February 9th, 2006

Chief Adminstrative Officer
Nunavut Water Board
P.O. Box 119
Gjoa Haven, Nunavut
X0B 1J0

Delivered by Email

RE: Part M, Item 2 and Part M, Item 7 Revised Interim Closure and Reclamation Plan

As per Tahera's Water License, Part M, Item 2 and Part M, Item 7, please find attached the Abandonment and Restoration Plan as well as an updated estimate of the total mine closure using the RECLAIM model.

Should you have any additional questions do not hesitate to contact myself or Site Environmental Staff.

Sincerely,

ORIGINALLY SIGNED BY

Greg Missal
VP, Government and Regulatory Affairs
Tahera Diamond Corporation

ORIGINALLY SIGNED BY

Mike Tanguay
Health, Safety and Environment Manager
Tahera Diamond Corporation

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Closure and Reclamation Plan Update
Jericho Diamond Mine, Nunavut

Water Licence NWB1JER0410

Submitted to:

Tahera Diamond Corporation
Toronto, Ontario

Submitted by:

AMEC Earth & Environmental
Burnaby, BC

February 2006

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EXECUTIVE SUMMARY

The reclamation plan for the mine has the objective of minimizing the environmental impact of mining operations to the extent practical, and of maintaining the overall present productivity of the site. The end-land use will be to leave disturbed areas so that they may return as quickly as possible to productive wildlife habitat.

The general reclamation program components will be as follows:

- salvage and stockpile overburden from the areas of disturbance;
- progressive revegetation of areas disturbed by the pre-production phase to the extent practical;
- reslope rock dumps to a maximum overall 2:1 slope angle (26°); average slope will be 19°. This will be accomplished by grading off the benches which will be 10 m high and set back from the one below 15 m;
- prepare surfaces for the replacement of overburden materials;
- recover stockpiled overburden and spread it over reclaimed areas that would benefit from addition of top dressing materials;
- revegetate the prepared areas where appropriate and indicated from reclamation trials;
- establish test plots to optimize growth mediums; and
- monitor growth and develop performance objectives.

Overburden will be used to top dress most disturbed horizontal surfaces. Given uniform coverage of overburden in the pit area and a 400 m diameter pit, approximately 940,000 m^3 of sand and gravel may be available. This is adequate to place a minimum of 0.3 m of overburden on these surfaces. The amount of organic overburden salvageable from the open pit area has been insufficient to separate from till.

The overburden stockpile will be constructed to minimize potential for slope failures. This will be achieved by placing the stockpile(s) in low lifts using a scraper or by end-dumping with trucks.

Pre-existing native plant communities cannot be completely re-established. However, partial reclamation is possible. Many species of wildlife (e.g. caribou, canids) should resume use of disturbed esker habitats when the infrastructure is removed. A cooperative approach will be sought with Ekati Diamond Mine™, Diavik and Snap Lake mines in information exchange on reclamation research in Arctic environments.

The target end land use is wildlife habitat and the aim of the Jericho reclamation is to promote, to the extent practical, rehabilitation of the land to this use. Vegetation prescriptions will be developed and tested based on the pre-disturbance ecological zones where the disturbed areas are located. The aim will be to provide overburden conditions similar to pre-disturbance conditions and to the extent possible, revegetate or encourage native species at the site similar to those that occurred prior to disturbance.

Reclamation trials will be used to determine what reclamation prescriptions are most likely to be successful in the Jericho Project area. However, work of others provides some guidance. Reclamation trials will be conducted throughout the mine life with greater intensity of activity during the initial years. The purpose of the trials will be to establish a database on establishment and growth success of vegetation on reclaimed land.

Reclamation will be progressive throughout the mine life up to closure and abandonment. Limited reclamation will be possible following construction. Major reclamation will occur following completion of open pit mining with reclamation of the waste dumps. Portions of the processed kimberlite containment area no longer required will be reclaimed as the mine units become inactive. Final reclamation will occur after mine closure. All infrastructure will be removed, or buried on site. Hazardous wastes will be removed; any remaining contaminated soils will be remediated. The landfarm will be closed and covered over. Compacted surfaces will be scarified, top dressed with overburden and planted as indicated by reclamation trials. Where possible, drainages will be returned to their pre-mining courses. Tahera will address the issue of aesthetics on closure to the extent practical. All removable infrastructure will be taken off site. No scrap will be left; it will be burned, buried, or taken off site.

A post closure monitoring program will be undertaken to ensure the mine site is left in a stable condition and no contaminants are being exported off the site.

The open pit will require a minimum of 20 years to fill naturally; during the interim, all mine drainage will be directed to the pit which will act as a sump. Upon filling, water will be directed either back into the C1 stream channel, or into a specially constructed open channel to Carat Lake. Some in-pit treatment of water may be required.

An updated reclamation and closure cost estimate to 31 December 2005 is attached in Appendix D.

1.0 INTRODUCTION

The closure and reclamation plan is submitted in fulfilment of requirements of Tahera Diamond Corporation (Tahera) Water Licence NWB1JER0410, Part M, Item 7 and is the first update submitted under the subject water licence. The Jericho Diamond Mine commenced construction in Q1 2005 and construction was nearly completed by the end of 2005. This plan reflects as-built conditions at the site for facilities completed.

1.1 Concordance

The plan addresses the requirements as set out in Schedule M, Item 1 of the Jericho water licence where applicable to this first update. Table 1.1 provides the list of water licence requirements and the section of this plan that addresses the requirements.

Table 1.1: Concordance Table – Reclamation and Closure Plan Requirements Under Water Licence Part M, Items 2 and 7 and Schedule M, Item 1

Schedule M, Item 1 Requirement	Closure Plan Section
a: The combined use of a Inuksuit built by Elders, berms, and signs to warn people and animals about the unfilled open pit. The edge of the Pit Lake shall be contoured and controlled-blasted on a shallow 5:1 angle into the lake for a 10 meter distance so as not pose a hazard to people or wildlife	Not applicable at the current mine stage
b: Maintenance of the diversion channel, as a permanent structure beyond closure should water quality dictate. This issue shall be further addressed during operation and resolve the issue prior to closure, when water quality concerns and the options available to re-instate the flows in the channel are better understood	Not applicable at the current mine stage
c: The implementation of revegetation through the abandonment and restoration planning	Section 4.0
d: to conduct re-vegetation research on the kimberlite to determine if the post-closure conditions can be improved	Section 4.6
e: details of the proposed methodology for recovering the stockpiled overburden materials for reclamation purposes	Section 2.4
f: address how meltwater from the stockpile is managed to prevent release of suspended sediment	Section 2.4
g: revisions based on all monitoring data collected to that time	No revisions of handling methods based on monitoring to the end of 2005
h: an updated prediction of pit fill rate and effluent discharge quality after closure	Only one construction year of data collected and more data are required after construction completed. See Water Management Plan Table 3 (attached to this report as Appendix F.
i: a plan to remove and dispose all chemicals and regulated materials in a manner that meets all current regulations	Sections 5.5.10, 5.5.11
j: An evaluation of alternative closure and reclamation measures for each project component, including the rationale for selection of the preferred measures, to include, but not be limited to all site facilities/infrastructure as defined in this licence	Sections 5.5.1.3, 5.5.2.1, 5.5.2.3, 5.5.3.1, 5.5.4.2, 5.5.9, 5.5.10
k: detailed description, including maps and other visual representations, of the pre-disturbance conditions for each site, accompanied by a detailed description of the proposed final landscape, with emphasis on the restoration of surface drainage over the restored units	Sections 4.4, 5.0. Maps in Appendix A, photos in Appendix E. See also Waste Rock Management Plans.

Schedule M, Item 1 Requirement	Closure Plan Section
l: a comprehensive assessment of materials suitability, including geochemical and physical characterization, and schedule of availability for restoration needs, with attention to top-dressing materials, including maps where appropriate, showing sources and stockpile locations of all reclamation construction materials	Materials suitability will be determine through revegetation trials. See Section 2.4 and Appendix A for discussion of stockpiled overburden and stockpile location. Section 2.2 provides information on salvage requirements and Table 5.1 lists area availability for reclamation by year.
m: an assessment of the long-term physical stability of project components	Section 5.5.1.2. See also Water and waste management plans + dyke design plans + causeway design plan
n: an assessment and description of any required post-closure treatment for drainage water that is not acceptable for discharge from any of the reclaimed mine components including a description for handling and disposing of post-closure treatment facility sludges	Section 5.5.2.3
o: monitoring programs to assess reclamation performance and environmental conditions including, but not limited to, monitoring locations for surface water and groundwater, parameters, schedules and overall timeframes	Section 6
p: contingency measures for all reclamation components including action thresholds that are linked to the monitoring programs	Sections 5.5.2.3, 6.5.1
q: a description of the proposed means for providing long-term maintenance of each reclaimed project component, including the water collection and distribution systems, retaining structures and spillways	Section 6.5
r: an evaluation of the potential to re-vegetate disturbed sites that includes the identification of criteria to be used to determine technical feasibility and alternative restoration options	Information pending U of A reclamation research
s: a description of how Waste Rock Dumps and the PKCA could use a geomorphic approach to simulate surrounding landscape conditions, rather than the highly engineered closure designs	The current designs are optimized for safety, long-term stability and minimization of footprint. Options within these constraints will be reviewed as mining moves forward. Dumps are graded to direct runoff water toward the open pit.
t: an identification of the research needs for reclamation	Sections 4.6, 5.4.5
u: a description of how progressive reclamation will be employed and monitored throughout the life of the mine, plus reclamation scheduling and coordination of activities with the overall sequence of the project; details of restoration scheduling and procedures for coordinating restoration activities within the overall mining sequence and materials balance	Sections 5.4.6, 5.5

1.2 Reclamation Objectives

The reclamation plan for the mine has the objective of minimizing the environmental impact of mining operations to the extent practical, and of maintaining the overall present productivity of the site. The end-land use will be to leave disturbed areas so that they may return as quickly as possible to productive wildlife habitat.

The short-term reclamation objectives are to:

- progressively reclaim disturbed areas as soon as they are no longer active;
- minimize the risk and impact of water erosion and sediment transportation;
- stabilize slopes;
- restore drainage;
- cover ground to prevent fine material drifting/dust;
- start to rejuvenate the top dressed material; and
- (where practical) create a green cover for aesthetic reasons.

Long-term objectives are to:

- maintain or improve the level of wildlife habitat; and
- (to the extent practical) create an aesthetically pleasing environment.

Specific commitments made by Tahera on the Jericho Diamond Project with respect to achieving the objectives include:

- to the extent practical, minimize disturbed areas through progressive reclamation;
- where stripping occurs, recover all overburden practical;
- conduct revegetation trials through the mine life to determine what prescriptions work most effectively at Jericho;
- maintain an active liaison with other mines in the Canadian Arctic with respect to reclamation initiatives at their mine sites.

This abandonment and restoration plan has been developed consistent with the objectives of the *Mine Site Reclamation Policy for Nunavut* (INAC 2002).

1.3 Reclamation Activities

The general reclamation program components will be as follows:

- salvage and stockpile overburden from the areas of disturbance where practical;
- revegetate areas disturbed by the pre-production phase to the extent practical pending results from trials;
- reslope rock dumps to a maximum overall 2:1 slope angle (26°); average slope angle will be approximately 18°; this will be accomplished by grading off the benches which will be 10 m high and set back from the one below 15 m;
- prepare surfaces for the replacement of top dressing materials;

- recover suitable stockpiled overburden and spread it over reclaimed areas that would benefit from addition of top dressing material;
- depending on reclamation trials results, coarse PK may be substituted for top dressing material if the PK proves to be a suitable growth medium;
- revegetate the prepared areas where appropriate and indicated from reclamation trials;
- establish test plots to optimize growth mediums, particularly on the PKCA where Ekati Diamond Mine™ (Ekati) experience has shown positive results; and
- monitor growth and develop performance objectives which will be developed as part of revegetation research.

1.4 Mine Plan

The Jericho Mine Plan was submitted to the NWT/NU Mines Inspector 17 October 2005 and accepted January 2006. The plan provides details on construction and operation of the open pit mine. The construction phase substantially complete at the end of 2005 and operation scheduled to commence Q1 2006.

The planned site arrangement overlain on surficial geology is shown in Appendix A, Figure 1. Appendix A, Figure 3 provides a detail of the camp and storage area.

2.0 OVERBURDEN MATERIALS HANDLING PLAN

2.1 Surveys

Overburden information at the Jericho Diamond site was derived from two sources: geotechnical surveys conducted by Bruce Geotechnical and a surficial geology survey conducted by Thurber Engineering in 2003.

2.1.1 Bruce Geotechnical

Geotechnical surveys were conducted to assess borrow materials (Bruce Geotechnical 1996a) and overburden properties (Bruce Geotechnical 1996b). Four test pits were dug and ranged from 0.4 to 0.7 m depth. Nine boreholes were also drilled in the esker containing the airstrip and to the east of the airstrip (Figure 2.1). Soil profiles were typical of eskers in that sand and gravel predominated. Up to 0.2 m of organic materials was found at two of the borehole sites. Soils on eskers are not representative of those present in other ecological zones, being thicker and having a much higher percentage of sand and gravel.

Seven boreholes were drilled in the area of the proposed 1996 waste rock dump (approximately co-incident with Waste Rock Dump #1) and the proposed open pit. Two additional holes were also drilled at the east end of Lynne Lake (Figure 2.2). Borehole logs indicate overburden composed predominantly of sand and gravels and vary in thickness from 0.6 to 12 m. One of the boreholes at the east end of Lynne Lake contained 1.8 m of organic overburden; this area is outside the zone of disturbance for the mine and thus organic soils from this location will not be available for reclamation. Average depth to bedrock was 7.1 m. The active layer at the site is between 0.3 and 2 m in till and thus removal of overburden in any location with tills deeper than the active layer would result in a new active layer forming. Unless side slopes at the removal areas are kept shallow, some slumping can be expected.

Available drilling data suggest the overburden comprises mainly sand and gravel, with some zones of silt and till. The coarse fraction includes cobbles and, occasionally, boulders.

The total tonnage of overburden tills is estimated to be 1.6 million tonnes. The density of these tills after dumping could range from about 1.6 to 1.9 t/m^3. Due to the presence of ice, the settled density has been conservatively estimated to be 1.7 t/m^3, leading to an estimated dump volume of about 0.940 million m^3.

2.1.2 Thurber Engineering

A general surficial geology survey of the mine site was conducted by Thurber Engineering Ltd. (Thurber) in 2003. The survey mapped surface units over the entire mine site prior to construction and will be used as a basis against which reclamation will be measured. A copy of the Thurber map with current facilities overlain is attached in Appendix A, Figure 1.

Tahera Corporation

FIGURE 2.1

Borehole and Test Pit Investigation Area

Date:30/9/1999
Author:
Office: North Vancouver
Drawing:
Scale: 1:0
Projection: UTM Zone 12 (NAD 27 for Canada)

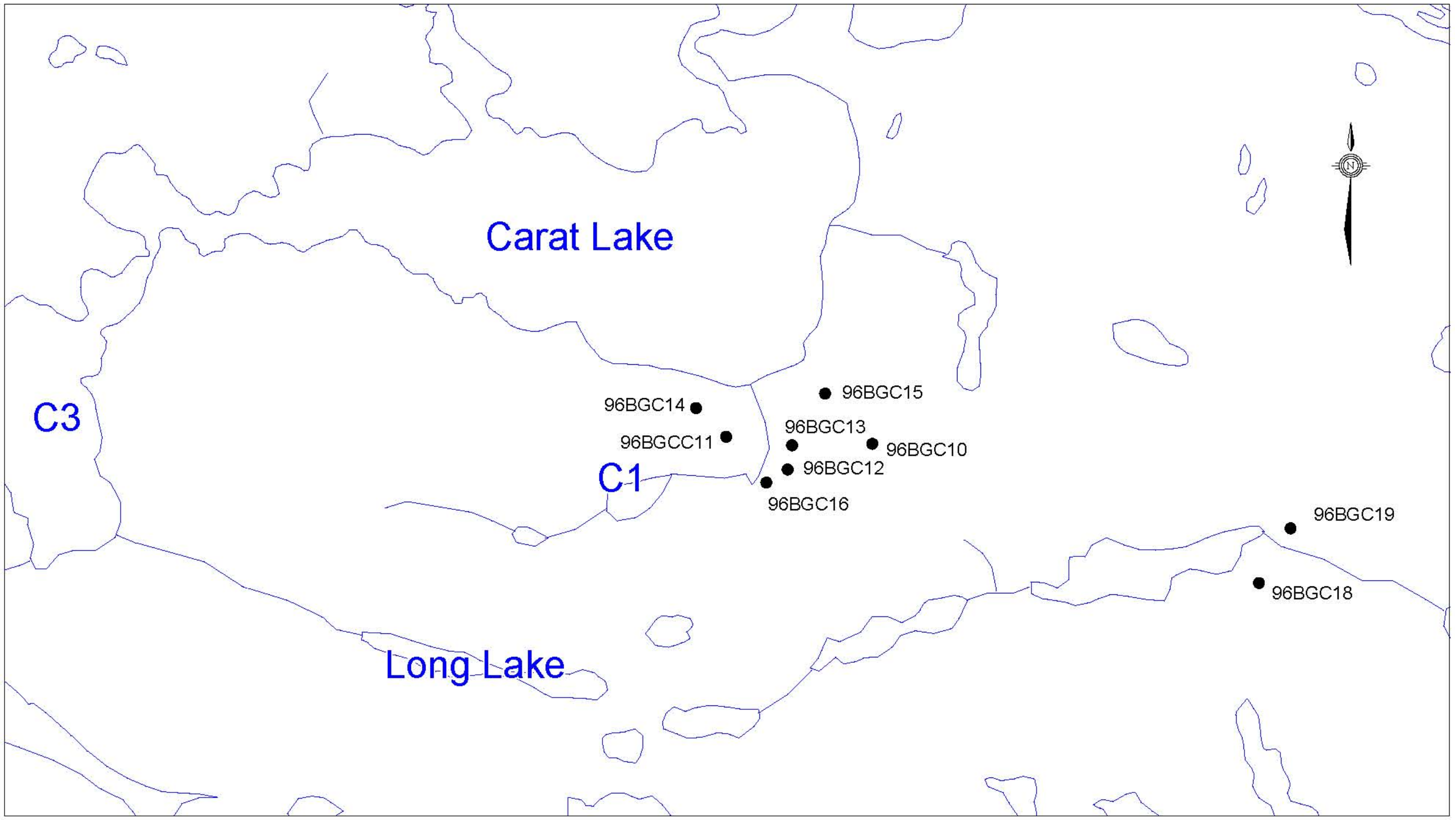


FIGURE 2.2

Borehole Location Map

Date:02/10/2000
Author:
Office: North Vancouver
Drawing:
Projection: UTM Zone 12 (NAD 27 for Canada)

2.2 Salvage Requirements

The two waste rock dump tops will encompass an estimated area of 20.8 ha. At a top dressing material depth of 0.3 m, coverage would require 62,400 m^3. The dump slopes are not anticipated to be top dressed. Priority areas for reclamation will be sites that have the highest chance of benefiting from top dressing, such as the PKCA and infrastructure pads.

The ore stockpile pad is located in the camp area and will be reclaimed with the camp, discussed below.

The PKCA will cover an area of 18.8 ha including dams. As the PKCA is developed from east to west it will be progressively covered with coarse PK and rock over the eastern part of the impoundment. On dry and settled areas, vegetation trials will be carried out and if proven successful, the PKCA will be progressively revegetated. A cover of up to 0.5 metre of coarse kimberlite may be used. If growth trials indicate poor plant growth success on coarse kimberlite, suitable overburden top dressing material may be placed to top dress the coarse PK. Use of overburden will pre-suppose successful vegetation trials on this growth medium. As shown on Appendix A, Figure 1, a pond will remain at the close of the PKCA. The PKCA slurry (east end) will be covered with 0.5 m of coarse PK and may be top dressed with 0.3 m of overburden. A total of 47,000 m^3 of PK and 28,000 m^3 of overburden will be required to reclaim the PKCA. Most of the coarse kimberlite stockpiles will not be required for reclamation. They will be regraded similar to waste rock dumps. Planting and/or cover with overburden will be decided on the same basis as for the PKCA. The area of the coarse kimberlite stockpile tops will be 6.7 ha upon completion of ore processing (discounting removal of coarse PK for reclamation of the processed kimberlite containment area).

Roads, laydown areas, the plant, powerhouse, accommodation, mechanical shop, crusher site, explosives storage, emulsion plant and explosives truck shop, and miscellaneous small areas will cover an additional approximately 32 ha.

The total area of disturbance of borrow areas and airstrip will be 36 ha, if borrow areas are completely exploited. As shown on Appendix A, Figure 1, only relatively small parts of the borrow areas are planned for extraction; a total estimated area of 8.6 ha will be disturbed. These facilities are/will be located on eskers and no top dressing of additional material will be required, only regrading where required to eliminate steep slopes and add micro-contours where indicated.

The open pit is not slated for revegetation due to the steep side slopes. Rather it will be allowed to fill with water. Current plans call for discharge through a dedicated channel once the pit fills (estimated to be a minimum of 20 years post mine closure). Estimates of pit refill time will be refined once adequate water balance data are collected by the mine.

Table 2.1 contains a summary of top dressing material requirements for reclamation.

