Water Permit Submission

for the

Jericho Diamond Mine
Nunavut

Submitted to:

The Nunavut Water Board
Gjoa Haven, Nunavut

Submitted by:

Tahera Diamond Corporation
Toronto, Ontario

August 2004

EXECUTIVE SUMMARY (English, Inuktitut, and Inuinaktun)

This document is being submitted to the Nunavut Water Board (NWB) by Tahera Diamond Corporation (the Company) for the purposes of water use at the Jericho Diamond Mine. Tahera Diamond Corporation intends to develop the Jericho Mine for the purposes of extracting commercially saleable diamonds to global markets. The Jericho Project is located at the north end of Contwoyto Lake, which is approximately 200 kilometres south east of Kugluktuk and 200 kilometres southwest of Bathurst Inlet.

The Company is proposing to construct a project that will have an eight-year life and will utilize modern mining methods to extract the kimberlite ore, by engineering an open pit. According to current mine reserves the mine will produce approximately three million carats of diamonds. Processing of the kimberlite will occur on site and the diamonds will be sold to global markets. The project will be self-sufficient and will have a footprint of approximately 220 hectares.

The site will be accessible by air and by utilizing the winter road that runs north from Yellowknife annually. The Jericho site will utilize this winter road access by continuation of the winter road from the Lupin mine site on Contwoyto Lake (approximately 30km). The site currently has a 1 kilometre long airstrip, which may be expanded to when the mine is built to accommodate larger aircraft; however, primarily supply will occur via the annual winter road.

The Company is currently scheduling mobilization of materials and supplies on the 2005 winter road over the January to March period. The project will take approximately one year to construct with full scale diamond production commencing in early 2006. Once operating the mine is expected to operate for eight years. The Company intends to continue its exploration efforts in the Jericho Region in an attempt to find other economic kimberlites, which could potentially extend the life of the project.

The project will require approximately 100 employees during construction and operation with a wide variety of skills and educational requirements needed to fill these positions. The Company has completed an Inuit Impact Benefit Agreement (IIBA) with the Kitikmeot Inuit Association, which focuses on employment, training, and community wellness. A signing ceremony for the IIBA will be held in Cambridge Bay in September.

The Jericho Project has completed the Environmental Review Process and the Nunavut Impact Review Board recommended (February 2004) to the Minister for Indian and Northern Affairs Canada (INAC) that the Project should precede to the regulatory phase. In July 2004 the Minister for INAC approved the NIRB report and a project certificate was issued by the NIRB. The NWB watering permitting process is one of the final requirements to met prior to construction efforts beginning. The Company will also be working with the Kitikmeot Inuit Association and INAC to secure land leases and with the Department of Fisheries and Oceans to obtain the required authorizations. In addition, the Company will be working with Natural Resources Canada for the purpose of obtaining the required explosives permit.

The application for this water permit is based on Guidelines provided by the Nunavut Water Board that were developed in conjunction with other reviewers. The application outlines specific details and plans regarding the water related components of the Jericho site. The Company has endeavoured to address all the guidelines provided by the NWB in this document.

The Company looks forwarded to working with the Board and staff of the Nunavut Water Board as we proceed through this process.

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AULAPKAIYINI NAITTUQ

Una uktuut tuniyauliqtuq tapkununga Nunavut Imarmut Katimayiit (NWB) tapkunanga Tahera Diamond Corporation (Havakvik) talvunga tukhiqtauhimayumun Jericho Diamond Mine. Tahera Diamond Corporation pivallialiurumayaa Jericho Mine piyumaplutik niuviqvingni niuvrutigiyauttaaqtuni taiman hilaryauni niuviqviitni. Tamna Jericho Havaktauyuq nunaqaqtuq hivuani Tahiryuap, 200 kilometres-kiaq kivataani kitaani Kugluktum 200 kilometres-kiaqlu kivataani kangiani Qingaum.

Tamna Havakvik tukhiqtuq havarumaplutik havakvighamik 8-nik ukiunik havakviqangniaqtuq atuqniaqtunlu ublumiutarnik uyaraghiurutjutinik piiyaarutinik tapkuninga kimberlite uyarait iluaniitaqaqtun taimanik. Maliklugit tatja uyarhiungnini tutquumayait uyarhiuqvik tiliniaqtun pingahunik million-nik kiaratnik taimanik. Havakningitni kimberlite uyaraitnik havaktauniaqtun tahamani. Tamna havaktauyughaq inmigun-aulapkaitjutiqaqniaqtuq tumiqarniaqtuqlu 220-ni hectares-nik.

Tahamna nuna tikittauttaaqtuq timitikkun aturniaqtaanlu ukiumi apqutiliuqtauhimayuq tunuviamun Yellowknife-min ukiunguraangat. Tamna Jericho nunanga aturniaqtaa ukiumi apqutiliuqtauhimayuq aulahimaningani ukiungmi apqutaani Lupin uyaraghiuqvianin Tahiryuami (imaakiaq 30km). Nunagiyaat tatja 1 kilometre takitilaaqaqtumik milviqaqtun, tikitilaanguqtauttaaqtuq uyaraghiuqvik havaktauqpan mittaangitni angitqiyan tingmitit; kihimi; tamayait agyaqtauniaqtun ukiumi apqutaagut.

Tamna Havakvik tatja ihuarhaiyut agyaqtauyughani tamayani talvuuna 2005 ukium apqutaani Janualimin Maasimun. Havaktauyughaq atauhiqmikiaq ukiungmi havaktauniaqtuq taimanik tililirlutik 2006-ngulihaaliqqan. Aulahimaliqqan uyaraqtarvik aulahimaniaqtuq 8-ni ukiuqni. Tamna Havakvik aulahimaniarhimayain qinirhianirmingnik talvani Jericho-m haniani nalvaarniarhimalutik atlanik kiinauyaliuqtaaqtunik kimberlites-nik, tapkuat takitilaaqtaqtaa itningani havaktauyugham.

