Nunavut Water Board

Review of Tahera Submissions for Water License Application on Jericho Diamond Mine, NU

Prepared for the December 6-7, 2004
Public Hearing in Kugluktuk, NU

Acres International Limited

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Summary and Recommendations

Executive Summary

Acres International Limited (Acres) was retained by the Nunavut Water Board (NWB) as an independent consultant to review a number of the technical documents submitted by Tahera Diamond Corporation (Tahera) in connection with a water license application for the Jericho Diamond Mine project.

Acres review was specifically focused on issues which are related to the geotechnical, geo-environmental, hydrological and hydro-geological aspect of the project. This review contains comments which were prepared concerning Tahera's documents on the following subjects:

- The Abandonment and Restoration Plan.
- Operational Monitoring Summary.
- Waste Rock, Overburden, Low Grade Ore and Coarse Processed Kimberlite Management Plan.
- Estimates of Receiving Water Quality.
- Proposed Discharge Limits.
- Design of Processed Kimberlite Containment Area (PKCA).
- Site Water Management.

The 2004 documents submitted by Tahera to the NWB contain a comprehensive plan for the Jericho mine operations. These documents provide some modifications, additional detail designs and further refinements to the Environment Impact Statement (EIS) documents which were submitted to Nunavut Impact Review Board (NIRB) in early 2004 and subject to reviews by both the regulators and the public at hearings held in the communities affected by the proposed mine operation. Additional information was also provided by Tahera in their addendum document submitted to the NWB on October 8, 2004. This addendum addressed some specific issues that were brought forward by the NWB following their conformity analyses.

Based on the technical documents that reviewed by Acres there is, in our opinion, no valid reason that the project could not proceed as Tahera has not only made a commitment to deliver a mining project that would be the first diamond mine in the Nunavut Territory, but also a project that would minimize disturbance to the natural environment and maximize the social and economic benefits to the people of Nunavut and the mining industry in general.

As the actual mining operation has not yet started, the documents contain a number of contingency plans, alternative schemes and some operation flexibilities to meet with the environment requirements and government regulations. It is therefore important, that once the mining operation starts, Tahera commence with the verification and monitoring of the selected programs, carry out additional trials/studies and complete the final designs, as well as continue with the selection process among the considered alternatives. Some of these activities must be carried out early because of the relatively short duration of the proposed mining operation (9 years).

Introduction

At the request of Nunavut Water Board (NWB), Acres International Limited (Acres) was retained as an independent consultant to review a selected number of technical documents that were submitted by the Tahera Diamond Corporation (Tahera) in connection with the proposed Jericho diamond mine project. These documents were prepared as a requirement for the water license application following an environmental screening and final public hearings conducted by the Nunavut Impact Review Board (NIRB) in early 2004.

The Jericho diamond mine project is situated in the Kitikmeot region of the Nunavut Territory, 60 km south of the Arctic Circle. It is located at the north end of the Contwoyto Lake, approximately 230 km by air from Kugluktuk (Coppermine) and 200 km from Bathurst Inlet. Other mines in the region include the Lupin gold mine located approximately 30 km southeast of Jericho, and the Ekati and Diavik diamond mines which are located near Lac de Gras, NWT, approximately 170 km south of Jericho.

The documents submitted by Tahera to the NWB consist of a summary document and 34 appendices (Appendix A to Z, and AA to HH). Acres review was specifically focused on issues which are related to the geotechnical, geo-environmental, hydrological and hydrogeological aspects of the project. In particular, the following appendices were reviewed by Acres:

- Appendix A – Abandonment and Restoration Plan.
- Appendix I – Operational Monitoring Summary.
- Appendix T – Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan (Technical Memorandum M).
- Appendix U – Estimates of Receiving Water Quality (Technical Memorandum N).
- Appendix V – Proposed Discharge Limits for the Jericho Project (Technical Memorandum O).
- Appendix W – Design of the Processed Kimberlite Containment Area (PKCA) (Technical Memorandum P).
- Appendix X – Site Water Management (Technical Memorandum W).