Table 2.1: Reclamation Top Dressing Material Requirements

Facility	Requirements for 0.3 m Cover (m^3)
Waste Rock Dumps Tops	62,400
PKCA	28,300
Coarse Kimberlite Tops	20,200
Camp Storage, Explosives Storage, Crusher Site, Laydown, Waste Transfer	44,400
Total	**155,300**

In addition 47,000 m^3 of coarse PK will be spread on the PKCA east of the divider dyke on closure. Roads and the airstrip will be scarified but not topdressed since they are surfaced with till (roads) or esker (airstrip).

2.3 Stockpile Locations

The largest proportion of overburden tills will be removed in Years 1 and 2 and will be stockpiled on the overburden stockpile on Waste Dump 2 (Appendix A, Figure 1). Overburden may temporarily (less than one season) be stockpiled at other locations where sedimentation in runoff can be controlled and where the area is already in a disturbed site, such as one of the pads with vacant space. Temporary storage may occur, if it allows placement of overburden near its final location and if it is anticipated the overburden will be placed at its final location within that year.

2.4 Overburden Stockpile Design and Construction

The overburden stockpile will be used primarily to store potential top dressing material, most of which will be frozen when it reports to the overburden stockpile. Some portion of the overburden stockpile is likely to thaw during the summer months and may require confinement. The design of the overburden stockpile was based on the use of waste rock to provide confinement to the overburden in the event it thaws and, due to excess water, shows a propensity to slump or "run." For planning purposes, it has been assumed that a waste rock buttress will be constructed around parts of the overburden not confined by Waste Rock Dump 2 using centreline construction methods. The downstream slopes of the waste rock would be the same as for the two waste dump sites.

Overburden was hauled to its stockpile using off-road mine trucks on all-weather mine access roads. The overburden stockpile will be principally constructed over a two-year period (Years 1 and 2); Year 1 is completed. The foundation preparation procedures for the waste rock were the same as those used for the waste dumps. The waste rock was placed by end dumping and spread with a dozer.

In order to preserve the frozen conditions within the base of the waste rock, a frozen foundation layer was developed at the base of the overburden. In addition, waste till placement will be managed to try to lock in the frozen conditions within the foundation layer and prevent thawing of either the foundation layer or the underlying foundation.

In the summer prior to the anticipated need for material from the stockpile, the anticipated quantity will be windrowed if necessary to facilitate handling when frozen and to increase the active layer depth if required. Because excessive rehandling negatively affects top dressing material properties, rehandling will be minimized to the extent possible.

2.5 Top Dressing Placement Strategy

For reclamation, top dressing material will be windrowed along the top dressing area in preparation for a dozer to replace the material. Stockpiles located remote to the replacement area will be hauled by truck, and again windrowed along the top dressing area for replacement.

The replacement of the top dressing material will be under the direct supervision of in-house environmental personnel to ensure the required replacement thickness is achieved and to monitor the condition of the replaced material. Weather or material conditions, which are not conducive to effective replacement, will require temporary suspension of the program or remediation measures. Any amendments to the top dressing material, which are identified as being required based on reclamation trials, will be added during replacement.

3.0 EROSION AND SEDIMENT CONTROL PLAN

Sedimentation control structures and erosion control are discussed in the water management plan for the project (Tahera 2005). In summary, all clean water (runoff from undisturbed areas) will be routed around the site as required. All runoff from disturbed areas will be directed to the open pit, east sump or sediment ponds (when constructed) as required for settling of suspended sediment and then released to the environment (in most cases, upland tundra). Alternatively, this water will be discharged to the PKCA if water licence criteria are not met. On closure mine area drainage will be directed to the open pit which will act as a sink until it eventually fills and overflows, either into Stream C1 or an open channel to direct water away from Stream C1 (see Section 5.5.2).

Erosion will be controlled principally by slope angles of constructed facilities being kept less than the angle of repose or by rock armouring, as appropriate. Long-term sediment control will consist of revegetation, where such is feasible, or rock armouring where it is not, and where erosion control is required.

There will be areas where revegetation is not possible and rock armouring will be used in such areas. Because overburden material will be placed and revegetation will proceed on most flat surface areas, the un-revegetatated areas are likely to be the slopes of the waste rock, coarse kimberlite and the remaining overburden stockpiles. The regraded surfaces will consist of coarse rock in most of these cases, so the requirement for additional erosion protection is likely to be very limited. Where it is necessary to import armouring for erosion protection, it will be obtained by screening suitably sized inert material from the waste rock or overburden stockpiles.

4.0 REVEGETATION PLAN

4.1 Introduction

Pre-existing native plant communities cannot be completely re-established, however, some reclamation is possible. Many species of wildlife (e.g., caribou, canids) should resume use of disturbed esker habitats when the infrastructure is removed. A cooperative approach will be sought with Ekati, Diavik and Snap Lake mines information exchange on reclamation research at diamond mines in Arctic environments. Revegetation research will be conducted at Jericho in cooperation with the Dr. Anne Naeth of the University of Alberta. This research effort will commence early in the operating life of the mine.

Wherever possible, islands of undisturbed vegetation will be left in disturbed areas. These islands will provide a seed source for adjacent areas once reclamation of those areas commences. This approach has been shown to be effective in temperate alpine areas (Bittman 1995), and also at preliminary trials at Ekati (Reid 2002).

4.2 Ekati Experience

Ekati has conducted revegetation experiments at the mine since 1998. A recent series of reports details revegetation research and results at Ekati (Kidd and Max 2000a, 2000b, 2001, 2002; Martens & Assoc. 2000, 2001, 2002, 2005; Reid 2001a, b, 2002). In summary Ekati's findings are:

- except on mesic to moist, fine-grained soils, establishment of vegetation without amendments is problematic;
- addition of fertilizer will speed initial establishment, but, in combination with cultivars (agronomic species) can retard establishment of native vegetation; limited addition of fertilizer (every three years for 10 years) is required to develop a self-sustaining plant cover;
- limited use of native grass cultivars are the most successful in establishing on recontoured surfaces and when applied at a low seeding rate, appear to enhance colonization of native species;
- for treatment of erosion on mesic or wet sites, annual grasses (agronomic species) and fertilizer will produce an adequate cover in one season; there is no practical alternative to fast-growing agronomic species other than riprap;
- sewage sludge (from the mine) is an acceptable substitute for inorganic fertilizer on many sites;
- on Ekati's PK containment facility, tundra seedling survival has continually declined due principally to burying by wind blown kimberlite;
- the availability of native Arctic vegetation, except for natural seed sources, is extremely limited;

- coarse and fine PK do not make ideal growth media over the longer term and may result in elevated metals in plants, although not at phytotoxic levels; some success in revegetation occurred in mesic to wet areas of the PKC; and
- upper beaches with predominantly coarse PK are not amenable to plant growth and rock armouring appears to be the only viable overburden stabilizer.

Table 4-1 summarizes the nine years experience at Ekati.

Table 4.1: Summary of Revegetation Trials at Ekati

Location	Amendments	Plants	Results
Fox Portal test plots	Organic soil Esker sand Lake sediments	Native grass cultivars Indigenous seed Legume Shrub cuttings	Most favourable growth from organic soil and native grass cultivars (5-8% in 1 year, 6 – 20% in 2 years, 39-52% in 5 years); others negligible
Wetland (diversion)	None	Legume (*Epilobium*)	26% vegetative cover
PKC mid slope	Fertilizer every 3rd for 10+ years	Native grass cultivars	From 10% to 50% survival
PKC	Coarse kimberlite Fine kimberlite	Native grass cultivars	Little growth on coarse PK; better on fine PK; high trace metals in vegetation (not phytotoxic)
PKC	Fertilizer 1st year; reapplied 3rd year	Annual fall rye or regreen	2004 results indicate not suitable for long-term erosion control. Hairgrass and Arctared fescue appear most tolerant to wind-blown kimberlite smothering
Channel banks	None	Polar grass (*Arctagrostis latifolia*)	Assist in stabilization; subject to grazing damage
Riparian/aquatic	None	Willow cuttings	46% survival in 1 year (2004); subject to grazing damage
Airstrip graded banks	Contour to create hollows and add boulders	Seed + fertilizer	11% - 13% cover up to 20% in depressions

Table 4.2 provides a list of the species of native cultivars used at Ekati.

Table 4.2: Native Cultivars Used for Revegetation at Ekati

Native Grass Cultivars	Native Forb Cultivars
Arctatgrostis latifolia (Polar Grass)[1]	*Astragalus alpinus*
Carex sp.	*Epilobium angustifolium*
Festuca rubra[1]	*Epilobium latifolium*
Poa alpigena	*Oxytropis viscida*
Poa glauca[1]	
Poa sp.	
Unidentified grass	

Notes: [1] Best survival in revegetation trials.

4.3 Diavik Experience

Diavik experience is limited due to the recent development of the mine. Reclamation testing has commenced building on Ekati experience (Naeth and Wilkinson 2004).

4.4 Revegetation Objectives

The target end land use is wildlife habitat and the aim of Jericho reclamation is to promote, to the extent practical, rehabilitation of the land to this use. Vegetation prescriptions will be developed and tested based on the pre-disturbance ecological zones, where the disturbed areas are located. The aim will be to provide conditions similar to pre-disturbance and to the extent possible, revegetate or encourage native species at the site similar to those that occurred prior to disturbance.

The active layer (permafrost) plays an important role in erosion, particularly thermokarst and slumping. An objective of reclamation activities will be to design rehabilitation so as to minimize any potential negative effects to the active layer (particularly increases) and prevent melting of ice lenses, which can lead to slumping and erosion from runoff. The principal control will be building in winter to lock in permafrost where possible; alternately addition of till or till and rock cover.

A primary objective in some cases will be to retard wind and water erosion. In areas particularly susceptible to erosion, and this objective may require the use of agronomic species in favour of slower growing native species, with the realization that this will lead to retarding of natural successional processes and delay return of these sites to productive natural wildlife habitat. Failing relatively rapid establishment of vegetation, rock armouring may be required.

4.5 Mine Land Units

4.5.1 Ecological Zones

The pre-mining mine land units at the Jericho Diamond Project are best visualized by superimposing the ecological zones existing at the site with the mine facilities. This superposition was shown on Map C of the Final EIS (Attached here in Appendix A, Figure 2). The mine land units for planned construction together with the maximum disturbance areas of each are listed in Table 4.3. Disturbance is broken down by ecological zone based on Map C (with current mine footprint). All mine land units, with the exceptions of the airstrip and borrow pits are in multiple ecological zones. The 1999 vegetation study (Burt 1999) described vegetation associations and relevant extracts are presented in this section. Surficial geology provides some insight into surficial characteristics and the mapping produced by Thurber (2003) is attached in Appendix A as previously noted.

Aerial photographs of the mine area prior to mine construction are provided in Appendix E. The appendix also contains photographs of representative areas that were constructed in 2005.

Table 4.3: Approximate Areas of Surface Disturbance by Ecological Zone

Mine Unit	Ecological Zones and Areas Affected (ha)[1,2]							
	WGBM	**MBM**	**DBT**	**DRT**	**LK**	**CRH**	**EKD**	**Total**
Mine								
Open Pit	3.8		10.2	2.8				16.9
Waste Rock Dumps	5.9	6.7	15.5	39.6				67.6
Roads								
Haul (18 m width)	0.2	0.6	0.8	4.2	0.01			5.8
Access (9 m width)	1.3	0.4	2.5	4.0				8.2
Airport (6 m width)	0.5		0.2	1.1			1.7	3.5
Airstrip							2.4	2.4
PKCA	1.0		1.4	2.4	9.0			13.8
Dams/Dykes	0.3	0.9	1.2	2.2	0.4			5.0
Coarse PK Stockpiles	0.6		6.3	7.3	2.0			16.2
Camp/Plant Area			1.1	9.5				10.6
Crusher				1.5				1.5
Explosives Storage	0.6		0.1	1.0				1.7
Borrow Areas	0.1						8.5	8.6
Waste Transfer Area							0.5	0.5
Total	**14.5**	**8.7**	**39.8**	**73.9**	**11.4**	**0.3**	**13.8**	**162.3**
% of Total	**9%**	**5%**	**25%**	**46%**	**7%**	**0.2%**	**8%**	**100%**

Notes: [1] Based on maximum areal extent of surface disturbance. [2] WGBM = Wet grass/birch meadow, MBM = Moist birch meadow, DBT = Dry barrenground tundra. DRT = Dry rocky tundra, LK = Lake, CRH = Cliffs/rocky hills, EKD = Esker, Kame Delta

Maximum area disturbance will occur at approximately Year 3 with the expected ultimate footprint of waste dump #1 being established (excluding pit wall development) given that Borrow Area A3 will require development. A small reduction in some disturbed area may be possible with preparation for revegetating parts of the camp and borrow areas not longer required. Realistically, however, greening up will not have occurred in this short timeframe in that decades are normally required for revegetation of mesic sites and typically even longer for dry sites.

Ecological zones are described in detail in the vegetation report for the Jericho Final EIS (Burt 1999).

4.5.2 Surficial Geology of Mine Units

Table 4.4 provides the same mine unit list as Table 4.3 but with surficial geology units rather than ecological zones. The table includes post mining (prior to reclamation) surficial units.

Table 4.4: Surficial Geology of Jericho Mine Units – Pre- and Post Mining Reclamation (ha)

Mine Unit	Surficial Type													
	Organic		Till		Glacial/Fluvial		Colluvium		Rock		Lake		Total	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Mine														
Open Pit	1.6		10.9	0.8			0.1		4.3	16.1			16.9	16.9
Waste Rock Dumps	7.4		1.4	27.0			9.2		49.6	40.6			67.6	67.6
Roads														
Haul (18 m width)			0.3	5.8			1.0		4.5		0.01		5.8	5.8
Access (9 m width)	0.4		0.2	8.2			2.5		5.1				8.2	8.2
Airport (6 m width)	0.7		0.04	3.5	1.7				1.1				3.5	3.5
Airstrip					2.4	2.4							2.4	2.4
PKCA				9.5			1.2		3.6		9.0	4.3	13.8	13.8
Dams/Dykes			0.07	5.0			2.1		2.4		0.4		5.0	5.0
Coarse PK Stockpiles			4.6	16.2			2		8.4		1.2		16.2	16.2
Camp/Plant Area	1.0			10.6					9.6				10.6	10.6
Crusher				1.5					1.5				1.5	1.5
Explosives Storage	0.7			1.7			1.0						1.7	1.7
Borrow Areas	0.07				8.5	8.6							8.6	8.6
Waste Transfer Area					0.5	0.5							0.5	0.5
Total	**11.85**	**0**	**17.51**	**89.9**	**13.1**	**11.5**	**19.1**	**0**	**90.1**	**56.6**	**10.61**	**4.3**	**162.3**	**162.3**
% of Total	**7%**	**0%**	**11%**	**55%**	**8%**	**7%**	**12%**	**0%**	**56%**	**35%**	**7%**	**3%**	**100%**	**100%**

Surficial cover of most of the mine units listed in Table 4.4 will be altered by mine development as shown. These units include the open pit, waste rock dumps, ore stockpiles, building pads and the part of the PKCA holding fine PK. The surficial conditions of other areas will not be completely altered. These units include the airstrip, most mine roads except for extensive fill areas, laydown areas and the exploration camp area. Section 5 discusses the reclamation plans for each of the mine units. Based on Ekati experience, till and organic surficial units are the most likely areas to be successfully reclaimed without soil amendments or other manipulation of the surface other than stabilization and scarification. Reference to the surficial geology map indicates this would include much of those areas that will not be extensively modified from the pre-mining condition.

4.6 Reclamation Research

Revegetation trials will be used to determining what reclamation prescriptions are most likely to be successful in the Jericho Project area; reclamation research is scheduled to commence early in the production phase. The reclamation research planned will build on the experiences of Ekati and Diavik and will be lead by Dr. Anne Naeth, the same professor from University of Alberta who has guided studies at the other two mines.

4.7 Reclamation Trials

Reclamation trials will be conducted throughout the mine life with greater intensity of activity during the initial years. The purpose of the trials will be to develop a database on establishment and growth success of vegetation on reclaimed land. As discussed previously, other diamond mine operators in the area will be canvassed as to their successes and failures. The reclamation literature will also be reviewed on an on-going basis. Conceptually, trials could include:

- the effects of top dressing on plant growth for a particular land unit;
- the effects of mixing organic and mineral soil;
- the success of establishment of various vegetation prescriptions;
- the effects of fertilizer mixtures and rates of application;
- the existence and rate of encroachment of native species;
- effects of water content of soil;
- effects of drainage characteristics of soil;
- soil characteristics measurements:
  - pH;
  - organic carbon content;
  - texture/particle size distribution;
  - salinity (sodium adsorption ratio);
  - electro-conductivity (EC);
  - total N; and
  - trace metals in roots and shoots.

Because some limited success with use of PK as a growth medium has been demonstrated by Ekati, test plots both on and off the PKCA will be established at Jericho to test the use of PK at the mine. As part of this program, the on going results at Ekati and other diamond mines will be monitored by the Jericho Mine.

5.0 RECLAMATION PROGRAM

5.1 Reclamation Activities During Construction

Reclamation of the exploration camp area began in 2005 and will continue in 2006. Reclamation has consisted of removal of all buildings and materials stored at the site. The site consists of a pad of esker material. Some areas beyond the esker pad were also used to store equipment and materials. All soils in the camp area will be tested for petroleum contamination. Soils that do not meet CCME industrial site guidelines will be remediated in the mine landfarm.

5.2 Temporary Shutdown

A temporary shutdown for this plan is defined as a cessation of mining and processing operations for a finite period with the intention of resuming operations as soon as possible after the reason for the shutdown has been resolved. Possible causes for such a shutdown could be a major mechanical equipment failure, late delivery of critical equipment or supplies, or labour conflict.

5.2.1 Open Pit Mine

The follow procedures will be undertaken:

- All mobile equipment will be removed from the pit and stored in the plant area.
- During the summer, electricity to the pit will be maintained and the sump pumps operated as required to keep the pit drained; if maintenance of power to the pit is not practical, diesel pumps will be substituted for the normal sump pumps. During the winter this precaution is not necessary.
- All hazardous materials will be taken from the pit and stored in appropriate central locations.
- The pit will be inspected regularly to ensure overall integrity.

5.2.2 Processing Plant

The plant will be shut down in a planned and orderly sequence to prevent damage to equipment, piping and instrumentation. The following preparatory measures will be taken:

- The plant will be run until all kimberlite in the process stream is through the plant.
- The plant will be purged of all diamondiferous materials.
- All diamonds will be removed from the site.
- All slurry lines will be flushed of solids.

Procedures during the shutdown will be as follows:

- Minimal heating to the process building will be maintained to prevent equipment freezing.
- Electricity to the building will be maintained.

- All major equipment will be run periodically to ensure lubrication and integrity of the rotating parts.
- Ferrosilicon will be recirculated once per day to prevent setting up in the circulating medium tanks.

5.2.3 Surface Infrastructure

During temporary shutdown, the site infrastructure will be placed into a care and maintenance mode to ensure environmental stability and orderly restartup as follows:

- Minimal heating to critical facilities will be maintained to prevent equipment freezing.
- All non-critical equipment will be shut down.
- All necessary support facilities and services for care and maintenance personnel will continue to operate:
  - freshwater intake and potable water treatment;
  - sewage treatment;
  - power plant;
  - glycol heating systems;
  - diesel fuel storage and distribution;
  - part of the accommodation and kitchen facilities.
- All major equipment will be run periodically to maintain operability.
- All hazardous materials stored within site facilities will be collected and stored in a central secure area, e.g., hazardous materials storage building.

5.2.4 Mine Waste and PKCA

The following actions will be taken:

- PK slurry lines will be purged, flushed and drained.
- Dust control operations will be maintained.
- Routine dam inspections will be continued.
- Pump back equipment below dams (except the reclaim water system) will continue to operate.
- The reclaim pump and line will be purged, flushed and drained.

5.2.5 Water Management Facilities

Collection sumps and ditches around the site will be maintained to manage runoff from the site.

5.3 Indefinite Shutdown

For this plan, indefinite shutdown is a cessation of mining and processing operations for an indefinite period with the intention of resuming operations in the future. During indefinite shutdown the site will be placed into a mode of minimal operating expense while maintaining safety and environmental stability. Possible causes included prolonged unfavourable market conditions or protracted labour dispute.

5.3.1 Open Pit Mine

Procedures similar to those for temporary closure will be followed.

5.3.2 Processing Facilities

Procedures similar to those for temporary closure will be followed. In addition:

- Equipment and gearboxes will be drained of lubricants, which will be stored in sealed drums in the maintenance shop.
- Tanks will be drained.
- Remaining ferrosilicon will be pumped to the PKCA.
- All water, glycol and slurry lines will be flushed and drained. Glycol will be stored in sealed drums.
- Reagents will be stored in locked sea containers.
- The entire process plant will be locked and all heating and electricity turned off.

5.3.3 Surface Infrastructure

Procedures similar to those for temporary closure will be followed.

5.3.4 Mine Waste and PKCA

Procedures similar to those for temporary closure will be followed.

5.3.5 Water Management Facilities

Procedures similar to those for temporary closure will be followed.

5.4 On-Going Reclamation

Table 5-1 lists areas of disturbance and the year reclamation will be carried out.