Havaktauyughaq piyumaniaqtuq 100-nik kiaq havaktighanik havakningani aulapkainingani quyaginnanik ayurhimayunik ilinniarhimayainnilu pihimayughani piyumayauyut havaktighagiangitni hapkunani havaaghani. Tamna Havakvik inirhimaliqtuq uminga Inuit Hulaqutini Ikayuutiit Angirut (IIBA) tapkunani Kitikmeot Inuit Katimayiitni, turaagayun havaaghani, ayuirhainini, nunalaanilu inuuhiriqningni. Tamna IIBA havakhimayunlu imakkun akiliqtaunikkun piyunnautighanik Inuinnarnun naunaiyaqtauhimayuq Article 20-mi umani Nunavut Nunataknikkun Angirutmi. Atiliurviknikkun katimaniaqtun IIBA-kun Iqaluktuuttiaqmi Saptaipami.

Tamna Jericho Havaktauyughaq qangiqhimayuq Avatinin Ihivruiqniqmin tamnalu Nunavut Avatilirinirmut Katimayiit pitquiyut (Fipyuali 2004) Ministamun Inuliriyituqakkutni Kanadami (INAC) tamna Havaktauyughaq aullaqtughaq maligaliuqtaunirmun. Juun 2004-mi tamna Minista INAC-mun angiqhimayaa NIRB unnuitjutaa uvvalu havaktauyughangnikkun titiraq tuniyauhimayuq NIRB-min. Tamna NWB imaqturnikkun laisighaqnikkun kingulliuyuq pitquyauhimatjut pihimayauyughaq hanaliqtinnagin. Tamna Havakvik havaqatiginiaqtainlu

Kitikmeot Inuit Katimayiit INAC-kunlu piyaamingni nunanik akiliqattaqtaghamingnik tapkuatlu Imarmiutaliriyikkut piyumaplugit pitquyauyun angirutin. Uvvalu, tamna Havakvik havaqatiginiaqtain Nunamiutait Atuqturhat Kanada piyumaplutik piyumayauyun qaraqtautin laisiit.

Tamna uktuut umunga imakkun laisimi tunngayuq tapkunani Atuquyauyuni tuniyauhimayut Nunavut Imarmut Katimayiitnin tapkuat pivallialiuqtauyun katimaplutik atlanlu ihivriuqtinin. Tamna uktuut naunaiyaghimayuq nanaiyaqpiarhimayunik nauniatkutinik upalungaiyautiniklu mighaagun imakkun pitqutiqaqtun havagutin talvani Jericho nunaani. Tamna Havakvik uktuqhimayuq kiuniarhimaplugit tamaita atuquyauyut tuniyauhimayut NWB-kunnin umani titiraqmi. Una tunihiniq uqaqhimayuq angitqianik ilitturipkaitjutinik mighaagun imakkun atuqningani talvani nunaani, tunihiyuqlu aulapkainikkun hivulliurutighainni havaktauyughami. Talvalluaq, tamna tunihinik ilaqaqtuq aulapkainikkun ingattangittaanganilu upalungaiyautiit aulatjutaanun havaktauyugham, ilitturipkaitjutiit qimmakuni hulaqutiitni, amigaittunlu ilitturipkaitjutin mighaagun munaginikkun umiktirnikkunlu upalungaiyautiit. Tunihipluni hapkuninga ilitturipkaitjutinik tamna Havakvik uppiriyuq pihimayuq ilitturipkaitjutinik, piyumayauyuq, paariangitni piyumayain NWB-kun atlanlu ihivriuqtinin iniriangitni laisighakkun havaqutainni.

Tahera Diamond Corporation niriuqtuq havakatigiami Katimayiit havaktiitlu Nunavut Katimayiitni hivumuutilluta umani havaaghami.

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1.0 INTRODUCTION

This report is intended to summarize the information provided for the purposes of a water permit application for the Jericho Diamond Project. This document is inclusive, with attached detailed reports as appendices. A conformity table is provided that directs the reader to the appropriate report were specific NWB Guidelines are addressed. Due to scope of this application the reader will be required to reference the attached appendices to appreciate the full context of the information provided. For some guidelines the reader will be required to refer to more than one document where a particular subject has been discussed.

In January of 2003 the Company took part in the Final Hearing process conducted by the Nunavut Impact Review Board (NIRB). During that process the Company and its consultants presented the Project to the NIRB Board and staff and went into extensive detail from an Impacts Assessment prospective for the project. The Jericho Project has now completed the Environmental Review Process and the Nunavut Impact Review Board recommended (February 2004) to the Minister for Indian and Northern Affairs Canada (INAC) that the Project should precede to the regulatory phase. In July 2004 the Minister for INAC approved the NIRB report and a project certificate was issued by the NIRB.

The role of the Nunavut Water Board, in granting a water permit, is significant in the approvals process for mine development. The NWB has developed guidelines for this project, which the Company has made every effort to address. The contents of this submission reflect the evolution of a project moving through the environmental and regulatory processes. The most up to date information available for the project has been provided in this document and should replace any previous plans or concepts.