The review was conducted by Messrs. Ramli Halim, P.Eng., Bruce Bennett, P.Geo. and Paul Holmes, P.Eng. Mr. Halim covered the subjects related to the foundation of structures, geotechnical and geo-environmental issues, including permafrost conditions. Mr. Bennett covered the subjects related to hydrogeology, water balance and water quality while Mr. Holmes covered the subject related to the hydrology of the site.

Background

Tahera filed an application to the NWB for a water license on September 11, 2000, in connection with the use of water and disposal of mining waste effluents during the operation of the proposed Jericho Diamond Mine. The application for the water license triggered an environmental screening process by the NIRB. Draft and Final Environmental Impact Statements (EIS) were submitted by Tahera in early 2001 and early 2003, respectively. After a postponement of the initial final hearings to solve some concerns and significant deficiencies in the EIS, the final public hearings were held in the Communities of Cambridge Bay, Kugluktuk and Gjoa Haven in early 2004. Following these public hearings, the NIRB submitted their report to the Minister of Indian and Northern Affairs (INAC) in February 2004. The Minister approved the report in June 2004, and a final Project Certificate was issued by NIRB on July 20, 2004.

The NIRB's Project Certificate brought Tahera to the requirements for a water license from the NWB prior to the development of the project. Tahera submitted their documents for the application of the water license to the NWB in August 2004. Guidelines for the provision of Tahera's supplemental information were then issued by the NWB in August 2004. The NWB subsequently decided to carry out their intention to hold a technical meeting, pre-hearing conference and a public hearing, prior to their decision for granting the water license. The NWB issued a letter to Tahera on September 25, 2004, which indicated that Tahera's application generally conformed to the NWB's guidelines issued in August 2004, but that a number of issues had been identified which were not clear or did not conform to the guidelines. Tahera subsequently submitted an addendum to their submission on October 8, 2004, which addressed the issues identified from the NWB's conformity analysis. A technical meeting was then held in Kugluktuk on October 28, 2004, followed by a pre-hearing conference on October 29, 2004. The public hearing was scheduled for December 6-7, 2004.

Acres was not present during the technical meeting in Kugluktuk on October 28, 2004. However, a series of questions were submitted for the technical meeting so that Tahera could response to them. A technical teleconference meeting was subsequently held on November 9, 2004, between Acres and Tahera and their technical teams from SRK Consulting, AMEC, EBA Engineering and Aquatic Mainstream. Correspondence was also made with Clearwater Consultants as they were not available as part of the Tahera's team during the teleconference. The meeting was deemed to be productive as it enabled direct discussions about the technical content of Tahera's submission with Tahera's technical teams and clarified some questions previously submitted by Acres.

Acres Review and Comments

Acres review and comments on the documents submitted by Tahera to the NWB for the application for the water license are provided in the following sections. As mandated by the NWB, the review and comments were specifically targeted on the aforementioned documents related to geotechnical, geo-environmental, hydrology and hydrogeology of the site (see documents listed in Introduction section of this report). These comments and observations were prepared for the Public Hearing to be held in Kugluktuk between December 6 and 7, 2004.

1 Geotechnical and Geo-Environment Issues

1.1 Processed Kimberlite Containment Area (PKCA)

The designs of the structures for the PKCA facilities, including discussion about the taliks and permafrost conditions, are described in Technical Memorandum P of Tahera's submission and which also refer to Appendix W - Design of the Processed Kimberlite Containment Area (PKCA).

1.1.1 Settling Pond Elimination

In contrast to Tahera's EIS document, the settling pond has been eliminated in their submission for the water license and now is considered as a contingency plan. Another alternative to the construction of the settling pond dam is the construction of a dyke between the West Dam and the Divider Dyke. Specific details on both of these alternative structures are not currently provided in Tahera's submission for the water license.

