cooperation 2018) and for industry-led responsible mine closure (Sánchez et al. 2014; International Council on Mining and Metals [ICMM] 2019) and, more recently, international standards and a glossary for mine closure and reclamation (International Organization for Standardization [ISO] 2023).

Closure risk management, while considering threats and opportunities, must be appropriate to the site context and the stage of the mine's life. The most effective time to manage closure risks, whether mitigating

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adverse impacts or enabling opportunities, is in the design and operational phases of a mine (ICMM 2019). To mitigate closure risk, long-term planning must be iterative, integrate meaningful engagement with stakeholders and Indigenous peoples, build trust and maintain a company's social licence to operate and its social licence to close (Braithwaite 2016), and identify effective measures for transition to a post-mining future (Wilson et al. 2022). Robust planning is needed so that execution and delivery can be cost-effective and achieve its objectives, rather than submit to redesign and rework (Flyvbjerg & Gardner 2023).

While early and iterative closure planning is logical for an operating mine, many legacy sites exist where mining activities ceased some time ago, but the site has not yet been fully remediated and closure activities not yet completed (Pepper et al. 2014). Some of these sites were mined in a different era, perhaps more than 100 years ago, when environmental consideration was limited (or absent), and records were less rigorous about how the mine and its extracted materials were managed. At legacy sites, the opportunity for integrated, iterative planning no longer exists. The old age of structures, uncertainty in records and lack of earlier environmental management at legacy sites often means that protection of human safety and the environment remains the primary concern. However, safety and environmental risk management from a mining perspective can be at odds with local stakeholders' views, especially if there is a strong sense of place or a predefined post-mining vision.

Social values can be complex and intertwined with environmental, historical, local context and economic characteristics. The relative importance of these factors varies across individuals, communities, governments and time (Finucane 2024). The views of the community and Indigenous peoples towards mining can be positive, such as fond childhood memories, sponsorship and employment, or negative, from past injustices, environmental degradation and the lived experience of changing socio-economics (Bainton & Holcombe 2018; Sommerville & Ferguson 2022). Proactive and ongoing engagement is necessary to understand these views in the context of rehabilitation and closure. To achieve a positive legacy, engagement needs to be meaningful and responsive while balancing safety and environmental management with community and stakeholder expectations.

2 Cobalt and AEM

The Town of Cobalt in Ontario, Canada, was the site of a silver mining boom in the early 20th century. Heralded as the birthplace of hard rock mining in Canada, Cobalt is also the reason for the Toronto stock exchange, and where the predecessor of the National Hockey League developed (Ontario Mining Association 2010). The discovery of silver in 1903 quickly led to an inrush of prospectors, miners and financiers from many countries, including those with decades of experience from the American goldfields who were looking for new opportunities after the Klondike collapse four years earlier (Baldwin & Dunn 1988; Angus 2022). The train line provided easy access for anyone seeking their fortune and the town boomed to more than 15,000 people at its peak in 1911, with haphazard housing in unsanitary conditions (Dumaresq 2017).

Ore across the region was mined from narrow veins, initially from surface exposures then deeper with mechanical hoists (Sulatycky et al. 2011; Dumaresq 2017). Mines and processing facilities competed for limited real estate, with mining companies able to evict homeowners, and limited regulations regarding the expansion of mines or the management of their waste (Angus 2022). Ore was extracted as it was found and mined material was dumped where it was convenient, albeit in lakes, creeks, or next to the headframe or mill. The ore, naturally high in arsenic, was processed using chemicals such as mercury and cyanide which were flushed into the lakes. Coniagas Mines Ltd. is said to have discharged tailings down the main street in such volumes that Argentite Street was nicknamed 'Swamp Street', after which they trenched the street and crushed the roof of the Jameson Meat Company with rock, despite complaints from municipal officials (Dumaresq 2017; Angus 2022). It is fair to say that mining caused adverse environmental and social impacts which led to protests and, ultimately, regulatory reform with establishment of the Department of Labour in 1919 (Angus 2022).

Cobalt's second silver and the first cobalt boom started after World War II and it's during this time that the global gold mining company AEM was formed from the original Cobalt Consolidated Mining Company

(Noel et al. 2015). After reprocessing the Cobalt Lake tailings and persistent exploration, AEM went on to operate 22 mines, four mills and one refinery (Agnico Eagle Mines 1987). Mining in Cobalt ended for AEM in 1989 after its relocation to the LaRonde complex in Abitibi, Quebec (Figure 1). In total, Agnico Eagle Mines extracted about 25 million ounces of silver from its Cobalt operation, about 5% of the total production from Cobalt (Noel et al. 2015).