1.1 Conformity Table

Guidelines Section No.	Title of Reference Document	Section/ Page No.	Comment
4.1(a) (i)	Summary Report	Section 10.2	Water fees
4.1(a)(ii) 1.a	Appendix EE: Causeway Matrix	All	Causeway/water intake alternates
4.1(a)(ii) 1.b	1. Appendix AA: FEIS (P&E 2002); 2. Appendix P: Memorandum A (Mainstream 2004); 3. Appendix R: NNLP (Mainstream 2004)	1. Appendix B, B.2.3, Attachment 4.1, Sections 2.3.4 and 3.5 2. Section 3.0 3. Section 2.2	Fish mitigation/culverts
4.1(a)(ii)1.c	Appendix Q: Memorandum B (Mainstream 2004)	All	DFO guidelines for water intakes
4.1(a)(ii)2.a	Appendix X: SRK Tech Memo W - Site Water Management and Appendix S – SRK Drawings	Drawings W2 & W3, Section 2.3.1	Diversion design
4.1(a)(ii)2.b	Appendix X: SRK Tech Memo W - Site Water Management	Section 2.2	Diversion design flood is 200 year event; not PMF
4.1(a)(ii)2.c	1. Appendix X: SRK Tech Memo W - Site Water Management and Appendix S – SRK Drawings.	1. Drawings W2 & W3 2. Sections	Diversion plan for DFO

Guidelines Section No.	Title of Reference Document	Section/ Page No.	Comment
	2. Appendix R: NNLP (Mainstream 2004)	2.5, 2.6, 3.4	
4.1(a)(ii)3	Appendix X: SRK Tech Memo W - Site Water Management	Section 2.2	Water use volumes
4.1(b)(i)	1. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area 2. Appendix S: SRK Drawings	2. Drawings P1, P3 through P8	Dam plans
4.1(b)(ii)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Section 9.3	Dam materials
4.1(b)(iii)	1. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area and Appendix S – SRK Drawings 2. Appendix X: SRK Tech Memo W - Site Water Management	From 1: Entire report & Drawings P1 through P11 From 2: Section 3 and Drawing W1	dam and appurtenant structures design, foundations, geology, construction materials, topography, construction plan, monitoring systems; failure mode analysis; and closure
4.1(b)(iv)1.a.	1. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area 2. Appendix S: SRK 2004 Drawings	From 1: Sections 2.2, 2.6 & 5.3 and From 2: Drawings P2 through P6 From 2: Drawings G5 through G7	PKCA dam permafrost/bedrock
4.1(c)(i)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Sections 3, 5.1 & 5.2	PKCA design plan
4.1(c)(ii)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Section 5.2	PKCA area and storage
4.1(c)(iii)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area and Appendix S: SRK Drawings	Section 2.5, 5.3.1 & 5.3.6, Figure 5.1, and Drawings P2 through P6	PKCA plan & cross sections
4.1(c)(iv)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area and Appendix S: SRK Drawings	Section 5.3 and Drawings P3 through P6	PKCA foundation conditions
4.1(c)(v)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	All	Guidelines for Tailings Impoundment Design in the NWT
4.1(c)(vi)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	All	PKCA additional information based on the MAC Guidelines
4.1(c)(vii) 1.a	1. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area and Appendix S: SRK Drawings. 2. Appendix BB: SRK Tech Memo E - Supplemental Information on the PKCA and Settling Pond	From 1: Sections 6.1 & 6.2 and Drawing P7 From 2: Geotech Folder, Section 7.2 and Figure E.7.1	PKCA liner and alternatives
4.1(c)(vii) 1.b	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area and Appendix S: SRK Drawings	Sections 5.2 & 10.2 and Drawing P1	PKCA centre divider dike
4.1(c)(vii) 1.c	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	From 1: Section 3.2 From 2: Sections 8, 10.2 &10.3	PKCA water management

Guidelines Section No.	Title of Reference Document	Section/ Page No.	Comment
4.1(c)(vii)1.d	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Section 10.1	PKCA sediment deposition
4.1(c)(vii)2.	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix K: AMEC Spray Irrigation	From 1: Sections 2.7 & 3.4 From 2: All	PKCA other effluent options
4.1(d)(i)	Appendix X: SRK Tech Memo W - Site Water Management and Appendix S: SRK Drawings	Section 2.7 & Drawing W2	Plan and sections of water crossings (for C1 Crossing mainly)
4.1(d)(ii)	Appendix X: SRK Tech Memo W - Site Water Management and Appendix S: SRK Drawings	Drawing W2	Crossings existing conditions (for C1 Crossing)
4.1(d)(iii)	Appendix BB: SRK Tech Memo C - Supplemental Climate and Hydrology Data	Air Quality Folder, Section 3 and Figure C.17 & C.18	Crossings flow data (for Stream C1)
4.1(e)(i)	1. Appendix I: AMEC Summary Monitoring Report 2. Appendix X: SRK Tech Memo W - Site Water Management	From 1: 4 From 2: Section 4	Monitoring and mitigation wrt surface drainage
4.1(e)(ii)	Appendix X: SRK Tech Memo W - Site Water Management	All	Additional NWB water crossings information
4.1(e)(iii) 1.a	Appendix M: AMEC Winter Road Water Withdrawal	All	Winter road water use
4.1(e)(iii) 2.	Appendix J: AMEC Spill and Emergency Response Plan, RTL Trucking Spill Plan	Appendix 5.1	Winter road spill contingency
4.1(e)(iii) 3	Appendix J: AMEC Spill and Emergency Response Plan, RTL Trucking Spill Plan	Appendix 5.1	Winter road materials handling
4.1(f)(i)	1. Appendix F: AMEC Hazardous Materials Management Plan 2. Appendix C: AMEC Ammonium Nitrate and Explosives Management Plan 3. Appendix G: AMEC Landfarm Management Plan 4. Appendix H: AMEC Landfill Management Plan 5. Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan	From 1 to 4: All From 5: Sections 3.2 and 3.3	Wastes and chemicals description
4.1(f)(ii)	Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan	Sections 2.5 and 3.1	Revision of waste volumes
4.1(f)(iii) 1.a.	Appendix X: SRK Tech Memo W - Site Water Management	Tables W2 & W3	Open pit water volume
4.1(f)(iii) 1.b.	1. Appendix AA: FEIS (P&E 2002); 2. Appendix O: Technical Memorandum: Blast zone effects (SRK 2004)	1. Appendix B, B.2.1, Attachment 4.1,Section 3.2; 2. All	Blast zone effects on fish
4.1(f)(iii)2.a.	1. Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite	From 1: Sections 2.3, 2.3 & 4.2 and	Geotech/geothermal conditions of ponds, ditches, foundations

