



November 7, 2019

Mackenzie Valley Land and Water Board  
7<sup>th</sup> Floor, 4922 – 48<sup>th</sup> Street, P.O. Box 2130  
Yellowknife NT X1A 2P6

Attention: Shannon Allerston

**Re: Giant Mine Water Licence Application MV2019X0007 and MV2007L8-0031**

Alternatives North (AN) is a grassroots community organization which offers engagement and advocacy on issues ranging from health and social issues to economics and climate policy. As a coalition including individuals, faith groups, labour unions, environmental organizations, family advocates, and anti poverty groups, our mandate includes offering recommendations to governments based upon well researched analysis. AN is a territorial leader in addressing the abandonment and remediation of the Giant Mine site. Alternatives North is proud to be the only non-governmental signatory to the 2015 Environmental Agreement and to lend our voice to the Giant Mine Remediation Project (MRP) Working group.

It is difficult to overstate the scope of the challenge this project represents. Its massive scale, perpetual time span, and enormous potential impacts strongly invoke the precautionary principle. Alternatives North will strive to minimize the risks and maximize the benefits to both local ecosystems and communities while helping to establish a stable framework for responsible care of the site.

Alternatives North wants to acknowledge that the project staff and representatives of other parties have consistently been diligent, motivated and professional throughout our interactions. It is a pleasure to share a table, and AN is proud to contribute.

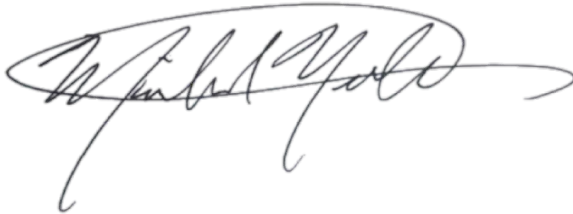
The mutual commitment to shared goals by all participants leads us to conclude that the primary sources of future risk most likely fall within four categories:

- limitations in our collective knowledge or ability to anticipate unknowns,
- limitations in our collective technical capacity to address those concerns,
- limitations in our capacity to fully utilize our collective expertise that may result from the lack of access to financial or material resources, and
- limitations in our ability to act decisively in a timely manner to changing circumstances.

These dominant considerations recur throughout our deliberations on various aspects of the project. Wherever possible, AN recommends that all responsibilities be clearly defined. This will ensure that the buck stops somewhere. AN also recommends that access to relevant information and development of necessary skills be as widespread as possible. This will contribute to operational redundancy and increase public confidence in the project.

Attached are our thoughts on the Giant Mine Water Licence application.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Nabert", with a large, sweeping flourish extending to the right.

Michael Nabert,  
on behalf of Alternatives North

P.O. Box 444, Yellowknife, NT X1A 2N3  
Tel. (867) 920-2765 Fax (867) 873-4295  
[www.alternativesnorth.ca](http://www.alternativesnorth.ca)

## **INTERVENTION SUBMISSION**

### **GIANT MINE WATER LICENCE APPLICATION**

#### **Post-Remediation Site Appearance, Use, and Objectives**

For maximum effectiveness, the overall post-remediation site design must consider practical ways to prevent further contamination of the local environment, including people and animals, and how the appearance of the site may serve as a communication tool to future generations about site dangers. We believe that the final landscape design should serve as a visual warning which renders areas within the site unattractive for future use that might expose individuals to unnecessary danger. Potential future uses of the various parts of the Giant Mine site post-remediation should be defined as best they can, while keeping the whole site in mind. A straightforward end concept for the visual appearance of the site as a whole should be incorporated into all areas of the remediation plan. Alternatives North is concerned that aspects of site design may be decided independently without a framework approach towards developing a consistent whole. Alternatives North believes that work on all components of remediation should be informed by a coherent and comprehensive vision of the desired end result.

AN is concerned that the proponent desires that the water licence include approval of some design details or plans that have yet to be fully clarified, developed, or determined. We are not comfortable with the idea of approving anything that is not adequately defined, and recommend that the Board approve what is necessary to begin needed work while making approval of any currently undefined aspects of the project contingent upon further clarification and input from the parties. As an example, we recognize that the process of determining what sort of pit covers may be used lies largely within the purview of relevant experts, but where aspects of the project like this undergo the process of decision-making, AN recommends that this process be transparent and include opportunities for the parties to comment.