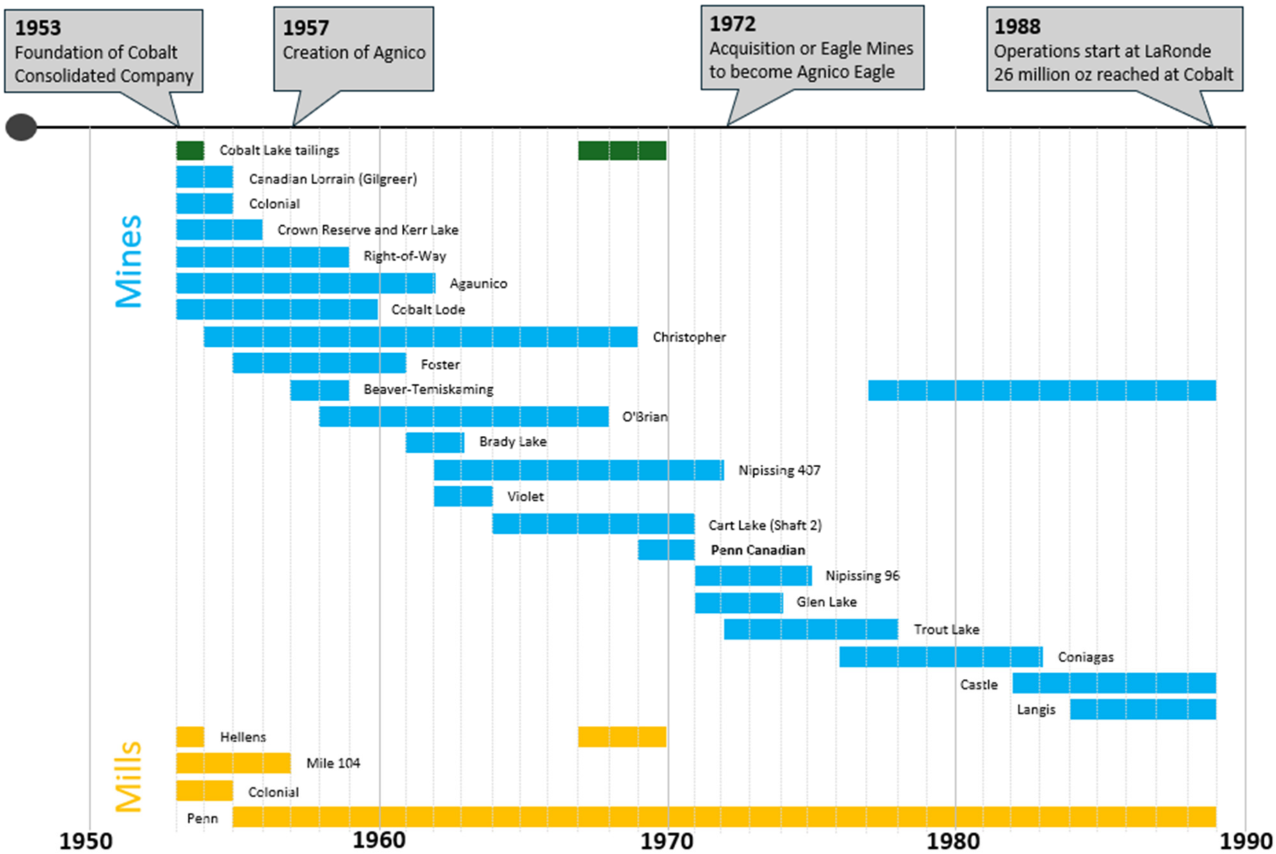

Figure 1 AEM's operations in Ontario until 1990 (mines may refer to specific shafts)

Environmental regulations were developed in the 1960s and mine closure regulation was introduced in the 1990s, with Ontario's first mine rehabilitation requirements introduced in 1991 (Cowen & Robertson 1999). This period led to vast improvements in consideration of the environment, however, the legacy of mining since the early 20th century has left more than 900 historical mining hazards in the Cobalt area across AEM properties alone, entwined with the town, community and local history.

The Town of Cobalt started to dwindle in the 1960s, and with the final mines closing and the global recession in 1991, people left town, and shops and the school closed. Today, Cobalt and the nearby Coleman Township have a population of 989 and 517, respectively, (Statistics Canada 2021). This socio-economic change could have led to resentment towards the mining industry and ambivalence towards this era of mining history. Instead there is pride in the towns' long mining history, with the Cobalt Historical Society and the Cobalt Mining Museum aiming to preserve the heritage of the area and promoting its history for tourism.

3 Risk-based closure and its challenges

Therefore, in a historic mining area more than a century old and with such a chaotic beginning, which was unregulated from an environmental perspective, it is not surprising that there are many hazards and environmental complexities. Initial rehabilitation works between 1992 and 2005 focused on physical public safety and today AEM manages just under 200 properties across Cobalt and the surrounding area (Figure 2). A significant proportion of AEM's past and future rehabilitation efforts in the Cobalt area relate to the management of physical hazards and rehabilitation of crumbling concrete foundations, old mills, crown pillars, mine shafts, raises, open stopes, and potentially adversely impacted soils and waterways, and the installation of more than 15 km of fencing to help prevent access to these hazards.