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	Management Plan 2. Appendix S: SRK 2004 Drawings	Drawings M1 & M2 From 2: Drawings G5 through G7	
4.1(f)(iii) 2.b.	Appendix X: SRK Tech Memo W - Site Water Management	Tables W2 & W3	Surface runoff volumes and concentrations
4.1(f)(iii) 2.c.	Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan	Section 5.3.1	Dewater and disposal of site runoff (for coarse PK stockpile area)
4.1(f)(iii) 3.	Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan	Section 3.3	Waste rock characterization
4.1(f)(iii)4.	Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area	Section 3.1.2	Tailings characterization
4.1(f)(iii)5.	1. Appendix AA: Tahera Project Description 2. Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area	From 1: Appendix 2, A.1, Section 6.0 From 2: Section 3.1.1	Mill [sic] operations characteristics
4.1(f)(iii)6.a.	Appendix D: AMEC Borrow Management Plan	3.1	Borrow water management
4.1(f)(iii)6.b.	Appendix D: AMEC Borrow Management Plan	2.3	Granular requirements
4.1(g)(i)	1. Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan 2. Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area 3. Appendix S: SRK 2004 Drawings	From 1: Sections 2.5, 3.1, 4.1 & 4.2 and Drawings M1 & M2 From 2: Sections 3.1.1, 5.1, 5.2, 5.3 and Drawings P2 through P6 From 3: Drawings G5 through G7	Deposit of waste
4.1(g)(ii)	1. Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan 2. Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area	From 1: Section 3.3 From 2: Section 3.1.2	Waste constituents
4.1(g)(iii)	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix K: AMEC Spray Irrigation	From 1: Sections 2.7 & 3.4 From 2: All	Waste storage and treatment
4.1(g)(iv)	Appendix U: SRK Technical Memorandum N	All	Receiving water effects
4.1(g)(v)1.a	Appendix H: AMEC Landfill Management Plan	5.2	Domestic waste disposal
4.1(g)(v)1.b	Appendix G: AMEC Landfarm Management Plan Appendix H: AMEC Landfill Management	2.0 3.0	Construction

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	Plan		
4.1(g)(v)1.c	Appendix H: AMEC Landfill Management Plan	4.1	Types and quantities of wastes
4.1(g)(v)1.d	Appendix G: AMEC Landfarm Management Plan Appendix H: AMEC Landfill Management Plan	2.0 3.0	Location
4.1(g)(v)1.e	Appendix G: AMEC Landfarm Management Plan	4.0	Remediation
4.1(g)(v)2.a	Appendix L: AMEC Waste Water Treatment Plant Operations Plan	All	STP plan
4.1(g)(v)2.b	Appendix L: AMEC Waste Water Treatment Plant Operations Plan	2.0	STP efficiency
4.1(g)(v)2.c	Appendix L: AMEC Waste Water Treatment Plant Operations Plan	1.0	STP design
4.1(g)(v)2.d	Not applicable to the methods proposed – see Appendix L: Waste Water Treatment Plan	All	Chlorine concentration
4.1(g)(v)2.e	Appendix L: AMEC Waste Water Treatment Plant Operations Plan	2.0	BOD, TSS
4.1(h)(i)	Appendix F: AMEC Hazardous Materials Management Plan	All	Hazardous materials management plan
4.1(h)(ii)	Appendix F: AMEC Hazardous Materials Management Plan	All	Consider GN guidelines for hazardous wastes
4.1(h)(iii)	Appendix J: AMEC Spill Prevention and Emergency Response Plan	All	Spill clean up
4.1(h)(iv)	Appendix J: AMEC Spill Prevention and Emergency Response Plan AMEC Landfarm Management Plan	4.2 4.3	Reporting protocol
4.1(h)(v)	Appendix J: AMEC Spill Prevention and Emergency Response Plan	n/a	CCME guidelines considered to be irrelevant to spills
4.1(h)(vi)	Appendix F: AMEC Hazardous Materials Management Plan	Attachment 2.1	Detailed plans for fuel storage
4.1(h)(vii)1.	1. Appendix F: AMEC Hazardous Materials Management Plan 2. Appendix C: AMEC Ammonium Nitrate and Explosives Management Plan	1. Table 2-1 2. Table 4-1	Hazardous materials list
4.1(h)(vii)2.	Appendix J: AMEC Spill Prevention and Emergency Response Plan	All	Specific spill contingency plans
4.1(h)(vii)3.	Appendix J: AMEC Spill Prevention and Emergency Response Plan	All	Distribute spill plan—will occur once accepted by NWB
4.1(i)(i)	Appendix A: AMEC Abandonment and Restoration Plan	All	Conform to NWB guidelines
4.1(i)(ii)	Appendix A: AMEC Abandonment and Restoration Plan Appendix DD: Letter submitted to Fisheries and Oceans Canada, June 2004	1. All 2. All	Conform to INAC/DFO guidelines
4.1(i)(iii)	1. Appendix A: AMEC Abandonment and Restoration Plan 2. Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area	From 1: All From 2: Section 13.2	Closure stability
4.1(i)(iv)1.a.	Appendix A: AMEC Abandonment and Restoration Plan	Appendix B	Pit pond closure water quality
4.1(i)(iv)2.	Appendix A: AMEC Abandonment and Restoration Plan	Appendix A	Diversion channel contingency reclamation measures
4.1(i)(iv)3.	Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite	Section 13.6	PKCA freeze back