Depending on the mining operation and the actual effluent flow into the PKCA, either one of these two alternatives may still be required. Geotechnical data are available at the site of the proposed Settling pond dam, but none exists at the location of the alternative dyke. It is suggested that Tahera provide more information about the advantages or disadvantages for each of the two alternatives, and then submit a comprehensive plan regarding their preference. Such information, together with its supporting design, should be finalized prior to the construction of the PKCA facilities. If the alternative dyke between the West Dam and the Divider Dyke is chosen, Tahera should provide further details on how to build such a structure and whether there is adequate subsurface information at the proposed site. It is assumed that this alternative dyke would be built in a similar way as the Divider Dyke (built in the wet by end dumping).

1.1.2 Divider Dyke

Tahera has indicated during the technical meeting that additional design information will be provided prior to the construction of the Divider Dyke. The details would also include the dyke cross section, and details whether an

upstream fine-filter material will be required to reduce the transportation of fine sediments from the tailings area to the western half of the pond. In addition, the crest elevation of the Divider Dyke needs to be finalized to accommodate the water flow into the PKCA without overtopping. A schedule and details which show when and how the dyke may need to be raised will be required.

1.1.3 Final Design and Drawings for Construction

Most of the construction in the PKCA facilities will likely occur a year after the start of mining activities (i.e. removal of the overburden and the initial rock excavation of the mine pit). This will provide additional time for Tahera to finalize and complete the designs for the various structures at the PKCA. Final construction drawings, complete with a Professional Engineer's stamp, will be required prior to the construction of these structures.

1.1.4 Stability Analyses

Stability analyses have been carried out for the typical dam section and dam height at the PKCA. The analyses also included the use of earthquake loading as required by the new National Building Code which will come into effect in 2005. In general, the dams and dykes have been designed using slopes and materials which are common for the size and purpose of these structures.

As indicated in the technical meeting (and also mentioned in Acres list of questions for the technical meeting), Tahera accepted that some of the analyses performed on the typical dam were not reflected in the drawings provided in the document. This was due to the changes in the design and cross section of the dam submitted in the EIS document and the final submission documents for the water license. The drawing in the submission (Appendix B – "Stability Analysis" to Technical Memorandum P "Design of the Processed Kimberlite Containment Area") still shows the use of a high density polyethylene geomembrane (HDPE) liner instead of a geo-composite clay liner (GCL) for the impervious barrier. During the technical teleconference on November 9, 2004, Tahera confirmed that the stability analyses presented in the submitted documents were based on the use of GCL – therefore, this drawing will need to be revised to show the GCL liner.

Both the HDPE and GCL barriers have been used as impermeable liners in dams built in the Arctic region. HDPE liners were used in some dams at the Lupin gold mine, while GCLs have been used to build some dams at Ekati. Tahera indicated that the GCL would be more practical for installation in the arctic environment as it is easier to work with in cold weather conditions.

1.1.5 Potential Seepage Through Dams

During the discussions with Tahera about concerns related to potential seepage through the West Dam and the North Dam, it was indicated that these dams would be constructed during the winter and the core will be built as frozen core. The dam foundations would be trenched into the permafrost-affected overburden till, ensuring that any existed ice-rich zones within the overburden would be removed prior to the placement of the dam's fill. Thermosyphon technology will be used to ensure that the foundation contact area remains frozen. As a third protection, a GCL consisting of a composite geo-synthetic liner and a clay layer will be placed between the frozen core and the upstream granular fill materials.

Similarly, concerns related to potential seepage through the East and Southeastern dams will be overcome by the formation of tailings which will be deposited in layers that will freeze immediately during the winter, forming a frozen thick tailings zone on the upstream portion of these dams. The frozen tailings will act as additional protection against seepage as these dams do not have a GCL liner. The core of these dams will also be built as frozen core.

