JERICHO PROJECT

MINE RECLAMATION PLAN

Tahera Corporation
Suite 803
121 Richmond Street West
Toronto, Ontario
M5H 2K1

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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 soil from the areas of disturbance according to the soil salvage plan;
- immediately revegetate areas disturbed by the pre-production phase to the extent practical (see revegetation prescriptions below; in general mesic soils will not have agronomics seeded unless site-specific experience indicates this is necessary);
- reslope rock dumps to a maximum overall 2:1 slope angle (26°); 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 soil materials;
- recover stockpiled soil and spread it over reclaimed areas that would benefit from addition of soil;
- 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 880,000 m^3 of sand and gravel may be available. This is adequate to place a minimum of 0.3 m of soil on these surfaces. The amount of organic soil salvageable from the open pit area remains to be determined.

The soil 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 can not 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™ and Diavik 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 soil 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 key to determining 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 in Year 4, following completion of open pit mining with reclamation of the waste dumps and infrastructure no longer required for the underground mining phase. Ore stockpile pads and 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 in Year 9. All infrastructure will be removed, or buried on site. Hazardous wastes will be removed; any remaining contaminated soils will be remediated. The landfill 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 estimated total reclamation cost for the Jericho Project is $7.35 million. This will be reduced at the end of Year 4 with reclamation of waste rock dumps and removal of unneeded open pit mining equipment. Total reclamation costs at closure will be further reduced, when PKCA cell 1 and the central ore stockpile pad are reclaimed and underground mining equipment and required infrastructure are removed in approximately Year 8.

TITIRAQHIMANILLUANGIT HIVUNNIURNIKKUT

Benachee Resources Inc., tamaat nanminiriplujjuk ukuat Tahera-kunni Kuaparisat (Tahera) hanajumaplutiklu havaarilugillu qipliqtunik ujarakhiurnikkut ("una Jericho-kunni Ujarakhiuqtit Piliriarutigijaat) haniani tunuata kiklingani uumap Tahirjuap (Contwoyto Lake-mik taijauvaktuq) uvani Nunavut Nunanganni (NT). Havaarilirniaqtaat ukunani angmaumajumi ujarakhiurnikkut tunuata kiklingani uumap Tahirjuap (Contwoyto Lake) uvani Uataani Qitirmiut. Havingnik ungavavangniaqtut maniqqamit havaarilugit tatqiqhiutinin iingujut talvani ukiumi (April-mit November-mut) talvalu havaariinnarlugit ukiuq tamaat. Hiqupluttiaqhimajut qipliqtuniqaqtunik (ahu haniani 15%-ngujuni haffumap havagviup ilanganni) milukaqtaulutik talvunga tahirmut hanianiittumit uumap havagviup initurlianni (taijauvaktumi Takijuq Tahiq); pijuminangittut (hapkuat ilangat uvani havagvingnin pijauvaktut tahapkuangungittut kihimi ujaqqat qipliqtut) katitiqtaulutik atuqtauvangniaqtut matugijauvaklutikluunniit aallanullu atuqtauvaklutik qanurliqaak matugijauvaklutik. Ukiuraangattauq hikumi apqutiqarlutik akjaqattaqpangniaqtut hunanikliqaak ingilrutighaniklu uvunga Jericho-kut initurligijaannut. Tajja havautigijamingnit ukuat ujarakhiuqtit havagviat havauhiqaqpangniaqtut ukiunik- iingujunik makitajjutigilugit havaktiqaqpaklutiklu 105-ngunilluunniit 175-ngujunilluunniit inungnik (ilagilugit havaktiillu kaantraaliqijillu) hapkuninga avvarijaannik havakpaklutik havautigiiqattarlutik ukunani havagvingni pivangniaqtut. Tahera Kuaparisatkut qinirhivaghutik ujaqqanik qipliqtunik uvani Nunavunmi saivanik ukiunik qinirhialirhutik (atuliqtinnagu 1999 himmautigijaat havagvik una, Lytton Minerals-kut). Hamna havagvik ilitturihimajut qaffinikliqaak tahapkuninga qipliqtuniqaqtunin ujarakhiurnikkut talvalu tajja huli qinirhiaffaaqpangniaqtut ukunani Jericho-kut Piliriarutainni. Hamna tikittumajaat ilagijaghainni qipliqtuniqaqtunik ujarakhiurnikkut haniani Jericho-kut talva haffuminga havagviujup makitapkautigijaaghaanin. Kiinaujaqtaarutigijaghaat ukunangat tutquqtuivingnut-iliffaaqtauvangniaqtut hapkuat qinirhiajjutighamikkullu havautigijaujjutighakkullu piliriarutighainnik.

Pijumaffaarningata parnaijautigijumajaat ujarakhiuqtinut hilarjuatigut akhuurutigijumanngitaat ujarakhiuqtit havaarijainnik, talvalu havaarijaittauq angiklinahurrillugit pijumajaat talvani initurlini. Hamna kiklingani-nunap aturningat ighinnarlugit tahapkuat ihuiqtauhimajut talvuuna anngutighat utiffaarniarumik tahamunga nunamingnut.

Pijumaffaarningata piliriarutighaat hapkuninga ilaqaqpangniaqtut:

- annainahurriffaarlugit katitiriffaarlugillu maniqqat tahapkuningat kitumilliqaak ihuiqtauhimajunin tahamna maliglugu annainahurrinnikkut parnaijautainnin;
- qilaminnuaq nauttiffaalirlutik tahamani ihuiqtauhimajuni nauttiqattaqpaklutik qanurliqaak ihuaqtumik (takulugu nauttiffaarnikkut titirauhianik uvani ataani; tahapkuat kinipajjittut maniqqat nunaliqinikkut pijaunngitkaluarlutik talvani kihimi pijaaqariaqarumik);

- katitiffaarlugit ujaqqanik iqqakuurvigijaat haffumunga 2:1 majuqqarijaanin (26°); talvauuna tahapkuat iniqtirutiginiaqqaat ikhivautanin angikliqaqtunin 10 m-ngujunin qunmut talvalu ungahiktiginiaqtaattauq qulaaniittunin 15 m-ngujunin;

- himmautighaaniklu maniqqap hanaqivaklutik;

- katitiriffaarhimajut maniqqat talvalu himajaghimalugit tahapkununga pijauffaarhimajunin ilanganni atuqtaujungnaqtunin maniqqanin;

- nauttiffaarlugillu tahapkunani ilanganni pijuminaqqat tahapkuningat pijuminarniffaangujunin;

- uuktuutighaniklu angikliqattarningaghainnin pivaklutik; talvalu

- ihivriuqattaqpaklugillu angiklivallianighait talvalu atuqtaujughanik pijumajainnik.

Haujjivaklutiklu tahapkununga ihuiqtauhimajunin qaanganiittut maniqqat. Maniqqat haujjigijauhimajut talvani pualriqhurvingni ilagijaanni talvalu 400 m-ngujunik kaimmalluringniqarniaqtuq, talvalu ahu 880,000 m^3-ngujunik hiuqqaniklu ujaralianiklu ilaqarniarungnarhijut. Hamna naammagilruungniaqtaat hapkuninga mikijuugaluamit 0.3 m-ngujunik maniqqamin hapkununga qaanganiittughamin. Qaffiuniarungnarhijuugaluit nauttigijuminaqtut maniqqat annaguminaqtut ukunangat angmaumajunin pualriqhuqtauhimajunin piffaaruminangniaqtut tajja naunarmata.

Tahamna maniqqani katitiqtauhimajut hanajauhimaniaqtut majuqqanin qajagilugit. Hamna aturnighaat ihuatqijauniaqtuq tahapkuat katitiriniit katitiqtauvakkumik kingikpallaangittumin.

Nauttianguhimajuugaluit nuiffaalimaittungnarhijut, qanurliqaak, ilangat nuiffaarungnarhijuugaluit. Amigaittut anngutighat (imaittulluuniit tuktullu, kigutiqaqtullu anngutighat) atuffaarniarungnarhijaat tahamna maniraq tahapkuat igluqpait ungavaqtauffaarumik. Havaqatigiittiarnikkut pinahurritpangniaqtuk ukuak Ekati-kunnilu Diavik-kunnilu ujarakhiuqtik hapkuninga ilitturipkainikkut himmauhiriiktiqattarlutik ihivriurnikkut ukunani Ukiuqtaqtuni hilarjuanganni.