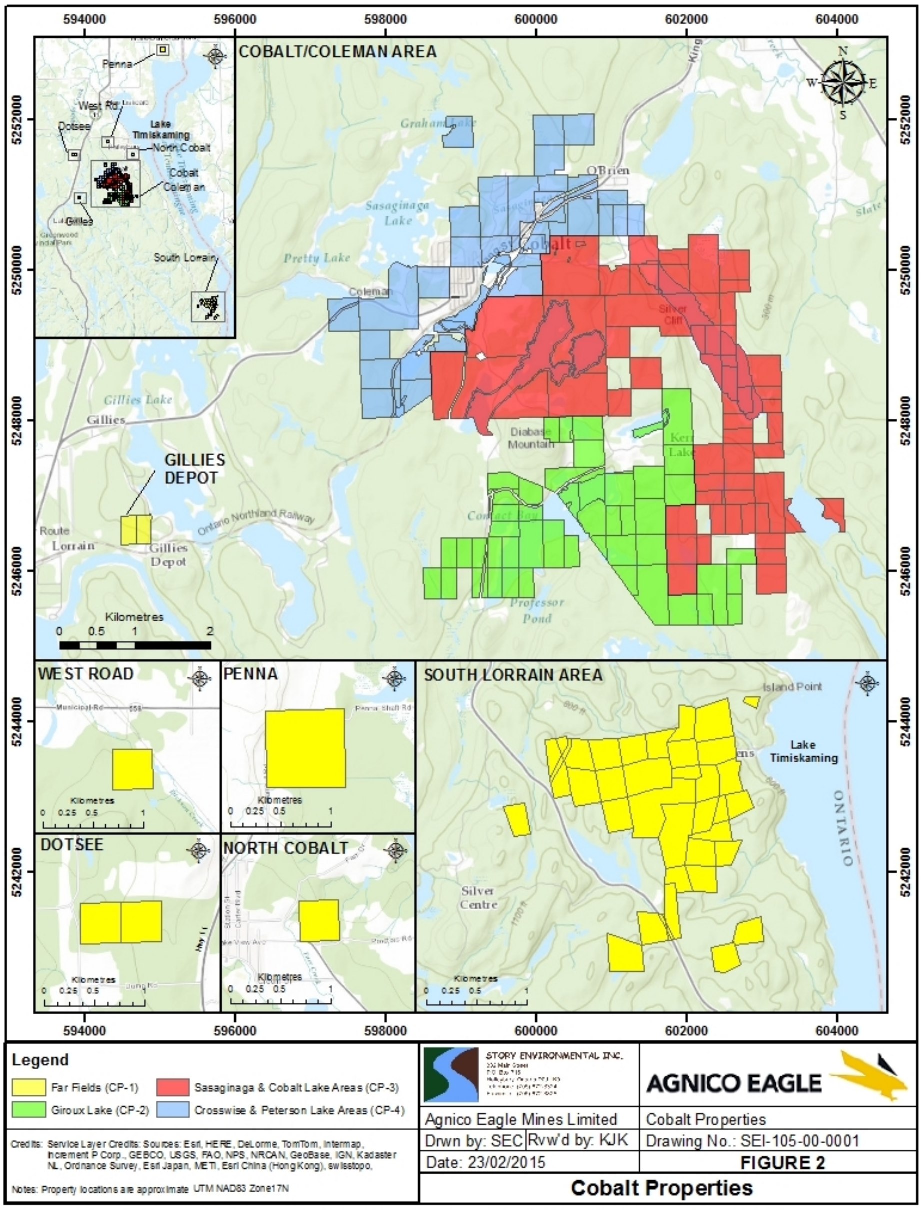

Figure 2 AEM's properties in Cobalt and the surrounding area (2015)

Records for the location of old underground workings are not always readily available and not knowing the location of shafts and thin crown pillars can pose a threat to residential houses and public amenities. This was exemplified in 1987 when Highway 11B, a provincial highway, collapsed unexpectedly into old underground workings and led to significant local disruption, with some officials claiming that Cobalt should be abandoned. The establishment of the Abandoned Mines Information System (AMIS) was followed by an inventory of mining hazards in Ontario to enable safety prioritisation and restoration of public trust (Mackasey 1993). The AMIS database, for geographic areas surrounding Cobalt, utilised reference maps associated with preliminary geologic reports authored in the 1960s (Thomson 1962).

Ontario Regulation 240/00 Mine Development and Closure in 2000 set a minimum standard for mitigation, with an update in 2011 requiring a significantly more detailed closure plan. In 2012 in response to this and a requested update of earlier closure plans by the Ministry of Northern Development and Mines (Noel et al. 2015), AEM commenced an inventory of mining hazards on its properties, an intensive task that continues to this day as old workings continue to be better understood. Early assessments included discussions with former employees, consultants and regulatory personnel involved with the sites (Noel et al. 2015). Mapping included title searches and document reviews of patents, parcels, leases, transfers, block maps, claim maps, surveys and other documents.

Ontario has a system that affords different rights and responsibilities to surface rights and mining (mineral) rights holders. Mining rights and surface rights owners may occupy the same area, with mining rights owners being responsible for any mine infrastructure and mined material, even that which is on the surface rights owner's property. Early mapping highlighted complexity with this patchwork of historical features and rights owners. For example, historical waste (tailings/waste rock) straddled tenure, responsibilities were shared with other parties, and the town had developed around old workings and subsequently built a school on a shaft and tailings, where it remained until the vacant property was demolished after a fire in 2020.

A process was needed to efficiently evaluate and prioritise rehabilitation of hundreds of features across AEM's extensive landholdings. Initial reconnaissance targeted features in the AMIS database. However, as this progressed, issues and inaccuracies were identified. These included a lack of official records, coordinates that were in a local grid and hadn't been transformed, developed or reworked area which obscured the older features, data entry errors and place names changing – making features difficult to find. Records searches were supplemented with field surveys and drilling, and a concentrated effort was made by local consultants to locate historical mine plans in private, municipal and provincial archives (Story Environmental Inc. pers. comm., 2025).