Table 5.1: Reclamation Areas by Year

Facility	Area (m^2)	Year Reclaimed
Waste Rock Dump 1 top	119,660	Year 7
Waste Rock Dump 2 top	88,320	Year 8
Overburden		n/a
Roads	175,000	Year 9
Airstrip	24,000	Year 9
PKCA	94,350	on going

Facility	Area (m^2)	Year Reclaimed
Coarse PK	67,220	on going
Camp and Storage, Explosives, Crusher, Waste Transfer	148,000	Year 9
Exploration Camp[1]	50,000	Year 1, 2
Borrow Area A1	31,000	on going
Borrow Area A2	8,000	on going
Borrow Area A3	29,000	on going

Notes:[1] Reclamation underway; not included in cost estimate (Appendix D)

5.4.1 Borrow Areas

Once borrow areas are no longer required, they will be reclaimed. Borrow pits are exclusively on eskers or kame deltas and overburden is granular, thus not presenting surfaces easily eroded by wind. However, any steep micro-slopes will be subject to water erosion during the summer. Removal of esker surface material will increase the depth affected by freeze-thaw. As well, there is a potential to expose ice-rich overburden, which could result in further melting and slumping; geotechnical investigations by Bruce Geotechnical (1996b) suggest limited existence of ice lenses in areas proposed for extraction. This in turn may lead to additional potential for erosion. During active use, esker borrow areas will be managed so as to minimize any potential for water erosion. Once areas are no longer active, steep slopes will be regraded to the angle of repose or 3:1, as appropriate, and revegetated as indicated by reclamation trials.

5.4.2 Waste Rock Dumps

Waste rock dumps will remain active until the end of open pit mining. Open pit mine equipment on site for mining will be used for reclaiming the dumps. Dumps will be constructed in step-back lifts; final regrading of slopes will be to attain an average slope of approximately 19° by pushing material down onto benches. Top surfaces will be compacted from traffic use and will be ripped or scarified to loosen the surface and provide microhabitat for plants. Dumps are expected to be dry microhabitats and inimical to plant growth. If revegetation trials indicate the potential for successful revegetation of the dump tops, salvaged top dressing material will be placed on the top or flat surface of the dump to a depth of up to 0.3 m. This top dressed material will be fertilized and seeded as indicated by reclamation trials. Consideration will be given to placement of boulders on the dump top surfaces to provide perches for raptors. Ramps will be built into lifts to allow safe caribou transit across the dump slopes.

Portions of the dumps that remain active throughout the mine life will be reclaimed at closure in the manner indicated above. The side slopes will be left in a stable condition not subject to water or wind erosion, but will not be revegetated. Slopes will be coarse rock to retard water and wind erosion. Both moisture content and the probability of successful revegetation on these slopes will be very low. Organic overburden will be scarce, making their use in areas with a low probability of successful revegetation unwise. Any planting will take place in the spring or fall so as not to moisture stress seedlings during summer months.

Figure 5.1 illustrates reclamation regrading concepts for dumps.

5.4.3 Open Pit

The open pit will remain for a number of years as a large opening in the ground. To prevent accidental entry or fall into the pit by animals such as caribou, or by people that may visit the site after closure, a rock berm will be placed around the lip of the pit. The rock berm will be built of rock mined from the open pit after it is pushed back to its final position. Waste rock from the mine will be directly dumped in place and dozed into a berm. The berm will remain unfinished at the access road point until pit closure. A swale will be placed at the location in the berm where the natural channel of Stream C1 would exit once the pit fills. There are a number of options for managing pit water on closure that have been considered and these are discussed in Section 5.5.2. The present plan, subject to change pending on results of monitoring after closure, is for a channel to direct pit water, once it fills, back into the Stream C1 channel if water quality is acceptable or away from the lower Stream C1 channel to the east where the water will enter Carat Lake either with or without in pit treatment. In pit treatment is discussed by John Chapman in a memorandum to SRK (Appendix C).

5.4.4 Ore Stockpiles

The ore stockpile area will be completely processed at the end of Year 8. Following processing the pad will be reclaimed by scarifying and grading down the perimeter as required. Top dressing the margins with overburden will be undertaken, if reclamation trials indicate probable success.

5.4.5 Access Roads

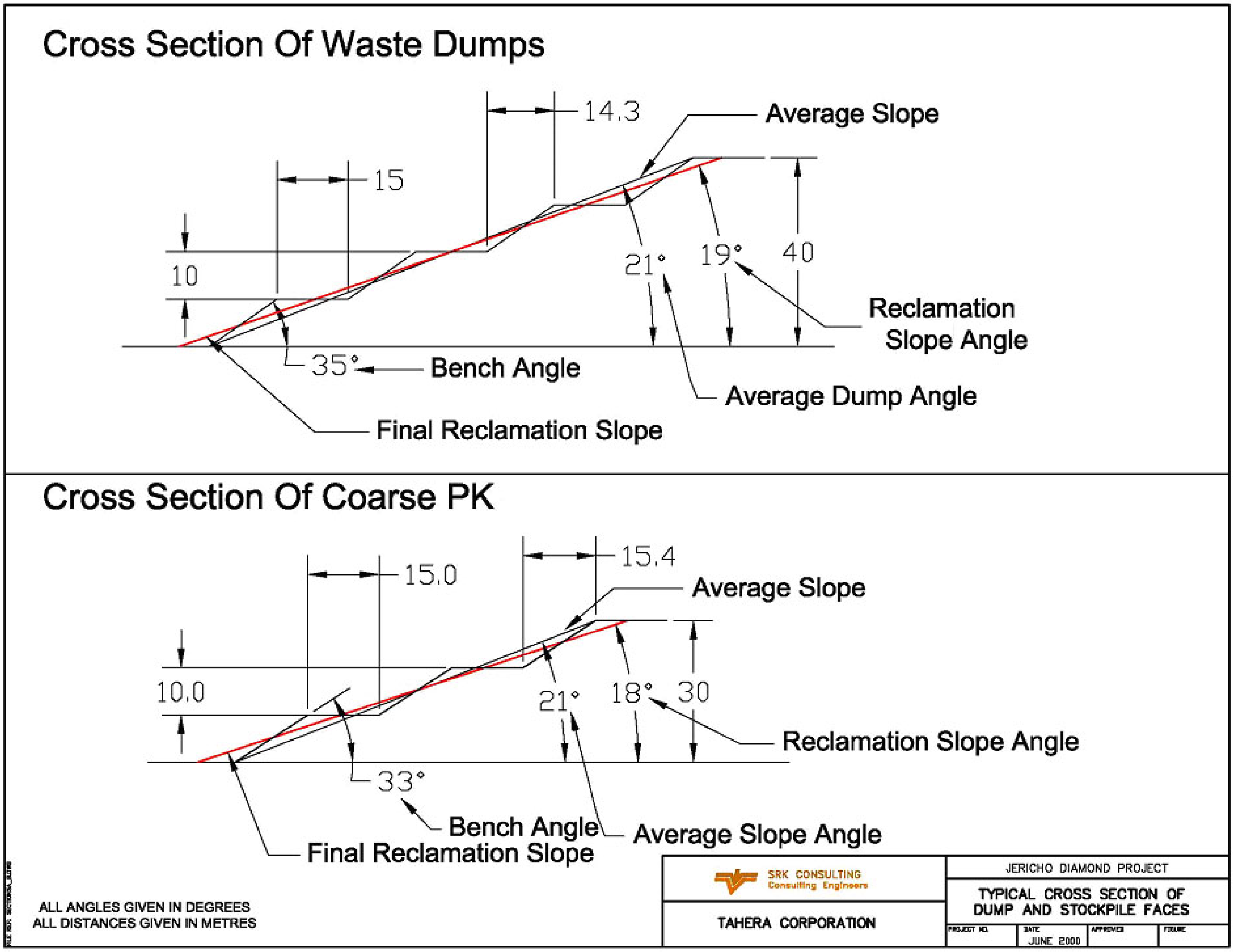
Access roads are anticipated to be required throughout the mine life. Should access roads no longer be required, these roads will be reclaimed during the mine life before closure. The road surface will be scarified, or ripped, and the surface revegetated as indicated from reclamation trials.

5.4.6 Monitoring of Progressive Reclamation

Monitoring of revegetation will be dependent on the reclamation research carried out during mine operations. Monitoring frequency will be annual. An outline of possible revegetation initiatives was presented in Section 4.

Monitoring of chemical and physical stability will be identical to monitoring programs for active mine components until final mine closure. Final reclamation is discussed in the following section.

Figure 5.1: Cross Section of Dumps and Coarse PK Stockpile



5.5 Final Reclamation

5.5.1 Waste Rock Dumps

5.5.1.1 Reclamation

Dumps that remain active throughout the mine life will be reclaimed at closure in the manner indicated in Section 5.2.2. The tops of the dumps may be revegetated. The side slopes will be left in a stable condition not subject to water or wind erosion, but will not be revegetated. The principal reasons for this are:

- the impracticality of making granular mineral overburden remain in place on angle of repose rock slopes;
- the low probability of successful revegetation on these slopes considering the high probability of very low moisture content; and
- the probable scarcity of overburden available for top dressing, making its use in areas with a low probability of successful revegetation unwise.

5.5.1.2 Long-term Stability

The final angle on the waste rock dumps will be an average 19°, slightly more than half the angle of repose of 33°. Stability of the dumps during operations will be monitored by an independent geotechnical engineer annually as required by the water licence; monitoring will continue as required after closure until the water licence is cancelled. Any modifications of dump configurations suggested from monitoring results will be implemented during the life of the mine.

5.5.1.3 Alternatives and Contingencies

Alternatives for cover and soil amendments for the tops of the waste dumps will be assessed in light of vegetation trials. Should revegetation not prove practical, due to low survival of plants in test plots, the tops of the dumps will not be dressed with wind or water erosion prone soils, rather the use of coarse run-of-mine rock in erosion prone areas will be evaluated.

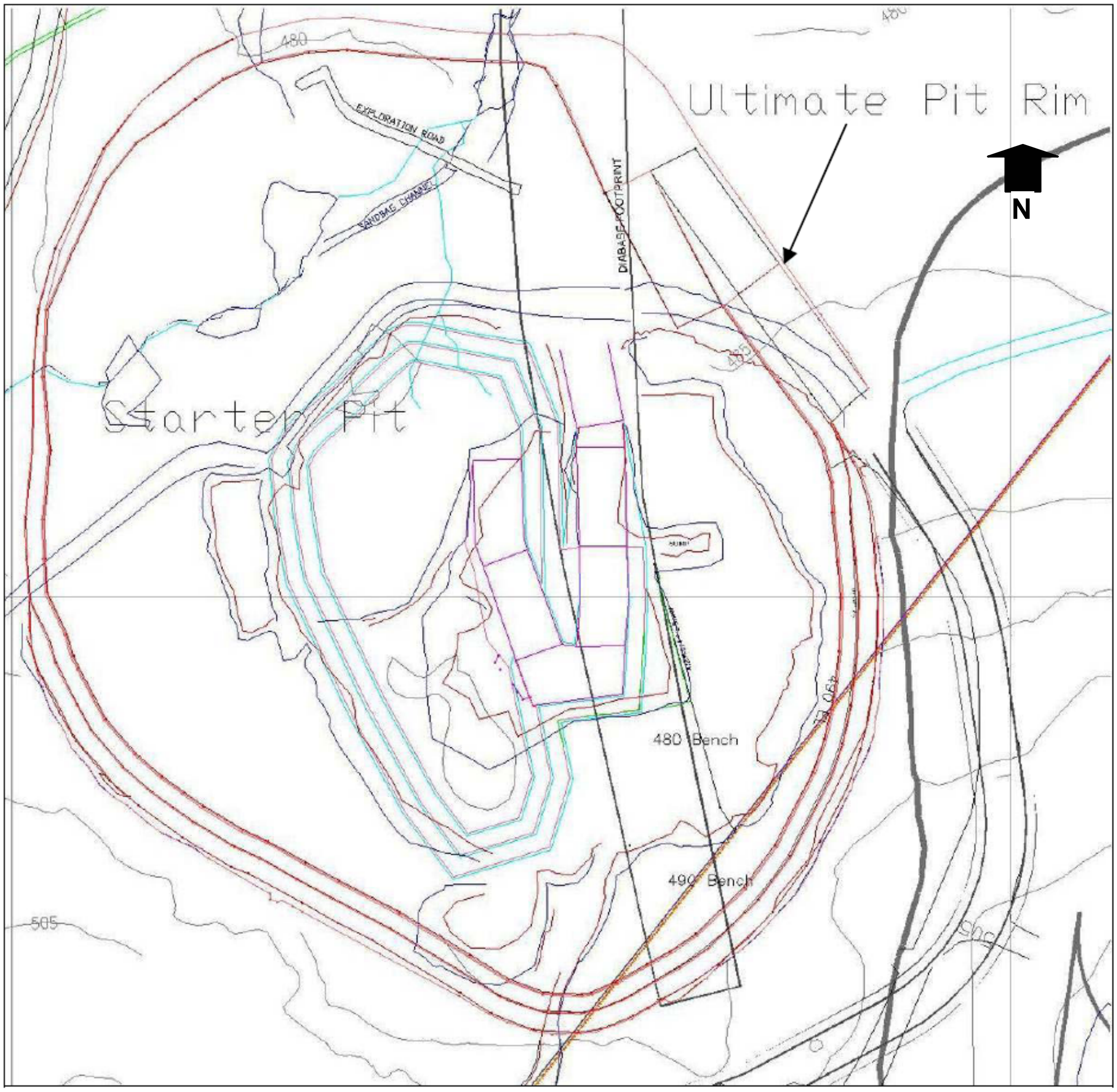
5.5.2 Open Pit

5.5.2.1 Final Configuration

A plan of the expected ultimate pit configuration is presented in Figure 5.2.

A safety berm will be constructed beyond the ultimate crest of the till slope. The berm will be constructed with a steep outer face to discourage caribou entry, and a flatter inner face to allow any caribou to exit. The setback distance will be adjusted as necessary to allow snowmobiles and caribou that happen to cross over the berm sufficient time and space to stop before reaching the pit edge. As required by the mine water licence, the lip of the ultimate pit will be graded and/or blasted down to a 5:1 angle for 10 m between the berm and the lip of the pit.

Figure 5.2: Jericho Ultimate Pit - Plan View



Source: Jericho Mine Plan October 2005. Grid interval is 500 m. Carat Lake is beyond the top of the figure.

The final pit will have steep walls and a ramp road connecting the bottom and top of the pit. Walls will be entirely in bedrock. The pit will be allowed to flood on closure which will require a minimum of 20 years if all mine area drainage is directed to the pit. If pit water quality on filling is of adequate quality (assumed to be CCME), Stream C1 will be re-directed back into its natural channel.

Runoff, precipitation, and melt water will not exit the pit until it is filled. The pit will form a deep, relatively small lake. Some shallows will be present near the lip of the pit, especially where the access ramp enters and the mining 8m mining catch bench that lies below the final pit water level. Once the pit is filled, water will flow out and into Carat Lake. Pit water quality estimates on closure were provided by SRK (2003) in Technical Memorandum F and re-examined taking into account probable partial freeze back in a subsequent memorandum (SRK 2004a, Appendix B).

Alternatives and Contingencies
An alternative to allowing the pit to flood would be to backfill with waste rock. This alternative was examined and rejected on economic and practical grounds. Cost to backfill the pit would be approximately $2 per tonne; total cost $16 million plus mobilization / demobilization. Backfill could not occur until the end of mining. At that time much of the mass of waste rock dumps is expected to be infiltrated by permafrost. Any use of this rock would require re-blasting, which would further raise costs. Finally, because there would be void spaces in the backfilled rock, only about two thirds of the 13 million tonnes of waste rock could be backfilled into the pit without overtopping the pit rim. Any runoff water from the pit would require treatment for some years after pit backfill to reduce ammonia levels to acceptable discharge concentrations. This alternative approach to reclaiming the pit would make mining the deposit uneconomic and also increase, rather than decrease, environmental impacts.

5.5.2.2 Exploration Portal

The existing exploration portal, immediately south of the ultimate pit, will not be removed by open pit development. Therefore, on mine closure, the portal will be sealed as per requirements of the *Northwest Territories Mine Health and Safety Act and Regulations*.

5.5.2.3 Post-Closure Water Management

It is estimated that the pit will take over 20 years to fill, which should allow ample time for flushing and removal of any residual blasting residues from the dumps. Freeze back of the dumps is also expected to occur in the first few years following deposition, which will reduce the exposed surface area and therefore available loading from the rock. During this period, flows to Stream C1 will be maintained to ensure this area remains acceptable for fish habitat.

Current estimates of long-term water quality using the conservative assumptions discussed in SRK Technical Memorandum Q (SRK 2004a, Appendix B) indicate that the pit lake may not meet CCME guidelines for freshwater aquatic life. Monitoring of seepage and runoff during operations and the post closure filling period will result in improved estimates of long term water quality.

If the updated estimates indicate the pit water will meet CCME guidelines for freshwater aquatic life or can be demonstrated to have negligible impacts on aquatic life, the pit will be allowed to spill into the original Stream C1 channel, and Stream C1 will be redirected into the pit. If the revised estimates indicate the pit will not meet CCME guidelines, but could be discharged without significant impacts to the shore of Carat Lake, it will be discharged via a constructed channel to the northeast of Stream C1. The location will be determined when the need is identified and in consultation with regulators. In the unlikely event that the pit water quality would be unacceptable for discharge, contingency measures such as in-pit biological treatment could be used to reduce concentrations to acceptable levels for discharge (SRK 2004b, Appendix C). Current estimates of post-closure concentrations in the pit discharges are presented in Table 5.2.

Table 5.2: Post-Closure Estimates of Pit Water Quality

Discharge Scenario	TDS (mg/L)	TSS	Alk	Ca	Cl	K	Mg	Na	SO4	TAl* (mg/L)
1 Discharge from Pit Lake without Stream C1	372	2	16	38	161	13	62	8	70	0.15
2 Long-term Discharge from Pit Lake with Stream C1 redirected to pit.	231	2	14	24	96	8	37	5	42	0.13
CCME Aquatic Life Guidelines	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*0.1*
Health Canada Guidelines	*500*	*na*	*na*	*na*	*250*	*na*	*na*	*na*	*500*	*0.1*
Carat Lake Baseline Data	*11*	*1.4*	*4.7*	*2.3*	*3.4*	*2.0*	*0.8*	*2.0*	*1.2*	*0.052*
Discharge Scenario	**TAs mg/L**	**TCd mg/L**	**TCr mg/L**	**TCu mg/L**	**TFe* mg/L**	**TMo mg/L**	**TNi mg/L**	**TPb mg/L**	**TU mg/L**	**TZn mg/L**
1 Discharge from Pit Lake without Stream C1	0.0005	0.0003	0.0017	0.009	0.20	0.032	0.015	0.0020	0.063	0.006
2 Long-term Discharge from Pit Lake with Stream C1 redirected to pit.	0.0004	0.0002	0.0012	0.007	0.24	0.019	0.009	0.0013	0.038	0.004
CCME Aquatic Life Guidelines	*0.005*	*1.7E-05*	*0.0089*	*0.002*	*0.3*	*0.073*	*0.025*	*0.001*	*na*	*0.03*
Health Canada Guidelines	*0.025*	*0.005*	*0.05*	*1.0*	*0.3*	*na*	*na*	*0.01*	*0.02*	*5*
Carat Lake Baseline Data	*0.00016*	*0.00005*	*0.0025*	*0.0020*	*0.025*	*0.00005*	*0.0005*	*0.00005*	*0.00020*	*0.0020*

Notes: Assumptions and Calculations are provided in SRK (2004a). 1 Assumes all sources of water entering the pit have reached post-closure water quality by the start of filling. 2 Reflects mixed water quality in the pit in the long term, once steady-state mixing has been reached (approximately 30 years after pit is filled).

Tahera has 8 years during operation to establish expected end-pit water quality, and a minimum of 20 years following closure to work out appropriate mitigation before discharge to Carat Lake is required.

5.5.2.4 Long-term Stability

Post-closure, the slopes may ravel or degrade to a slope as flat as approximately 15°. The bedrock below the till will also ravel back over the very long term. This is common in all rock slopes, and is the reason why there is no requirement for long-term stabilization of pit slopes in most mine reclamation guidelines. During 2005, as a starter pit was excavated for construction material, Tahera was able to assess the performance of slopes that intersected the overburden. Observations from that period suggest that the slope performance will be similar to, or slightly better than, expected. Stability monitoring through the mine life will allow assessment this initial finding.

Prior to filling warning signs and the perimeter berm will serve to keep people and animals away from the pit lip. The pit wall will not be dissimilar to the nearby cliff tops of the Willingham Hills. Extensive surveys in the area during baseline wildlife studies failed to reveal any evidence of animals falling accidentally.

5.5.3 PKCA

5.5.3.1 Reclamation

During operation, the PKCA will be progressively filled from east to west (Site Water Management Plan, Tahera 2005). As areas are filled to design height, they will be covered by a 0.3 to 0.5 m layer of coarse kimberlite to act as a filter for runoff and to improve drainage characteristics of the cap. Coarse kimberlite will be taken from the stockpile for reclamation. The plant front end loader and dump trucks will be used for this operation. Once the coarse kimberlite buffer is placed, one of three scenarios will follow:

1. If vegetation trials indicate vegetation can be successfully established on the coarse kimberlite, finished areas will be revegetated. Ekati has had some success at planting directly onto dried fine kimberlite in the mine's PKCA and, pursuant to further favourable results, PKCA beaches at Jericho will be treated the same way, i.e., by direct planting on the dry beaches. There is some question about the long-term suitability of PK as a growth medium.
2. If vegetation trials indicate overburden promotes successful revegetation, areas will be top dressed with up to 0.3 m of overburden from the overburden stockpile. This will occur in either winter or summer, depending on the driving conditions on the cell. Reclamation costing (Appendix D) conservatively assumes both coarse PK and overburden will be placed on the PKCA at closure.
3. If vegetation cannot be demonstrated to establish successfully, PKCA finished areas will be covered with coarse kimberlite and run-of-mine rock to retard erosion and to provide perching areas for rodents and birds.