Hamna tikittumajaat kiklinga nunakkutigut aturniriit anngutighat najugainni. Tikittumajaat ukunani Jericho-kut pijumaffaaqtainni atuqtiffaalirlugit initurlirijait anngutighat tahapkunani nunani aturutainni. Nauttianut aturutighainnik hananiaqtullu uuktuutigijaghainullu ihuiqtauhimajunut hilarjuatigut nalvaarahurritpangniaqtut. Tikinnahurrinniaqtaat tahapkuat maniqqanik qanurittaaghaat uuktuqpaklutik taimaatut ijjuhiraluamingnit naunairahurrillugit ihuiqtautaaqhimanngitillugit, nauttiffaalirlutik nunatuqqaniittunik tahapkuninga aajjikkutarijaraluangannin ihuiqtautaaqtinnagit tahapkuat nunamiuttat.

Piffaarumajaanikkut uuktuutigijaat tahapkuninga naunaipkutaulutik pijumaffaarnikkut titirauhighait ihuatqijauniaqquuqtutut ittut uvani Jericho-kut Piliriarutigijaat ilagijainni. Qanurliqaak, havaarijaujullu aallat tikkuaqtuutigiplugittauq pijauvaktut. Piffaarumajaanikkut uuktuutigijaat uuktuutigiqattarlugit ukunani ujarakhiuqtini piqattaqpangniaqtut tahapkunani ukiughat atuqtughani. Hapkuat uuktuutigijaghat imaatut hananiaqtut naunaipkutaghanik tutquqtuivighaannik makitapkainikkullu talvalu angiklivalliajjutigijaghaannik nauttiat tahapkunani nunani pijauffaarhimajuni.

Piffaarumajaaniq hivumuurutauvangniaqtuq tahaffumap ujarakhiuqtit havaarijaannik umiktitaungnirinillu ikhinngaqtaungniriilu. Piffaarutigijaghaillu ajurnarniangittut hanajautaarumik igluqpaghat.

Angijumik piffaarutiqarniaqtut uvani 2005-mi iniqtiritautaarumi angmaumajuq ujarakhiurvighaq tahapkuninga piffaarutigijumajaat ukunani iqqakuurvighani talvalu tahapkuat igluqpait pijumanngitaugumik ujara khiuqtut talvani iluani nunap. Havivaluit katitirhimajut ukuallu ilangit qipliqtuniqaqtut initurlighait pijumajauhuiqtut piffaarutigiinnariaqaqtaat tahapkuat ujarakhiuqtit nutqaqpalliarumik. Piffaarutigijauniarmijut tahamna ujarakhiuqtit umikkumik uvani 2010-mi. Igluqpait tamaita ahivaqtauniaqtut, haujaulutikluunniit tahamani initurlianni. Hivuuranaqtut tuqunalgit ahivaqtauniaqtut; maniqqattauq tuqunaqaliqtut ahivaqtaulutiklu. Tahamna iqqakuurviujuq haujaulutik umiktauniaqtut talvalu qaangannik matujaulutik. Qiqhuumajut qaanganiittut takughaulimaittut, qaanganiittut ihuarhaqtaulutik nauttiulutiklu pijauvangniaqtut. Ajurnangitpat, qurluaqpaghimaniit aullaqtitauffaalingmilutik ujarakhiuqtit-pilaatinnagit taimaatut ilirmilutik. Tahamna pinnirutigaluanga nunap uqautigihimajaat umingniaqqat ujarakhiurviit ihumagivangniaqqaat ukuat Tahera-kut qanurliqaak. Tamaita ungavaruminaqtut igluqpait ungavaqtauniaqtut talvangat initurlinit. Ilakunnuaqalimaittut iqqakuuqtauhimajunit; ikulattijauvangniaqtut, haujauvaklutikluunniit ungavaktauvaklutikluunniit tahapkunangat initurlinit.

Umiktinnagit ujarakhiurviit munarijauqattarlutik pijauvangniaqtut talvuuna tahamna ujarakhiurviit initurliraluangit upaktauqattaqtaujughaunginniriillu tahapkuallu tuqunalgit ungavaktaupqunngittugit initurliviniannin.

Tamaat akighaa haffumap piffaarutaujughap ukunani Jericho-kut Piliriarutigijaanni 7.35 million taalaujuq. Hamna akighivallianiaqtuq nungutpat 2005 tahapkuninga pijumaffaarutiginiarumikku iqqakuuqtauhimajullu ahivaqtauhimajullu atulimaiqtut ujarakhiuqtit ingilrutait. Akighaittauq huli akighivalliaffaarniarmijut ukuat PKCA-kut iglunnuanganni 1 talvalu qitqaniittunik haviqarviit katitiriningat pijaufaarniarumik tahapkuallu nunap iluani ujarakhiuqtit ingilrutainnik talvalu igluqpait ungavaqtauniaqtut ahu 2009-mi.

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- **b[?vstQ WD6gc3=st9lA x[=x3=sMs6g6 nN}=Q4v8i3lA WDC/6gi4 xJ3N8q8io]nzA5 GbflA x]bi WD6t5t4v8i3i3j5 si4]y6bsJ5; w2Jw5 Wbclx3ix8qM5 WDDysN/6gi4 wiQ/sJu bwm8N wodycExc3iC6bs4X5 ryxi WbcsC/6S6 WD6tbs7mE[=Qix6bzi4H;**

- **]k6rQx3lA s/c5 x4bfw5 d[?y]MaJj5 wodyEJ8N6bzk5 @:! s=zic3lA G@^ tAE{H; bm8N]k6r4bsix6S6]W/6bst9lQ5 s/c5 nio]E4g5 ns/symJ5 wosc6bsymJ5 xbsy3j5 !)]ubi4 S6gic3ix6g5 x7m wl7j5 wq3Cic3lt4 !%]ubu4;**

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- **k6r4ylt4 cspnDbsix6gi4 xqMadlA WD3isJ6; x7ml**

- **Ns5t6g3lA WD3isJ6 WoExElQ9l WD6X9oxisJ5 WP9oDt4nq5.**

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TABLE OF CONTENTS

LIST OF TABLES

All tables are located at the back of the report

LIST OF FIGURES

All figures are located at the back of the report

LIST OF MAPS

All maps are located in Appendix E

LIST OF ATTACHMENTS

1.0 INTRODUCTION

1.1 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 soil drifting/dust;
- start to rejuvenate the soil and start soil building processes; 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 our objectives include:

- to the extent practical, minimize disturbed areas through progressive reclamation;
- recover all soil practical;
- conduct reclamation 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.

1.2 RECLAMATION ACTIVITIES

The general reclamation program components will be as follows:

- salvage and stockpile soil from the areas of disturbance according to the soil salvage plan;
- immediately revegetate areas disturbed by the pre-production phase to the extent practical (see revegetation prescriptions below; in general mesic soils will not have agronomics seeded unless site-specific experience indicates this is necessary);
- reslope rock dumps to a maximum overall 2:1 slope angle (26°); 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 soil materials;
- recover stockpiled soil and spread it over reclaimed areas that would benefit from addition of soil;
- 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.

1.3 MINE PLAN

The general plan for mining the Jericho deposit is presented in the Project Description (Appendix A.1). Map A (Appendix E) provides a site layout for reference.

2.0 SOILS HANDLING PLAN

2.1 SALVAGE REQUIREMENTS

2.1.1 Surveys

Soils information at the Jericho Diamond site was derived from geotechnical surveys conducted to assess borrow materials (Bruce Geotechnical 1996*a*) and overburden properties (Bruce Geotechnical 1996*b*). 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.

Nine 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 soils are 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 soils and thus removal of overburden soils in any location with soils 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.