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	Containment Area		
4.1(i)(iv)4.	1. Appendix A: AMEC Abandonment and Restoration Plan 2. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	From 1: 5.3.3 From 2: Section 13	PKCA closure details
4.1(i)(iv)5.	1. Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area 2. Appendix U: SRK Technical Memorandum N	1: Section 3.1.2 2: 2.1.2	PK final tailings geochemistry
4.1(i)(iv)6.a.	Appendix A: AMEC Abandonment and Restoration Plan	4.0	Revegetation details
4.1(i)(iv)7.	1. Appendix A: AMEC Abandonment and Restoration Plan 2. Appendix T: SRK Technical Memorandum M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan	From 1: Section 5.4.2 From 2: Section 6	Waste dump contouring
4.1(i)(iv)8.	Appendix A: AMEC Abandonment and Restoration Plan	Section 5.4	Progressive reclamation
4.1(j)(i)	Appendix A: AMEC Abandonment and Restoration Plan	Appendix C	Financial security
4.1(j)(ii)	Appendix A: AMEC Abandonment and Restoration Plan	Appendix C	Other security
4.1(j)(iii)	Summary Report	Section 7.5	Other environmental insurance
4.1(j)(iv)	Appendix A: AMEC Abandonment and Restoration Plan	Appendix C	Development, operation and closure costs
4.1(j)(v)	Summary Report	Section 10.1	Capital costs
4.1(j)(vi)	Appendix A: AMEC Abandonment and Restoration Plan	Appendix D	3rd party estimate
4.2(a)(i)1.	Appendix AA: Baseline Summary Report	Appendix B, B.1.1, Section 6.0	Baseline water quality
4.2(a)(i)2.	Appendix BB: SRK Technical Memorandum B –Supplemental Permafrost Data	Geotech Folder, All	Baseline permafrost data
4.2(a)(ii) 1.	Appendix BB: Pilot AEMP (RL&L 2001) AEMP (Mainstream and AMEC 2004)	Aquatics Studies Folder, All	Pre-impact aquatic monitoring
4.2(a)(ii) 2.	Appendix I: AMEC Operational Monitoring Summary Appendix N: AEMP (Mainstream and AMEC 2004);	5.1 Section 3.7	Winter oxygen/benthic macroinvertebrate monitoring
4.2(a)(ii) 3.	Appendix R: NNLP (Mainstream 2004)	Section 5.0	Effectiveness of baseline data for no net loss
4.2(a)(ii) 4.	Appendix I: AMEC Operational Monitoring Summary	3.0	Operational hydrology monitoring
4.2(b)(i)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Section 12	North dam failure
4.2(b)(ii)	Appendix X: SRK Tech Memo W - Site Water Management	Section 2.2	Stream C1 diversion failure
4.2(b)(iii)	Appendix W: SRK Technical Memorandum P - Design of the Processed Kimberlite Containment Area	Section 3.1.2	PK components potentially harmful to wildlife
4.2(c)(i)	Appendix R: NNLP (Mainstream 2004b)	Section 5.0	Aquatic effects of fish out of Long Lake
4.2(c)(ii)	1. Appendix AA: FEIS (P&E 2002);	1: Appendix B,	Explosives use guidelines

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	2. Appendix O: Technical Memorandum: Blast zone effects. (SRK 2004b)	B.2.3, Attachment 4.1, Section 3.2; 2: All	
4.2(d)(i) 1.	Appendix N: AEMP (Mainstream and AMEC 2004) Appendix V: SRK Tech Memo O – Proposed Discharge Limits	Section 2.0 All	Water quality monitoring and Proposed Discharge Limits
4.2(d)(i) 2.	Appendix U: SRK Tech Memo N Est. of Receiving Water Quality Appendix V: SRK Tech O – Proposed Discharge Limits	Appendix N5 All	Receiving Water TDS concentration, proposed limits
4.3(a)(i) 1.	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	All	Mitigation of PK discharge
4.3(b)(i) 1.	Appendix X: SRK Tech Memo W - Site Water Management	Section 2 & Drawings W1 through W6	Water management design
4.3(b)(i) 2.	Appendix X: SRK Tech Memo W - Site Water Management	Section 3	Water balance analysis
4.3(b)(i)3.	Appendix X: SRK Tech Memo W - Site Water Management	Section 3	Dilution modelling
4.3(b)(i)4.	1. Appendix X: SRK Tech Memo W - Site Water Management and Appendix S: SRK Drawings 2. Appendix R: NNLP, (Mainstream 2004b)	From 1: Section 2.3.1 & Drawings W2 & W3 From 2: Sections 2.5, 2.6, 3.4	Fish enhancement of C1 diversion
4.3(b)(i)5.	Appendix X: SRK Tech Memo W - Site Water Management	Section 3	Refine water balance
4.3(b)(i)6.(a)	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area 3. Appendix K: AMEC Spray Irrigation	From 1: Sections 2.7 & 3.4 From 2: Section 10.2 From 3: Appendix K	Treatment optimization
4.3(b)(i)6.(b)	Appendix FF: Trade-off Matrix	All	Scenario matrix for water management
4.3(b)(i)6.(c)	Summary Report	Section 3.1.5	Metals removal treatment
4.3(b)(i)6.(d)	Appendix GG: Trade-off Matrix	All	Environmental cost/benefits of treatment options
4.3(b)(i)7.	Appendix BB: Geotechnical Folder, SRK Tech Memo I: Estimates of Source Concentrations	5.3, pg.18	Ice as contaminant source
4.3(b)(i) 8.	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Section 6	Long term permafrost degradation mitigation
4.3(b)(i) 9.	1. Appendix BB: Geotechnical Folder, SRK Tech Memo K - Supplemental Information on Closure Plan 2. Appendix A: AMEC Abandonment and Restoration Plan	1.Section 4 2. Section 5.2.2	Open pit wall stability mitigation
4.3(b)(i) 10.	Appendix I: AMEC Operational Monitoring Summary	5.2.3	Long-term effects of sedimentation mitigation
4.3(b)(i) 11.	Appendix X: SRK Tech Memo W - Site Water Management	Section 3,, Table W2 &	PKCA water balance

