



December 19, 2008

To the Distribution List

RE: Reasons for Decision for the EA of the Giant Mine Remediation Plan

Please find attached the Reasons for Decision issued by the Mackenzie Valley Environmental Review Board in the matter of the scope of development and scope of assessment for the EA of the Giant Mine Remediation Plan.

The Review Board will now develop a Draft Terms of Reference (TOR), which will give specific direction to the developer, Indian and Northern Affairs Canada, on the information that should be included in their Developers Assessment Report. This Draft TOR will be circulated for comment before it is finalized.

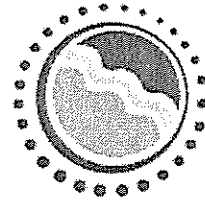
Thank you for your interest in this matter.

Regards,

A handwritten signature in dark ink, appearing to read 'Tawanis Testart', written over a light blue horizontal line.

Tawanis Testart
EAO

Mackenzie Valley Review Board



IN THE MATTER OF:

The Environmental assessment of the Giant Mine
Remediation Plan (EA0809-001)

AND IN THE MATTER OF:

Determination of scope of development and scope
of assessment for the environmental assessment of
the Giant Mine Remediation Plan

1. BACKGROUND

The Giant Mine is a former gold mine located within the municipal boundaries of the City of Yellowknife. The mine operated from 1948 until 2004 under various owners, most recently, Royal Oak Mines Inc. from 1990 to 1997 and Miramar Giant Mine Limited from 2000 to 2005. Royal Oak Mines Inc. went bankrupt in 1997 and since then care and maintenance of the site has been overseen by the Department of Indian and Northern Affairs Canada (INAC). The surface leases are on Commissioner's Lands and have reverted to the administration of the Government of the Northwest Territories (GNWT). The site is contaminated with arsenic trioxide that resulted from the milling of gold ore on site over the years. The milling process released arsenic trioxide as a by-product of the process and over the 50 year life span of the mine approximately 237,000 tonnes of this substance have been collected and stored on site in underground chambers. Arsenic trioxide is a highly toxic and carcinogenic substance.

The development of the Giant Mine Remediation Plan (GMRP) for this contaminated site has been ongoing since 1997 and has been a collaborative project led by INAC and involving both the Federal and Territorial Governments. Shortly after assuming care and maintenance responsibilities in 1997, INAC implemented a public consultation program to determine the best course of action to minimize the risk to human health and the environment from the Giant Mine arsenic contamination. These efforts involved a comprehensive engineering analysis of alternatives and included a number of public information sessions, workshops, publicity campaigns and other means of stakeholder engagement. The GMRP was subject to a detailed review by the Independent Peer Review Panel, which is an independent body of expert engineering and scientific advisors; and the Giant Mine Community Alliance; a community association made up of local residents, including an observer from the Yellowknives Dene First Nation (YKDFN).

On October 19, 2007, INAC submitted an application for a water license (MV2007L8-0031) to the Mackenzie Valley Land and Water Board (MVLWB). The application was to conduct reclamation activities at the Giant Mine site over a period of up to 10 years.

The application was deemed complete by the MVLWB on October 26, 2007. That board proceeded to conduct its preliminary screening pursuant to the *Mackenzie Valley Resource Management Act*. On February 21, 2008, the MVLWB conducted a preliminary screening and determined that the development was not likely to be a cause of adverse environmental impact or public concern.

2. REFERRAL TO ENVIRONMENTAL ASSESSMENT

Notwithstanding the MVLWB preliminary screening decision, on March 31, 2008 the City of Yellowknife referred the Giant Mine Remediation Plan, proposed by INAC's Contaminants and Remediation Directorate, to environmental assessment (EA). This referral was made under section 126(2)(d) of the *MVRMA* and the City of Yellowknife cited potential adverse environmental impacts within its municipal boundaries as its reasons for the referral.

On April 7, 2008, the Mackenzie Valley Environmental Impact Review Board (Review Board) initiated the EA of the development described in the GMRP and water licence application. The first phase of the EA was the scoping phase, when the Review Board sets out to identify and prioritize the relevant issues in the EA. In an effort to avoid duplication of work that may already have been done by participants, the Review Board requested that any written materials previously prepared during the development of the GMRP that might be pertinent to the EA be submitted to the Review Board.

Review Board staff conducted a one day scoping session in Yellowknife on June 17, 2008 to secure public input on the EA. After review of both the written submissions and the results of the scoping session, it was apparent that in addition to the City of Yellowknife's concerns about potential environmental impacts there was public concern surrounding the GMRP. This public concern was centered on the issue of the arsenic trioxide and its eventual disposition. On July 22 and 23, 2008, the Review Board held a public scoping hearing in Yellowknife to hear directly from parties and members of the public about any concerns and issues.