A site-specific risk-based feature analysis was developed in 2016 to meet the unique needs of Cobalt (Figure 3). The close interconnection of community and infrastructure, including 'explorers' who were interested in the 'attractive nuances' of Cobalt, was important (Parshley & McCallum 2016).

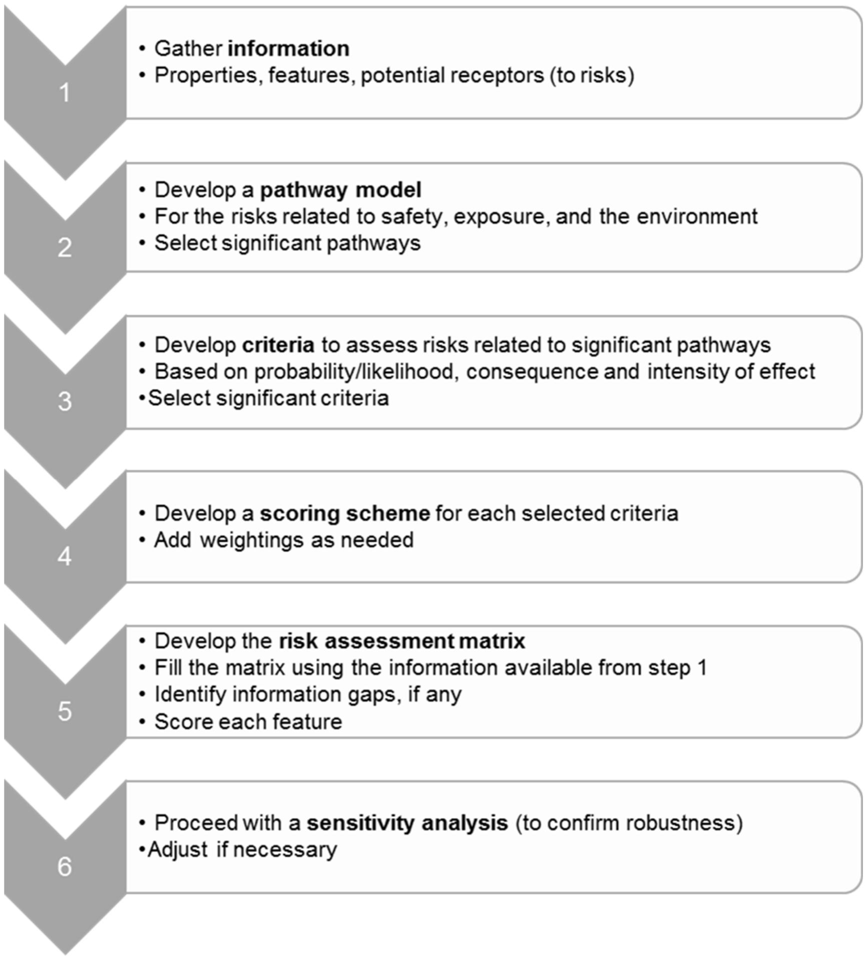

Figure 3 The site-specific risk-based feature analysis process

With more than 900 identified features, the risk-based analysis needed to be simple and efficient so that features with the highest risk of adverse consequences could be identified and prioritised for prompt remediation. Two primary risk sources were distilled: physical hazards that pose a risk to public safety; and exposure to contaminants for people and the environment. Criteria that considered the source of these two pathways in terms of simple examples of likelihood and consequence were developed to allocate a rapid risk score. For example, the risk to public safety included likelihood criteria such as distance to the nearest residence and ease of access and egress, and consequence criteria that impacted the level of injury that could be sustained from the feature, such as height/depth and potential for failure. If multiple pathways were identified, each pathway was assessed and then the scores were summed.

A risk assessment is a key decision-making tool to enable action. A key objective of the risk-based analysis was to prioritise activities, so scoring included a multiplier (1) to account for any current mitigations in place, such as whether access was prevented with fences or shaft caps, whether there was egress and whether the feature had even been located:

$$\text{Risk score} = \text{pathway score} \times \text{current mitigation} \tag{1}$$

A sensitivity analysis was performed on the results to test that the outcomes were robust, with scores ranging from 0 to 15,000. The 2017 assessment results are shown in Figure 4. Nineteen features were identified as P1 (having a score more than 10,000) that consisted of unsafe old workings open to the surface such as shafts, stopes, raises and adits. Further studies and rehabilitation activities were prioritised, and these types of features remain a focus of ongoing work.