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		Figure W12	
4.3(b)(i) 12	Appendix X: SRK Tech Memo W - Site Water Management	Section 4	PKCA source monitoring
4.3(b)(i)13.	Appendix X: SRK Tech Memo W - Site Water Management	All	Causeway mitigation
4.3(b)(i)14.	Appendix X: SRK Tech Memo W - Site Water Management	All	Stream diversion mitigation
4.3(c)	Appendix J: AMEC Spill Prevention and Emergency Response Plan	All	Spill contingency plan
4.3(d)(i)	Appendix N: AEMP (Mainstream and AMEC 2004)	2.1.5, 2.1.7, 2.2.5, 2.2.7, 3.9, 4.5	QA/QC
4.3(d)(ii)	Appendix N: AEMP (Mainstream and AMEC 2004)	2.1.1	Water quality sampling analyses
4.3(e)(i)	Appendix H: AMEC Landfill Management Plan	2.0	GN waste management policies and regulations
4.3(e)(ii)	See 4.1(g), above		Deposit of waste
4.3(e)(iii)	1. Appendix G: AMEC Landfill Management Plan 2. Appendix H: AMEC Landfarm Management Plan	1: 5.0 2: 4.0	Control impacts from wastes
4.3(e)(iv)	N/A		Not accurately predictable
4.3(e)(v)	Appendix H: AMEC Landfill Management Plan	5.2	Ash dust control
4.3(e)vi)	Appendix H: AMEC Landfill Management Plan	4.1	Disposal methods for non-combustibles
4.4(a)(i)	Summary Report	Section 9.1	Compensation for use of water and deposit of waste
4.4(a)(ii)1.	Appendix R: NNLP (Mainstream 2004b)	Section 3.0, Tables 3.2, 3.4, 3.8, 3.13, Appendices C1 to C4	HADD area
4.4(a)(ii)2.	Appendix R: NNLP (Mainstream 2004b)	Section 3.0, Appendices B1 to B4	HADD area quality
4.4(a)(ii)3.	Appendix R: NNLP (Mainstream 2004b)	Section 3.0, Tables 3.2 and 3.13 Section 4.0, Tables 4.2 and 4.3, Appendices D1 and D2.	HADD mitigation
4.4(a)(ii)4.	Appendix R: NNLP (Mainstream 2004b)	Section 5.0	DFO monitoring
4.4(a)(iii)	Summary Report	Section 9.1	Article 20 water compensation
4.4(a)(iv)	Summary Report	Section 9.1	Water use and disposal of waste into water
4.5(a)(i)(1)a.	Appendix I: AMEC Operational Monitoring Summary	3.0	Additional stream flow gauging stations
4.5(a)(i)(1)b.	Appendix I: AMEC Operational Monitoring Summary	3.0	Additional stream flow gauging station at outlet from Carat Lake
4.5(a)(i)(1)c.	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix BB: SRK Tech Memo C - Supplemental Climate and Hydrology Data	From 1: Section 3.3.1 From 2: Geotech Folder,	Stream C3 flow regimes

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	3. Appendix W: SRK Tech Memo P – Design of the Processed Kimberlite Containment Area	Section 3 From 3: 10.2.2	
4.5(a)(i)(2)	Appendix N: AEMP (Mainstream and AMEC 2004)	All	AEM Program
4.5(a)(i)(3)	Appendix N: AEMP (Mainstream and AMEC 2004)	Table 2.2, 3.4, 4.1	Operational control lakes and streams
4.5(a)(i)(4)	Appendix Z: AMEC Toxicity Protocols	All	Non-chronic toxicity testing at last point of effluent control
4.5(a)(i)(5)	1. Appendix U: SRK Technical Memorandum N 2. Appendix Z: AMEC Toxicity Protocols	1: All 2: All	Mixing zones Acute and chronic toxicity assessment
4.5(a)(i)(6)	Appendix N: AEMP (Mainstream and AMEC 2004)	All	AEMP plan expert advice
4.5(b)(i)1(a)	1. Appendix T: SRK Tech Memo M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan 2. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area 3. Appendix X: SRK Tech Memo W - Site Water Management	From 1: Sections 4.4, 8.4 & 8.5 From 2: Sections 6.5, 6.6 & 10.4 From 3: Sections 2.3.1, 3.3.1 & 4	Inspection and stability monitoring
4.5(b)(i)2.(a)	1. Appendix T: SRK Tech Memo M - Waste Rock, Overburden, Low Grade Ore, and Coarse Processed Kimberlite Management Plan 2. Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area 3. Appendix X: SRK Tech Memo W - Site Water Management	From 1: Sections 4.4, 8.4 & 8.5 From 2: Sections 6.5, 6.6 & 10.4 From 3: Sections 2.3.1, 3.3.1 & 4	Stability monitoring program
4.5(b((i)3	Appendix X: SRK Tech Memo W - Site Water Management	Sections 2.2 through 2.4 & Drawing W1	Runoff management
4.5(c)(i)	Considered as part of preparation of reports		Guide to Management of Tailings Facilities re: water quality
4.5(c)(ii)1.(a)	Appendix U: SRK Technical Memorandum N	All	Dilution modelling
4.5(c)(ii)1.(b)	Appendix U: SRK Technical Memorandum N	All	Dilution modelling
4.5(c)(ii)1.(c)	1. Appendix U: SRK Technical Memorandum N 2. Appendix N: AEMP (Mainstream and AMEC 2004)	All All	Dilution modelling Receiving environment monitoring
4.5(c)(ii) 1.(d)	Appendix U: SRK Technical Memorandum N	Appendix N1	Effects of TDS
4.5(c)(ii) 2.(a)	Appendix N: AEMP (Mainstream and AMEC 2004)	Tables 2.2 and 4.1	SNP table
4.5(c)(ii) 2.(b)	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix N: AEMP (Mainstream and AMEC 2004)	From 1: Attach W1 From 2: Section 2, Table 2.1	Estimates of TDS components Site specific TDS monitoring criteria
4.5(c)(ii) 2. (c)	1. Appendix X: SRK Tech Memo W - Site Water Management 2. Appendix N: AEMP (Mainstream and AMEC 2004)	From 1: 4 From 2: All	Water quality monitoring
4.5(d)(i)	Appendix W: SRK Tech Memo P - Design of the Processed Kimberlite Containment Area	Section 10.1	Guide to Management of Tailings re: deposition