4. Revegetation, as indicated from reclamation trials, will take place either in the spring or fall, depending on timing of completion of the overburden placement. Organic overburden will be retained for reclamation of the PKCA as this facility has the best chance of successful revegetation. The proposed facility will occupy a shallow valley, where water naturally collects (a lake and meadows presently occupy the site) and therefore, with the proposed impermeable east and west embankments, can be expected to provide a moist microhabitat for plant growth after closure.

5.5.3.2 Long Term Stability

Long-term stability for the dams and impoundment requires different considerations. Stability after closure will be monitored throughout the closure and post closure period by mine staff and independent geotechnical engineers as a requirement of the mine water licence.

Impoundment
Physical stability of the section of the impoundment containing fine PK will be achieved by placement of coarse PK and top dressing materials if revegetation trials indicate probable success or coarse PK and rock. Chemical stability post closure was discussed in detail in SRK Technical Memorandum P (SRK 2004d) submitted to the NWB in support of water licence application. Water in the western end of the PKCA (see Appendix A, Figure 1 for PKCA anticipated final configuration) is forecast to meet mine discharge criteria; monitoring during operations will provide additional evaluation information. Should the water not meet criteria, the water will be treated until criteria are consistently met.

Dams
Stability analyses were completed for all dams which indicated Canadian Dam Association (CDA) guidelines for factors of safety would be met. The performance of the dams will be monitored during operations to verify stability and any adjustments that are required will be made prior to closure. The dams will be inspected annually during operations and post closure by an independent geotechnical engineer until such time as the water licence is cancelled.

East, Southeast and North Dams
All these dams are relatively low structures (maximum 8 m for east and southeast dams and 3 m for the north dam) that will not have water against their upstream faces at closure.

Design details for the east and southeast dams can be found in EBA Engineering (EBA) design reports (EBA 2005 a, b). Preliminary design details for the north dam can be found in SRK (2004d).

Divider Dyke
Design details for the divider dyke can be found in EBA design reports (EBA 2005c, d). The divider dyke on closure will have PK fines and no free water against the upstream face. The divider dyke will be inspected post closure by an independent geotechnical engineer until such time as the water licence is cancelled.

A small amount of pore water may be expelled by the freezing process but will have negligible effect on the much larger volume of water in the downstream pond (SRK 2004d).

West Dam

Design details for the west dam can be found in EBA 2005 e, f). The west dam is designed to hold water against the upstream face. Long-term thermal and dam stability monitoring will be instituted as part of PKCA operation as recommended by EBA (2005e).

Closure preparation of the west dam is discussed in SRK 2004d and closure procedures will be included in the PKCA Management Plan required by the water licence. At closure, ponded supernatant water will be pumped to Stream C3 if water meets discharge criteria or treated as indicated from operational experience prior to closure to meet these criteria. In order to minimize long-term stability risks, the dam will be breached; the final discharge elevation will be determined as part of final closure planning. The west dam will, therefore, no longer perform or be classified as a dam. The discharge elevation will set so that fine PK in the upstream pond does not wash out through the discharge. Natural discharge from the basin is expected to be restored with these measures.

5.5.3.3 Alternatives and Contingencies

Alternatives and contingencies are discussed in Section 5.5.3.1.

5.5.4 Coarse Kimberlite and Recover Circuit Rejects Stockpiles

5.5.4.1 Final Configuration

As shown in Appendix A, Figure 1, the current mine plan calls for separation of coarse PK into three stockpiles. This configuration was chosen to allow for better environmental control of the coarse PK, particularly of recovery plant rejects which will be stockpiled immediately south of the PKCA east end. Management of coarse PK is discussed in detail in the Jericho Waste Rock Management Plan, Part 2 (SRK 2006). The remainder of the coarse kimberlite and recovery plant reject stockpiles not used for reclamation will be sloped to approximately 18°, as shown in Figure 5.2, and covered with up to 0.3 m of overburden to prevent dust generation from fines should dusting become problematic (not expected since coarse rejects are thoroughly washed in the processing plant). A small amount of runoff may occur in the spring when the stockpile surface is frozen. A shallow ditch will be constructed on the down slope side of the stockpile to retard export of sediment overland in the initial years after reclamation and prior to surface consolidation. Monitoring will continue at the site through this time allowing sediment removal from ditches if required.

5.5.4.2 Alternatives Considered

Alternatives to overburden cover include rock armouring should overburden cover not prove practical. Based on Ekati experience, direct placement of vegetation on coarse PK is unlikely to be successful. However, creation of microhabitats to prevent sand drifting will be investigated as part of revegetation trials.

5.5.4.3 Long-term Stability

Considerations for long-term stability for coarse PK stockpiles are similar to those for waste rock dumps (Section 5.5.1.2).

5.5.5 Ore Stockpile Pad

The ore stockpile pad will be scarified and revegetated if success is indicated from reclamation trials. Overburden will be added to the perimeter of the pad, if reclamation trials indicate probable plant growth success.

5.5.6 Mine and Access Roads

When no longer required, mine and access roads will be scarified or ripped and possibly revegetated (as discussed above). Road edges will be graded off to form a gentle slope, yet minimize additional disturbance of tundra. The road between the camp and the airstrip will be left in a stable condition until final closure and may be left un-reclaimed at final closure, if requested by a government agency or by a third party who agreed to assume responsibility for its maintenance.

5.5.7 Sediment Ponds, Berms and Ditches

On closure, all mine drainage will be directed to the open pit and sediment ponds, berms and ditches no longer required will be reclaimed. Ditches will be stabilized where they pass through overburden; ditch portions in bedrock will remain as constructed. To the greatest extent possible, ditches will be altered to return drainage to pre-disturbance conditions. For pre-mining areas draining to Lake C1, this would pre-suppose runoff meets CCME guidelines; otherwise, water would be directed to the open pit. Prior to levelling, any sediment in ponds would be removed and placed on one of the dumps, then covered with waste rock or overburden to retard wind or water erosion. Conceptually, all dikes and berms would be flattened and revegetated. Any remnant of berms or pond dikes left after resloping would be stabilized and revegetated, assuming reclamation trials suggest probable success.

5.5.8 Borrow Areas

Any borrow areas active to the end of mine life will be reclaimed and revegetated as discussed above. Some borrow material may be required for final reclamation and thus this borrow area would be one of the last sites to be reclaimed and revegetated.

5.5.9 Airstrip

The airstrip will be scarified or ripped and vegetated when no longer required, pursuant to probable success as shown in reclamation trials. However, the strip will be left for others to use, if requested by government agencies or by a third party willing to assume the airstrip land lease. The airstrip will be kept open until final closure for use by Tahera Diamond Corporation reclamation personnel.

5.5.10 Infrastructure

Infrastructure at mine closure will include:

- the accommodation and mine office;
- the fuel farm;
- the explosives magazines;

- truck shop;
- the laydown areas; and
- the landfarm.

Infrastructure associated with explosives (emulsion plant, ammonium nitrate storage, explosives truck shop) will be removed and the areas reclaimed/revegetated at the end of the mining phase.

Upon closure infrastructure will be removed and the site graded. All buildings will be torn down. Demolition scrap will be placed on the edge of the waste dumps and covered during final resloping efforts. Foundations will be covered with top dressing materials. The fuel farm tanks will be emptied into tanker trucks, decontaminated, disassembled and buried, as will all warehousing and trailers. The explosives magazine trailers (steel bulk shipping containers) will be removed. Pipes will be removed from the water intake causeway and buried. The causeway will be cut to 2m below the normal summer water level from the northern extent back to a water depth of 3.5m. From 3.5m water depth to 1m the causeway will taper up. The reclaimed causeway will intersect surface near the shoreline. Non-salvageable scrap metal left at closure will also be placed in the waste dumps and covered. Any supplies, such as ammonium nitrate, will be removed at the time the emulsion plant building is removed. All necessary removal of infrastructure will take place the first winter of final closure, thus obviating the necessity of constructing the winter road beyond the end of mine life plus one year.

All mine-related mobile equipment will be trucked out on the winter road the first opportunity after completion. Since the equipment will belong to the mine contractors, this will be the contractor's responsibility. Tahera Diamond Corporation, as holder of the land leases for the site, will however retain ultimate responsibility for removal of equipment from Jericho.

All pads used for buildings will be scarified, topdressed, and possibly revegetated as previously discussed.

Most of the mine camp, including trailer modules will be removed on final closure. Portable housing, such as tents which can be flown off site by aircraft, will be used by reclamation crews once buildings are removed. Alternately, if a third party agrees to assume the land lease for the camp, the applicable part of the mine camp will be retained and signed over to the third party assuming the land lease.

5.5.11 Soils Testing

Any soils suspected of being contaminated (stained) with petroleum hydrocarbons, and not previously remediated, will be tested and those not meeting criteria for CCME industrial land use in place at the time of mine closure will be remediated. Remediation will preferably be done on site, e.g., by land farming, but may be done off site, in which case soils would be transported off site by truck during the first year after mine closure, or later by aircraft if required. The success of land farming will be investigated during mine life and treatment on closure will be based on this investigation. Any spills in areas where additional routine spills are unlikely to occur will be decontaminated prior to end of active mining.

6.0 MINE ABANDONMENT

Mine abandonment refers to the stage at which all reclamation activities aimed at rehabilitation and stabilization have been completed, all infrastructure removed (or transferred to third parties to manage and the only activity is post closure monitoring.

Site layout at closure is provided in Appendix A. The objectives of the abandonment plan are as follows:

- show the abandonment condition of the mine site;
- show the final drainage plan; and
- provide the monitoring plan after abandonment.

6.1 Infrastructure

Infrastructure remaining at abandonment will depend on the intended use of the site. Assuming complete closure, all buildings will have been removed, all roads and the airstrip rehabilitated and permanently stabilized against erosion. At the election of Transport Canada, or other government agency, the airstrip may be left intact, likely with removal of the landing lights and associated cabling. The generator and airstrip outbuilding will be removed. The airstrip will only remain if the federal land lease for the airstrip can be terminated by Tahera while leaving an un-reclaimed airstrip.

6.2 Drainage Controls

Natural drainage patterns will be re-established at closure to the extent possible. At abandonment all drainage systems will be confirmed to be stable. The Stream C1 diversion channel will remain intact to ensure the lower end of the stream does not dewater. The diversion dike will be stabilized for long-term maintenance-free operation either by having sufficient vegetation established during its lifetime, or more likely given climatic conditions, by additional armouring with rip rap. Mine area runoff water will be directed to the open pit.

6.3 Sedimentation Ponds

Sedimentation ponds will be removed on closure and all water directed to the pit until CCME guidelines attainment is demonstrated to the satisfaction of regulators. Reclamation of sedimentation ponds will consist of berm removal (by spreading till used in their construction and removing any liners, if present) and pond surface revegetation as indicated from reclamation trials.

6.4 Land Use at Abandonment

6.4.1 Wildlife Habitat

Disturbed areas, other than mesic and moist soil microhabitats will only very slowly revegetate. Wildlife habitat lost to create dumps, pads, and roads will regain pre-disturbance productivity at the same rate as vegetation returns. Every practical effort will be made to accelerate this process as previously discussed. Upon successful establishment of vegetation, wildlife habitat in these areas should return to pre-mining conditions. The area is currently used by a number of wildlife species discussed in the Jericho Final EIS. Caribou, muskox, carnivores, small mammals (ground squirrels, lemmings, and voles) and birds (passerines, raptors, waterfowl, and upland game birds) use the site to some extent. The dumps may be used by raptors as lookout perches for prey. Ground squirrels are known to den in natural piles of rock and may use crevices in dumps as burrows where adjacent vegetated areas can provide forage. Tops of dumps will be used by birds, small mammals, and carnivores for foraging. The open pit will be flooded and the area of the pit would be permanently lost as terrestrial wildlife habitat.

6.4.2 Fish Habitat

Based on pre-operations modelling, the filled open pit is predicted to have water quality that does not meet 2004 CCME criteria for the protection of aquatic life. Therefore current plans call for use of the pit as a treatment facility and not as fish habitat. Should water quality be found to be suitable upon pit filling, it could potentially serve as fish habitat. Under this latter scenario, once the pit fills and water once again flows in the pre-mining Stream C1 channel, fish will have access to the filled open pit, which will form a small lake. The lake will be deep (approximately 180 m), but will have narrow shallow margins around the edge and a somewhat larger shallow area where the pit access road slopes into the pit (shallow area estimated to be 4800 m^2). The pit lake will follow a primary succession sequence and thus will remain devoid of rooted aquatic vegetation for a considerable length of time. Food chains will consist of freshwater bacteria, phytoplankton, zooplankton, and possibly fish, if they access the pit lake. Diatoms and periphyton (attached algae) will colonize shallow rock surfaces readily and will provide food for grazing macrobenthos once these organisms invade the pit lake. Fish-eating birds will forage for fish, should they invade the pit lake, or result from fertile fish eggs carried into the pit lake by birds. The pit lake will not likely provide suitable spawning habitat for Arctic char or lake trout although grayling could spawn in the inlet stream. The lake will likely remain permanently oligotrophic, similar to Carat and other lakes in the area.

6.4.3 Recreation

There will be no recreational opportunities at the Jericho site, unless people chose to fish at Carat Lake (unlikely given the lack of access and proximity to Contwoyto Lake, which supports large game fish). However, should a guide-outfitter decide to make use of the site, some of the site facilities could be used for recreational purposes, such as hunting and fishing (the latter likely at Contwoyto Lake, since Carat Lake is too small to support sustained sport fishing). Since caribou frequent the site occasionally in large numbers; wildlife photography could also be promoted.

6.5 Monitoring After Abandonment

Monitoring after mine closure will be in two phases:

- immediately post closure, until Tahera is assured long-term facilities, such as waste rock dumps and the C1 stream diversion are stable; revegetation success will also be monitored during this period; and

- longer-term monitoring of water quality to ensure the predicted return to receiving environment guidelines from site runoff and maintenance of receiving environment water quality is achieved.

6.5.1 Post Closure Monitoring

During this period immediately after mine closure, sedimentation ponds, berms, and outfall (if required) will be maintained. Water quality will be monitored four times per year as indicated below for parameters controlled by the Jericho Project Water Licence in place at the time of closure.

Rock dumps and infrastructure associated with the Stream C1 diversion will be inspected on closure and periodically thereafter by a qualified geotechnical engineer for stability and their report recommendations implemented. Engineering inspections will be annual initially, reducing in frequency as appropriate to structures and in accordance with water licence requirements until the water licence is cancelled. Performance during mine operations will be used as the main indicator of probable long-term stability. Adaptive management strategies will be implemented based on recommendations from geotechnical inspections if long-term stability may be problematic.

Seven water quality sites are proposed for monitoring and are shown on Figure 6.1:

- Lake C1 at its outlet;
- Stream C1 at its mouth;
- Lake C3 at its southern (principal inlet);
- Carat Lake at its inlet;
- Carat Lake at its outlet;
- Jericho Lake at its inlet; and
- Jericho River on Inuit owned land.

Monitoring will be monthly during the open water period (July, August, September) and once during late winter/early spring (April).

Depending on results of the aquatic effects monitoring program during mining, additional aquatic monitoring may be warranted after closure.

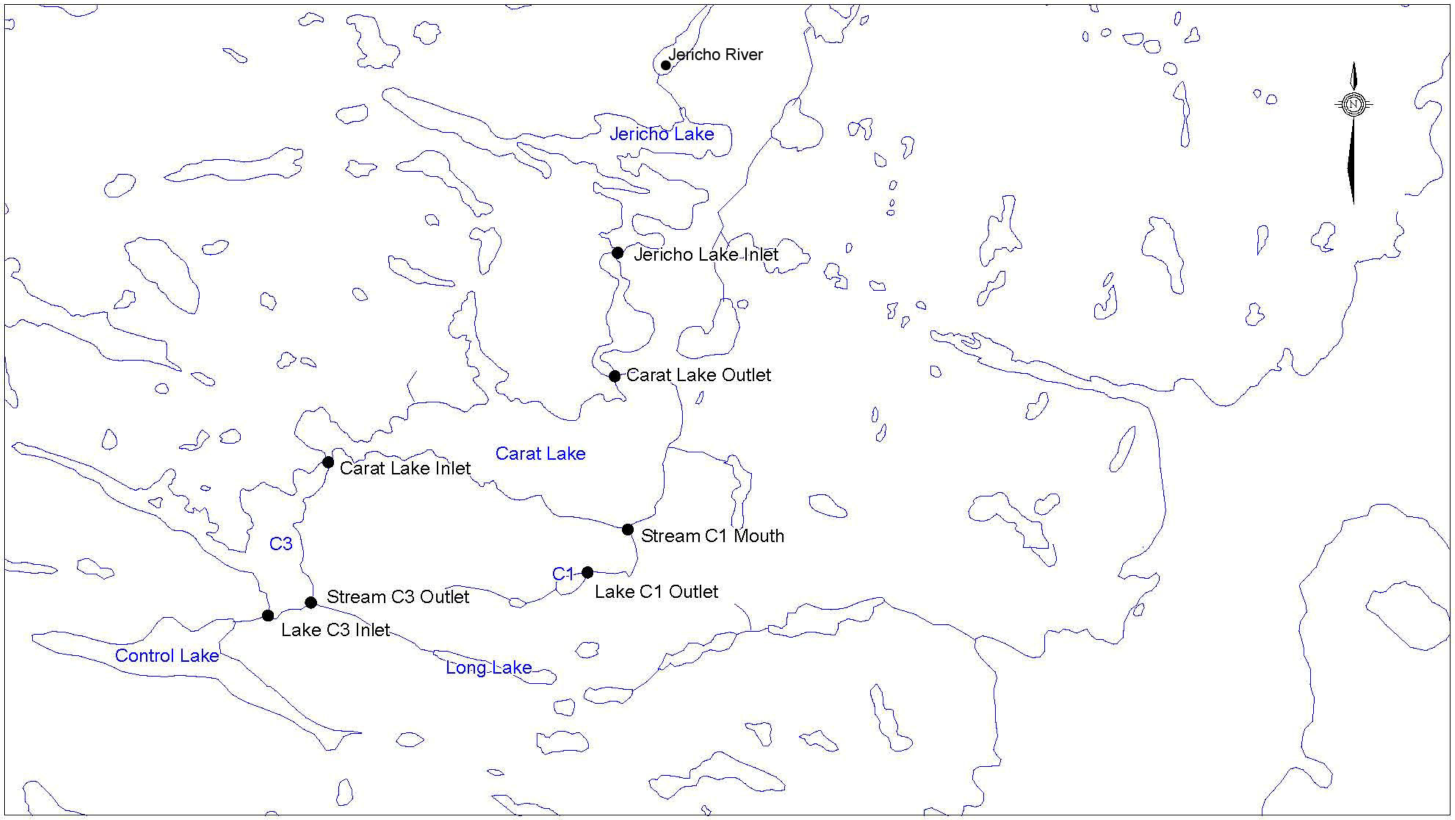
6.5.2 Post Abandonment Monitoring

Post abandonment monitoring will be continued until Nunavut Water Board cancels the mine water licence. For mines without an acid generation problem, monitoring for at least five years after closure is typical; each mine is judged on its own merits however. Monitoring will include annual visual inspection of rock dumps and the Stream C1 diversion as well as the seven water quality monitoring sites sampled once annually in mid to late summer. All site monitoring may be reduced from annual after the initial period in discussions with the Nunavut Water Board. Monitoring reduction criteria will be the following, or as directed by the Board:

- Water quality at background for the past two years will trigger reduction of water quality monitoring to once every 3 years until the pit overflows at which time annual monitoring will resume until water quality is again at background for two years. At that time, cancellation of water quality monitoring will be requested.
- Geotechnical annual inspections will be requested to be reduced to once every five years after the initial period of five years indicates long-term stability of the remaining water and waste handling facilities at the mine. Prior to pit water overflow, a geotechnical inspection will be carried out and actions taken at that time should any problems be revealed.
- Monitoring of revegetation success will be dependent on vegetation trials undertaken as part of reclamation research.

Biological monitoring will not be continued unless indicated by runoff water quality. The trigger to cease biological monitoring will be runoff water quality from the site (as determined by grab samples during spring from ephemeral stream sites near waste rock dumps) achieving receiving environment guidelines or better prior to mine abandonment.

Once the open pit is close to filling, water quality will be determined and plans finalized for discharge of the water either in Stream C1 or an open channel, as previously discussed.



Tahera Corporation

FIGURE 6.1

Aquatic Monitoring Sites

Date:02/10/2000
Author:
Office: North Vancouver
Drawing:
Projection: UTM Zone 12 (NAD 27 for Canada)

7.0 AESTHETICS

Tahera will address, to the extent practical, the issue of aesthetics on closure. To maintain topographic consistency, the stockpiles have been designed so that their height does not exceed the height of surrounding landforms. All removable infrastructure will be taken off site or buried. No scrap will be left; it will be burned, buried, or taken away. All areas that can be practically revegetated will be. All remaining stained soils will be scraped up and remediated or removed from site. Evidence of past mining will still remain however. It will not be practical to level the waste rock dumps nor to completely refill the open pit prior to final abandonment. Waste rock dumps will be approximately the same elevation as the lower of the surrounding hills. The small diversion around Stream C1 will be required to ensure the bottom 100 m of the stream does not dewater and thus potentially harmfully alter fish habitat. The site will slowly green up, but such processes take decades on the Arctic tundra and therefore, bare rock and till will be visible for many years after mining.