Frozen core dams have been successfully designed for use in the arctic environment. The use of thermosyphon technology, placement of GCL, as well as construction of the dam's core in the winter to ensure that the core will be frozen will provide a security measure in terms of dam stability and curtailing seepage through the dam. However, there is still a possibility that some problems will be experienced in connection with dam construction on a permafrost foundation in the arctic using the above technologies. The failures of the Kubaka Dam in Russia's Siberian Peninsula and the Raglan Dam in Northern Quebec are two examples in which construction and design of these

dams can be problematic. Significant concerns for these dams have been attributed to the design and the quality of the construction.

In lieu of the above, it is critical that quality control during construction be implemented and that the dams be built according to the intended design. The construction of the dam should follow the intended design and should also be inspected by a qualified geotechnical engineer who has experience in dam construction in the arctic environment. Tahera should ensure that the final designs of these dams will be carried out such that they take into account all of the geothermal and geotechnical properties of the in-situ foundations, as well as the proposed fill materials. During construction, rigorous inspections and quality control measures must be implemented to ensure that these dams will be constructed as frozen structures and on foundations which have minimal potential for thawing and settlement. Ice-rich zones encountered at the dam's foundation must be excavated and removed prior to fill placement. Instrumentation must also be placed to monitor the effectiveness of the technology used, as well as the assumed design parameters. Thermistor probes will be required to check the temperature of the dam's core and its foundation.

1.1.6 Thermal modeling

The model that was presented in the EIS document was based on steady state conditions. In contrast, the revised model presented in the submissions for the water license was modified and is based on transient conditions up to a 10 year period after construction. The revised model appears to be more representative as the life of the dams will be relatively short and, hence, only temporary. In the analyses, Tahera should also include transient conditions longer than the specified 10 year period. This would cover any possibilities that the existence of these dams may exceed their current intended operation life in the event that more economical kimberlite bodies are encountered during the mine operation.

Consideration should also be made to include the effects of global warming, particularly since these trends appear to be accelerating within the past few years. While the effects may be small during the relatively short life of the mine operation at Jericho, the thermal modeling should reflect this condition.

In addition, the model should also include cases where the freezing process of the foundation occurs much more slowly than anticipated. This will provide information for both extreme and conservative conditions.

1.1.7 Thermosyphons

The thermosyphon technology that is proposed for the West and North Dams will consist of a system of looped evaporators at the dam's foundation and a series of radiators that will be located only at the downstream side of the dam's two abutment areas. Tahera indicated that the final design of the thermosyphons will be prepared. The design should provide adequate radiators and evaporators to ensure that the dam' permafrost affected foundation soils can be maintained in frozen conditions. The design should also include instrumentation details and its installation to monitor the performance of the thermosyphons. No instrumentation details were included in the current drawings submitted by Tahera.

Clarifications will be required for some of the details shown in Drawing 1CT004.06 - P8. The location of the thermosyphon evaporators on the Plan (Detail 1) does not agree with the dam's section drawing (Detail 5). In addition, the Plan shows that the thermosyphon radiators on the north abutment will be located north of the spillway, which means that the pipes from the evaporators will need to cross the spillway.

1.2 Waste Rock Stockpiles

Technical information relating to waste rock stockpiles are described in Appendix T – Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan (Technical Memorandum M).

1.2.1 Recovery Plan Rejects

It is understood that the recovery plan rejects site would be a temporary site. Based on its initial geochemical analysis, Tahera is confident that this material can be neutralized by removing it to the Coarse Processed Kimberlite (PK) stockpile site and encapsulating it within the coarse PK waste rock which has

a high neutralizing potential. At the end of the mining operation, this site would be reclaimed by placement of a cover material over the site.

The current design for the temporary storage of the recovery plan reject will have a GCL to ensure that any effluent coming from this area can be contained and will be disposed into the PKCA. A contingency plan should be included for cases where additional treatment will be required. This plan can be prepared when the mine operation is underway and on-site geochemical characteristics of the actual reject materials can be collected and evaluated.