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4.5(d)(ii)	Appendix A: AMEC Abandonment and Restoration Plan	4.0	Reveg trials and metals uptake
4.5(e)(i)	Appendix B: AMEC Air Quality Management Plan	4.2	Soils and lichen monitoring
4.5(e)(ii)	Appendix B: AMEC Air Quality Management Plan	4.2	Lichen monitoring plan
4.6(a)	Summary Report	Section 8.1	Ownership/tenure
4.6(b)	Summary Report	Section 8.1	Status of KIA surface leases
4.7(a)	Appendix X: SRK Tech Memo W - Site Water Management	Section 3	Water recycling
4.7(b)	Appendix K: AMEC Spray Irrigation Report	Appendix K	Ammonia removal alternatives
4.7(c)(i) 1.	Appendix Y: Jericho Catchment Area	All	Drainage basin map
4.7(c)(i) 2.	Appendix Y: Jericho Catchment Area	All	Share of water use on the drainage
4.7(c)(i) 3.	Appendix Y: Jericho Catchment Area	All	Cumulate effect on water quality
4.7(c)(ii)	Appendix R: NNLP (Mainstream 2004b)	All	Results of NNLP

1.2 Modifications to Site Layout

Summary of Changes to the Layout of Facilities at the Jericho Project

The proposed layout of facilities at the Jericho Project has been modified slightly in relation to what was indicated in the FEIS submission and in supplementary documents submitted for the NIRB Hearings. These modifications reflect advances in project design as well as input from DFO in relation to fisheries issues. All of the changes are relatively minor but warrant highlighting to avoid confusion as participants commence their reviews in advance of the Water Licence Hearings. In particular, the following minor changes to the layout have been made:

- The causeway for the freshwater intake has moved approximately several hundred metres to the west, along the south shore of Carat Lake. In doing so, the causeway is now west of the mouth of Stream C1 rather than east of it.

- Roads accessing the freshwater intake causeway have shifted accordingly.

- To the extent possible, the existing site roads will be utilized for access during the initial site development. By approximately the second or third year, the "final" site roads will be in place. The main differences relative to what was shown previously on Map A of the FEIS are as follows:

    - The segment of road between the original Carat Camp and the pit has shifted upslope to accommodate a shift in the location of waste dump site 1 (discussed below).

    - The road that links the open pit to the storage area for the explosives supplies will terminate at the ammonium nitrate storage pad. Previously this road continued to the east almost to Contwoyto Lake as the site access road linking with the winter road network. This link will now be constructed as a seasonal winter road from Lynne Lake.

- The layout of the explosives plant, magazines, and AN storage area have been modified to conform to regulatory requirements based on discussion between NRCAN and Tahera's potential explosives contractor. In addition, an emulsion plant location has been designated to this area.

- A landfarm (for remediation of hydrocarbon contaminated soils) has been added to the infrastructure. The landfarm will be developed on the surface of waste dumpsite 2, since this waste dump will be completed early in the mine operation.

- The overburden will be stored at waste dumpsite 2 (previously it was to be stored at a location upslope of waste dump site 1).

- The location of waste dump site 1 has been shifted slightly upslope so that it now coalesces with the previous location of the overburden dump. This location change will enable Pond A to move upslope, thereby increasing the buffer between it and Carat Lake and making it easier to direct seepage from Pond A to the open pit at closure. The total footprint of the coalesced dump is virtually the same as the two independent dumps.

- During the initial development of waste dump site 1, a series of ditches will be developed along interim access roads within the footprint of waste dump site 1. These ditches will be developed in stages to direct water to the open pit, thereby eliminating the need to construct Pond A at the outset of waste dump site 1 development. Flows will be monitored, which will guide the final selection of pumps at Pond A once it is constructed.

- Following discussions in January 2004 with DFO, the C1 Diversion has been slightly re-aligned. In particular, the alignment now has more curvature, which will help reduce the gradient in the lower portion of the diversion and provide a wider buffer zone between the diversion and the north wall of the open pit.