The probable aesthetics of the reclaimed and abandoned mine site must, however, be viewed in the context of the setting. The Jericho Project is in a remote location with access limited to snowmobiles in the winter and aircraft year round. Prior to exploration activity in the early 90's, people did not use the site to any significant extent. This is evidenced by archaeological studies and the completely undisturbed state of the site when exploration commenced. Further, the site was not visited casually by anyone not connected to mining activities throughout the period from 1992 (when exploration commenced until the present time). Finally, the site is relatively small (a total of 162.3 ha disturbed by mining) in the context of the vastness of the Arctic.

8.0 COST

A detailed discussion of costs is provided in Appendix D.

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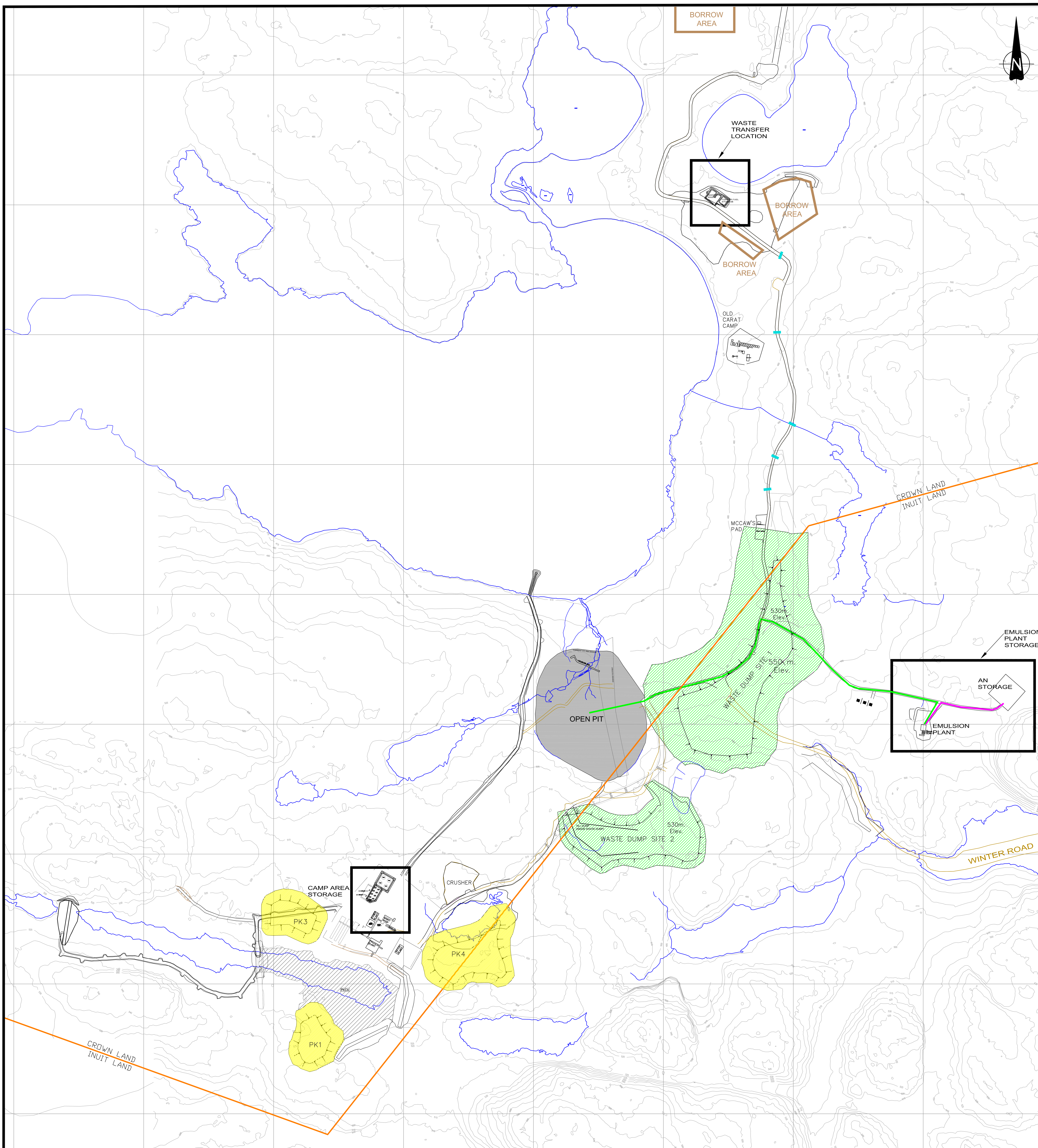
APPENDIX A

MAPS



Legend

0m 50 100 150 200

- Waste Dump
- PKCA
- Open Pit
- Stockpile
- AN truck route
- Explosives truck route
- Culvert

NOTE:
Base map provided by Tahera. Stockpiles and PKCA boundary provided by SRK Consulting.

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CLIENT

Tahera Diamond Corporation

PROJECT: JERICHO DIAMOND PROJECT	DWN BY: BWS	DATUM: NAD27	DATE: JANUARY 2006
TITLE: SITE MAP	CHK'D BY: BO	REV. NO.: A	PROJECT NO: VE51295
	PROJECTION: UTM Zone 12	SCALE: AS SHOWN	FIGURE No. FIGURE 1

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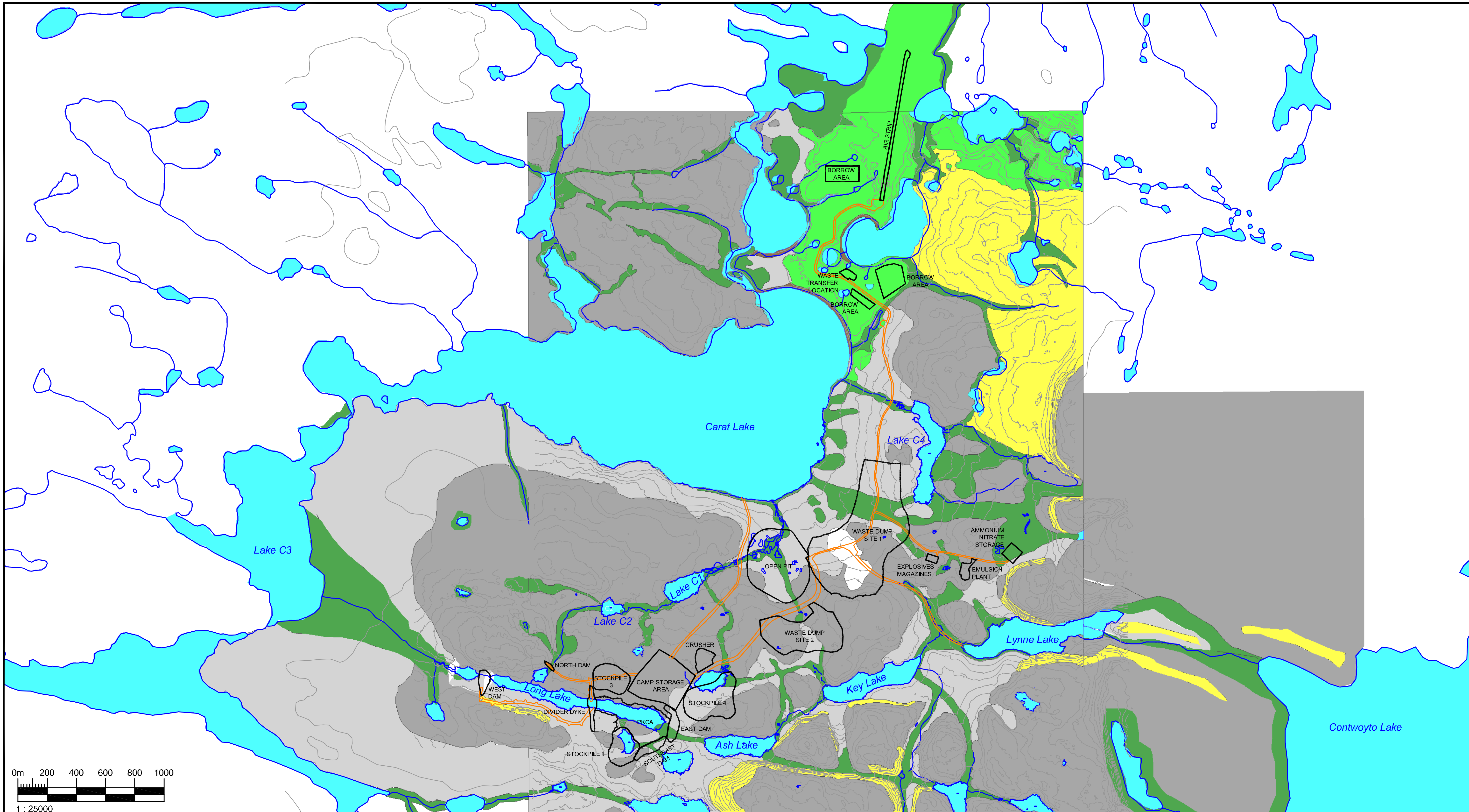

ROCK TUNDRA DRY ROCK TUNDRA	LAND TUNDRA DRY BARREN LAND TUNDRA
WATER	WET GRASS WET GRASS AND BIRCH MEADOWS
CLIFF CLIFF/ROCKY HILL	ESKER ESKER/KAME DELTA
BIRCH BIRCH BRUSH	BEACH BEACH SHORELINE

CLIENT:

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amec

DWN BY:	BWS
CHK'D BY:	BO
DATUM:	-
PROJECTION:	-
SCALE:	AS SHOWN

PROJECT
JERICHO DIAMOND PROJECT

TITLE
ECOLOGICAL ZONES
AT THE JERICHO SITE

DATE:	JANUARY 2006
PROJECT NO:	VE51295
REV. NO.:	A
FIGURE No.	FIGURE 2

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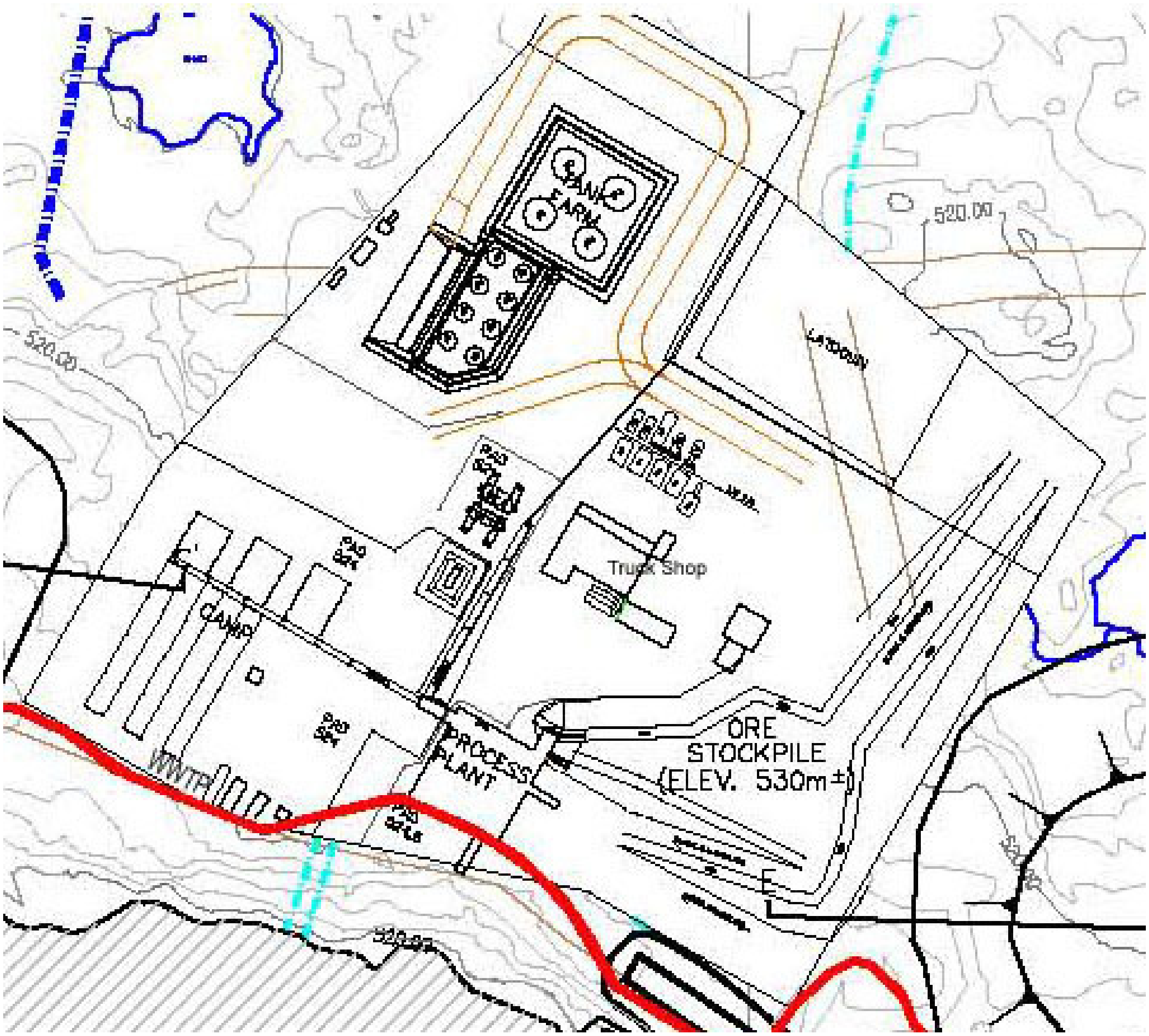

Figure 3: Camp and Storage Detail. Not to scale. Source: SRK 2006

APPENDIX B

SRK May 2004 Closure Pit WQ Memo

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Tel: 604.681.4196
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Memo

To:	Greg Missal, Tahera Corporation	**Date:**	May 6, 2004
cc:	Rick Pattenden, Mainstream Aquatics	**From:**	Kelly Sexsmith
Subject:	Technical Memorandum Q: Post Closure Pit Lake Quality	**Project #:**	1CT004.06

SRK Consulting has completed additional calculations to demonstrate the potential effects of partial freezing of the dumps on the long-term water quality in the pit lake. The results were used to assess the suitability of using the pit lake for fish habitat and to support negotiations with the Department of Fisheries and Oceans (DFO) for the habitat compensation plan for the Jericho project.

The assessment is based on the mine plans, data and calculations presented in the EIS (Tahera, 2003) and supplemental information provided to the Nunavut Impact Review Board by Tahera, AMEC and SRK Consulting in October 2003. Minor changes in the final design of the waste rock dumps and water management facilities have also been considered.

The first part of Table 1 provides a summary of the operational and revised post-closure estimates of water quality for each source of water that will be directed to the pit during closure, i.e. Ponds A, B, and C, runoff from the pit. Key assumptions were as follows:

- The operational water quality estimates were derived following the methods described in Technical Memorandums F and I (SRK 2003). These estimates were updated to account for minor changes in the design of the waste and water management facilities, which will be documented in the Water Licence Application.
- Post-closure TDS and metal concentrations were assumed to be 3x lower than estimates for the operations period due to an approximately 2/3 freeze back of the dumps and stockpiles, resulting in removal of 2/3 of the pile from interaction with infiltration and runoff.
- Post-closure concentrations of total aluminum and total iron were assumed to approach dissolved values due to high residence times in the pit.
- Post-closure concentrations in Pond C were further reduced to account for depletion of the North and Central Lobe Stockpiles at the end of the mine life.

Further concentration reductions resulting from depletion of soluble minerals have not been considered in this analysis because the magnitude of decrease cannot be reliably predicted. However, these processes are expected to result in further reduction of many of the components.

The second part of Table 1 presents initial and revised estimates of water quality in the pit lake:

- Estimate 1 is the revised estimate from the updated water and load balance (SRK 2004, *in preparation*).

- Estimate 2 assumes water in the pit would be a mixture comprised entirely of sources that have reached a post-closure condition, which would apply after freeze back has occurred in the dumps. The Stream C1 Diversion would be maintained and Stream C1 would not enter the pit.

- Estimate 3 also assumes all of the sources will have reached post-closure water quality, but that Stream C1 would be returned to the pit once the pit reaches the spill point. Due to the large volume of water in the pit, it would take approximately 30 years after the pit lake reaches the spill point to approach these steady-state mixing concentrations (Figure 1).

Estimates of nutrient concentrations have been excluded from this presentation, but are expected to reach background levels by the time the pit lake reaches the spill point.

These estimates suggest that concentrations of several parameters could exceed the CCME guidelines for protection of aquatic life or Health Canada guidelines for drinking water quality. While these guidelines do not necessarily indicate that fish would be adversely affected by the pit water quality, they suggest that it may not provide appropriate conditions for the long-term health of fish that may colonize this area.

Regular monitoring of seepage and runoff from the waste rock and low-grade ore stockpiles, throughout operations, and water quality in the pit during the 15 to 20 year filling period will be required to further refine these estimates. Due to the conservative nature of the water quality estimates, it is possible that the monitoring data may indicate improved water quality in the pit lake.

In conclusion, the current estimates of long-term water quality in the pit lake indicate that it may not meet CCME guidelines for the protection of aquatic life. Until the mine is in operation and there is additional monitoring data, further improvement of the accuracy of these estimates are not possible. Therefore, it would be advisable to eliminate the pit from potential habitat compensation alternatives at this time.

Please contact me if you have any questions regarding this assessment.

Yours truly,

Kelly Sexsmith
Senior Environmental Geochemist

Table 1 - Assessment of Pit Water Quality for Different Assumptions of Source Concentrations

Flows and Concentrations of Water Sources to the Open Pit

Source Concentrations	Source	Annual Flow	TDS	TSS	Alk	Ca*	Cl*	K	Mg*	Na	SO4	TAl*	TAs	TCd	TCr	TCu	TFe*	TMo	TNi	TPb	TU	TZn
			mg/L									mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Estimated Water Quality during	Pond A	126,668	529	5	41	133	86	23	63	31	144	0.19	0.0014	0.0005	0.0046	0.050	0.28	0.029	0.015	0.0042	0.24	0.021
Operations Period	Pond B	48,839	481	5	39	119	78	21	56	28	128	0.18	0.0013	0.0004	0.0041	0.045	0.27	0.026	0.014	0.0050	0.23	0.020
(from Revised Water and Load Balance)	Pond C	118,173	3176	9	89	161	1674	100	586	27	520	0.04	0.0027	0.0025	0.0084	0.0039	0.20	0.26	0.12	0.0065	0.11	0.022
	Pit Runoff	34,120	167	7	14	40	77	5	17	5	24	0.34	0.0004	0.0001	0.0059	0.0078	1.1	0.0047	0.070	0.0033	0.066	0.013
Estimated Water Quality	Pond A	126,668	176	2	14	44	29	8	21	10	48	0.06	0.0005	0.0002	0.0015	0.017	0.09	0.010	0.0051	0.0014	0.079	0.0072
Post-Closure Period	Pond B	48,839	160	2	13	40	26	7	19	9	43	0.06	0.0004	0.0001	0.0014	0.015	0.09	0.009	0.0046	0.0017	0.076	0.0066
(see *)	Pond C**	118,173	762	2	23	38	397	24	140	7	123	0.30	0.0007	0.0006	0.0020	0.0014	0.30	0.07	0.029	0.0032	0.052	0.0063
	Pit Runoff	34,120	56	2	5	13	26	2	6	2	8	0.112	0.00012	0.00004	0.0020	0.0026	0.37	0.002	0.023	0.0011	0.022	0.004
Baseline Data (average of 2003 Seeps)	Stream C1	224,045	24	2	12	2.8	0.5	2	1.2	0.70	1	0.093	0.00025	0.00005	0.0005	0.0034	0.31	6.5E-05	0.00073	0.00014	0.0010	0.0015

Water Quality in the Pit Lake

Contributing Sources	TDS	TSS	Alk	Ca	Cl	K	Mg	Na	SO4	TAl*	TAs	TCd	TCr	TCu	TFe*	TMo	TNi	TPb	TU	TZn
	mg/L									mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1 A+B+C+Pit sump (Revised Water and Load Balance)	**1081**	7	47	109	**467**	37	180	23	202	0.70	0.0015	0.0009	0.0048	0.027	0.81	0.092	0.043	0.0061	**0.18**	0.018
2 A+B+C+Pit Runoff - Revised Post closure estimates	372	2	16	38	161	13	62	8	70	0.15	0.0005	0.0003	0.0017	0.009	0.20	0.032	0.015	0.0020	**0.063**	0.006
3 A+B+C+Pit+Ice+Stream C1 (after steady state mixing is reached)	231	2	14	24	96	8	37	5	42	0.13	0.0004	0.0002	0.0012	0.007	0.24	0.019	0.009	0.0013	**0.038**	0.004
CCME Aquatic Life Guidelines	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*na*	*0.1*	*0.005*	*1.7E-05*	*0.0089*	*0.002*	*0.3*	*0.073*	*0.025*	*0.001*	*na*	*0.03*
Health Canada Guidelines	*500*	*na*	*na*	*na*	*250*	*na*	*na*	*na*	*500*	*0.1*	*0.025*	*0.005*	*0.05*	*1.0*	*0.3*	*na*	*na*	*0.01*	*0.02*	*5*
Carat Lake Baseline Data	*11*	*1.4*	*4.7*	*2.3*	*3.4*	*2.0*	*0.8*	*2.0*	*1.2*	*0.052*	*0.00016*	*0.00005*	*0.0025*	*0.0020*	*0.025*	*0.00005*	*0.0005*	*0.00005*	*0.00020*	*0.0020*

Notes:

* Post Closure Water Quality reflects a 3x reduction in TDS and metal conentrations,
which accounts for freeze back of 2/3 of the rock in the dumps and stockpiles
and dissolved source concentrations for aluminum and iron, reflecting the large retention times in the pit lake.
This reduction does not account for any reductions caused by flushing of the more soluble constituents from the pile.

