7.4 Land Use at Abandonment

7.4.1 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.

7.4.2 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.

7.4.3 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.

7.5 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.

7.5.1 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 monthly as indicated below for parameters controlled by the Jericho Project Water Licence in place at the time of closure. An annual seepage survey will be conducted for two years post closure. If results indicate water quality is improving, annual surveys will cease and be replaced by surveys at Year 5 post closure and every 5 years after that until abandonment.

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. Stability and drainage characteristics of borrow pits will also be monitored after closure on the schedule discussed above, to ensure no sediment loss to water bodies. 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.

Eight water quality sites are proposed for monitoring and are shown on Appendix A, Drawing 2:

- Lake C1 at its outlet;
- Stream C1 at its mouth;
- Stream C3 outlet;
- Lake C3 at its southern (principal inlet);
- Carat Lake at its inlet;
- Carat Lake at its outlet;
- Jericho Lake at its inlet;
- 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 for the mine, additional aquatic monitoring may be warranted.

7.5.2 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 eight 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.

7.6 Global Warming Considerations

The western Arctic has warmed about 2ºC over the past 100 years. In that same time period human activities have caused an increase globally of about 0.5ºC (Environment Canada 1991a). By 2050 the amount of carbon dioxide in the atmosphere is predicted to double, which is also predicted to raise the mean annual global temperature between 1.5º and 4.5ºC (Environment Canada 1991). In the continuous permafrost zone the active layer may thicken and permafrost slowly melt. However, specific responses of permafrost and the active layer are difficult to predict, since they also depend on precipitation changes, vegetation, soil moisture, and snow cover (Williams 1979, Maxwell 1992, Harris 1987). Evidence at present suggests that winter warming will be greater than summer, but that winter temperatures will not rise above freezing in the western Arctic (Cohen, et al. 1994). Based on data compiled by the Geological Survey of Canada, Terrain Sciences Division (GSC 2000a), the Project site is in an area of high thermal response to warming, but also an area of low to minimal impact from permafrost thaw.

A lag occurs between changes at the ground surface, e.g. caused by increases in average temperature and changes in permafrost at depth, and will range from years to decades for thin permafrost up to centuries or millennia for thick permafrost (GSC 2000b). Permafrost at Jericho is 540 m thick and would thus be expected to change temperature only over a very long time.

Waste rock, ore, and coarse PK will be placed in areas with little overburden and will be bedrock controlled. Thus, thermokarst erosion will not be an issue. None of the dams will be required to retain water. The West Dam spillway will be cut into bedrock on the north abutment of the dam or breached and rock armoured. All remaining dumps and stockpiles will drain to the open pit or PKCA area.

8.0 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.

9.0 COST

A detailed discussion of costs is provided in Appendix D (which see).

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APPENDIX A

DRAWINGS

Site Arrangement
Year End 2006

JERICHO LAKE

Lake

AIRSTRIP

Lake 01

WASTE TRANSFER

BORROW AREA

LAYDOWN AREA

AIRSTRIP ROAD

OLD EXPLORATION CAMP SITE

CARAT LAKE

CROWN LAND
INUIT LAND

Lake C4

CAUSEWAY FOR FRESHWATER INTAKE

STREAM C1

OUTLINE OF ULTIMATE PIT

C1 DIVERSION

AMMONIUM NITRATE STORAGE PAD

EXPLOSIVE MAGAZINES

EMULSION PLANT

Lake C1

Lake C2

WASTE ROCK DUMP

TILL AREA

Lynne Lake

TANK FARM

TRUCK SHOP

GENERATORS

CAMP

East Sump

Key Lake

WEST DAM

COARSE PK

PKCA

Lake

Ash Lake

CROWN LAND
INUIT LAND

Legend

0m 50 100 150 200m
1 : 6000

- Waste Dump
- PKCA
- Stockpile Pad
- 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

TITLE: SITE AS OF 31 DECEMBER 2006

DWN BY: BWS	DATUM: NAD27	DATE: MARCH 2007
CHK'D BY: BO	REV. NO.: A	PROJECT NO: VE51295
PROJECTION: UTM Zone 12	SCALE: AS SHOWN	FIGURE No. DRAWING 1

N:\Projects\51000\51200\VE51295 - Tahera Jericho Final EIS\Jericho\Water Licence\ARP\Drawings\cad\SiteMap\Site_2006-12\Jericho-Closure-Plan_Site-as-of-2006-Dec-31.dwg - 34x44 - Mar. 22, 2007 3:47pm - brad.sparks

Conceptual Site Arrangement
Closure

JERICHO RIVER

JERICHO LAKE

JERICHO LAKE INLET

BORROW AREA

CARAT LAKE OUTLET

BORROW AREA

BORROW AREA

CARAT LAKE

CARAT LAKE INLET

CROWN LAND
INUIT LAND

MCCAW'S PAD

STREAM C1 MOUTH

530m Elev.

WASTE DUMP SITE 550m Elev.

LAKE C1 OUTLET

OPEN PIT

LAKE C3

STREAM C3 OUTLET

LAKE C3 INLET

530m Elev.

WASTE DUMP SITE 2

LYNNE LAKE

WINTER ROAD

KEY LAKE

PK3

PK4

PK1

ASH LAKE

CONTROL LAKE

CROWN LAND
INUIT LAND

0m 50 100 150 200 250 500

0m 250 500

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Apr 3, 2007

SCALE: NTS

TAHERA DIAMOND CORPORATION

CLOSURE PLAN

DRAWING 2

Ecological Zones Map

475000E
475500E
476000E
476500E
477000E
477500E
478000E
478500E
479000E
479500E

7324000 N
7323500 N
7323000 N
7322500 N
7322000 N
7321500 N
7321000 N
7320500 N
7320000 N
7319500N
7319000N
7318000N

JERICHO LAKE
CARAT LAKE
LAKE C3
CONTROL LAKE
ASH LAKE
KEY LAKE
LYNNE LAKE

BORROW AREA
BORROW AREA
BORROW AREA

MCCAW'S PAD
OPEN PIT
530m Elev.
550m Elev.
530m Elev.
WASTE DUMP SITE 1
WASTE DUMP SITE 2

PK1
PK3
PK4

CROWN LAND
INUIT LAND
CROWN LAND
INUIT LAND

WINTER ROAD

N

0m 50 100 150 200 250 500
0m 250 500

Rock Tundra
Dry Rock Tundra

Land Tundra
Dry Barren Land Tundra

Water
Water

Wet Grass
Wet Grass and Birch Meadows

Cliff
Cliff/Rocky Hill

Esker
Esker/Kame Delta

Birch
Birch Brush

Beach
Beach Shorline

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Apr 9, 2007

SCALE: NTS

TAHERA
DIAMOND CORPORATION

CLOSURE PLAN

DRAWING 3