The Closure and Reclamation Plan (CRP) represents our area of dominant concern in this regard. Closure criteria within the CRP must refer to measurable targets rather than relying upon design elements in order for the CRP to afford a meaningful rubric by which the success of the project can be measured. AN recommends that no Closure and Reclamation Plan which is not fully defined through a process of engagement with the parties be approved as a part of the current water licence process.

#### **Underground Mine Workings**

The approach to management of underground mine workings in the GMRP appears to effectively manage overall safety considerations while maintaining reversibility. AN supports the decision not to experiment with increasing the mine water level, as it was unclear what benefits relative to

increased risks such a measure might have represented.

### **Freeze Program**

While the freeze program may not serve as an effective strategy on the perpetual timescale, particularly in the context of an uncertain amount of climate warming, AN agrees with the use of the freeze program specifically as a credible and cost-effective interim measure when combined with research towards a permanent solution to the hazards associated with the arsenic contained on-site.

### **Open Pit Workings**

It is AN's opinion that decisions regarding the filling and covering of open pits should prioritize managing ponded water and any subsequent possibility of inflow to the underground from pit areas. The aesthetics of the final design should also be in keeping with a consistent overall plan for the post-remediation landscape of the site, in order to visually discourage future visitors from unsafe use of the site. Objective P2 in the water licence application states that pits will not contain permanently ponded water. If the final design of pit covers entails the possibility of non-permanently ponding water, AN recommends that the Board require additional study and public engagement regarding how this would alter the possibility of any inflow to underground mine workings. P2 also says that standard parameters regarding potential settlement and erosion of pit caps will be established. With detailed design of pit caps thus far not established, AN also recommends that the feasibility of utilizing clay to minimize permeability of pit covers be fully explored on the basis that this would present greater longevity than the use of a manufactured geomembrane.

### **Contaminated Soils and Sediments**

While it is currently impractical to remediate all areas of arsenic contaminated soil, and the areas of greatest known risk lie within the defined site boundary, we are concerned that the contamination extends beyond the proposed on-site fenced areas. Over a perpetual time frame, this may be exacerbated by the relative impermanence of a boundary fence, and within the comparatively shorter term, a fenced boundary may serve to create an erroneous impression that risks are effectively limited to that clearly defined area. As such, AN recommends that the GMRP include a commitment to mapping the contamination levels in soil areas outside the fenced boundary areas, making that information publicly available, and determining ways that these areas of concern may eventually be effectively remediated.

### **Baker Creek and Surface Water**

With climate change representing the most significant unknown factor impacting the GMRP, the design of Baker Creek rightly includes consideration for accommodating potential extreme flooding events. During the July 2019 technical sessions, we were informed that an updated calculation of the probable maximum flood, which incorporates more up-to-date scientific data, was under way. We await the details of this updated assessment. Considering that real-world climate impacts have repeatedly surpassed best scientific projections of the time,<sup>1,2</sup> AN recommends consideration of adding some amount of additional freeboard to pit rims as a contingency against possible underestimation of the probable maximum flood.

### **Borrow Material**

AN prefers that, geology and volume needs permitting, borrow material be predominantly gathered within the site boundaries in order to minimize off-site impacts. However, highly contaminated material outside of the site boundary, yet adjacent to the site, should be considered, if this would assist in reducing the off-site areas of contamination. AN recommends that borrow needs – how completely voids and pits are to be filled, as well as decisions regarding how and where borrow is to be collected – be informed by safety considerations first. Following public safety, we ask that community input and cost considerations be incorporated, while also bearing in mind post-remediation site appearance. This is another context in which a well defined and consistent concept of using landscape design to communicate to future generations can illuminate decisions on specific aspects of the site plan to produce a more coherent overall message.