** Post Closure water quality is further improved in Pond C due to depletion of the ore stockpiles.

1 Estimates from Revised Water and Load Balance, using source concentrations from operations, but post-closure flows

2 Assumes all sources of water entering the pit have reached post-closure water quality by the start of filling

3 Reflects mixed water quality in the pit in the long term, once steady-state mixing has been reached (approximately 30 years after pit is filled)

Yellow highlight indicates values exceed CCME criteria for Aquatic Life

Bold Bold indicates values meet CCME criteria, but exceed Health Canada guidelines for community water supplies.

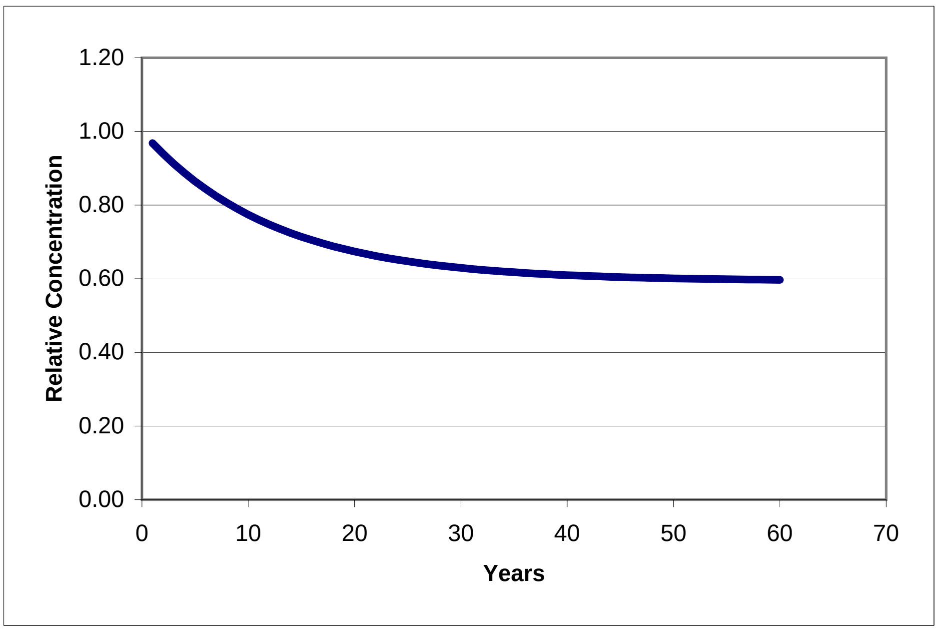

Figure 1 - Effect of diverting Stream C1 water into the pit lake, assuming Ponds A, B and C are also discharged to the pit. The pit lake and the collection pond discharges are assumed to be at a concentration of 1. Therefore, the maximum dilution within the pit from Stream C1 is approximately 60%

Appendix C

SRK Pit Water Treatment Memorandum

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Memorandum

To:	Project File	**Date:**	July 22, 2004
cc:	Kelly Sexsmith, SRK Cam Scott, SRK	**From:**	John Chapman
Subject:	Technical Memorandum R Jericho Post Closure Pit Lake Water Treatment	**Project #:**	1CT004.06

1 Introduction

1.1 Objectives

SRK Consulting has developed estimates of long-term post closure water quality in the Jericho Pit Lake (*Technical Memorandum Q: Post Closure Pit Lake Quality, SRK 2004, In: Abandonment and Restoration Plan, AMEC 2004)*. The current predictions suggest that concentrations of some contaminants may slightly exceed CCME guidelines for the protection of freshwater aquatic life. Given the proximity to the receiving environment, a contingency for post closure water quality management may be required to reduce contaminant concentrations in the pit lake to levels that are appropriate for discharge into Carat Lake.

The purpose of this memorandum is to provide "proof of concept" for use of an in-pit treatment system as a contingency to remove contaminants from the pit lake in the event water quality does not meet acceptable limits.

1.2 Background

Development of treatment strategies for water contained in pit lakes is dependant on site specific requirements. The evaluation and design of associated measures for treatment of the pit lakes should consider factors such as capacity, reliability, longevity, as well as monitoring and maintenance requirements.

Chemical treatment has a long track record. It is robust and reliable and is the technology of choice where the contaminant loads are high or there is no opportunity for experimentation. However, depending on the volume of water that has to be treated from a pit lake, the cost may be high. Biological treatment in some instances, where volumes are high and contaminant concentrations are low, have been shown to be cost effective and represent a viable alternative to conventional chemical treatment.

As discussed below, the current estimates of metal concentrations in the pit lake are within levels that may be treated with a biological treatment system. The intent would be to first revise the long-term estimates of pit water quality once actual seepage and runoff water quality data for the waste rock and pit wall runoff become available. If this data indicates that post-closure treatment may be required to meet discharge criteria, then verification would be completed during or shortly after operations cease, so that by the time the pit is flooded, the full scale system performance can be optimized. In the following sections, the likely performance of such a system is assessed and recommendations to verify the performance and develop specific design and implementation criteria are provided.

2 Biological Treatment Concept

A number of studies have been conducted on the use algae for the in-situ treatment of and pit lake water (Steinberg *et al.*, 2001; Pohler *et al.*, 2002; Poling *et al*., 2003). Typically, *in-situ* biological remediation involves the addition of nutrients to pit lakes to stimulate the growth of primary producers, mainly photosynthetic unicellular algae or phytoplankton. The algae remove metals from the top water layer through absorption and/or adsorption and eventual settling to the lake bottom where the decomposition of organic material creates biological oxygen demand that may in turn create suitable anoxic conditions for biological sulphate reduction (SRB). Under anoxic conditions, SRB can reduce sulphate to sulphide through a series of enzymatic reactions. The sulphide thus generated can form sulphide minerals with dissolved metals to reduce dissolved metal concentrations to very low levels. The cycling of iron from the sediment to the water column under anoxic conditions can also contribute to the co-precipitation of dissolved metals with Fe(III) oxy-hydroxide formed in the oxygenated zones of the pit lake.

Nutrient additions usually comprise phosphorous and nitrogen sources to stimulate phytoplankton growth. Nutrient additions to stimulate the growth of phytoplanktonic algae to promote dissolved metal removal have been successful at the Island Copper and at Landusky pit lakes (Adams, 2002). Successful results were also obtained from pilot-scale tests at Equity Silver mine (Martin *et al.*, 2003; Crusius *et al.*, 2003; McNee *et al.*, 2003). The growth of phytoplanktonic algae has also been stimulated by phosphorus addition at the Colomac Mine site within large contained areas exposed to ambient weather conditions (albeit that the primary purpose was ammonia removal), which demonstrated algae growth in a northern climate.

In a northern climate, heating by the sun causes the surface layer of water in a lake to warm up. The density of the warmer water in the surface layer is lower than the colder water at depth, resulting in a stratification of the lake during the summer months. It is this warmer surface layer of water that is productive. Phytoplanktonic growth would be supported to the depth of light penetration.

During fall, the surface water cools down to about 4 ^{o}C when it reaches its maximum density. This generally causes the now heavier water to sink to the bottom of the lake causing complete mixing of the lake. Typically lakes would also turn over in spring soon after ice-melt when the surface water temperature again approaches 4 ^{o}C.

In general, a similar sequence of events would be expected to occur in the pit lake. However, certain pit lakes may become permanently stratified if the water at depth is more saline, i.e. the water at depth consistently has a density that is higher than the surface water. The shape and depth of the pit lake, the thickness of the ice that forms during the winter and the energy of the flows into the pit lake are additional factors that will determine whether or not this condition, known as meromixis, would develop in the pit lake.

In the case of the Jericho pit lake, the post closure continuous flow through of water and the low salinity conditions would prevent the build-up of salinity and it is therefore unlikely that meromixis would develop. The kinetic energy input from the inflows would also promote mixing. Therefore, the water in the pit lake is likely to be mixed on a regular basis.

In concept, implementation of a biological treatment system in the Jericho pit lake in a post-closure situation would require that nutrients be dispersed throughout the productive surface layer of the pit lake throughout summer. This is generally done by discharging a liquid containing dissolved nutrients into the propeller wash of a small boat as it traverses the surface of the pit lake. The timing and the frequency of the nutrient additions would depend on the productivity and the rate of nutrient consumption to ensure that elevated nutrient concentrations are not released to the receiving environment.

In the next section, a brief assessment of the likely performance of biological treatment system is completed.

3 Application to Jericho Site

3.1 Site Conditions

The rate of growth of phytoplankton will depend on the depth of light penetration, solar radiation, the temperature in the surface layer, and, the availability of nutrients.

The water flowing into the pit is not expected to contain elevated levels of suspended solids, therefore light penetration is not expected to represent a constraint on phytoplankton growth. In the following sections, the climatic conditions at the site are compared to those at the Colomac site, where phytoplankton growth has successfully been demonstrated through nutrient additions.

3.1.1 Sunlight

Table 3-1 below compares the average sunshine hours for nearby meteorological stations, and the exposure profiles are shown in Figure 3-1. The Jericho site is located at a latitude of about 66^{o}N, and is therefore expected to have sunshine exposures similar to that of Kugluktuk of about 1,629 hours of sunshine per annum. The sunshine exposure for Colomac, at a latitude of 64 ^{o}N is expected to similar to that of Baker Lake, i.e. 1,843 hours per annum. Both Kugluktuk and Baker Lake had approximately 300 hours of sunshine during July and 200 hours of sunshine during August. Based on these comparisons, the Jericho and Colomac sunshine profiles, and peak sunshine hours are expected to be similar. Therefore, during these peak exposure months (June and July) primary production of phytoplankton at Jericho is expected to similar to that observed at the Colomac Site. While the overall annual exposure is lower, this is of no consequence since the difference occurs primarily in the fall and winter when no growth would be expected anyway.

Table 3-1
Total Bright Sunshine (hours)

Station	Latitude	Longitude	Annual
Baker Lake	64 18 N	96 05 W	1843
Kugluktuk (Coppermine A)	67 50 N	115 7 W	1629
Norman Wells A	65 17 N	126 48 W	1854
Yellowknife A	62 28 N	114 27 W	2277

(Source: Environment Canada 1951-1980 Climate Normals)

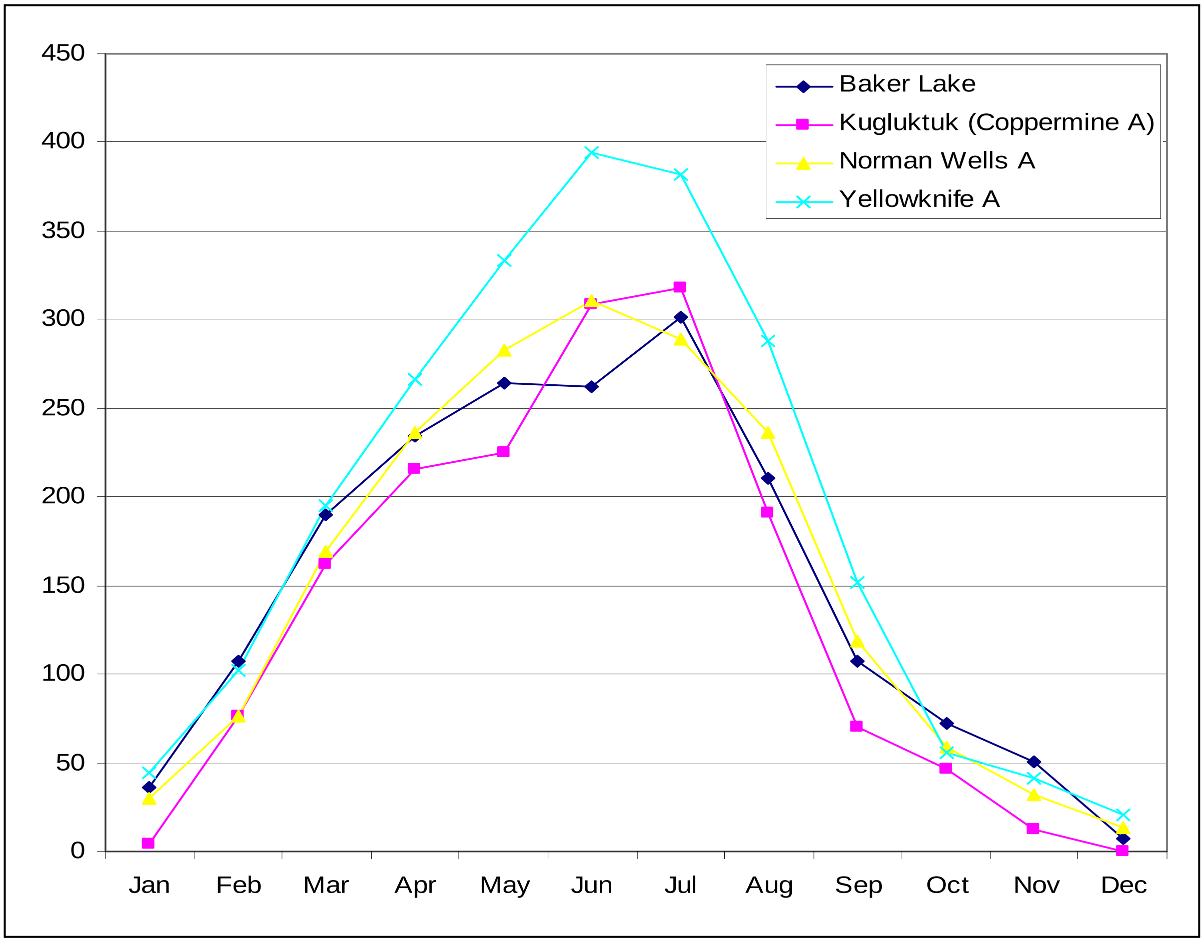

Figure 3-1 Average Annual Sunshine Profiles

3.1.2 Thermal Profile/Stratification

As discussed above, the solar radiation in the summer months is expected to be similar to that for the Colomac site. Therefore, the thermal stratification and peak temperatures are likely to be similar. At the Colomac Pit, thermal stratification occurs to a depth of about 5 meters, and the temperature increases to about 15 ^{o}C. (It should be noted that phytoplankton and metal removal occurs at temperatures as low as 4 ^{o}C at the Island Copper Pit Lake.)

It is therefore concluded that the climatic conditions at the site will be suitable for phytoplankton growth.

3.1.3 Nutrients

The treatment strategy requires that nutrients be added to the pit lake at concentrations that would stimulate phytoplankton growth. Baseline characterization of the receiving surface water quality indicated oligotrophic conditions (i.e. low nutrient conditions), which suggest that nutrient management within the pit lake will be key to the success of an in-situ treatment system.

3.2 Predicted Water Quality

Table 3-2 provides a summary of the initial estimates of key parameters for each source of water that will be directed to the pit lake. These comprise discharges from Ponds A, B, and C and runoff from the pit walls. The table includes the initial estimates of the pit water quality, as presented in Technical Memorandum F (SRK 2003), and revised estimates of pit water quality which consider the effects of partial freezing of the waste rock dumps (SRK 2004). The pit lake water quality, as shown in the second part of the table, represents estimated long-term steady state conditions. The long-term steady state concentrations are shown to indicate the effect of the net loadings to the pit lake, since it will be possible to remove most of the accumulated contaminants before discharge occurs.

Table 3-2
Assessment of Pit Water Quality for Different Assumptions of Source Concentrations

Flows and Concentrations of Water Sources to the Open Pit									
Source Concentrations	**Source**	**Annual Flow**	**T-Al mg/L**	**T-Cd mg/L**	**T-Cu mg/L**	**T-Fe mg/L**	**T-Pb mg/L**	**T-U mg/L**	**T-Zn mg/L**
Estimated Water Quality during Operations Period (from Revised Water and Load Balance)	Pond A	126,668	0.19	0.0005	0.050	0.28	0.0042	0.24	0.021
	Pond B	48,839	0.18	0.0004	0.045	0.27	0.0050	0.23	0.020
	Pond C	118,173	0.04	0.0025	0.0039	0.20	0.0065	0.11	0.022
	Pit Runoff	34,120	0.34	0.0001	0.0078	1.1	0.0033	0.066	0.013
Estimated Water Quality Post-Closure Period	Pond A	126,668	0.06	0.0002	0.017	0.09	0.0014	0.079	0.0072
	Pond B	48,839	0.06	0.0001	0.015	0.09	0.0017	0.076	0.0066
	Pond C	118,173	0.30	0.0006	0.0014	0.30	0.0032	0.052	0.0063
	Pit Runoff	34,120	0.112	0.00004	0.0026	0.37	0.0011	0.022	0.004
Baseline Data (avg. of 2003 Seeps)	Stream C1	224,045	0.093	0.00005	0.0034	0.31	0.00014	0.0010	0.0015
Predicted Water Quality in the Pit Lake									
Contributing Sources			**T-Al mg/L**	**T-Cd mg/L**	**T-Cu mg/L**	**T-Fe mg/L**	**T-Pb mg/L**	**T-U mg/L**	**T-Zn mg/L**
A+B+C+Pit+Ice+Stream C1 (at steady state)			0.13	0.0002	0.007	0.24	0.0013	0.038	0.004
CCME Aquatic Life Guidelines			*0.1*	*1.7E-05*	*0.002*	*0.3*	*0.001*	*na*	*0.03*
Health Canada Guidelines			*0.1*	*0.005*	*1.0*	*0.3*	*0.01*	*0.02*	*5*
Carat Lake Baseline Data			*0.052*	*0.00005*	*0.0020*	*0.025*	*0.00005*	*0.00020*	*0.0020*
Ratio of Pit Lake to CCME Aquatic Guidelines			*1.3*	*12*	*3.5*	*0.8*	*1.3*	*-*	*0.1*

Table 3-2 also provides a ratio of the estimated pit lake water quality to the CCME Guidelines for the protection of freshwater aquatic life. As shown, cadmium and copper are the primary contaminants of concern, whereas aluminium and lead may marginally exceed the guidelines. Iron and zinc would meet the CCME guidelines for the protection of freshwater aquatic life.

At neutral pH conditions, it is anticipated that the total aluminium is likely to be present as a suspended precipitate, which would in part be removed within the lake due to gravitational settlement. It is not expected to represent a concern in the downstream receiving environment. In the next section, the performance of a biological treatment system is estimated.

3.3 Biological Treatment Performance Assessment

In this section the Island Copper experience will be used to assess the potential performance that could be expected at the Jericho Pit Lake. The Island Copper in-situ pit lake treatment system for metals removal is a full scale system with several years of operational data that has been well documented. Although the Island Copper project is located at a latitude of only 51.7^{o}N, in the winter the site experiences significantly lower solar radiation and lower water temperatures than will be expected at the Jericho Pit Lake. Therefore, the Island Copper winter performance data can be used to provide a conservative indication of the potential performance at Jericho.

3.3.1 Contaminant Loading and Removal Rates

The metal concentrations and flows presented in Table 3-2 can be used to calculate specific loadings to the pit lake. The estimated contaminant loadings to the Jericho pit, calculated as grams per hectare of pit lake surface area per year, are shown in the first row in Table 3-3.

Table 3-3 also summarises the removal rates achieved at the Island Copper Mine (Poling et al. 2003). Note that the removal rates are given in units of g/ha/**day**, as opposed to the units of g/ha/**year** in which the loadings are reported. The annual average, winter (December to February) and summer (June to August) removal rates are shown. (Removal rates in test cells or limno corrals at the Equity Silver mine yielded similar rates of metal removal.) Typically the rate of removal at the Island Copper Mine decreases in the winter due to reduced sunshine and colder weather. In the winter, the surface water temperature in the Island Copper Pit Lake may decrease to below 5 ^{o}C. Apart from the latitude of the Island Copper site, the predominantly rainy winter (overcast) also limits solar radiation so that the winter conditions are significantly less conducive to phytoplankton growth than would be the case during the summer at the Jericho site. Therefore, estimating contaminant removals that may be achieved at Jericho using the winter rates observed at the Island Copper site will provide a conservative indication of the pit lake treatment performance.

The last row in Table 3-3 provides an estimate of the time that would be required to remove the annual metal loading from the Jericho Pit Lake, estimated from the Island Copper winter removal rates. As shown by the results, the cadmium removal would require the longest treatment time (at about 22 days). This would mean that 3 to 4 fertilizer applications spaced 10 days apart should be sufficient to achieve metal removals equivalent to the annual loadings.

Table 3-3
Estimated Contaminant Loadings and Removal Rates

Description	Units	T-Cd	T-Cu	T-Pb	T-Zn
Jericho Pit Lake Loadings	g/ha/year	6.6	227	41	145
Island Copper Removal rates					
Annual Average	g/ha/day	0.91	25	n/a	66
Low (Winter)	g/ha/day	0.30	18	n/a	40
High (Summer)	g/ha/day	1.6	37	n/a	160
Time to achieve removal (using winter rates from Island Copper)	Days	22	13	n/a	4

3.3.2 Retention Time

In the previous section it was shown that within a treatment period of less than 1 month it is possible to remove the equivalent of an entire years loading to the pit lake. The potential for contaminant release from the pit lake would depend on the retention time within the pit lake. Effectively, if the retention time exceeds the time required to treat the equivalent loading, the net release of contaminants would effectively be limited. On the other hand, if the retention time is much shorter than the treatment time, the risk for contaminant release will be significant.

The pit lake will have a total flooded volume of about 6.5 million m^3. For completely mixed conditions it can be shown that the retention time of the annual flow into the pit lake will be about 20 years. In the event that meromixis develops, the retention time in the surface layer would be approximately 1.5 years. In either event, the retention time significantly exceeds the treatment time indicating an insignificant risk for contaminant release.