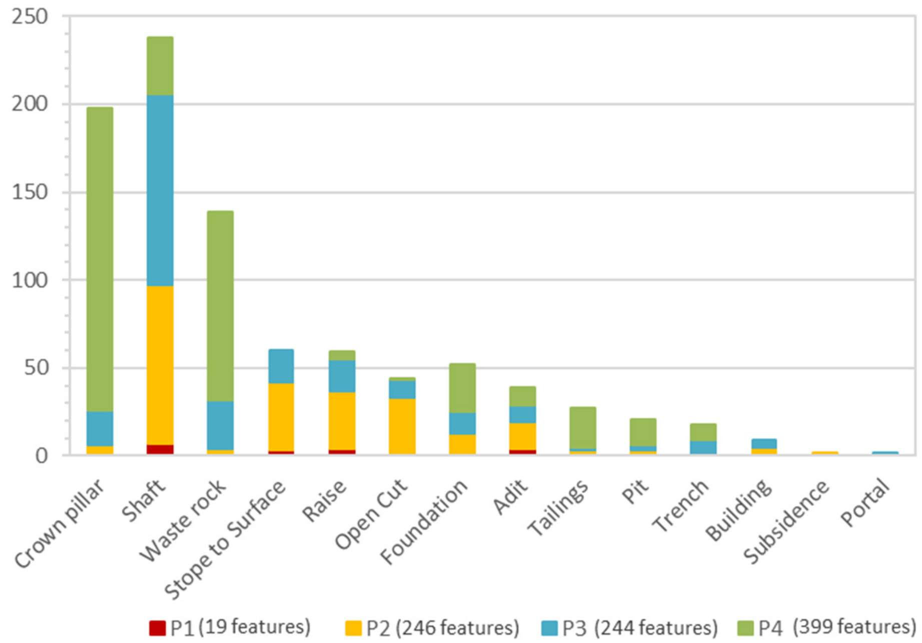

Figure 4 Prioritisation of features from the site-specific risk-based feature analysis in 2017

Concurrent with physical stability management, investigations are ongoing to better understand the complex surface water, groundwater and mine water interactions at Cobalt. Extensive hydrogeological pathways were created from a maze of underground workings and the opportunistic placement of mined material (Figure 5), as demonstrated by the correlation between water levels at the mined-out Cobalt Lake and a glory hole located 250 m north (Figure 6). Arsenic is a major element of interest in Cobalt and has been studied extensively since the 1960s (Noel et al. 2015). Background arsenic levels are naturally high due to the local mineralisation (Sprague & Vermaire 2018a) but it is also more mobile at Cobalt than other locations due to an unusual lack of iron minerals, which would usually facilitate the co-precipitation of arsenic at neutral pH. Understanding potential impacts is further complicated by the patchwork of rights holders across the various and variable sources, pathways and receptors. Continuing studies by AEM and others are evaluating safety and environmental health to improve understanding of background conditions – as baseline data are not available (c.f. Sprague & Vermaire 2018b) – and the resilience and return of biodiversity (Chen et al 2019; Little et al. 2020).