The registered parties to the EA scoping hearing for the Giant Mine Remediation are:

- The City of Yellowknife;
- Mr. Kevin O'Reilly;
- Mr. Bob Bromley;
- The YKDFN;
- The Department of Fisheries & Oceans (DFO);
- Environment Canada (EC); and
- The North Slave Métis Alliance.

All parties were present at the scoping hearing, although DFO and EC did not make formal presentations to the Board. Members of the public attended the hearing, made several presentations to the Review Board and submitted written materials after the hearing was concluded.

It became evident through the scoping session and hearing that the GMRP is a large and complex project.¹ The information included in the GMRP and its appendices and the associated material available on the project is lengthy, technical and detailed. A number of the participants spoke of challenges related to the task of reviewing and analyzing the volumes of information presented by the developer.² The issues raised during the scoping process were typically of a general nature and were raised in a broad sense. Additionally, participants had concerns that were sometimes not related to specific environmental impacts, but rather addressed concerns about project management that they anticipated might lead to significant adverse impacts. For example, participants had concerns about the adequacy of the proposed monitoring program. Monitoring activities are important to the mitigation of adverse impacts of development, but are not usually an impact of development.

As a result, the Review Board's reasons for the scope of assessment for the Giant Remediation EA are set out below in broad terms and the Board has chosen to focus on topic areas that will be further developed into specific items in the EA Terms of Reference. These Reasons for Decision are intended to explain the rationale for the selection of issues/project components that will be scoped into the assessment. This Decision is intended to be a key input in the drafting of the Terms of Reference for the Developers Assessment Report for this EA.

3. THE REVIEW BOARD DECISION

The matters considered by the Review Board outlined in this decision are limited to issues raised by parties and the public during the scoping phase. The Review Board may also consider additional matters in its Terms of Reference for this EA, where it deems these matters relevant to the EA.

3.1 SCOPE OF DEVELOPMENT

In order to determine a scope of assessment, the Review Board must first determine the scope of development. It is necessary to understand the physical works and activities proposed by the developer and to determine which of these should be included in the environmental assessment in order to understand how these works and activities may effect the environment. The Review Board is required to set a scope of development for each EA under *MVRMA* s. 117(1), which reads,

117.(1) Every environmental assessment of a proposal for a development shall include a determination by the Review Board of the scope of the development, subject to any guidelines made under section 120.

¹ Summary Notes from Scoping Session, June 17, 2008 & Hearing Transcripts, July 22 & 23, 2008

² Summary Notes from Scoping Session, June 17, 2008, pg. 3 & 11

The Environmental Impact Assessment Guidelines³ set out a process for determining scope of development, including a framework for deciding whether associated developments might be considered to be a part of the main undertaking. This decision is based on three criteria; interdependence, linkage and proximity.⁴

Interdependence: Can the main project proceed without the additional project?

Linkage: Does the main project make the additional project inevitable?

Proximity: Is the developer undertaking two activities in the same area?

The following three sections make up the decision reached by the Review Board on scope of development.

General Scope of Development

The Review Board has determined that all components of the development included in the GMRP will be included in the scope of development for this EA. The GMRP includes the following principal works and activities:

- Immobilization of arsenic trioxide through ground freezing (the frozen block method)
- Ongoing treatment of contaminated water to remove arsenic, which includes:
 - Construction of a new water treatment plant
 - Treatment using additives to initiate the precipitation of arsenic from water
 - Storage of treated water and eventual discharge to Great Slave Lake
 - Storage and disposal of byproducts of treatment
- Removal of site infrastructure and materials, such as buildings, waste and contaminated materials
- Capping of tailings areas
- Removal of contaminated soils from mine site and tailings areas
- Rehabilitation of Baker Creek
- Reclamation of open pits, of which some will be filled with site materials, some flooded due to changes in the water course of Baker Creek and some left open and bermed and fenced to prevent access
- Relocation of a small portion of the Ingraham Trail (Hwy 5)

Proposed Relocation of the Ingraham Trail (Department of Transportation proposal)

³ EIA Guidelines, MVEIRB, 2004

⁴ EIA Guidelines, section 3.8, pg. 27

In addition to these main physical works and activities, the Review Board heard concerns from participants at the scoping hearing about a proposed relocation of a longer portion of the Ingraham Trail than that described in the development proposal. Parties suggested that this project be scoped into the GMRP as an associated development. The road relocation is proposed by the GNWT Department of Transportation. The Review Board gathered evidence from the GNWT to supplement the evidence heard from parties at the hearing.⁵ The Review Board then applied the tests described above to determine if the two projects should be assessed as one.