3.3.3 Water Quality

The Island Copper Pit Lake metal loadings are significantly greater than those indicated for the Jericho Pit Lake (as can be inferred from the metal removal rates). The retention time of the surface layer in the Island Copper Pit Lake is approximately 1 year, compared to a more favourable minimum retention time of about 1.5 years at Jericho. Therefore metal concentrations at Jericho are expected to similar or lower than at Island Copper. At the Island Copper Pit Lake, copper concentrations are typically lowered from about 0.02 to 0.03 mg/L to less than 0.004 mg/L; lead from about 0.009 mg/L to less than 0.00005 mg/L; zinc from in excess of 5 mg/L to less than 0.002 mg/L; and cadmium from 0.03 mg/L to less than 0.001 to 0.002 mg/L. It should be noted that the surface water of the Island Copper Pit Lake is brackish, with a salinity of about 3 parts per thousand, because it is partially mixed with seawater. The resultant elevated chloride content, which strongly complexes cadmium and to a lesser extent copper and zinc, is limiting the extent of metal removal. In the case of the Jericho Pit Lake, chloride concentrations will be lower, and complexing reactions are not expected to affect metal removal. It is therefore likely that metal concentrations will be reduced below those observed for the Island Copper site.

Results from limno-corral tests conducted at the Equity Silver mine (McNee et al, 2003) indicated that copper decreased from about 0.005 mg/L to <0.001 mg/L and cadmium decreased from about 0.005 mg/L to < 0.0002 mg/L. Similar reductions in metal concentrations would be expected for the Jericho Pit Lake, which suggests that water quality approaching CCME guidelines may be achieved by in-situ biological treatment.

3.3.4 Fertilization and Nutrients

At the Island Copper Site, liquid fertilizer is applied at a frequency of about 10 days throughout the entire year. The program is designed to coincide with the phytoplankton growth cycle. Typically, dissolved otho-phosphate is maintained at less than 0.005 mg/L (as P) at the time of fertilization which decreases to less than 0.001 mg/L by the end of the 10 day fertilization cycle. Total nitrogen is maintained at less than 0.5 mg/L (as N).

It is anticipated that at Jericho, fertilization would be undertaken only during the ice free period and only for about 2 months of the year. The fertilization would be undertaken every 10 days during July and August, once the majority of the spring runoff has discharged from the pit, and the thermocline has established in the pit lake. A liquid fertilizer mix would be prepared, and dispensed from a small boat that would traverse the surface of the pit lake. The liquid fertilizer would be released to the propeller wash of the boat, which would disperse the fertilizer. Studies elsewhere have shown this to be an effective method of fertilizing. The volume of liquid fertilizer that would be added would be determined from the residual nutrient concentration in the surface layer, the composition of the fertilizer and the volume of the surface layer.

Discharges from the pit lake during the fertilization period would be minimal and could be controlled with an appropriate spillway design. Treated water would be released by gravity the following spring. Assuming nutrients levels would be maintained at level similar to those for the Island Copper Lake, nutrient levels are not expected to impact on the receiving environment, even though it is oligotrophic.

3.3.5 Conclusions

As discussed in the previous sections, biological in-situ treatment represents a feasible contingency in the event that unacceptable water quality results in the Jericho Pit Lake.

The technology and understanding of the metal removal processes is rapidly evolving and finding application elsewhere. However, at present, laboratory and field scale demonstration of the technology would be required to verify its application to the Jericho Pit. Considering the estimated time-scale to complete flooding of the pit lake (25 to 30 years), sufficient time is available to complete such a demonstration during or after operations. In the next section, recommendations for the demonstration in-situ biological treatment of the Jericho Pit Lake are provided.

4 Requirements for Demonstration

Water quality and flow monitoring during the first three to five years of operation will be required to refine the current estimates of long-term water quality in the pit lake, and therefore determine the need for the in-situ treatment. The demonstration program would be implemented if the refined predictions indicate that treatment is required.

As noted before, the technology is evolving rapidly and it will be necessary to stay abreast of developments through continued literature reviews. The following presents a program that would demonstrate the applicability of the technology to the Jericho site. However, adjustments may be required to accommodate future developments.

A program for the demonstration of the effectiveness of biological treatment as a contingency measure would comprise three phases as follows.

4.1 Phase I – Bench Scale Assessment

The objectives of the bench scale investigation address the following questions:

- Can phytoplankton blooms be established in water from the site (that would represent the estimated long term pit lake water quality)?
- What are the minimum nutrient requirements to initiate a phytoplankton bloom, and how frequently should fertilization occur to maintain phytoplankton growth?
- Will metal removal rates exceed metal loadings and will sufficiently low metal concentrations be achieved?

To address these objectives, it is recommended that a laboratory program be undertaken on site in large containers (20 to 200 L vessels) that are exposed to ambient solar radiation and that are maintained at a temperature equivalent to that which develops in the surface layer of the local lakes.

The vessels would be filled with seepage from the waste rock piles or simulated pit lake water, and fertilized with different concentrations of nutrients. The rate of phytoplankton growth, dissolved nutrient concentrations and contaminant concentrations would be monitored on a regular basis. Typically the tests would be completed over a 6 to 8 week period.

Typically this scale of testing provides good information on the nutrient demand and the rate of phytoplankton growth. However, metal removal rates and achievable water quality are more onerous to demonstrate at this scale due to the short duration of the tests.

Results from the phase of the program would be used to design a larger scale field test that would be undertaken in Phase II of the program.

4.2 Phase II – Field Scale Demonstration

The purpose of the field scale tests would be to provide large scale demonstration of metal removal rates and nutrient requirements. The larger scale would enable easy scale-up to a full-scale system. This phase of testing would follow the initial bench scale program.

Larger scale tests would then be undertaken to more accurately evaluate metal removal. The larger scale tests would comprise limno-corrals that would be established in the PKCA, water management pond or a local lake as soon as thermal stratification occurs. (Limno-corrals are simple open ended enclosures that comprise a circular vertical curtain suspended from a floatation ring to isolate a column of water from the surrounding water body. While the enclosure is open-ended at the base, isolation is achieved due to thermal stratification in the water body.) If the water quality in the waterbody does not reflect the pit lake water quality, the surface water layer within the limno-corral would be replaced with water at an appropriate quality. The surface layer would then be fertilized at a rate and schedule determined from the laboratory program. The water quality would be monitored to establish metal removal rates and terminal concentrations. The limno-corrals would also be equipped with sediment traps to verify the fate of the metals. Further testing would also be undertaken on the sediments to assess the potential for nutrient recycling.

4.3 Phase III – Full Scale Verification

The objectives of this phase of investigation would be to verify the results from the field scale demonstration and to treat the pit lake water so that it meets discharge criteria before reaching the spill point. This phase of the investigation would be undertaken during the flooding of the pit.

Once a sizeable water body has been established in the pit, it is recommended that the water quality profiling be undertaken on a regular basis to monitor the water quality and mixing regime of the pit lake. Since numerous seasons will be available before the water level reaches the spill elevation, it is recommended that intermittent fertilization programs be undertaken to verify metal removal and treated water quality. At this time, nutrient recycle rates can also be established to ensure that over-fertilization does not occur once full scale flow-through operations commence.

5 Conclusions and Recommendations

The evaluation of in-situ biological treatment as a contingency treatment process for the Jericho Pit Lake after closure presented herein suggests that in-situ biological pit lake treatment may achieve water quality approaching CCME guidelines. In addition, nutrient concentrations are not expected to significantly impact the receiving environment. As such, it is appropriate to consider biological treatment as a post closure treatment strategy to remove contaminants from the pit lake.

Water quality monitoring during the first three to five years of operations will be required to refine the current estimates of water quality in the pit lakes. If the refined estimates indicate there is a need for water treatment after closure, staged demonstration of the treatment process will be required to verify residual metal and nutrient concentrations.

6 References

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Appendix D

Reclamation Cost Estimate

Reclamation costs have been updated from Nuna Logistics 16 August 2004 estimate based on the as built mine configuration to 31 December 2005. The RECLAIM model was used to calculate costs. Costs do not include facilities that have not been constructed, except with respect to any surface disturbance occasioned by ground preparation for such facilities. Excluded are:

- Waste Rock Dump 1
- Coarse PK stockpiles except:
  - Area disturbance for PK stockpiles 1 and 3
  - Area disturbance for PK stockpile 2 is included with East Dam
- PKCA cover; no PK slurry generated; cover not applicable.

Nuna Logistics' current (31 December 2005) machine and operator costs were used.

Revegetation and post-closure vegetation monitoring have not been included in the estimate as per Nuna Logistics' August 2004. Revegetation research is scheduled to commence in 2006 and once revegetation prescriptions are developed, revegetation costs will be addressed in the reclamation cost estimates.

Assumptions were similar to those made by Nuna Logistics and are listed below:

Item	Assumptions
Open Pit	**Objective: Control Access** A control berm will be constructed around the ultimate pit boundary early in operations with minor completions (pit accesses) during reclamation. The pit lip will be contoured to 5:1 for 10 m from the perimeter. Fencing and signage are not included in the estimate.
	Objective: Stabilize Slopes Not expected to be required. Additionally, it is planned that the pit will be naturally flooded.
	Objective: Cover/Contour Slopes Not required.
	Objective: Spillway The equivalent functionality of the spillway is included in the construction and operation phases. The spillway equivalent will not be required to operate until after the pit naturally fills (minimum 20 years after closure).
	Objective: Flood Pit This is expected to occur naturally. Dewatering pipes will be removed during reclamation and is included in facilities demolition in the estimate. Water quality additives arte not included in the estimate. During the monitoring stage, it may be determined if the requirement exists or not.
	Objective: Develop Wetland Not applicable.
	Objective: Reclaim Borrow Areas Borrow A disturbed 31 December 2005 and reclamation included in estimate
	Other Items Allowance for grading down the causeway to lake subsurface.

Item	Assumptions
Underground PKC Area	Not constructed 31 December 2005
	Objective: Control Access Not required.
	Objective: Stabilize Embankment Not required. The dams are relatively low angle, stable structures
	Objective: Cover Tailings No tailings deposition 31 December 2005.
	Objective: Flood PKC Not applicable.
	Objective: Treat Supernatant Not required.
	Objective: Upgrade Spillway On completion of operations, spillway or dam will be lowered to allow clean water overflow resulting in a small PKC area settling pond to remain.
	Objective: Stabilize Decant System Not applicable.
	Objective: Remove Tailings Discharge No tailings deposition 31 December 2005.
Waste Dumps: Waste Dump 1 not constructed 31 Dec 05	**Objective: Stabilize Slopes** The waste dumps will be dozed to a slope of about 18° (approximately ½ the natural angle of repose of the materials.
	Objective: Cover Dump The top bench will be covered with 300 mm of overburden material.
	Objective: Relocate Dumps Not applicable.
	Objective: Collect and Treat Waste dump runoff will be diverted to the open pit.
Coarse PK Piles 1 & 3	PK Pile 2 is incorporated in the East Dam; PK Pile 4 has not been constructed. PK Pile 1 & 3 pads only; no PK.
	Objective: Stabilize Slopes Not applicable.
	Objective: Cover Pile 300 mm of overburden will be placed on the pads.
	Objective: Relocate Pile Not applicable.
	Objective: On-Going Treatment Not applicable.
	Objective: Develop Wetland Not applicable.
Building/Equipment	**Objective: Dispose Mobile Equipment** Not applicable.
	Objective: Dispose Stationary Equipment Removal from site included in estimate.
	Objective: Dispose Ore Concentration Equipment Not applicable.
	Objective: Dispose Water Treatment Equipment Not applicable.
	Objective: Decontaminate Buildings & Tanks Included in estimate.
	Objective: Mothball Buildings Not applicable.

Item	Assumptions
	Objective: Remove Buildings Included in estimate.
	Objective: Break Basement Slabs Included in remove building estimate.
	Objective: Remove Buried Tanks Not applicable.
	Objective: Landfill for Demolition Waste Demolition waste will be buried in the waste rock dump where drainage is to the open pit.
	Objective: Grade and Contour Included in estimate
	Objective: Reclaim Roads/Airstrip Included in estimate.
Chemicals	**Objective: Laboratory Chemicals** Laboratory chemicals will be hauled off site and disposed of appropriately.
	Objective: PCBs Not applicable.
	Objective: Fuel Excess fuel and waste oil will be hauled off site.
	Objective: Process or Treatment Chemicals Not applicable.
	Objectives: Explosives Explosives will be hauled off site.
	Objective: Contaminated Soils No allowance has been made in the estimate for significant spills. It is expected that contaminated soils will be remediated when/if the events occur. The material underlying the tank farm and power plant will be encapsulated within the waste dump as a precautionary measure.
	Objective: Hazardous Material Testing and Assessment Not applicable.
Water	**Objective: Stabilize Embankment** The estimate allows for excavation of the causeway to below water level.
	Objective: Upgrade Spillway **Objective: Stabilize Sediment Containment Ponds** The water management structures are developed during construction and operations and are intended to remain in operation post-closure with excess water diverted to the open pit.
	Objective: Breach Embankment Not applicable.
	Objective: Stabilize Ditches The C1 diversion ditch is intended to remain in operation post closure.
	Objective: Remove Pipelines **Objective: Remove Storage Tanks** Pipelines and storage tank removal is included in facilities demolition in the estimate. The materials will be buried in the waste dump.
	Objective: Collect Drainage for Treatment The water management structures and drainage collection ae established during construction and operations and remain in operation post-closure with excess water diverted to the open pit.
	Objective: Treat Drainage On going treatment costs are not included in the estimate. This will not be required until after the open pit fills (minimum 20 years). No treatment is expected to be required.

Item	Assumptions
Mobilization	**Objective: Mobilize Heavy Equipment** Included in estimate.
	Objective: Mobilize Camp We have included the openings of the operations camp and the mobilization of a small well-site during final demolition of the operations camp.
	Objective: Mobilize Workers **Objective: Mobilize Miscellaneous Supplies** **Objective: Mobilize and House Workers** **Objective: Winter Road** Included in estimate.
	Objective: Bonding **Objective: Taxes** Performance bonding and GST are not included in the estimate.
	Objective: Insurance Typical contractor insurances are included in the estimate
Monitoring	**Objective: Inspections** Included in estimate. **Objective Maintenance** Not required.
Post-Closure Maintenance	In the closure plan, there is no requirement for site maintenance.
On-Going Water Treatment Costs	Not required.

SUMMARY OF COSTS

Capital Costs

Component Type	Component Name		Total Cost	Land Liability	Water Liability
OPEN PIT		0	$22,306.32	$19,397	$2,910
UNDERGROUND MINE		0	$0.00	$0	$0
TAILINGS		0	$19,396.80	$9,698	$9,698
ROCK PILE	WRD 2		$161,999.88	$162,000	$0
	PK1		$34,057.90	$34,058	$0
	PK3		$37,467.50	$37,468	$0
BUILDINGS AND EQUIPMENT		0	$4,062,726.16	$4,062,726	$0
CHEMICALS AND SOIL MANAGEMENT		0	$0.00	$0	$0
WATER MANAGEMENT		0	$0.00	$0	$0
POST-CLOSURE SITE MAINTENANCE			$0.00	$0	$0
SUBTOTAL			**$4,337,955**	**$4,325,347**	**$12,608**
			Percentages	99.7%	0.3%
MOBILIZATION		0	$761,584	$746,352.33	$15,231.68
MONITORING AND MAINTENANCE		0	$531,500	$0	$531,500
PROJECT MANAGEMENT & ENGINEER		0 %	$899,531	896917	2614.415717
ENGINEERING (Incl'd in Proj Manag)		0 %	$0	0	0
CONTINGENCY		10 %	$433,795	432535	1260.792
GRAND TOTAL - CAPITAL COSTS			**$6,964,365**	**$6,401,150**	**$563,215**

1 **Open Pit Name:** ____ **Pit # *1***

	Activity / Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: CONTROL ACCESS								
	Fence	m		#N/A	0	$0		$0	$0
.	Signs	each		#N/A	0	$0		$0	$0
.	Berm	m^3		#N/A	0	$0		$0	$0
.	Block roads	m^3		#N/A	0	$0		$0	$0
.	Other			#N/A		$0		$0	$0
B	OBJECTIVE: STABILIZE SLOPES								
.	Grade crest to 1:5	m^3	60000	#N/A	0.3233	$19,397	100%	$19,397	$0
.	Off-load crest, soil B	m^3		#N/A	0	$0		$0	$0
.	Doze/trimoverburden at crest	m^3		#N/A	0	$0		$0	$0
	Drill & blast pit crest	m^3		#N/A	0	$0		$0	$0
.	buttress slope	m^3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
C	OBJECTIVE: COVER/CONTOUR SLOPES								
.	Place fill, soil A	m^3		#N/A	0	$0		$0	$0
	Place fill, soil B	m^3		#N/A	0	$0		$0	$0
.	Rip rap	m^3		#N/A	0	$0		$0	$0
.	Vegetate slopes	ha		#N/A	0	$0		$0	$0
	Vegetate pit floor	ha		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
.	OBJECTIVE: SPILLWAY								
.	Excavate channel, soil A	m^3		#N/A	0	$0		$0	$0
.	Excavate channel, soil B	m^3		#N/A	0	$0		$0	$0
.	Concrete	m^3		#N/A	0	$0		$0	$0
.	Rip rap	m^3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
E	OBJECTIVE: FLOOD PIT								
.	Embankment, soil A	m^3		#N/A	0	$0		$0	$0
.	Embankment, soil B	m^3		#N/A	0	$0		$0	$0
.	Remove pipes etc.	each		#N/A	0	$0		$0	$0
	Remove power lines	each		#N/A				$0	$0
.	LIme addition, kg/m3 of water	tonne		#N/A	0	$0		$0	$0
.	Lime, purchase and shipping	tonne		#N/A	0	$0		$0	$0
.	Other	tonne		#N/A	0	$0		$0	$0
F	RECLAIM BORROW AREAS								
.	Contour slopes	m^2		#N/A	0.3233	$0	100%	$0	$0
.	Berm at crest	m^3		#N/A	0	$0		$0	$0
	Place overburder	m^3		#N/A	0	$0		$0	$0
.	Vegetate	m^3		#N/A	0	$0		$0	$0
H	OTHER ITEMS - CAUSEWAY	m^3	9000		0.3233	$2,910		$0	$2,910
.				#N/A	0	$0		$0	$0
	Subtotal					$22,306 Total Pits	87% Percent Land	$19,397 Total Land	$2,910 Total Water

1 Tailings Impoundment Name: ________ Impoundment # *1*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: CONTROL ACCESS								
	Fence	m	0	#N/A	0	$0		$0	$0
.	Signs	each	0	#N/A	0	$0		$0	$0
.	Ditch, mat'l A	m^3	0	#N/A	0	$0		$0	$0
.	, mat'l B	m^3	0	#N/A	0	$0		$0	$0
.	Berm	m^3	0	#N/A	0	$0		$0	$0
.	Block roads	m^3	0	#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
B	CONTOUR EMBANKMENTS								
.	Toe buttress, drain mat'l	m^3	0	#N/A	0	$0		$0	$0
.	, fill mat'l A	m^3	0	#N/A	0	$0		$0	$0
.	, fill mat'l B	m^3	0	#N/A	0	$0		$0	$0
.	Rip rap	m^3	0	#N/A	0	$0		$0	$0
.	Vegetate	ha	0	#N/A	0	$0		$0	$0
.	Raise crest	m^3	0	#N/A	0	$0		$0	$0
.	Flatten slopes	m^2	60000	#N/A	0.3233	$19,397	50%	$9,698	$9,698
.	Other			#N/A	0	$0		$0	$0
C	OBJECTIVE: COVER TAILINGS								
.	Soil cover	m^3	0	#N/A	0	$0		$0	$0
.	Rip rap	m^3	0	#N/A	0	$0		$0	$0
.	Vegetate	ha	0	#N/A	0	$0		$0	$0
.	Coarse PK	m^3	0	#N/A	0	$0		$0	$0
D	OBJECTIVE: FLOOD TAILINGS								
.	Ditch, mat'l A	m^3	0	#N/A	0	$0		$0	$0
.	, mat'l B	m^3	0	#N/A	0	$0		$0	$0
.	Raise crest	m^3	0	#N/A	0	$0		$0	$0
.	Other		0	#N/A	0	$0		$0	$0
E	OBJECTIVE: TREAT SUPERNATANT								
.	Pump water	m^3	0	#N/A	0	$0		$0	$0
.	Supply reagents	tonne	0	#N/A	0	$0		$0	$0
.	Operate treatment plant	m^3	0	#N/A	0			$0	
.	Other			#N/A	0	$0		$0	$0
F	OBJECTIVE: UPGRADE SPILLWAY								
.	Excavate channel, mat'l A	m^3		#N/A		$0		$0	$0
.	, mat'l B	m^3	0	#N/A	0	$0		$0	$0
.	Concrete	m^3	0	#N/A	0	$0		$0	$0
.	Rip rap	m^3	0	#N/A	0	$0		$0	$0
.	Other		0	#N/A	0	$0		$0	$0
G	OBJECTIVE: STABILIZE DECANT SYSTEM								
.	Remove	m^3	0	#N/A	0	$0		$0	$0
.	Plug/backfill	m^3	0	#N/A	0	$0		$0	$0
.	Other		0	#N/A	0	$0		$0	$0
H	OBJECTIVE: REMOVE TAILINGS DISCHARGE								
.	Cyclones	m^3	0	#N/A	0	$0		$0	$0
.	Pipe	m^3	0	#N/A	0	$0		$0	$0
.	Other		0	#N/A	0	$0		$0	$0
I	SPECIALIZED ITEMS								
.			0	#N/A	0	$0		$0	$0
	Subtotal					$19,397	0.5	$9,698	$9,698
						Total Tailings	Percent Land	Total Land	Total Water