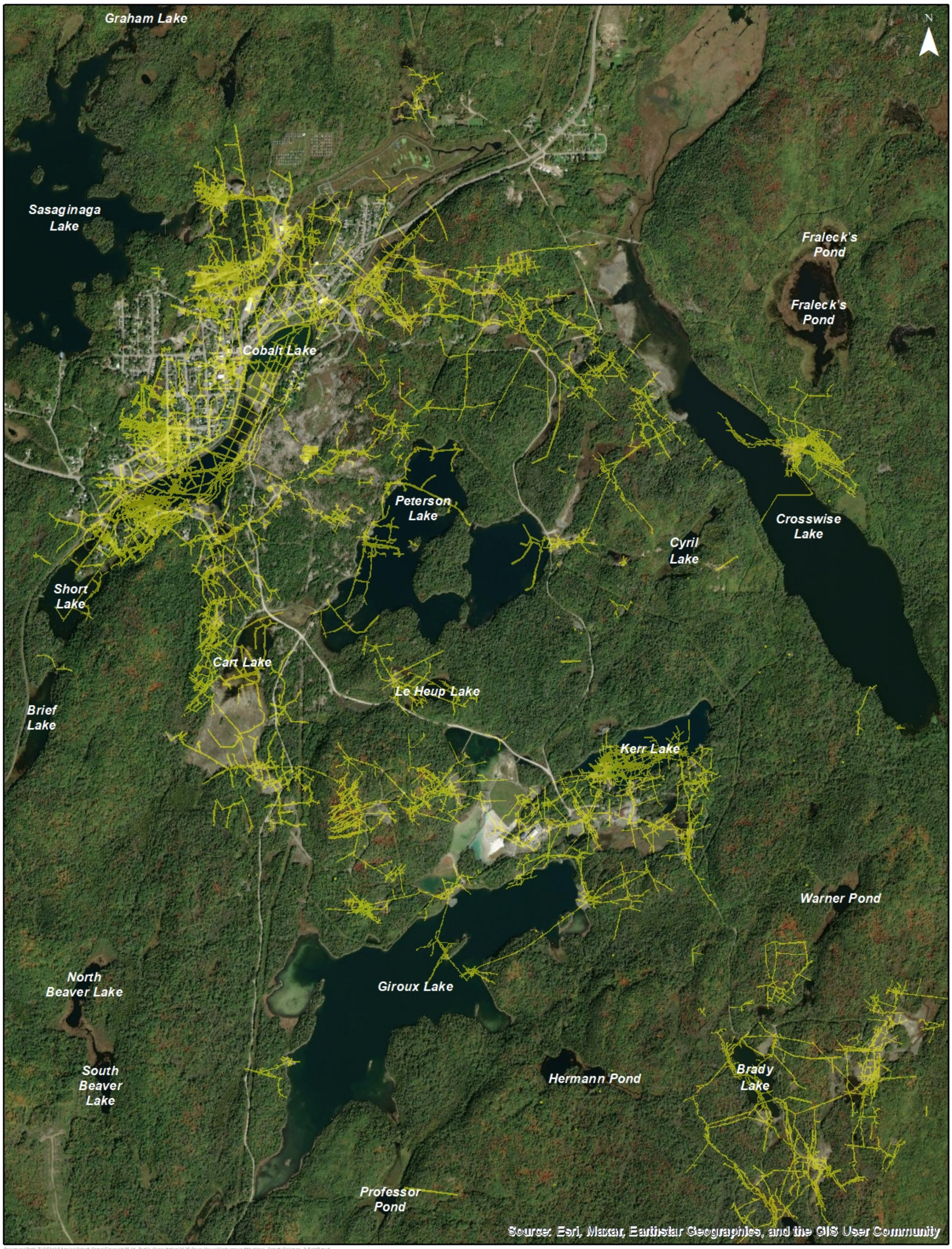

Figure 5 Underground workings mapped by Story Environmental Inc

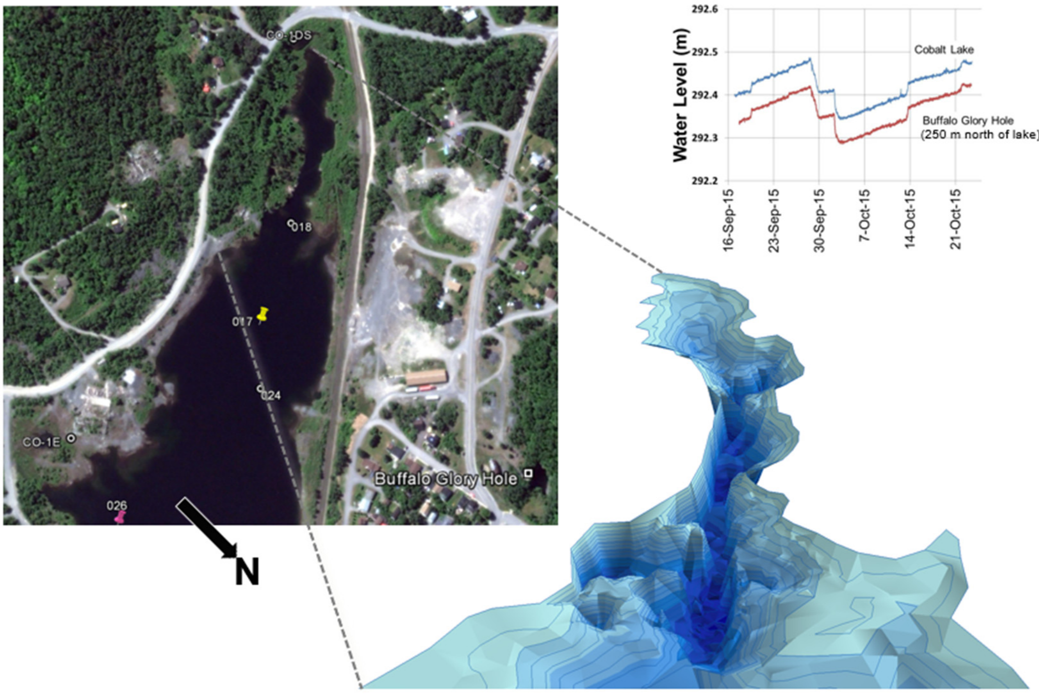

Figure 6 Example of water level connectivity between Cobalt Lake and a glory hole located 250 m north (Kennedy et al. 2017)

Reclamation work at Cobalt continues in parallel with evolving regulations and societal expectations. Often legislation changes in response to events that cannot be tolerated again (e.g. Western Australia implemented new Aboriginal cultural heritage laws in 2021 following the destruction of the Juukan Gorge rock shelters). Therefore, to only focus on compliance is short-sighted when considering the long time frames needed for successful rehabilitation. Having a risk-based approach is fundamental to effective legacy management. While the objective of the risk-based analysis above focused on prioritisation for the remediation of threats, risk, according to ISO 13001, can be a threat or an opportunity. Opportunities may exist with changing regulation. The *Building More Mines Act 2024* (Government of Ontario 2023) provides an opportunity to consider alternate post-mining uses as long as it remains compatible with the surrounding land (Ministry of Northern Development and Mines 2024). Legacy sites can be considered differently and a broader view can test and challenge the idea of restoration to a condition similar to the pre-existing environment. Perhaps instead we can use this land to test our assumptions, conduct trials and improve biodiversity outcomes, as well as supporting local energy needs, social transitions, community interests and local mining heritage.

4 Combining social considerations with risk-based legacy management

The heritage of Cobalt has received national acclaim. In 2001 TV Ontario named Cobalt 'Ontario's most historic town', in 2002 Parks Canada declared the Cobalt Mining District a National Historic Site and in 2003 the Royal Canadian Mint struck a special commemorative silver dollar to mark the 100th anniversary of the discovery of silver in Cobalt (Noel et al. 2015). Unsurprisingly then, the town, the Cobalt Historical Society and Cobalt Mining Museum have a sense of pride and obligation towards preserving the buildings and features that tell Cobalt's story, and they are not alone in the promotion of their mining history (with other such towns including Jerome in Arizona, US; Sovereign Hill in Victoria, Australia; and Rammelsberg in Germany). However, it's not always the case that the local community feels this way: closure can be unexpected, and the complex social repercussions from historical injustices and changing socio-economic fortune can leave communities and traditional owners distrustful and disengaged (Keeling & Sandlos 2015; Abreu & Jones 2021). Therefore, it is important when managing mining legacies to build and maintain community trust as "stakeholders are looking for realistic commitments and a clear lines of responsibility" (Owen & Kemp 2018).