The first test applied, the interdependence test, shows that the remediation proposed will take place regardless of the DOT project. The remediation of this contaminated site will continue whether or not the road relocation continues. The second test, linkage, shows that the highway project will not be inevitable subsequent to the Giant Mine Remediation. The remediation project will not create a circumstance that requires that the road be relocated.

The third test, proximity, is less clear. The project is a GNWT-DOT proposal and the GNWT is a joint developer in the remediation project. Also, the section of the Ingraham Trail which is proposed to be relocated does run through the Giant Mine site. However, the Review Board has given less weight to the proximity test than the other two, considering that the GNWT is a co-proponent and not the sole proponent in this project.

In addition, the highway project is at an early and conceptual phase of development. GNWT-DOT has not selected a proposed route and has not completed any feasibility studies or engineering designs. Without a defined project, the potential effects arising from the highway relocation cannot be reasonably assessed with any degree of certainty by the Review Board.

The Review Board has thus determined that these are separate projects and that the proposed relocation of the Ingraham Trail will not be included in the scope of development for the Giant Mine Remediation EA.

Alternatives to the Frozen Block Method

The Review Board repeatedly heard the concern, “will the proposed frozen block method adequately protect the environment and residents of the NWT from potential contamination which would result from the release of arsenic trioxide into the ecosystem in the future?” This issue was raised by all parties to the assessment who made presentations at the scoping hearing, as well as members of the public who attended and spoke at that hearing. In addressing this question, it was suggested to the Review Board that it consider the rationale for selecting the frozen block method and alternatives to this method.

⁵ Letter submitted by GNWT-ENR on August 8, 2008 in response to the second undertaking arising from the scoping hearing, July 22-23, 2008

The Review Board notes that while there remains some public concern about the selection of the frozen block method, the parties to the EA did not provide any new evidence which convinced the Board that the investigation of alternatives to the frozen block method should be reinitiated. The developer appears to have done a comprehensive review of alternative methods and made a reasonable assertion that the chosen method is the best available choice. Section 117(2) of the MVRMA does not require a review of alternatives to the development during an EA. The Review Board is aware of the significant efforts made by the developer to select an approach to arsenic treatment. These efforts were made with public input and the design was reviewed by the Independent Peer Review Panel.

The Review Board has not been persuaded that it should exercise its discretion under ss.117(2)(e) and include an assessment of arsenic treatment alternatives in this EA. The Review Board will not consider alternatives to the frozen block method, but reserves its right to do so should compelling evidence that a review of alternatives is necessary be brought forward.

Freeze Optimization Study

During the public scoping hearing held July 22-23, 2008, INAC requested that the Review Board exclude a proposed research study from the scope of development.⁶ INAC described the proposed study in a letter submitted on August 15, 2008 and in further detail in a letter submitted October 17, 2008. The study will involve the installation of freeze pipes and scientific instruments in drill holes and employ both active and passive freezing techniques to partially freeze one arsenic-filled stope (chamber 14). The aim of the study is to refine the plan for executing the freeze block method. This may include a better understanding of the required ratio of active vs. passive freezing and more detailed information for cost projections and other aspects of the freeze block method.

In order to determine whether the freeze optimization study should be considered as part of the development or as a separate project, the Review Board considered whether the study was interdependent, linked or in close proximity to the GMRP. These are the same questions posed of the proposed relocation project of the Ingraham Trail. The study is in the same location and is a similar activity to the GMRP, although smaller in scale.

However, the remediation project will continue regardless of the optimization study. It is not vital to the existence of the project, but intended to provide certainty to the developers assumptions put forward in their proposed project. The two are not interdependent and the main project may proceed without the study.

The last question is on of linkage. Will completing the main project make the second project inevitable? If the GMRP was complete and the frozen block method fully implemented, there would be no need to conduct optimization studies after the fact. In this instance, these two activities are not linked.

⁶ Transcript from the scoping hearing, July 22, 2008, pg. 57

Therefore, the Review Board has determined that the freeze optimization study will not be included in the scope of development for this project. The study will likely provide information that may be of use to the Review Board during its deliberations on this EA and of further use to regulatory agencies post-EA, should the Board recommend approval of the GMRP. If undertaking this study requires a permit, license or authorization, the developer will be subject to Part 5 of the *MVRMA* and the study will require a preliminary screening.