3 Rock Pile Name: *WRD 2* Rock Pile #: *2*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: STABILIZE SLOPES								
	Flatten slopes with dozer	m^2	99,240	#N/A	0.3233	$32,082	100%	$32,082	$0
.	Divert runon, ditch mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, ditch mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Toe buttress, drain mat'l	m^3		#N/A	0	$0.00		$0	$0
.	, fill mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, fill mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
B	OBJECTIVE: COVER DUMP								
.	Overburden	m^3	26496	#N/A	3.2547	$86,236	100%	$86,236	$0
.	Mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Rip rap	m^3		#N/A	0	$0.00		$0	$0
.	Vegetate	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
C	OBJECTIVE: RELOCATE DUMPS								
.	Load, haul, dump or doze	m^3		#N/A	0	$0.00		$0	$0
.	Add lime	tonne		#N/A	0	$0.00		$0	$0
.	Contour reclaimed area	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
D	OBJECTIVE: COLLECT AND TREAT								
.	See "ONGOING TREATMENT" costing component			#N/A	0	$0.00		$0	$0
E	OBJECTIVE: DEVELOP WETLAND								
.	Earthworks, mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Vegetate	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
F	SPECIALIZED ITEMS - 16 G Grader: allocated								
.		hrs	214	#N/A	204.12	$43,682	100%	$43,682	$0
				#N/A	0	$0.00		$0	$0
	Subtotal					$162,000	100.0%	$162,000	$0
						Total for Rock Pile	Percent Land	Total Land	Total Water

Rock Pile Name: *PK1*   Rock Pile #: *3*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: STABILIZE SLOPES								
	Flatten slopes with dozer	m^2		#N/A		$0		$0	$0
.	Divert runon, ditch mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, ditch mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Toe buttress, drain mat'l	m^3		#N/A	0	$0.00		$0	$0
.	, fill mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, fill mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
B	OBJECTIVE: COVER DUMP								
.	Overburden	m^3	10464	#N/A	3.2547	$34,058	100%	$34,058	$0
.	Mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Rip rap	m^3		#N/A	0	$0.00		$0	$0
.	Vegetate	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
C	OBJECTIVE: RELOCATE DUMPS								
.	Load, haul, dump or doze	m^3		#N/A	0	$0.00		$0	$0
.	Add lime	tonne		#N/A	0	$0.00		$0	$0
.	Contour reclaimed area	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
D	OBJECTIVE: COLLECT AND TREAT								
.	See "ONGOING TREATMENT" costing component			#N/A	0	$0.00		$0	$0
E	OBJECTIVE: DEVELOP WETLAND								
.	Earthworks, mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Vegetate	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
F	SPECIALIZED ITEMS								
.				#N/A	0	$0.00		$0	$0
				#N/A	0	$0.00		$0	$0
	Subtotal					$34,058		$34,058	$0
						Total for Rock Pile	Percent Land	Total Land	Total Water

Rock Pile Name: *PK3* Rock Pile #: *4*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: STABILIZE SLOPES								
	Flatten slopes with dozer	m^2		#N/A		$0		$0	$0
.	Divert runon, ditch mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, ditch mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Toe buttress, drain mat'l	m^3		#N/A	0	$0.00		$0	$0
.	, fill mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, fill mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
B	OBJECTIVE: COVER DUMP								
.	Overburden	m^3	11512	#N/A	3.2547	$37,468	100%	$37,468	$0
.	Mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Rip rap	m^3		#N/A	0	$0.00		$0	$0
.	Vegetate	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
C	OBJECTIVE: RELOCATE DUMPS								
.	Load, haul, dump or doze	m^3		#N/A	0	$0.00		$0	$0
.	Add lime	tonne		#N/A	0	$0.00		$0	$0
.	Contour reclaimed area	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
D	OBJECTIVE: COLLECT AND TREAT								
.	See "ONGOING TREATMENT" costing component			#N/A	0	$0.00		$0	$0
E	OBJECTIVE: DEVELOP WETLAND								
.	Earthworks, mat'l A	m^3		#N/A	0	$0.00		$0	$0
.	, mat'l B	m^3		#N/A	0	$0.00		$0	$0
.	Vegetate	ha		#N/A	0	$0.00		$0	$0
.	Other			#N/A	0	$0.00		$0	$0
F	SPECIALIZED ITEMS								
.				#N/A	0	$0.00		$0	$0
				#N/A	0	$0.00		$0	$0
	Subtotal					$37,468		$37,468	$0
						Total for Rock Pile	Percent Land	Total Land	Total Water

1 Building / Equip Name: ____ Bldg / Equip #: *1*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
	Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
.	Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
.	Other	each		#N/A	0	$0		$0	$0
B	OBJECTIVE: DISPOSE STATIONARY EQUIPMENT								
.	Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
.	Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
.	Other	each		#N/A	0	$0		$0	$0
C	OBJECTIVE: DISPOSE ORE CONCENTRATION EQUIPMENT								
.	Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
.	Decontaminate tanks & plumb.	each		#N/A	0	$0		$0	$0
.	Remove tanks & plumbing	each		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
D	OBJECTIVE: DISPOSE WATER TREATMENT EQUIPMENT								
.	Decontaminate tanks & plumb.	each		#N/A	0	$0		$0	$0
.	Remove tanks & plumbing	each		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
E	OBJECTIVE: DECONTAMINATE BUILDINGS & TANKS								
.	Process plant, chemicals	each		#N/A	0	$0		$0	$0
.	Maintenance plant, chemicals	each		#N/A	0	$0		$0	$0
.	Camp	each		#N/A	0	$0		$0	$0
.	Bulk fuel storage	each	1	#N/A	0	$15,000	100%	$15,000	$0
.	Power plant	each		#N/A	0	$0		$0	$0
.	Explosives plant	each	1	#N/A	15000	$15,000	100%	$15,000	$0
F	OBJECTIVE: MOTHBALL BUILDINGS								
.	Building 1	m^2		#N/A	0	$0		$0	$0
.	Building 2	m^2		#N/A	0	$0		$0	$0
.	Building 3	m^2		#N/A	0	$0		$0	$0
.	Building 4	m^2		#N/A	0	$0		$0	$0
.	Building 5	m^2		#N/A	0	$0		$0	$0
.	Other	m^2		#N/A	0	$0		$0	
G	OBJECTIVE: REMOVE BUILDINGS								
.	Dismantle & bury buildings		1	#N/A	3,809,051	$3,809,051	100%	$3,809,051	$0
.	Building 2	m^2		#N/A	0	$0		$0	$0
.	Building 3	m^2		#N/A	0	$0		$0	$0
.	Building 4	m^2		#N/A	0	$0		$0	$0
.	Building 5	m^2		#N/A	0	$0		$0	$0
.	Building 6	m^2		#N/A	0	$0		$0	$0
.	Building 7	m^2		#N/A	0	$0		$0	$0
.	Remove boneyard waste	m^3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
H	OBJECTIVE: BREAK BASEMENT SLABS								
.	Building 1	m^2		#N/A	0	$0		$0	$0
.	Building 2	m^2		#N/A	0	$0		$0	$0
.	Building 3	m^2		#N/A	0	$0		$0	$0
.	Building 4	m^2		#N/A	0	$0		$0	$0
.	Building 5	m^2		#N/A	0	$0		$0	$0

1 Building / Equip Name: ____ Bldg / Equip #: *1*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
.	Other			#N/A	0	$0		$0	$0
I	OBJECTIVE: REMOVE BURIED TANKS								
.	Tank 1, decontaminate	m^3		#N/A	0	$0		$0	$0
.	, excavate & dispose	m^3		#N/A	0	$0		$0	$0
.	Tank 2, decontaminate	m^3		#N/A	0	$0		$0	$0
.	, excavate & dispose	m^3		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
J	OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
.	Place soil cover	m^3		#N/A	0	$0		$0	$0
.	Vegetate	ha		#N/A	0	$0		$0	$0
.	Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
K	OBJECTIVE: GRADE AND CONTOUR								
.	Contour pads (camp, fuel farm, laydown)	m^2	16,640	#N/A	0.32328	$5,379	100%	$5,379	$0
.	Place soil cover	m^3	44400	#N/A	3.25467583	$144,508	100%	$144,508	$0
.	Rip rap on ditches	m^3		#N/A	0	$0		$0	$0
.	Vegetate	ha		#N/A	0	$0		$0	$0
.	Other			#N/A	0	$0		$0	$0
L	OBJECTIVE: RECLAIM ROADS / AIRSTRIP								
.	Scarify and install water breaks	m^2	210,994	#N/A	0.32328	$68,210	100%	$68,210	$0
	Contour roads	m^2	17255	#N/A	0.32328	$5,578	100%	$5,578	$0
.	Vegetate	ha		#N/A	0	$0		$0	$0
.				#N/A	0	$0		$0	$0
K	SPECIALIZED ITEMS								
.				#N/A		$0	100%	$0	$0
	Subtotal					$4,062,726	100.0%	$4,062,726	$0
						Total Buildings	Percent Land	Total Land	Total Water

1 **Mobilization Name:** ____ **Mob # *1***

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
	MOBILIZE HEAVY EQUIPMENT								
Equipment to regional centre									
.	Excavators	km		#N/A	0	$0		$0	$0
.	Dump trucks	km		#N/A	0	$0		$0	$0
.	Dozers	km		#N/A	0	$0		$0	$0
.	Demolition shears	km		#N/A	0	$0		$0	$0
Equipment, regional centre to site									
.	D10	Loads	3	#N/A	6000	$18,000	98%	$17,640	$360
.	992	Loads	7	#N/A	6000	$42,000	98%	$41,160	$840
.	777	Loads	9	#N/A	6000	$54,000	98%	$52,920	$1,080
	16G	Loads	2	#N/A	6000	$12,000	98%	$11,760	$240
	Crane	Loads	1	#N/A	12000	$12,000	98%	$11,760	$240
.	Cat 345	Loads	1	#N/A	6000	$6,000	98%	$5,880	$120
	Disassembly (allocation)		1	#N/A	15000	$15,000	98%	$14,700	$300
	Assembly (allocation)		1	#N/A	15000	$15,000	98%	$14,700	$300
B	TRANSPORT SOUTH								
	Building	Loads		#N/A		$0	98%	$0	$0
	Plant facilities	Loads		#N/A		$0	98%	$0	$0
	Gen Sets	Loads	6	#N/A	5200	$31,200	98%	$30,576	$624
	Fuel Tanks	Loads		#N/A		$0	98%	$0	$0
	Mobile Equipment	Loads	23	#N/A	5200	$119,600	98%	$117,208	$2,392
	Misc.	Loads	20	#N/A	5200	$104,000	98%	$101,920	$2,080
C	MOBILIZE WORKERS								
		Trips	180	#N/A	800	$144,000	98%	$141,120	$2,880
.				#N/A	0	$0		$0	$0
D	MOBILIZE MISC. SUPPLIES								
.	Fuel	litre		#N/A	0	$0		$0	$0
.	Minor tools and equipment	owance		#N/A	0	$0		$0	$0
.	Truck tires	owance		#N/A	0	$0		$0	$0
E	CATERING								
.	Earthworks	nan/mo	30	#N/A	1368	$41,040	98%	$40,219	$821
	Plant Decommissioning	nan/mo	72	#N/A	1368	$98,496	98%	$96,526	$1,970
	Administration	nan/mo	36	#N/A	1368	$49,248	98%	$48,263	$985
F	WINTER ROAD								
.	Full winter use	km		#N/A	0	$0		$0	$0
.	Limited winter use	km		#N/A	0	$0		$0	$0
.				#N/A	0	$0		$0	$0
G	BONDING lump sum								
.				#N/A		$0		$0	$0
H	TAXES lump sum								
.				#N/A		$0		$0	$0
I	INSURANCE lump sum								
.				#N/A		$0		$0	$0
	Subtotal					$761,584	98.0%	$746,352	$15,232
						Total Mob.	Percent Land	Total Land	Total Water

1 Monitoring & Maintenance Mon / Mtce # *1*

	Activity/Material	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: INSPECTIONS								
	Annual geotechnical insp.	years	7	#N/A	$4,500	$31,500		$0	$31,500
.	Survey inspection	each		#N/A	$0	$0		$0	$0
.	Water sampling	years	10	#N/A	$40,000	$400,000		$0	$400,000
.	Reporting	each		#N/A	$0	$0		$0	$0
.	Airfare	each	40	#N/A	$2,500	$100,000		$0	$100,000
B	OBJECTIVE: MAINTENANCE								
.	Security guard	month		#N/A	$0	$0		$0	$0
.	Accomodation	month		#N/A	$0	$0		$0	$0
.	Maintain pumping	month		#N/A	$0	$0		$0	$0
.	Clear spillway	each		#N/A	$0	$0		$0	$0
.	Other								
				#N/A		$0		$0	$0
	Subtotal					$531,500	0.0%	$0	$531,500
						Total Pits	Percent Land	Total Land	Total Water

Unit Cost Work Table

Machinery Unit Costs

Machinery	Use	Number	Capacity	Units	Cost/Hr	Fuel (L/Hr)	Fuel Cost/L	Op Cost/Hr	Total Unit Cost
D10	Contour	1	1000	m^2/hr	206	84	0.75	54.28	0.323
992	Top Dress	1	480	ECM	398	78	0.75	57.71	1.071
777	Top Dress	3	480	ECM	196	70	0.75	49.12	1.860
16G	Top Dress	1		Allocated	118	44	0.75	53.12	204.120

Catering

Task	Days / Mon	Cost / Day	Total Unit Cost
Catering - transportation	30.4	45	1368.000

Engineering & Management

Nuna Overheads	# Operators	Months	Days/ Month	Hrs/Day	Operator $ Cost/Hr	Total Cost $
Site Supervisors	1	6	30.4	12	89.4	195,679
Foreman	2	6	30.4	12	73.34	321,053
Safety	1	6	30.4	12	63.72	139,470
Administrator	1	6	30.4	12	52.84	115,656
Operator	1	6	30.4	12	58.33	127,673
						899,531

Dismantle Facilities

Disassembly of Facilities	Fuel/hr (litres)	Total Hrs	Machine $ Cost/hr	Operator $ Cost/hr	Machine Cost $	Operator Cost $	Fuel Cost $	Total Cost $
Crane	75	2,189	220	61.98	481,580	135,674	123,131	740,385
Cat 345	40	2,189	250	58.33	547,250	127,684	65,670	740,604
Welders/Riggers				64.73	n/a	566,724		566,724
Labourers				49.19	n/a	861,337		861,337
					1,028,830	1,691,420	188,801	2,909,051

	# Operators	Months	Days/Month	Hrs/Day
Crane Op	1	6	30.4	16
Excavator Op	1	6	30.4	12
Welders and Riggers	4	6	30.4	12
Labourers	8	6	30.4	12

Support Equipment	Months	Cost / Month	Total $ Cost
(Bobcat, Tractor Lowboy, IT 28)	6	30,000	180,000

Facilities Support	Months	Cost / Month	Total $ Cost
	8	90,000	720,000

Total Dismantle 3,809,051

Topdressing

Facility	Area (m2)	Depth (m)	Volume (m3)
Waste Dump 1			
Waste Dump 2	88320	0.3	26496
PK Pile 1	34881	0.3	10464
PK Pile 3	38373	0.3	11512
PK Pile 4			
Pads	148000	0.3	44400

Contouring

Facility	Perimeter (m)	Area (m2/m)	Slope Area (m2)
Waste Dump 1			279,095
Waste Dump 2	1654	60	99,240
PK Pile 1			28,251
PK Pile 3			28,120
PK Pile 4			53,772
Pads (camp/storage/explosives/crusher/laydown/waste transfer)	3328	5	16,640

Road Dimensions	**Length (m)**		
Haul (18 m)	3222	18	57,996
Access (10 m)	8200	10	82,000
Airport (6 m)	5833	6	34,998
Total	17255		174,994
Airstrip (30 m)	1200	30	36,000
Total airstrip + roads			210,994

Appendix E

Mine Land Unit Photographs

Pre-Mining

Photo 1: Airstrip Access Road and Airstrip Looking North

Photo 2: Airstrip Looking South. Carat Lake is at the Top of the Picture

Photo 3: Exploration Portal Area. Carat Lake is in the Background

Photo 4: Long Lake (PKCA site) Looking Southwest

Construction Year 1

Photo 5: Accommodation Complex Spring 2005. Long Lake is in the Foreground

Photo 6: Accommodation Complex Detail

Photo 7: Fuel Farm Under Construction

Photo 8: Water Intake Causeway

Photo 9: Road at PKCA Crossing at Divider Dyke Looking West

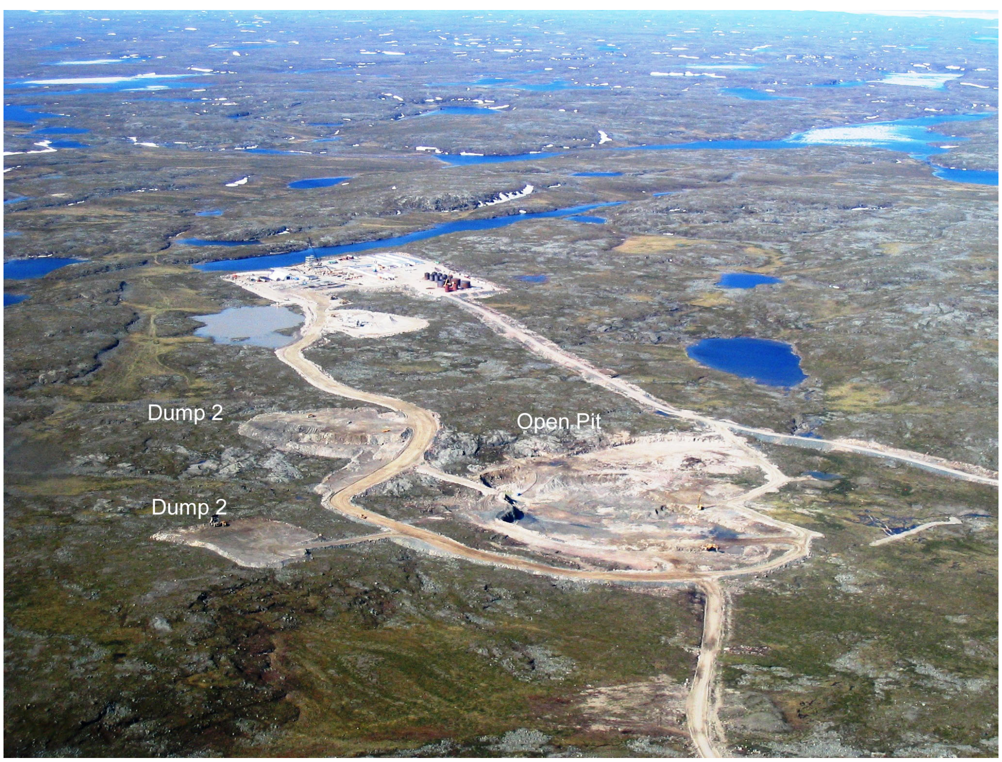

Photo 10: Open Pit and Waste Dump Construction Summer 2005

Appendix F

2005 Water Management Plan

Water Balance Table

Table 3 - Jericho Project - Monthly Water Balance Volumes for Year 2006

(all water volumes in cubic metres)

	Processed Kimberlite Containment Area (PKCA) Inflows & Outflows								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Month of Operations	Precip + Runoff - Evaporation	Slurry + Grey Water From Plant Area	Pumped From MIne Pit to East Sump	Total Inflow to PKCA =(1)+(2)+(3)	Reclaim to Process Plant	Tailings Void Losses =(2)*50%	PKCA Free Flow Water =(4)-(5)-(6)	Controlled Release to C3	Fresh Water From Carat Lake =(2)-(5)
January	0	24000		24000		12000	12000		24000
February	0	24000		24000		12000	12000		24000
March	0	24000		24000		12000	12000		24000
April	0	24000		24000		12000	12000		24000
May	3199	24000		27199		12000	15199		24000
June	56682	24000		80682	14400	12000	54282		9600
July	11470	24000	25000	60470	14400	12000	34070	70000	9600
August	15304	24000	26000	65304	14400	12000	38904	50000	9600
September	7685	24000	10000	41685	14400	12000	15285	20000	9600
October	0	24000		24000		12000	12000		24000
November	0	24000		24000		12000	12000		24000
December	0	24000		24000		12000	12000		24000
Totals	94340	288000	61000	443340	57600	144000	241740	140000	230400

Net Free Flow Water Added to PKCA =(7)-(8)= 101740

Notes:

1. The East Pit is the collection and transfer point for runoff water collected from the open pit and stockpile areas (see Figure 2). Volumes in column (3) are 2005 measured volumes (see Table 2).

2. Water lost to the tailings voids is based on 50% of Slurry & Grey Water.

3. Reclaim Water is calculated as 20% of the total plant process and area discharge. (Slurry and Grey Water column (2))

4. Net Free Flow Water Added to PKCA in 2006 will be left in the PKCA to offset the estimated 120,000 m3 of water discharged in 2005 to construct the West Dam Structure and provide for a contingency storage allowance. Runoff volumes will be assessed on a year to year basis and releases to C3 will be proportionally adjusted (subject to water quality) to maintain a consistant water cover in the PKCA.