Given that most disturbed areas will be top dressed with esker materials similar to soils available at those sites, no soil salvage at these sites is likely to occur unless organic soils are encountered. Removal of organic soils will depend on the resultant final ground slope. Steep micro-slopes will not be created at organic soil locations, as permafrost melting will lead to slumping and possibly water erosion problems.

Overburden will be used to top dress most horizontal surfaces. Given uniform coverage of overburden in the pit area and a 400 m diameter pit, approximately 880,000 m^3 of sand and gravel may be available.

The two waste rock dumps will encompass an estimated area of 52 ha. At a soil depth of 0.3 m, coverage would require 156,000 m^3. The dump slopes are not anticipated to be top dressed with soil. Priority areas for reclamation will be sites that have the highest chance of benefiting from soil addition, such as road and airstrip surfaces, infrastructure pads, etc.

Ore stockpiles will collectively cover an area of 20 ha. The North and Central Lobe ore stockpiles will be completely processed prior to mine closure, whereas the low grade ore stockpile may not. Sides of the low grade ore stockpile will not be covered, but the stockpile will be regraded similar to the waste rock dumps. With 0.3 m soil cover, 60,000 m^3 of soil will be required for reclamation of ore pads and stockpile.

The PKCA will cover an area of 33.42 ha, including dams. On closure, cells will be covered with a geotextile and 0.5 m of coarse kimberlite, followed by 0.3 m of soil. A total of 100,260 m^3 soil will be required to reclaim the PKCA. The polishing pond will be left as a pond; only the polishing dam will be breached and stabilized with rip rap as required. Surfaces not exposed to water from the polishing pond will be top dressed with soil.

Most of the coarse kimberlite stockpile will not be required for reclamation. It will be regraded similar to waste rock dumps and the top surface top dressed with overburden. The footprint area of the coarse kimberlite stockpile will be 16.67 ha upon completion of ore processing (discounting removal of 75,000 m^3 for reclamation of the processed kimberlite containment area (PKCA). A 0.3 m cover will require 50,000 m^3 of soil.

Roads, laydown areas, the plant, powerhouse, accommodation, mechanical shop, explosives storage pads, explosives truck shop, and miscellaneous small areas will cover an additional approximately 37 ha. Top dressing will require 111,000 m^3.

The total area of disturbance of borrow areas and airstrip will be 36 ha. These facilities are/will be located on eskers and no top dressing with soil will be required, only regrading where required to eliminate steep slopes.

The open pit is not slated for revegetation due to the steep side slopes. Rather it will be allowed to fill with water, augmented by flood flows from Stream C1, pursuant to agreement from Fisheries and Oceans Canada.

Table 2.1 contains a summary of soil requirements for reclamation.

2.1.2 Stockpile Locations

The largest proportion of soil will be removed in Years 1 and 2 and will be stockpiled on the overburden stockpile (Map A, Appendix E). Soil 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 soil near its final location and if it is anticipated the soil will be placed at its final location within that year.

2.1.3 Soil Stockpile Design

The soil 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. A toe berm of run of mine rock will be placed on the down slope side of the stockpile to prevent runout the first spring, when melting of contained ice will tend to liquefy the soil. As the stockpile(s) become larger and higher, a dozer will be used to slope the stockpiles to the angle of repose. The maximum height of the stockpile will be 10 m.

Following construction and ice melt out, the stockpile will be revegetated by fertilizing and planting of an agronomic grass-legume mixture. Salvaged soils will be hauled directly for placement on resloped areas whenever possible; this will not be the case for the major soil salvage in Years 1 and 2. The objective will be to reduce rehandling as much as possible. Runoff from stockpile(s) will be controlled by directing flows into sedimentation ponds. Water management is discussed further in the Project Description (Appendix A.1) and the Environmental Management Plan (Appendix B.3.1).

2.2 SOIL REPLACEMENT STRATEGY

The soil 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 soil 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 soil. 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 soil, 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. 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 sedimentation ponds for settling of suspended sediment and then released to the environment (in most cases, upland tundra). Alternative discharge procedures, should water not be suitable for direct discharge, are discussed in the Environmental Management Plan (Appendix B.3.1).

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.

4.0 REVEGETATION PLAN

4.1 INTRODUCTION

Pre-existing native plant communities can not 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™ and Diavik mines in information exchange on reclamation research in Arctic environments.

Some promising work, which may be applicable to the Jericho Diamond Project reclamation, is currently being carried out at alpine and subalpine sites at mines in North America. The major differences between alpine and Arctic tundra climates are the greater amount of solar radiation at lower latitude, high altitude alpine environments, and the smaller range of temperature between extreme highs and lows in alpine environments. This will factor into any results that may be obtained at Jericho. 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. Coal mines with alpine environments in northeastern British Columbia have successfully used revegetation islands to revegetate disturbed alpine areas (Bitmann, pers. comm.).

4.2 REVEGETATION OBJECTIVES

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 soil 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.

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.

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.

4.3 MINE LAND UNITS

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 is shown on Map C (Appendix E). The mine land units considered together with the maximum disturbance areas of each are listed in Table 4.1. Disturbance is broken down by ecological zone based on Map C.

The area of disturbance at the end of the construction phase (Year 1) will be approximately 80 ha less than the total shown, in that Dump 1 will be constructed first, pit walls will be at an early stage of development, and Borrow Area D will not be developed until Borrow Areas A and C are fully developed. Maximum disturbance will occur at approximately Year 3 (excluding pit wall development) given that Borrow Area D will require development. A small reduction in disturbed area may be possible with preparation for revegetating parts of the camp and borrow areas not being actively used. 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.

4.4 VEGETATION PRESCRIPTIONS

Reclamation trials will be key to determining what reclamation prescriptions are most likely to be successful in the Jericho Project area. However, work of others provides some guidance. Mined sites will vary from bare, steeply inclined rock (e.g. pit walls) to relatively lightly disturbed areas (e.g. winter road surfaces). On mesic sites where soil remains, revegetation with native species can be successful, due to the presence of seeds and living shoots in the ground and favourable moisture conditions. On these sites, unless immediate control of soil erosion is an issue, use of agronomic species tends to inhibit rapid re-establishment of native vegetation (Cargil and Chapin 1987). On sites where soil has been removed, or on ice-rich sites subject to cryoturbation, revegetation by native species will likely be slow and preparation of the soil by planting agronomic species, especially nitrogen-fixing legumes, may speed up the successional process. Salvaged overburden may be a repository of seed, but the effectiveness of this source after stockpiling and respreading on disturbed areas will need to be evaluated through reclamation trials.

On wet to moist sites, *Eriophorum* (cotton grass), *Ledum* (Labrador tea) and *Carex* (sedges) have been found to establish most readily; drier sites naturally revegetate to *Festuca rubra* and *Descurainia sopioides* (Bliss and Wein 1972). Seeding in spring during runoff or in early fall before snowfall have been found to be the best times to plant. During the summer, inadequate moisture may lead to excessive loss of seedlings (Bliss and Wein 1972). Bliss and Wein (1972) also found that addition of high nitrogen fertilizer significantly increased dry-weight production on test plots in the Mackenzie Delta. Loss of new plants to grazing by red-backed voles (*Clethrionomys gapperi*) may limit growth on replanted sites (Bliss and Wein 1972). Caribou grazing and trampling may also be problematic, especially if relatively large groups cross reclamation areas.

As a starting point, the prescriptions in Table 4.2 are suggested for the Jericho Project Area.

4.5 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 soil cover 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

5.0 RECLAMATION PROGRAM

5.1 RECLAMATION ACTIVITIES DURING CONSTRUCTION

5.1.1 Access Roads

Access roads were constructed as part of the exploration program. Existing access roads and other facilities are shown in Figure 5.1. The existing roads would be retained, except most of the road between the exploration camp and the "Minesite" would be routed to the east as shown on Map A (Appendix E). Additional access roads would be required as shown on Map A. Roads are all on relatively flat ground and no fill stabilization is anticipated to be required for erosion prevention. The winter road is not a permanent structure and does not result in ground disturbance; no reclamation is required. Should ground disturbance inadvertently occur on land portions of the road, these will be reclaimed the summer following the inadvertent disturbance according to the prescriptions suggested in Table 4.2, or as appropriate from reclamation trials results. Reclamation after construction will not be possible on the access roads shown on Map A, as they will remain active throughout the mine life. Should small spurs be required for construction purposes only, these will be reclaimed at the end of their active use as per Table 4.2, or as appropriate.