1.2.2 Leachate Potential

The effluents from the waste rock dump and stockpiles, and from the PKCA area, have been based on leachate geochemistry tests and experience from the nearby mines. Estimates and modeling have been used to determine the projected amount of leaching potential from these facilities based on the site conditions at Jericho. Verification and monitoring of the actual water chemistry and sediment loading will need to be carried out as the mine activities progresses (see also Section 2.2 of this report).

1.3 Abandonment and Restoration Plan

Technical information relating to this subject is described in Appendix A – Abandonment and Restoration Plan.

1.3.1 Cover Thickness for Tailings in PKCA and Waste Rock Dumps

Currently, the Abandonment and Restoration Plan indicates that the typical cover thickness for the tailings at PKCA and the waste rock piles would be in the order of 0.5 m to 0.8 m – the upper 0.3 m of which is intended to promote vegetation growth in areas containing coarse material stock pile materials (such as coarse kimberlite stock pile, waste rock piles, etc). There is no discussion about a cover provision to keep the tailings or the waste rock encapsulated below the thickness of the active zone, which is estimated in the order between 1 and 3 m thick in soils and over 3 m in rock. The Plan

assumes that any leachate from the reclaimed PKCA and waste dump piles would generate relatively low concentrations of any deleterious effluents to the environment, and therefore encapsulation of the tailings and the waste rock under the frozen conditions would not be critical.

The above proposed cover plan will need to be further reviewed after performance from these areas can be monitored during the mining operation. Adequate thickness for the cover in the PKCA and waste rock piles at the end of the mining operation will need be reviewed, and if necessary be revised, depending on the performance of these areas.

1.3.2 Long Term Considerations - Global Warming

Global warming may potentially impact the climate in the Arctic region. Recent scientific evidence indicates that its effect may have intensified in the past few decades, resulting in potential consequences on the physical, ecological and wildlife systems. The Abandonment and Reclamation Plan, however, did not provide any information on the consequences of global warming on the structures remaining after the end of the mining operation. No discussion was provided on how changes in the climate may affect an increase in the concentration of contaminants from leachate effluents (through deeper thawing of the tailings or waste rock piles) from the reclaimed areas, such as the tailings in the PKCA, waste rock stockpiles, etc. Such considerations must be addressed in the analyses of any reclamation work, and remedial measures must be provided in the Plan.

1.3.3 Reclamation Cost

The reclamation cost for the Jericho mine appears to be based on the assumption that the mining operation would proceed as planned, without encountering any major problems related to additional work or clean-up associated with worst-case scenarios. Such scenarios may include additional treatment that must be carried out on the waste rock materials, PKCA tailings and/or water that will be discharged back into the environment.

In general, however, the cost estimate appears to be in the correct order of magnitude. The 10% contingency which is added in the cost appears to be low since the reclamation work is based on the assumption indicated above. Furthermore, as detailed engineering and in-situ specific data have not been fully utilized and the mining operation has not yet started, a larger contingency (15% or 20%) would be more appropriate. However, this cost estimate will need to be updated as the mining operation and some progressive reclamation work are being carried out over the years.

2 Site Hydrology, Water Quality and Monitoring Issues

2.1 Site Hydrology

As discussed in Technical Memorandum W "Site Water Management", the proposed plan to manage the runoff and seepage from the various waste dumps and process areas (shown in Drawing 1CT004.06 – W1) is to collect and direct the runoff to the open pit by means of a series of temporary ditches and sumps. This water would then be discharged to the environment if acceptable, otherwise it will be pumped to the PCKA for treatment prior to release to the environment. As a contingency, the site water management plan includes provision for the construction of three (3) separate collection Ponds A, B and C. If necessary, these ponds would provide additional attenuating water storage and/or water quality monitoring prior to discharge to the environment or the PKCA. In addition, the plan involves the construction of several ditches to maintain surface runoff flows of watercourses diverted around the site (C1 and C4), to convey internal runoff to storage/treatment facilities (open pit, PKCA, Ponds A, B or C) and for discharges to the environment (C3).