It was realised early in AEM’s planning that rehabilitation in the Cobalt area needs community collaboration. Regular communication with interested stakeholders has been approached in several ways:

- Targeted engagement for specific works. Early engagement is needed to access properties where other parties hold surface rights. Some monitoring and stabilisation of old underground workings occurs within, adjacent and sometimes under the community. The Coniagas No 4 shaft, located within a bookshop at the time (Figure 7), required careful planning and consultation with the owner and the regulators to preserve the heritage of building, and won AEM the Tom Peters Memorial Mine Reclamation Award from the Canadian Land Reclamation Association in 2017.
- Open house consultations. Established in 2015, an annual ‘open house’ has been held locally to provide updates on work completed and planned through a series of posters in an informal environment, and to seek feedback via a question and answer session and survey responses. The open houses stopped due to COVID but started again in 2025.
- Cobalt Historical Society and Cobalt Mining Museum collaboration. Consultation and collaboration has formed an important part of rehabilitation activities for AEM. With authority and other support, the Heritage Silver Trail was established as a self-guided tour through early 1900s mining features. AEM has donated remediated land, provided information signs to explain rehabilitation processes (such as bat gates and revegetation trials) and restored or replaced key historical features.
- Cobalt/Coleman Environmental Advisory Committee (CCEAC). A working group was developed in 2005 for government, mining companies, the Town of Cobalt, Coleman Township and other community representatives to share information, work together on some environmental and social rehabilitation challenges, and inform the community. This including newsletters (Figure 8). Key objectives are to ensure the ongoing safety of the community and maintain a healthy relationship (Noel et al. 2015; CCEAC Chair, pers. comm., 2025).
- Historic Cobalt Legacy Fund. CAD 1 million was donated by AEM from 2014 and 2016 to the Historic Cobalt Legacy Fund, established with The Temiskaming Foundation in 2014 as an endowment fund to provide ongoing operating grants to preserve and support local heritage, including the Heritage Silver Trail, Paul Penna Library, the Cobalt Mining Museum, the Bunker Museum of Cobalt and the Classic Theatre.

Figure 7 Coniagas No 4 shaft

Figure 8 Community newsletter example

While regular engagement has been important for all parties involved, the ability to include local knowledge and support local heritage has been greatly advanced by locally based environmental consultancy Story Environmental Inc. (company of one of the co-authors of this paper). Based in Haileybury, less than 10 km from Cobalt, Story Environmental Inc. was engaged by AEM in 2013 for rehabilitation planning, implementation and monitoring. Having local consultants embedded in the community has helped build trust and participation. AEM and its consultants are contacted for any comments as they know they will be heard, and any matter will be dealt with professionally and expeditiously (Korman, pers., comm., 2025). In fact, the notion of community at Cobalt and Coleman perhaps extends beyond the passionate residents and former miners. Over the past decade the community has become everybody who wants good outcomes, including regulators who have spent years on the ground conducting inspections, AEM, as one of the last miners which arguably still remains in a social and economic context, and the tourists who keep returning (Korman, pers., comm., 2025).

Understanding local priorities, as well as the efficiency of nearby technical support, has vastly improved the likelihood of success when conducting environmental assessments, engaging regulators and inviting stakeholders to information sessions. The community sees AEM and its consultants participating in local events and leading tours with regulators, geologists, scientists and the public which serve to inform participants of ongoing rehabilitation efforts. This has built a sense of trust within the community and supports that AEM is 'present' within its legacy (Korman, pers., comm., 2025).

Support within in the AEM legacy team comes with a unique perspective as the Ontario-based Closure and Legacy Coordinator (and co-author of this paper) has the lived experience, having previously worked at some of AEM's legacy sites while in they were in operation under previous owners and now being responsible for their care and maintenance. This knowledge brings valuable insight to help maintain the corporate responsibility for these sites. While maintaining strong relationships with the community and interested stakeholders is a key objective for AEM, several challenges exist. The extensive workings are an *attractive nuisance* and trying to keep people out of hazardous areas requires continual oversight. Until all the hazards are reclaimed, AEM remains responsible. The desire for historical preservation cannot always be achieved when supporting structures are degrading after decades of neglect, but because of engagement with the community this can still result in positive outcomes such as the reconstruction of the Hellens Mill hoist building at a local lookout or removal of the Nipissing 96 headframe when it wasn't safe to retain the original structure. In this last case, making sure that everybody was aligned with the outcomes meant that an unsafe structure could be removed while preserving the sense of place. Trust is not only about engagement – it needs to be supported with action (Wilson et al. 2022).

5 Lessons learned

Mine closure is complicated, and for legacy sites where the best opportunity to optimise closure outcomes has passed, identifying and realising benefits can be even more challenging. But it is possible.