3.2 GEOGRAPHIC AND TEMPORAL SCOPE

Geographic Scope

The Review Board has determined that geographic scope will be limited to the area described in the developer's application for a water licence (MV2007L8-0031). This area includes Reserve R662T, the adjacent town site, a section of shoreline where, historically, tailings have been released to the north end of Yellowknife Bay and the Cruising Club launch site.

During scoping, participants suggested that this scope be expanded to include areas not within the lease area of the Giant Mine site. There is a concern that arsenic trioxide, dispersed through airborne emissions, had been deposited in areas beyond the lease block and town site and that these contaminated areas should be included in the EA. However, the activities that led to the deposition of arsenic in locations away from the Giant Mine site are not related to the activities proposed by the developer of this project, namely INAC. Also, the effects of these historical activities are not a component of the proposed development. The task before the Review Board in this EA is to assess the potential impacts resulting from the project proposed by this developer and this project, as proposed, includes development activities that occur wholly within the project area as defined in the GMRP.

While the Review Board has determined that the geographic scope be limited in this way, for the purpose of assessing potential impacts to valued components; such as impacts to water quality, it will consider a geographic scope that is appropriate to the valued component being assessed. In the case of water quality, the Review Board may assess potential impacts to the watershed, and not be limited to just water on the Giant Mine site.

Temporal scope

The method selected by INAC to mitigate the potential impact of arsenic trioxide contamination is to freeze the contaminant *in situ*, which minimizes the risk of contamination but does not ultimately remove this risk. As the contaminant will continue to exist on the site, the risk of potential impact will exist in perpetuity. During scoping, the perpetual care component of this project was raised as a concern by several parties.

To accurately assess future impacts, the Review Board must make certain assumptions about future events and conditions. As the length of time that must be considered increases, the assumptions which must be made become more speculative. It is generally more certain to anticipate events and conditions in the near future than it is to make predictions for the distant future. Similarly, the level of certainty with which the Review Board may make impact predictions will necessarily decrease as the temporal scope of the assessment increases.

After 10 years from the start of the development, the developer has predicted that the ground freezing will be complete and the contaminants will be immobilized.⁷ Once this happens, INAC asserts that the underground arsenic should no longer be a source of contamination and as time progresses the need for water treatment should gradually be reduced. The stated aim of the GMRP is that the arsenic levels in water will be reduced to levels requiring a minimal level of treatment, if any, and that the site will become self-perpetuating. The 10-year timeframe, in addition to five years of monitoring activities following the block freezing, offers the Review Board a reasonable timeframe within which impact predictions can be made with a higher degree of certainty and confidence. For this reason, the Review Board has decided to focus its consideration of the impacts of this development on the first 15 years of its operation, or until the site is expected to reach the anticipated state of stability.

The Review Board anticipates that the developer will require additional water licences or other authorizations to continue care and maintenance operations at the Giant Mine site after the first 15-year timeframe addressed by this EA. The relevant regulatory authorities will be responsible for ensuring that monitoring and follow-up activities continue to verify that the site is stable.

3.3 SCOPE OF ISSUES

The *MVRMA* s. 117(2) states:

117.(2) Every environmental assessment and environmental impact review of a proposal for a development shall include a consideration of:

- (a) the impact of the development on the environment, including the impact of malfunctions or accidents that may occur in connection with the development and any cumulative impact that is likely to result from the development in combination with other developments;
- (b) the significance of any such impact;
- (c) any comments submitted by members of the public in accordance with the regulations or the rules of practice and procedure of the Review Board;

⁷ Giant Mine Remediation Plan, pg. 125

(d) where the development is likely to have a significant adverse impact on the environment, the need for mitigative or remedial measures; and

(e) any other matter, such as the need for the development and any available alternatives to it, that the Review Board or any responsible minister, after consulting the Review Board, determines to be relevant.

The issues considered by the Review Board were brought forward through written submissions by interested participants, the scoping session and the issues scoping hearing. Also, issues were identified through:

- the Preliminary Screening Report;
- the types of impacts known to result from other developments with similar features;
- known sensitivities in the area of the proposed project;

The following text outlines the broad, topic areas that were raised by parties during the scoping phase of this EA, and outlines the Review Boards decision regarding inclusion in the scope of assessment for each. The purpose of making this decision is to ensure that the Review Board focuses its energies on assessing the most relevant issues in this EA.