The overall site water management plan, including the location and sizing of the various water management facilities (e.g. PKCA, diversion ditches, collector ditches and collection ponds) is consistent with standard hydrologic engineering methods and is considered to be an adequate approach to the manage the quantity of runoff generated from the site whilst minimizing the potential for adverse surface water-related impacts to the environment.

2.2 Water Quality

As noted above, the base case water balance analysis assumed that all runoff and seepage from the water management facilities would be collected and directed to the PKCA for storage and subsequent release to Lake C3 via Stream C3, unless the component area monitoring indicates that the collected runoff is acceptable in terms of water quality in which case that particular runoff would be released to Carat Lake instead of being routed to the PKCA.

Best estimate and upper bound (i.e., 90^{th} percentile) concentrations of contaminants from the waste rock and overburden, kimberlite ore and low grade

ore, and coarse processed kimberlite were derived using the methods described in Technical Memorandum I "Estimates of Source Concentrations." The derivations were made on the basis that the soluble contaminants (i) are immediately available and removed from these sources via infiltration/runoff, and (ii) would persist through the operational period of the mine. In actuality, Tahera expect that any build-up of the source concentrations over time would be minimal due to (i) the very low concentrations of sulphide minerals in the sources and, thus, negligible potential for acid generation, and (ii) the inability of the waste/ore sources to continue contributing soluble contaminants due to freeze-back of the waste/ore sources themselves.

The predictions of effluent quality at the PKCA were conservatively made by assuming that the waste rock dumps and ore stockpiles would be fully in place starting in Year 1. In actuality, contaminant concentrations in the PKCA effluent would normally be expected to gradually increase over the operational period of the mine as the contaminant sources build up in the waste/ore storage areas – notwithstanding the above noted discussion concerning negligible acid generation potential and freeze-back issues. Therefore, if the effluent quality approaches the Proposed Discharge Limits for the PKCA then, in our opinion, this outcome would not occur until the latter part of the mine operational period. Tahera indicated that sufficient storage capacity is available in the PKCA at all periods during the mine operation so that, if necessary, the effluent could be held while effluent treatment measures are assessed and, if necessary, implemented. Proposed measures for treatment of the PKCA effluent (as a contingency item) were described under the following documents:

- For ammonia – AMEC memorandum "Review of Ammonia Treatment Alternatives for Mine Effluent at Jericho" dated October 12, 2004, and;
- For metals – AMEC memorandum "Review of Treatment Alternatives for Metals in Mine Effluent at Jericho" dated October 22, 2004.

The average value Proposed Discharge Limits (PDL) described in Technical Memorandum O were developed on the basis of a 10 times dilution factor so that the release of effluent from the PKCA would be less than the aquatic threshold for a particular contaminant upon reaching the boundary of the 200 m mixing zone in Lake C3 and, thus, not exceed the assimilative capacity of this lake. Rationale was provided in this memorandum for lowering the PDL below the 10 times dilution value for TDS, chloride and zinc and increasing the values for aluminum and uranium. Although the release of effluent from the PKCA is expected to

exceed the CCME guidelines for freshwater aquatic life in Stream C3, Tahera has committed to testing the PKCA effluent so that the discharges would not be acutely toxic to aquatic life. The No Net Loss Plan presented to Fisheries and Oceans Canada addresses short-term impacts to aquatic biota in Stream C3 by restricting fish access to this stream and providing physical compensation for the temporary loss of habitat.

2.3 Monitoring

Technical information relating to this subject is described in Appendix I – Operational Monitoring Summary.

2.3.1 Monitoring Station on Eastern Watershed (Lynne Lake, Contwoyto Lake, etc.)

The current plan for the water quality monitoring stations will mostly be concentrated on streams and lakes located to the west and northwest of the Jericho mine area. In concept, these stations will be located in the mining areas and in areas where the watershed and water flows from the mining activities will be located. These include Stream C1, Stream C3, Lake C3, Carat Lake, the open pit and a few stations further to the north of Carat Lake where water will flow into the Jericho River and continue downstream into the Burnside River system.