5.1 Benefits of local knowledge and lived experience to develop trust

Working in proximity, and sometimes under, the local community requires a good relationship to effectively manage the risks, both positive and negative, associated with mining legacies. In a small town, execution of any closure work is visible. A relationship was built between AEM and the people, businesses and government agencies associated with Cobalt through engagement and safe delivery of plans. Face-to-face engagements take effort but are essential to build trust. The added benefit of having local knowledge and a team with lived experience associated with the impacts of mine closure on a community enable these engagements to have relevant context. This can provide a deeper understanding of community concerns and identify opportunities for collaboration which wouldn’t be available or otherwise possible without a local point of contact. Being present, engaging early and maintaining relationships, including those with regulators, means opportunities can be realised that might otherwise have be missed.

The benefits of working with local consultants that have the relevant technical expertise as well as a strong appreciation of local views may not always be available, yet the need to engage and actively incorporate social considerations for successful reclamation remains (Morrison-Saunders 2019; Monosky & Keeling 2021). This is not only a short-term goal for successful reclamation but it also supports a company’s long-term goals for a sustainable business (Gregory et al. 2023), including its social licence to operate and to close, and enables access to future resources in the region if a company can demonstrate it can mine and then close a mine responsibly (Braithwaite 2016; Mercer-Mapstone et al. 2017). Where local experience doesn’t exist, additional resources and social expertise need to be focused early enough to allow time to understand and build trust, and thereby effectively incorporate local needs. Additional time is needed because it always takes longer than expected (Getty 2023). Early and ongoing engagement to enable the agreement of acceptable outcomes is inherent in international good guidance (ICMM 2019) but it also needs to be relevant, meaningful and supported by action.

5.2 Develop tailored risk-based solutions

As discussed previously, a risk-based feature analysis was developed to enable prioritisation of hundreds of historical mining features at Cobalt and target further investigation and reclamation at those which posed the greatest threat to public safety and/or the environment. Having a clear objective and a need for an efficient and effective framework allowed the development of a tool that provided relative risk scores from a set of simple criteria. A more typical risk assessment could not have analysed the features so quickly and would have delayed the start of rehabilitation work.

There is a multitude of guidance, tools and options for evaluating closure risk and the discipline of risk, for closure and beyond, and further development continues (e.g. Byrne 2011; ICMM 2019; Mitchell et al. 2019). However, it is important to understand and stay focused on the objective, and any form of analysis should always consider if the tool is fit for purpose and will add value. There are always opportunities for continuous improvement, refining and adjustment of existing tools and processes to ensure they work for their intended purpose and do not just become a check box because something ‘should’ be done. Good practice guidance for closure endeavours to accommodate all regions, all mine types and all types of miners, and so, necessarily, is focused on the ‘what’ and the ‘why’. It is up to each closure project to define the ‘how’ (Rogers & Botha 2023; Whitbread-Abrutat 2024).

5.3 Change happens and can be an opportunity

Cobalt has seen a multitude of changes. A chaotic mining history, leaving hazards that progressively reveal themselves over time – the changing fortunes and expectations of the people of the town and other stakeholders, further knowledge development and changing regulations – requires that AEM’s management of its legacy sites at Cobalt also changes and develops. The updated Ontario Regulation 240/00 in 2011 was the catalyst for the risk-based analysis of hundreds of mining features, but also the catalyst for developing a stronger collaborative relationship with local stakeholders (Noel et al. 2015). Through these engagements and across more than a decade of progressive reclamation, the outcomes are more than a reduction in safety.

Opportunities have been realised, including donations of land and restoration (or replacement) of historical features important to the local community, biodiversity rehabilitation, and sharing information about bat protection and revegetation trials, and opportunities will continue to evolve as regulations enable thinking beyond restoration (Measham et al. 2024).

The pace of change today is greater than it has ever been in the history of development and is as applicable to closure and legacy management as it is to other fields. While social media promotes ideas, technical advances and artificial intelligence outpace what we can imagine. Closure and rehabilitation that aims to leave a positive legacy is complex – even more so where baseline data doesn't exist and the current state is confounded by complex interconnections that may not be recorded or well understood. It is important to see these changes as opportunities to improve outcomes for our legacy sites, engage regionally and explore new ideas. We can all lift each other and share in the exploration.

6 Conclusion

The Town of Cobalt in Ontario, Canada, is a unique case study into the challenge of balancing different expectations and community views for the rehabilitation of historical features. A history of more than 100 years of mining has left mining heritage and its hazards closely intertwined with the local community. This community is proud of its nationally recognised heritage. Rehabilitation at Cobalt needs to balance the desire to preserve history and sense of place with the need to focus on the protection of human safety and the environment.

A pragmatic risk-based approach to prioritise reclamation of hundreds of historical mining features enabled a relatively rapid assessment of key threats, and outputs of this tool continue to form the basis of threat reduction across AEM's property holdings. While the risk-based analysis was focused on managing physical and environmental threats, the need for meaningful engagement with the community and local stakeholders has also become a priority for AEM. A key part of the success of Cobalt's rehabilitation for AEM is not only the development of trust in the community, or even the proactive and meaningful engagement – it is about becoming part of the integrated community through action and collaboration.

The lessons learned at Cobalt of benefit to closure planning more broadly are:

- Leverage local knowledge and lived experience to develop trust. Local consultants embedded in the community can help inform the closure plan. This process takes time and requires action, demonstrating transparently that you will do what you say you will do.
- A tailored risk-based approach. There are many tools out there that can help and making sure the tools are fit for their purpose is essential.
- Embrace change. Change is inevitable and can bring new opportunities. The networks we build can help us share and benefit from the exploration of new ideas.

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