5.1.2 Sedimentation Embankments and Ponds

Sedimentation embankments are anticipated to be required to train runoff water from waste rock dumps, as shown on Map A. Ponds will collect water to allow settling of suspended solids prior to release or further treatment (Environmental Management Plan, Appendix B.3.1). Seeding of berms and pond dikes with fertilizer and agronomics will be undertaken following construction; rip-rapped surfaces will not be vegetated.

No sediment berms, ditches or ponds will be reclaimed after construction, except any temporary ponds that may be required to control sediment from disturbed areas during the summer after construction. No runoff will occur during construction, as construction is planned for winter and early spring.

5.2 ON-GOING RECLAMATION

Table 5.1 lists areas of disturbance and the year reclamation will be carried out.

5.2.1 Borrow Areas

Once borrow areas are no longer required, they will be reclaimed (except the centre of Borrow Area C, which lies on the airstrip). Borrow pits are exclusively on eskers or kame deltas and soils are 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 soils, which could result in further melting and slumping; geotechnical investigations by Bruce Geotechnical (1996*b*) suggest limited existence of ice lenses. 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 per Table 4.2, or as indicated by reclamation trials.

5.2.2 Waste Rock Dumps

Waste rock dumps will remain active until the end of open pit mining. In Year 4 they will be reclaimed, except for a small portion of one of the dumps required for underground waste rock (estimated 57,000 tonnes). Open pit mine equipment on site for that phase of mining will be used for reclaiming the dumps. Dumps will be constructed in step-back lifts; final regrading of slopes will be to attain a 2:1 slope (26°), or less, 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 soil will be placed on the top or flat surface of the dump to a depth of up to 0.3 m. This soil will be fertilized and seeded as per Table 4.2, or as indicated by reclamation trials.

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 soils 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.

5.2.3 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, box culvert, or bridge will be placed at the location in the berm where the natural channel of Stream C1 would exit once the pit fills.

5.2.4 Processed Kimberlite Containment Area

Cell 1 of the processed kimberlite containment area (PKCA) (Map A) will be filled prior to end of mine life. The exact time of this occurrence will depend on the relative use of cells 1 and 2, which will be determined during operation of the processing plant. Once cell 1 is filled it will be reclaimed by placing a geotextile fabric on the fine PK surface followed by coarse kimberlite to provide a buffer between PK and overburden and to prevent fine PK from being forced to the surface by frost heaving or groundwater upwelling. A 0.3 to 0.5 m layer of coarse kimberlite will be placed to act as a filter for runoff and to improve drainage characteristics of the cap. Coarse kimberlite generated during winter operation of the plant will be directly placed on the cell rather than the normal practice of placing the coarse kimberlite on the rejects stockpile. If additional coarse kimberlite is required, it will be taken from the stockpile. The plant front end loader and dump truck will be used for this operation. Once the coarse kimberlite buffer is placed, it 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. 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 and reclamation.

5.2.5 Central Ore Stockpile

The central ore stockpile will be completely processed at the end of Year 6. During the summer of Year 7 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.

5.2.6 Access Roads

Access roads are anticipated to be required throughout the mine life. Should access roads no longer be required, e.g., if Waste Rock Dump #2 is not required with underground mining, these roads will be reclaimed during the mine life before closure. The road surface will be scarified, or ripped, and the surface revegetated as per prescriptions listed in Table 4.2, or as indicated from reclamation trials.

5.3 FINAL RECLAMATION

5.3.1 Waste Rock Dumps and Low Grade Ore Stockpile

Dumps that remain active throughout the mine life and the low grade ore stockpile (if not processed) will be reclaimed at closure in the manner indicated in Section 5.2.2. The tops of the dumps and low grade ore stockpile 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 soils 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 soil available for top dressing, making its use in areas with a low probability of successful revegetation unwise.

5.3.2 Open Pit

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. Pursuant to agreement with DFO, the pit will be allowed to flood. This will be accomplished in two ways:

- snow melt, direct precipitation, and runoff in the catchment basin will remain in the pit, except for summer evaporation; and
- water surplus to that required to maintain flows in the lower 100 m of Stream C1 will be diverted into the pit. Such diversion is envisaged to occur predominantly in the spring and to a much lesser extent during prolonged summer storms, as occurred in the summer of 1999.

Approximately 7 million m^3 of water will be required to fill the pit. Runoff, precipitation, and melt water will not exit the pit until it is filled. From this source alone it is estimated that approximately 150 to 200 years would be required to fill the pit, excluding snow blown into the pit during the winter and evaporative loss in the summer. This estimate is based on long-term average precipitation (Baseline Report, Appendix B.1.1). No estimates are available at present as to the amount of water that could be diverted to the pit in the spring runoff period. Stream flow records will be kept during the life of the mine to provide this information.

To ensure only surplus water is directed back to the pit, a weir would be constructed in the diversion dam for Stream C1. The weir will be a concrete structure to ensure a long, maintenance-free life. Any water over weir height would flow both to the C1 diversion and over the weir, into the old Stream C1 channel and thus into the pit.

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. Once the pit is filled, water will flow out the old channel and into Stream C1. Water quality is not anticipated to be an issue at that point for several reasons. Suspended sediment sources that may be present at the end of mine life will be washed from the walls and will have settled in the pit lake. Any residual nitrogen from explosives use would be used by algae long before the pit filled. Acid generating rock is not present in the host rock of the JD-01 kimberlite pipe and thus, no metals leaching or acidic pH will occur, such as one might expect from a base metal deposit (e.g. a porphyry copper open pit). Water quality would be expected to be the same as is currently found in Stream C1 and Carat Lake, i.e., soft, low alkalinity, and with very low metals and nutrients.

Eventually, fish may enter the pit and use the habitat, especially once benthic algae, zooplankton, and phytoplankton establish in the pit lake. The result would be a net gain in productive fish habitat after mine abandonment with zero resultant cost.

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 in Year 7. 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.

5.3.3 PKCA

The remaining cell (2) will be reclaimed at end of mine life in a manner similar to cell 1, except that all coarse kimberlite must be taken from the stockpile as the plant will not be operating. The polishing pond will not be reclaimed to land. The polishing pond dam will have a permanent spillway constructed of concrete or rip rap armour that will pass a 200 year flood for the small drainage basin left at end of mine life. Water quality in the polishing pond will need to be at CCME receiving environment quality prior to final abandonment.

5.3.4 Coarse Kimberlite and Recovery Plant Reject Stockpiles

The remainder of the coarse kimberlite and recovery plant reject stockpiles not used for reclamation will be sloped to 26° and covered with up to 0.3 m of overburden to prevent dust generation from fines incorporated in the rejects. 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.

5.3.5 North 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.

5.3.6 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. For instance, some interest has been expressed to use the closed mine site as an outfitter's camp in a similar way Bathurst Lodge currently uses the Heccla Mining former exploration camp on Contwoyto Lake.

5.3.7 Sedimentation Ponds, Berms and Ditches

When water quality monitoring after mine closure indicates that sediment ponds and berms are no longer required, they would be breached and normal drainage patterns restored at the site. 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. 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.

5.3.8 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.

5.3.9 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 Corporation reclamation personnel.

5.3.10 Infrastructure

Infrastructure at mine closure will include:

- portal to the underground access ramp;
- vent raise (if outside the pit);
- the accommodation and mine office;
- the fuel farm;
- the explosives magazines;
- truck shop;
- explosives truck shop;
- the laydown areas; and
- the ammonium nitrate cold storage area.

Upon closure infrastructure will be removed and the site graded. The portal, and vent raise will be sealed. All buildings will be torn down. If acceptable to permitting authorities, building scrap will be placed in the open pit and covered. If not, buildings will be removed from the site. Foundations will be covered with soil. The fuel farm tanks will be emptied into tanker trucks, disassembled and removed, as will all warehousing and trailers. At least part of the exploration camp will be maintained for post closure activities accommodation. Tents can be air freighted from the site at abandonment. The explosives magazine trailers (likely steel bulk shipping containers) will be removed.