A concern was raised during the teleconference meeting about the lack of monitoring stations on the east and southeast parts of the mining area. Because of their proximity to the west dump stock pile areas, water quality in some of the smaller lakes to the south, southeast and to the east of the mine should also be monitored. This includes Ash Lake, Key Lake, Lynne Lake and Contwoyto Lake. Tahera indicated that the lakes mentioned above are located on a different watershed, and therefore would not likely be subjected to effluent flows from the mine. In addition, Tahera also mentioned that water quality monitoring station will be carried out in Lynne Lake.

Based on the latest information obtained from Tahera, Acres still recommends that some water sampling be carried out on the above noted lakes, at least in

the initial part of the mining operation and as background readings. If no notable effects from the mining operation are identified then the sampling program can be reduced or subsequently eliminated. Water quality monitoring at Ash Lake would be essential to prove that the frozen PKCA tailings, the East and Southeast Dams are effective in preventing any effluent flow into this lake.

2.3.2 Correction of Tables and Figures

Tahera has indicated that some of the Figures and Tables presented in Appendix I will be corrected, as there are some errors in labeling of the monitoring stations in Figure 6.1, Tables 5-3 and Table 5-4.

Summary and Recommendations

Tahera's 2004 submission documents for the water license application contain a comprehensive plan for the Jericho mine operations. These documents provide some modifications, additional detail designs and further refinements of the EIS documents that were submitted to NIRB and subject to reviews by the regulators and the public at hearings held in the communities affected by the proposed mine operation. Additional information was also provided by Tahera in their addendum submitted to NWB on October 8, 2004. This addendum addressed some specific issues that were brought forward by NWB following their conformity analyses.

Overall, the documents show that Tahera is committed to delivering a mining project that would not only be the first diamond mine in the Nunavut Territory, but also a project that minimizes disturbance to the natural environment and maximizes the social and economic benefits to the people of Nunavut and the mining industry in general.

As the actual mining operation has not yet started, the documents contain a number of contingency plans, alternative schemes and some operation flexibilities to meet with the environment requirements and government regulations. It is therefore important, that once the mining operation starts, Tahera commence with the verification and monitoring of the selected programs, carry out additional trials/studies and complete the final designs, as well as continue with the selection process among considered alternatives. Some of these activities must be carried out early because of the relatively short duration of the proposed mining operation (9 years). In particular, such activities should include, but are not limited to the following:

- Carry out reclamation trials.
- Carry out progressive reclamation activities.
- Conduct geochemical and geothermal monitoring of the excavated overburden, waste rocks, and ore materials stock piles.
- Provide adequate field monitoring and reporting during construction and operation of all collector, diversion and discharge ditches (C1, C3 and C4, among others) for signs of channel erosion and/or sedimentation.

- Provide adequate water quality monitoring and reporting at the proposed waste dump drainage outlets during the development and operation of the wastes dumps to confirm the need to construct Ponds A, B or C.
- Provide adequate field monitoring and reporting of drainage conditions along the southern fill slopes associated with the waste dumps with specific emphasis on ensuring that seepage and/or uncontrolled runoff from the waste dumps into Ash Lake, Key and Lynne Lakes do not occur.
- Complete final designs for the PKCA and its various dam and dyke structures, reclaim and decant system, settling pond (if required), etc.
- Complete final designs for the dump ponds, waste dumps and stockpiles, and their drainage and ditch system.
- Prepare operations manual for the PKCA.
- Review of water and waste rock/material balances.
- Carry out additional studies to determine sources of uranium in seepage from waste pile development.
- Adopt the Proposed Discharge Limits for the PKCA effluent to serve as a trigger for further investigation and possible implementation of the water treatment contingency measures.
- Adopt of the proposed acute toxicity testing program for the PKCA discharge to Stream C3.
- Adopt the No Net Loss Plan.
- Adopt the proposed Water Quality Monitoring program.