### **Water Treatment Plant and Outfall**

The water licence, as currently written, does not provide any details of the expected power needs of the WTP or clarify that any specific form of power supply will be utilized to meet the site's energy needs. An investment in renewable energy, sourced on site, would increase project resilience while reducing long term costs and avoiding any potential difficulties that might arise due to dependence on sourcing refined fuels from distant locations for power generation purposes. AN recommends that the proponent be asked to outline a plan for meeting the site's long-term power needs which includes a cost-benefit analysis of different power generation options as well as consideration of how dependent these options are upon external inputs. Of particular interest would be exploration of any possibility that site conditions may allow for the effective development of local geothermal power to meet its long-term energy needs.

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<sup>1</sup> Glenn Scherer, 'Climate science predictions prove too conservative', [scientificamerican.com](http://www.scientificamerican.com), Scientific American, Dec 6 2012, <http://www.scientificamerican.com/article/climate-science-predictions-prove-too-conservative/> (accessed Nov 6 2019)

<sup>2</sup> The Guardian Newspaper, 'Scientists shocked by arctic permafrost thawing seventy years sooner than predicted', the [guardian.com](http://www.theguardian.com), The Guardian, June 18 2019, <https://www.theguardian.com/environment/2019/jun/18/arctic-permafrost-canada-science-climate-crisis> (accessed Nov 6 2019)

**Site-wide**

AN recommends that the current wording in closure criterion SW4-2 be revised. As it reads now, this criterion will be met by the submission of a ‘map’ or ‘land map’ to the Land Titles Office (LTO). Submitting to the LTO has no guarantee of registration with LTO, and ‘map’ is not a valid format for submission and registration. We therefore suggest that this criterion be revised so that it is met by registration of the appropriate document(s) with the LTO.

**Measures from the Environmental Assessment**

Measure three establishes a multi-stakeholder research agency, which, in addition to assessing relevant new research and its applicability, is also responsible for administering research funds. Considering the ongoing inflationary nature of currency, AN recommends that research funding amounts be indexed to inflation.

AN also recommends that the GMRP establish a research incentive similar to the XPRIZE to provide independent research groups with motivation to pursue solutions for safely addressing arsenic management unconnected with direct project funding. The Ansari XPRIZE for Suborbital Spaceflight, first offered in 1996, motivated 26 teams from seven nations to independently invest more than \$100 million in pursuit of the \$10 million purse before a solution to the technical challenge was successfully developed only eight years later.<sup>3</sup> This provides an example that such an approach can prove effective not only at drawing public attention and interest towards complex technical challenges, but also at attracting outside investment that takes new approaches to resolving difficult problems. If no independent research team were able to produce results applicable to Giant Mine, no immediate financial cost would be incurred. On the other hand, awarding the prize for the successful development of a permanent solution would offset further site management costs and allow for the development of a made in Canada approach that might prove valuable at other toxic sites internationally.

Measure six, which concerns itself with long-term funding approaches for ongoing site maintenance and for contingencies, presents an area of particular concern. While the GMRP considers expert opinions on how climate change may impact the project’s engineering design and physical expectations for the site, the report on consideration of long-term funding options appears to rely on assumptions which disagree with expert opinions in the field of economics on how climate change is expected to impact the stability of our economy. The Bank of Canada has officially acknowledged

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<sup>3</sup> Bryony Everett, 'Evidence Review – Environmental Innovation Prizes for Development', [assets.publishing.service.gov.uk](https://assets.publishing.service.gov.uk), DFID Resource Centre for Environment, Water and Sanitation, July 2011, <https://assets.publishing.service.gov.uk/media/57a08abded915d622c00089b/61061-A0405EvidenceReviewEnvironmentalInnovationPrizesforDevelopmentFINAL.pdf> (accessed Nov 6 2019)

that climate change represents a threat to our economy and financial system<sup>4</sup>. The increasing strain that climate change is already having on government appropriation budgets is exemplified by annual federal disaster management costs associated with extreme weather, which averaged \$54 million between 1970 and 1994 but are now approaching \$900 million, well in excess of what the federal government has budgeted to address such events.<sup>5</sup> Reliance upon annual appropriations could also expose the GMRP to vulnerability whenever a change in sitting government includes an ideological shift in legislator priorities, or if some sort of emergency arises that demands an immediate national response. This leaves AN with a low level of confidence in the current approach to providing financial stability to reliably meet project needs over the long term.