The water intake will be sealed off at the Carat Lake end and the piping removed from the upland sections. During winter, the causeway will be graded down to a 3:1 or less slope. Rock will then sink to the lake bottom during the following summer. Some fish habitat will be covered near shore, but additional fish habitat will be created by the causeway material. Any in-water infrastructure, such as mine rock cover on pipes, will be left as it will likely have become usable fish habitat. All non-salvageable scrap metal left at closure will also be placed in the open pit and covered, or removed from the site as per buildings. Any supplies, such as ammonium nitrate, will be removed at the time buildings are 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 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 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.

5.3.11 Soils Testing

Any soils suspected of being contaminated (stained) with petroleum hydrocarbons will be tested and those not meeting criteria for industrial purposes 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. Northwest Territories guidelines for remediation of contaminated sites are presently used in Nunavut; the territory may have developed its own regulations by the time the Jericho Diamond mine closes. 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, e.g. if the site is taken over be a guide-outfitter), and the only activity is post closure monitoring.

A reclamation plan is provided in Map F (Appendix E). 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. This would only occur 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. Any weir structures placed in the dike (to allow passage of flood waters back into the original channel) will be constructed of concrete to ensure a long maintenance-free life. Where natural drainage patterns permit (i.e. where pumping is not required), runoff water from the site will be directed to the open pit.

6.3 SEDIMENTATION PONDS

Sedimentation ponds will remain in place until post-closure monitoring indicates water quality is acceptable for discharge directly to the environment. At that point berms will be removed (by spreading soil used in their construction and removing any liners, if present) and pond surfaces revegetated as indicated from reclamation trials. Final abandonment of the site will not take place until ponds can be removed.

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 Project Description (Appendix A.1) and in the Project wildlife report (Appendix B.1.3). 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

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. 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 other 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; grayling would 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; 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 on a monthly basis for parameters controlled by the Jericho Project Water Licence in place at the time of closure, until such time as those parameters meet CCME (or applicable at the time) guidelines for protection of freshwater aquatic life. At that point, sediment control structures will be dismantled and reclaimed as discussed elsewhere in this report. As waste dumps will be reclaimed after the end of open pit mining in Year 4, there will be several years monitoring data to ascertain the trend in runoff water quality from these areas.

Rock dumps and infrastructure associated with the Stream C1 diversion will be inspected on closure by a qualified geotechnical engineer for stability and their report recommendations implemented

Six 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; and
- Jericho Lake at its inlet.

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 for the mine, additional aquatic monitoring, such as for periphyton growth, etc. may be warranted.

6.5.2 Post Abandonment Monitoring

Post abandonment monitoring will be continued until resource agencies, notably Nunavut Water Board and DIAND, agree to cessation. For mines without an acid generation problem, monitoring for a five-year period 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 six water quality monitoring sites sampled once annually in mid to late summer.

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.

7.0 AESTHETICS

Tahera will address, to the extent practical, the issue of aesthetics on closure. All removable infrastructure will be taken off site. No scrap will be left; it will be burned, buried, or taken away. All areas that can be practically revegetated will be. All 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 (two planned) 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 soil 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 221.8 ha disturbed by mining) in the context of the vastness of the Arctic.

8.0 COST

The estimated total reclamation cost for the Jericho Project is $7.35 million. This will be reduced by approximately $530,000 at the end of Year 4 with reclamation of waste rock dumps and removal of unneeded open pit mining equipment. Total reclamation costs at closure will be further reduced when PKCA cell 1 and the central ore stockpile pad are reclaimed and underground mining equipment and required infrastructure are removed in approximately Year 8. An estimate provided by the probable open pit mining contractor is attached in Attachment 8.1.

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TABLES

TABLE 2.1 RECLAMATION SOIL REQUIREMENTS	
Facility	**Soil Required for 0.3 m Cover (m^3)**
Waste Rock Dumps	156,000
Ore stockpiles	60,000
PKCA	100,260
Coarse Kimberlite Stockpile	50,000
Roads, Plant, Miscellaneous	111,000
Total	**477,260**

TABLE 4.1 APPROXIMATE AREAS OF SURFACE DISTURBANCE BY ECOLOGICAL ZONE[1]								
Component	**Ecological Zones and Areas Affected (ha)[2]**							
	WGBM	**MBM**	**DBT**	**DRT**	**LK**	**CRH**	**EKD**	**Total**
Mine								
Open Pit	2.7		3.7	3.7				10
Waste Rock Dumps	17.5		22	13				52.5
Overburden Stockpile		5.07	3	4.2				12.3
Low Grade Ore Stockpile		5.3	2.7	5.07				13.1
Coarse Kimberlite Stockpile	1.85		5.95	6.7	2.14			16.6
Roads								
Haul (22 m width)	0.7	0.4	0.9	0.9			1.1	4
Access (13 m width)	1.4		3.2	4.7		1.1		10.4
Airport (10 m width)							1.5	1.5
Airstrip							2.4	2.4
Plant-Related + Ore Stockpiles				22.7				22.7
PKCA	2.07	0.9	9.6	10.9	11	0.14		34.6
Expl Camp, Truck Wash, Explosives		0.3	0.2	2			3	5.5
Sediment Collection Ponds	0.5	0.6		1.1				2.2
Borrow Areas							34	34
Subtotal Disturbance	**26.72**	**12.57**	**51.25**	**74.97**	**13.14**	**1.24**	**42**	**221.8**
% of Total	**12.05%**	**5.67%**	**23.11%**	**33.80%**	**5.92%**	**0.56%**	**18.94%**	**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 = Cliffs/rocky hills, Kame deltas

TABLE 4.2

POTENTIAL REVEGETATION PRESCRIPTIONS FOR THE JERICHO PROJECT

Mining Land Unit	Overburden Treatment[1]	Plants	Fertilizer Application
Pit walls[2]	None	None	None
Bench and pit floors	None	None	None
Borrow Areas			
Slopes	None	None	None
floors	10 to 15 cm	*Calamagrostis* *Arctagrostis* *Poa pratensis* *Festuca ovin,* *Agropyron trachycaulum* *Phleum pratense*	200 kg/ha N/P
Airstrip and roads		*Festuca ovina*	200 kg/ha N/P
dry areas	10 to 15 cm	*Descurainia* *Calamagrostis* *Arctagrostis* *Poa pratensis* *Agropyron trachycaulum* *Phleum pratense*	
Roads		*Eriophorum*	None, or 100 kg/ha N/P, depending on trials results. *Punccinellia* will allow faster succession if it will take[4]
mesic areas moist areas	None	*Carex* *Punccinellia* *(Astragalus* *Oxytropis* *Hedysarum)*[3]	
Waste rock dumps			
Tops	10 to 15 cm	As per dry roads	100 kg N/P
Sides	None	None	
Pads	10 to 15 cm	As per dry roads	100 kg N/P

Notes:

1 The amount of overburden placement possible will depend on stockpiles, which are expected to be limited.
2 The most likely post-mining treatment for open pits will be flooding and creation of aquatic habitat.
3 These agronomics will only be used if trials with *Punccinellia* are unsuccessful.
4 McKendrick and Palmer, 1997.