Release of Arsenic & Other Contaminants

The Review Board will consider issues related to potential contamination of the environment through the actions described in the Remediation Plan. This may include, but is not limited to, contamination resulting from:

- Accidents or malfunctions of the frozen block method
- Removal of buildings and other hazardous waste materials
- Removal of tailings and other contaminated sediments

Remediation Standards

One issue identified by the Review Board during the scoping phase that related to soil remediation standards was, “does the Remediation Plan as proposed set out a standard of remediation that will not prevent future residents of the area from making full use of the lands in question?” This concern was not linked to any particular land use, but was rather a general concern that the land be available for both recreational and residential use. The Giant Mine site is very close to Yellowknife, and it is very likely that the municipality and local residents will want to make use of the site once it is reclaimed.

At present, the Giant Mine site is contaminated by arsenic. The intention of the GMRP is to improve the soil quality at the site to one of a higher quality than exists today. The Review Board has concluded that the standard of remediation selected by the developer, as an end point addressed by their project design, will not in itself have an adverse impact on the existing environment. The remediation standard chosen is intended to improve physical conditions at the Giant Mine site. The standard of remediation is a matter of

choice for the land owner which is the GNWT. As a result, the Review Board has determined that the EA will not focus on the standard of remediation chosen.

Water Quality & Quantity

The developer will be treating contaminated water on site for an extended period of time. This water will be stored on site, discharged into the environment and will be available for potential interaction with the environment, animals and people over this time. Arsenic contamination to the food chain can adversely impact water quality, aquatic organisms and plant life, along with larger terrestrial organisms.

There is a potential for adverse environmental impact due to the contaminated water on site. The Review Board will consider questions related to contaminated water and its storage, treatment, discharge and management on the Giant Mine site in this EA. This will include surface water, mine water, groundwater, seepage from tailings and storage ponds and new water bodies created by flooding open pits.

Hazard to human populations

There are eight open pits on the Giant Mine site, some of which will be used for disposal of hazardous and contaminated materials and some of which will be left open. These open pits may eventually fill with water and become lakes, but some will remain open indefinitely.

The Review Board will consider the potentially adverse impacts of these open pits, in particular the risk to the public due to the pits' location in a populated area.

Impacts to Biological Systems

There are several sources of arsenic contamination at the Giant Mine site; including arsenic contained in underground storage chambers, underground mine workings, contaminated soils, and tailings, along with background levels of arsenic in surface runoff. Contamination may occur through airborne and waterborne dissemination. These sources have the potential to adversely impact the surrounding ecosystem through contamination of biological systems. Arsenic in water and food sources may adversely impact local wildlife and fish, as well as the human population either directly or through consumption of local foods.

The Review Board will be considering the impacts of this development on the biological environment.

Legacy Issues

The Giant Mine operated for over 50 years, and had an effect on the Yellowknife area. Several parties to the assessment raised legacy issues with the Review Board and asked that consideration of these concerns be included in the scope of assessment. Notably, the

YKDFN raised these concerns in their submissions, at the scoping session in June and in their presentation to the Review Board at the scoping hearing. They put forward comments and evidence that the area around the Giant Mine was once used by the YKDFN for traditional activities, such as fishing and berry picking, but is now avoided by people because of their fears of cancer and other contamination.⁸

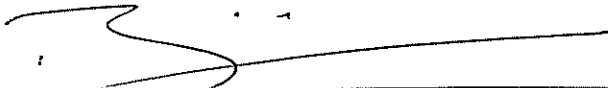
These historic mining activities referred to by the YKDFN included many other mines, such as Con Mine and Burwash Mine. It was suggested during scoping that the Review Board consider the legacy impacts of not only the past mining activity at Giant Mine, but also the impact of gold mining in the Yellowknife area since the 1930s to present.⁹ These activities were conducted by various operators and much of this mining activity occurred before any comprehensive environmental management framework, like the *MVRMA*, existed. Environmental protection did not exist as a legal requirement as they do today and this likely led to environmental contamination that was left unmitigated and never cleaned up. The legacy impacts of mining, as described by the parties, are unfortunate and regrettable.

However, these mining activities were not conducted by the developer in this EA. Also, they are not related to activities described in the GMRP, which is a reclamation project designed to improve environmental conditions at Giant Mine. It is the view of the Review Board that the scope of development be limited to the activities and work described in the developer's application to the MVLWB for a water licence (MV2007L8-0031). The remediation activities would be the cause of any direct impacts of this development and the scope of assessment will focus on any issues and concerns arising from those activities.

4. CONCLUSION

These reasons set out the Review Board's scope of development and scope of assessment decision in relation to the GMRP development.

Dated: December 19, 2008



Richard Edjericon, Chairperson
Mackenzie Valley Environmental Impact Review Board

⁸ Presentation to the Review Board, July 23, 2008

⁹ Presentation by YKDFN to the Review Board, July 23, 2008