Separate from the cost of active remediation, this measure considers long term costs relevant to ongoing operations and maintenance of the site post-remediation, as well as potential costs incurred in responding to possible future changes in the site condition. The current report on measure six anticipates that ongoing costs for the regular operation of the site will progressively decline over the coming century. The expense of providing maintenance for aging infrastructure, material inputs, and personnel costs all demonstrate a historic tendency to increase rather than to decrease, so a context for these projections of declining costs needs to be provided.

Ultimately, local confidence in the long-term stability of the project is partially dependent upon reliable access to the financial resources necessary for ongoing site maintenance and operation, as well as the means to act in response to changing project needs. AN recommends that the Board require the GMRP to address these concerns about long term funding which have repeatedly been expressed by parties to the agreement.

Measure nine addresses the creation of a framework for health monitoring and response. In order to improve local communities' ability to respond to potential health risks in a timely and effective manner, AN recommends that the GMRP utilize a qualitative risk assessment framework to produce and distribute a plain-language "Giant Mine Handbook" that outlines defined contingency responses to potential problem scenarios. This may permit identification of health risks and appropriate responses to them to be widely understood and increasingly well established in local populations. Alternatively, such responses should be clearly incorporated in municipal and territorial health emergency response plans, and made readily available to concerned parties.

Measure fifteen requires that output from the WTP meet drinking water standards. AN recommends adding chloride, sulphate, nitrate, and ammonia to water monitoring criteria.

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<sup>4</sup> Governing Council of the Bank of Canada: Stephen S. Poloz, Carolyn A. Wilkins, Timothy Lane, Lawrence Schembri, Lynn Patterson, Paul Beaudry, 'Financial System Review – 2019', *BankofCanada.ca*, Bank of Canada, May 16 2019, <https://www.bankofcanada.ca/2019/05/financial-system-review-2019/> (accessed Nov 6 2019)

<sup>5</sup> Don Forgeron, CEO of the Insurance Bureau of Canada, 'Climate, flooding, devastation: why no national strategy?', *theglobeandmail.com*, The Globe and Mail, published April 11 2016, updated May 18 2018, <https://www.theglobeandmail.com/report-on-business/rob-commentary/climate-flooding-devastation-why-no-national-strategy/article29580063/> (accessed Nov 6 2019)



### **Suggestions from the Environmental Assessment**

Alternatives North understands that the suggestions within the environmental agreement are voluntary in nature. As such, it is solely with the intention to work collectively towards the best possible outcomes for the GMRP that AN respectfully offers feedback on how we believe these suggestions can achieve the greatest benefits to the project and the communities impacted by it.

Suggestion two proposes the creation of a monument as a memorial to the impacts of past contamination from Giant Mine on the environment and on local inhabitants, particularly local Dene and Métis communities. If this suggestion is followed, AN proposes that impacted communities be invited to choose design elements from submissions by local artists as a part of a broader process of engagement. Creating a musical or cultural event related to honouring those impacted might serve as an effective vehicle towards greater public awareness and engagement with the site.

Suggestion three encourages the development of educational resources relating to the GMRP suitable for inclusion in school curricula. In addition to addressing the ways that Giant Mine has impacted the land and local people, this suggestion potentially provides an opportunity to maximize the long-term resilience of the project by encouraging the development of skills that might be relevant to the community throughout the lifespan of the project. AN suggests that an active effort be made to teach students how to conduct tasks like water monitoring. Increasing the number of individuals who possess such skills will improve the local capacity to understand the risks associated with the site and maintain it safely.

Suggestion four involves the development of a perpetual care framework, and this ground-breaking work, which will represent the first such framework ever developed, has recently begun. As oral history, narrative storytelling, music and arts consistently show a greater level of cultural persistence and accessibility than most other forms of human communication, AN suggests that the proponent consider including an encouragement to the arts community to help ensure that stakeholders are well informed through the establishment of an arts grant or endowment, specifically to better communicate key project messages to a broad audience, as a component of the perpetual care approach to communicating with future generations. As one of the concerns about effectively communicating to future generations rests upon the understanding that language and the perception of symbols evolve over time, this method would contribute to an ongoing supply of creative communication efforts that remain contemporary.