TABLE 5.1		
RECLAMATION AREAS BY YEAR		
Facility	**Area (m^2)**	**Year Reclaimed**
Waste Rock Dump 1 top	270,500	Year 4
Waste Rock Dump 2 top	254,900	Year 8
Low Grade Ore (assumes uneconomic)	131,000	Year 4
Overburden		n/a
Roads	159,000	Year 9
Airstrip	24,000	Year 9
PKCA Cell 1 (east)	162,000	Year 7
PKCA Cell 2 (west)	172,300	Year 9
Coarse PK	166,000	on going
Central Ore Pad	40,000	Year 8
Northern Ore Pad	40,000	Year 9
Plant	2,386	Year 9
Accommodation	10,000	Year 9
Process Laydown	5,600	Year 9
Mine Laydown	5,600	Year 7
Mine Shop	3,600	Year 9
Magazines, Ammonium Nitrate	5,000	Year 8
Exploration Camp	50,000	Year 9
Borrow Area A	95,320	on going
Borrow Area C	89,960	on going
Borrow Area D	155,400	on going

FIGURES

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)

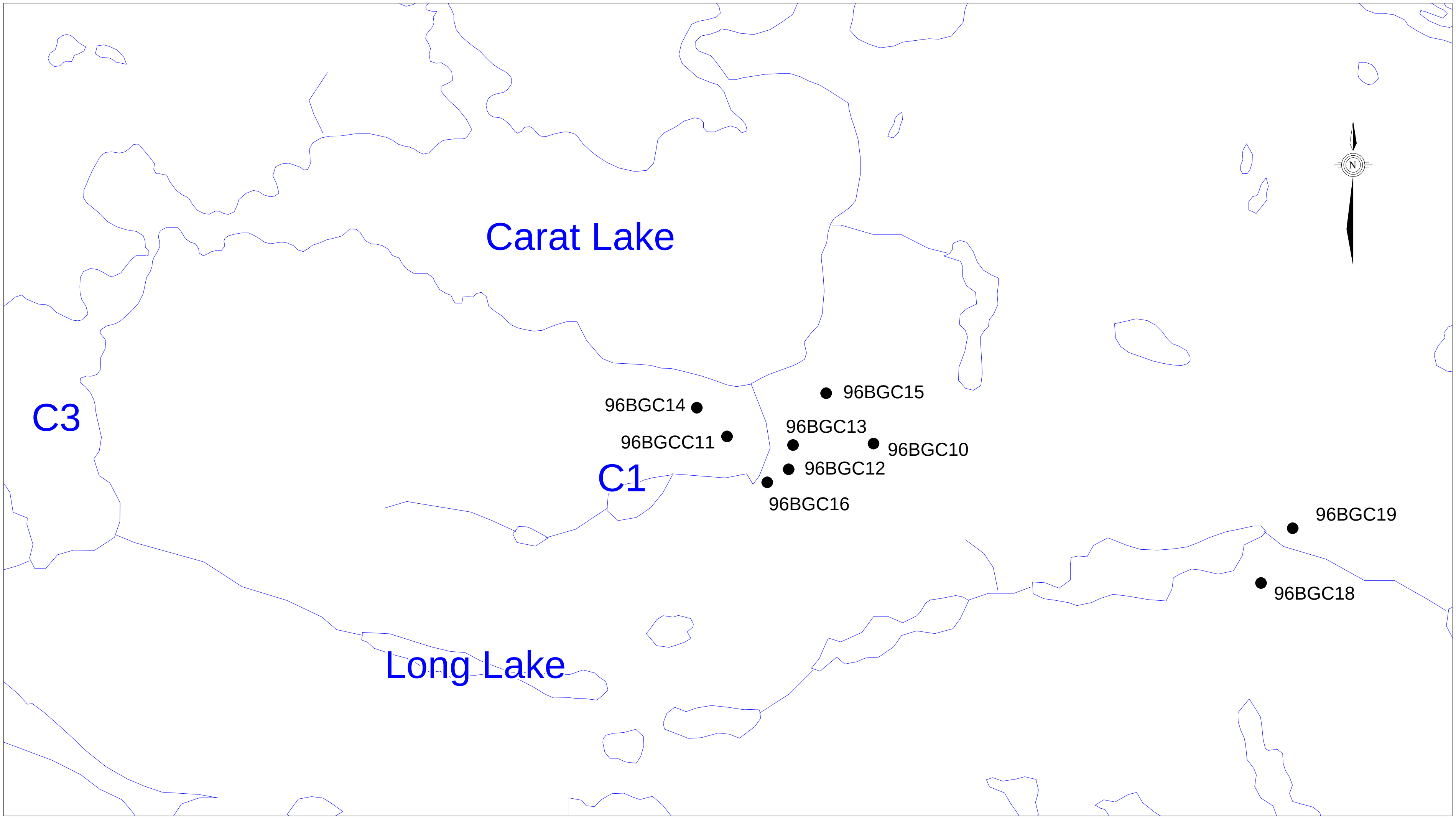


FIGURE 2.2

Borehole Location Map

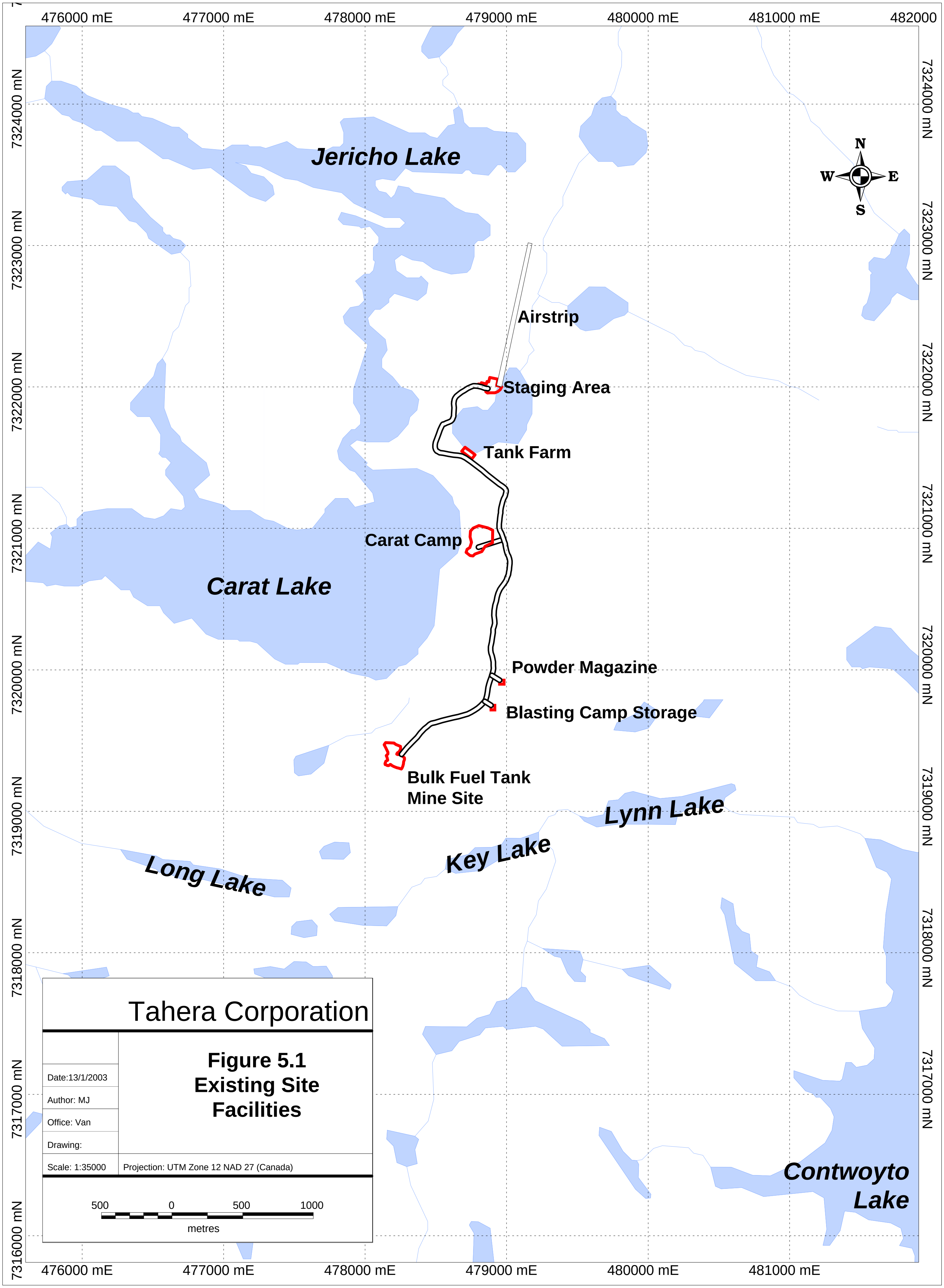
Date:02/10/2000

Author:

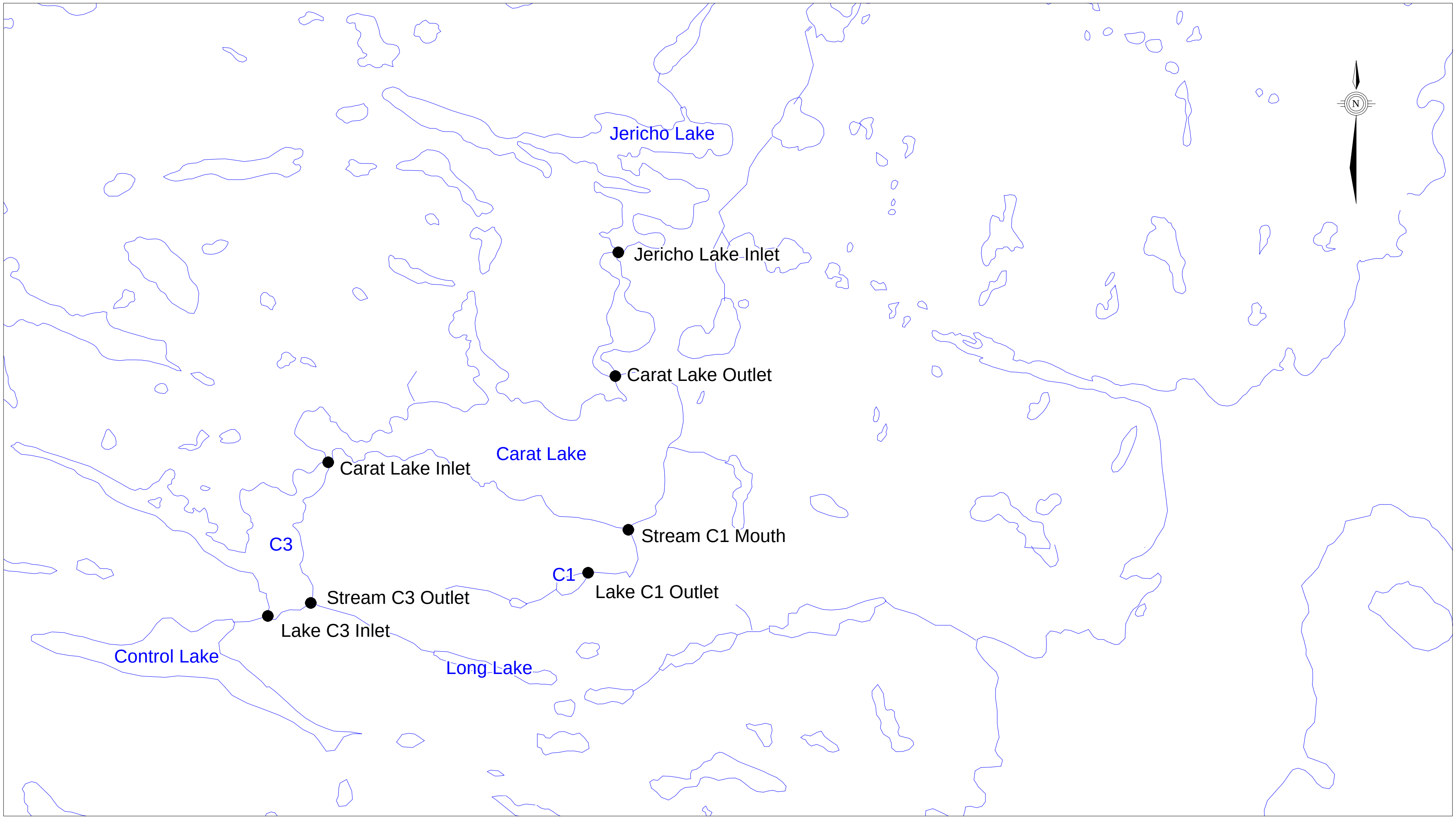
Office: North Vancouver

Drawing:

Projection: UTM Zone 12 (NAD 27 for Canada)



476000 mE
477000 mE
478000 mE
479000 mE
480000 mE
481000 mE
482000
7324000 mN
7323000 mN
7322000 mN
7321000 mN
7320000 mN
7319000 mN
7318000 mN
7317000 mN
7316000 mN
N
W
E
S
Jericho Lake
Airstrip
Staging Area
Tank Farm
Carat Camp
Carat Lake
Powder Magazine
Blasting Camp Storage
Bulk Fuel Tank
Mine Site
Lynn Lake
Key Lake
Long Lake
Contwoyto
Lake
Tahera Corporation
Figure 5.1
Existing Site
Facilities
Date:13/1/2003
Author: MJ
Office: Van
Drawing:
Scale: 1:35000
Projection: UTM Zone 12 NAD 27 (Canada)
500
0
500
1000
metres



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)

ATTACHMENT

ATTACHMENT 8.1

Nuna Logistics Reclamation Cost Estimate

ADDENDUM TO NUNA LOGISTICS RECLAMATION COST ESTIMATE

The attached document contains dates that are no longer valid. However, the sequence of events discussed will still take place. The table below lists the old and new dates together with mining activity. New dates should be substituted for the dates in the report, i.e., 2005 = 2007 and 2011 = 2013. Costs are in 2000 dollars.

JERICHO DEVELOPMENT SCHEDULE			
Old Date	**New Date**	**Mining Year**	**Activity**
2002	2004	1	Construction – open pit, plant
2003	2005	2	Open pit mining
2004	2006	3	Open pit mining
2005	2007	4	Open pit mining
2006	2008	5	Underground Development & Mining
2007	2009	6	Underground Mining
2008	2010	7	Underground Mining
2009	2011	8	Processing only
2010	2012	9	Processing only
2011	2013	10	Closure

NUNA LOGISTICS

340 Park Place, 666 Burrard Street, Vancouver, BC V6C 2X8
Tel.: (604) 682-4667 Fax: (604) 682-4473

3010 Calgary Trail South, Edmonton, AB T6J 6V4 Tel.: (780) 434-9114 Fax (780) 434-7758

June 27, 2000

Delivered Via Telecopier: 604-904-9877

Bruce Ott, Ph.D.
Environmental Scientist
Tahera Corporation
1408 Crown Street
North Vancouver, BC
V7J 1G5

Dear Sirs:

RE: **REVISION #2 - RECLAMATION COST ESTIMATE - JERICHO PROJECT - CONTRACT MINING**

The cost of reclaiming the Jericho site is expected to be a follows:

YEAR 2005 – RECLAIM THE TWO WASTE DUMPS **$531,200**

This work would be incremental to the final year of open pit mining. Most of the work would occur during the summer season, with the final completion of Dump 2 to coincide with the finish of the open pit mining.

The work would require the following heavy equipment time:

D10 Dozer	617 Hours
992 Loader	282 Hours
777 Trucks	846 Hours
16G Grader	141 Hours

The work will require 140,000 litres of fuel.

YEAR 2011 – RECLAIM THE REMAINING SITE **$4,670,200**

This work would require a dedicated crew after the completion of all mining activities. We have included the costs for the use of Tahera's equipment and facilities assuming Nuna Logistics' rates for similar equipment and facilities. We have assumed that the full dismantling of facilities and equipment can be completed in three months.

Aside from the Tahera equipment, Nuna Logistics would mobilize a D10 dozer, two D300 trucks, 16G grader, and a large all-terrain crane.

The cost breakdown is as follows:

Earthworks	$698,068	
Mobilization and Demobilization	285,000	(Nuna Equipment)
Facilities Disassembly	2,173,712	
Administration	673,384	
Support Equipment	150,000	
Tails Dam Liner	150,000	
Support Facilities	540,000	
	$4,670,164	

The work will require the following heavy equipment time:

D10 Dozer	585 Hours
777 Trucks	1,283 Hours
992 loader	428 Hours
16G Grader	214 Hours

The work will require 900,000 litres of fuel.

YEAR 2012 – OUTBOUND FREIGHT **$928,800**

The outbound freight is based on 129 loads and was estimated based on a verbal conversation with Serge Benoit.

The above estimate summarizes a calculation sheet prepared by Serge Benoit of Tahera Corporation. The calculation sheet uses a revised quantities schedule prepared by Tahera Corporation and uses similar assumptions, productivities, etc. to the original calculation sheet prepared by Nuna Logistics.

We have made no allowance for contingency or risk items. The estimated costs are expressed in Year 2000 Canadian Dollars.

Yours truly,

NUNA LOGISTICS LIMITED

Courtland Smith, P.Eng.
Vice President
CS/jm

cc: Roy Meade, Deputy Chairman – Tahera Corporation
Serge Benoit, Plant Metallurgist – Tahera Corporation

NUNA LOGISTICS

Assumptions

Waste Dump 1 and 2

Reclaimed at the end of open pit 2005

Edges would be sloped, Upper bench would be cover with 0.3m of overburden

Tailings area

A liner would be installed to cover the fine kimberlite rejects 1$/m

East Cell would be reclaimed prior to the end of operation

West Cell 2 would be reclaimed at the end of the processing

0.5 m of coarse tailing would be deposited on the liner

0.3 m of overburden would be deposited on the coarse kimberlite rejects

Pads

Edges dozed by 5m, no cover on flat portion only scarified

Roads

5 m on shoulder dozed and covered, flat area scarified only

Coarse Kimberlite Rejects Dump

Doze down slopes

Cover slopes and upper bench with 0.3m of overburden

Low Grade Stockpile

Doze down edges

Cover upper bench

Reclaim Waste Dumps at the end of Open Pit using Mining Contractor Equipment

					Total
Contour					
Assume D10 can countour	1000	m2/hr			
Waste Dump #1					
Waste Dump #1 Slope Length	123	m			
Waste Dump #1 Perimeter	1993	m			
Waste Dump #1 Final Contour	245139	m2	to contour the side of the dumps		
Approximate time to contour	245	hrs			245
Waste Dump #2					
Waste Dump #2 Slope Length	123	m			
Waste Dump #2 Perimeter	1919	m			
Waste Dump #2 Final Contour	236037	m2	to contour the side of the dumps		
Approximate time to contour	236	hrs			236
Cover with Overburden					
Assume D10 Pushes	1000	m3/hr			
Waste Dump 1					
Cap over Waste dumps	0.3	m			
Last Bench Area Waste Dump 1	229013	m2			
To spread overburden over dump 1	68,704	m3	top of last bench only		
Approximate time to spread	69	hrs			69
Waste Dump 2					
Last Bench Area Waste Dump 2	222,430	m2			
To spread overburden over dump 2	66,729	m3	top of last bench only		
Approximate time to spread	67	hrs			67
					617
Load and Haul Overburden					
Cycle time 992 loader	4	min/load			
Cycle time 992 loader	12	load/hr	loader	1	992
Cycle 777 Highway truck	15	min/trip	Off higway truck	3	777
Cycle per 777	4	trip/hr			
Cycle 3 -777	12	trip/hr			
777 Capacity	50	m3/hr			
Capacity per hour	600	LCMs/hour			
Capacity per hour	480	ECMs/hour			
Qty Waste Dump 1	68,704				
Qty Waste Dump 2	66,729				
Hrs required	282				

RECLAMATION COSTS

Equipment	Fuel/hr litres	Total Hrs	Machine Cost /hr	Operator Cost/hr	Total	Total Fuel	
D10	84	617	250	56.83	189,194	51,795	
992	78	282	273	56.83	93,062	22,008	
777	70	846	211	53.7	224,057	59,252	
16G	44	141	120	56.23	24,848	6,204	
Sub Total					531,161	139,259	531,161

Rates for equipment all inclusive

Incremental operation 12 more people,

Reclaim Remaining

Disturbance Areas Contour		
Tails Dams		
Tails Dam Distance to Contour	1,000	m
Tails Dam Area to Contour	60	m2/m
Total Arrea to Contour	**60,000**	m2
Roads		
Road Distance to Contour	15,000	m
Road Area to Contour	10	m2/m
Total Road Area to Contour	**150,000**	m2
Pads		
Total Distance to Contour	5,000	m
Area to contour	5	m2/m
Total area to Contour	**25,000**	m2
Coarse tailings waste dump	**75,000**	m2
Low Grade Stockpile	**70,000**	m2
Total area to Contour	380,000	m2
D10 hrs to Contour at 1000m2/m	380	

Disturbance Areas to Cover				
Tails Dams Overburden				
Area to Cover (overburden)	150,000	m2		West & East Cell
Volume to Cover @ 0.3m	45,000	m3		
Tails Dams Coarse rejects				
Area to Cover (coarse kim. rejects)	150,000	m2		West Cell
Volume at 0.5m	75,000	m3		
Total volume tailings	**120,000**	m3	120,000	
Roads				
Distance 6 m roads	3,500	m		
Area to cover / meter	10	m2		
Area to cover	35,000	m2		
Volume of Overburden @ 0.3m	**10,500**	m3		
Distance 9 m roads	9,000	m		
Area to cover / meter	10	m2		
Area to cover	90,000	m2		
Volume of Overburden @ 0.3m	**27,000**	m3		
Distance 18 m roads	2,000	m		
Area to cover / meter	10	m2		
Area to cover	20,000	m2		
Volume of Overburden @ 0.3m	**6,000**	m3		
Total Roads	**43,500**	m3	43,500	
Pads				
Total area contoured	25,000	m2		
Volume @ 0.3m	**7,500**	m3		
Coarse tailings waste dump				
Total area to Cover	99,400	m2		
Volume @ 0.3m	**29,820**	m3		
Low Grade Stockpile		m2		
Total area to Cover	15,000	m2		
Volume @ 0.3m	**4,500**	m3		
Total volume to contour	**41,820**	m3	41,820	
Total Volume to Cover			**205,320 m3**	

RECLAMATION COSTS

Equipment	Fuel/hr litres	Total Hrs	Machine Cost /hr	Operator Cost/hr	Total	Total Fuel	
D10	84	585	250	56.83	179,594	49,167	
992	78	428	273	56.83	141,085	33,365	
777	70	1283	211	53.7	339,676	89,828	
16G	44	214	120	56.23	37,713	9,416	
Sub Total					698,068	181,775	698,068

Mobilization and Demobilazation				
D10	30000	2	60000	
16G	15000	2	30000	
777	45000	3	135000	
992	60000	1	60000	
Sub Total			285000	285,000

Tails Dam Liner Cover			
Total Area	110,000	m2	
Cost per m2	1		
Cost for material	110000	$	
Cost to install	40000	$	
SubTotal	150,000 $		150,000

Disassembly of Facilities	#	months	Days/mont	Hrs/day	Rental $/hr	Operator $/hr	Total	
Crane		6	30.4	16	200	61.53	763249	
Welders & Rigers	4	6	30.4	12		63.1	552453	
Labourers	8	6	30.4	12		49	858010	
							2173712	2,173,712

Note Assembly costs = 3,425,000
Proposed di-assembly cost = 2,137,712 or 68% of assembly costs

Nuna Overheads	#	months	Days/mont	Hrs/day	Rental $/hr	Operator $/hr	Total	
Site Supervisors	1	6	30.4	12		78.76	172390	
Foreman	2	6	30.4	12		61.53	269354	
Safety	1	6	30.4	12		56.83	124390	
Administrator	1	6	30.4	12		49	107251	
							673384	673,384

Support Equipment	150000	150,000

Support Facilities		
Cost per month	90000	
Cost for 6 months	540000	540,000

Transport South Bound 2011		
Plant Building	51	
Plant	24	
Gen Sets	4	
Fuel Tanks	10	
Mobile Equipment	10	
Misc.	30	
# Loads	129	
Cost per load	7200	
Total Transport	928800	928,800

Total Reclamation 2010	4,670,164
Total Reclamation 2011	928,800
Total Reclamation	6,130,126