- The FEIS showed a divider dyke within the PKCA footprint. This internal dyke was eliminated in the preliminary designs presented in the supplemental FEIS, but has been reintroduced in this Water Licence application as a means of maximizing the size of the pond at the west end of the facility. To the extent possible, fine PK will be deposited on the east side of the divider dyke and water will collect to the west of the divider dyke. This should assist in concentrating the settlement of solids in the eastern end of the PKCA and thereby improve the quality of water near the west end of the PKCA, which is the approximate location from which water will be discharged.

- The settling pond dam (and associated spillway) that appeared downstream of the PKCA in the FEIS and the supplementary documents submitted for the NIRB Hearings is now a contingency element. The inclusion of the divider dyke within the PKCA, and the option of constructing addition internal dykes within the PKCA in the event that suspended solids are a problem, are expected to reduce the suspended solids to acceptable limits.

CONSTRUCTION PHASE

2.0 PROJECT DESCRIPTION

General Overview of Site

Site location maps have been revised and are found to aide the reader in making reference to site-specific items. The Company has also prepared stage site arrangement maps (Appendix S), which gives the reader an idea of what the site will look like during various phases of its development. Updated Site Facilities Maps, previously known as Map A, show the most up to date site arrangements as presented for the purposes of this application. Site maps have been generated to show staged progress through the life of the mine and can be found in Appendix S: SRK Drawings (G10 to G15).

Key components of the site include:

2.1 Causeway

A causeway will be constructed at the Jericho site for the purposes of withdrawing water from Carat Lake for use in the processing plant and in the accommodations. The causeway will be built out of waste rock and will extend 90 metres into Carat Lake directly northwest of the open pit. A water intake pipe will be buried in the rock causeway, which will transport water from the Lake to the plant and accommodation facilities.

The intake will be located in a minimum 4 m depth of water to allow operation under the ice during the winter. The design flow will be 40 cu m per hour to account for process water makeup and potable camp water use, but normal operating flows are expected to be from 20 to 30 cu m per hour.

2.2 C1 Diversion

Presently a small stream, referred to as stream C1, runs over the surface trace of where the proposed open pit will be developed. Therefore, it is necessary to divert stream C1 for the purposes of this project. The general arrangement of the C1 Diversion is shown on Drawing 1CT004.06-W-2 of the Site Water Management Report. Typical cross sections and details are shown on Drawing 1CT004.06-W-3 are also shown in the Site Water Management Report. The channel is designed to convey a peak 200-year flow of 0.7 m^3/s from a total catchment area of 105 ha. The diversion consists of a small diversion dam located downstream of Lake C1. The first approximately 150 m of the channel (Reach A) will be excavated as an unlined channel into the local bedrock with a minimum base width of 2 m, minimum depth of 1 m, and a longitudinal slope of about 1.5%. Reach B will be 150 m long with a 3.5% slope section founded on bedrock with lined banks. The channel will transition via a small pool into a 180 m long lined channel (Reach C) excavated into the active layer of overburden materials which comprise mainly sand and gravel, with some zones of silt and till. This section of channel will be fully lined with geotextile and riprap to prevent erosion or movement of fines into the channel and will incorporate fisheries enhancement measures as described below. The lined channel will transition into the natural C1 channel discharging into Carat Lake north of the open pit. The channel alignment will be adjusted in the field to allow for local ground conditions and topography. Final channel dimensions will likely be in excess of the design requirements due to practical construction considerations.

The lined channel section will include a number of fisheries enhancement measures as shown on Drawing 1CT004.06-W-3 (Site Water Management Report) and summarized as follows:

- The alignment in plan will include a number of gentle bends and meanders, each with a typical meander length of about 20 m;

- The channel cross section will include a low flow channel and pool-riffle complexes located about every 10 m to 15 m along the channel. Pool depths will be from 0.2 to 0.5 m.

- The channel lining will consist of coarse, clean rock and gravel with larger cobbles and boulders incorporated into the pool-riffle sequences.

2.3 Processed Kimberlite Containment Area (PKCA)

The PKCA and its various components will be constructed over multiple seasons. The specific construction steps for the West Dam are as follows:

- Ice-rich and deleterious materials (boulders, organics, low density, etc) will be removed from the dam footprint;
- The key-cut will be excavated as shown on Drawing 1CT004.006 – P7. During the key-cut excavation, should areas of talik be identified, the bottom width of the key-cut will remain as shown, but the overall key-cut depth dimension will increase based on cut slope requirements (0.5 to 1 m – horizontal to vertical);
- Esker sand (material A) and GCL liner will be installed within the key-cut and core. The esker sand should be dried, moisture conditioned to ensure saturation and placed in thin lifts. Each lift will be allowed to freeze prior to placement of the next lift.
- The transition material (material B) will be placed over frozen core material (material A);
- The run-of-mine (material C) will be placed over the transitional material to provide the bulk fill and thermal insulation needed for the frozen core. The thickness and final slopes of the run-of-mine materials will be as shown on Drawing No 1CT004.006 – P7.

The PKCA will be commissioned and the dams and related infrastructure will be built in the following stages:

- 2nd and 3rd Quarter 2005. Access road to West, North, East and Southeast Dams to be constructed. The North Dam road access causeway will be built as part of the road construction. The core material will be moved to West, East and Southeast Dam areas. After the natural freshet has passed, most of the water will be pumped from Long Lake. In conjunction with this operation, the fish will also be removed. The water level will be lowered to the 513.5 m level or lower, exposing several natural ridges in the lake bottom (Figure 5.1).

- 4th Quarter 2005. Plant commissioning begins with initial fine PK deposition into the depressions at the east end of Long Lake.
- 1st Quarter 2006 (winter). The West Dam will be constructed to elevation 527 mamsl. This will be followed by the construction of the East and Southeast Dams to elevation 524 mamsl.
- 3rd Quarter 2006 (summer). The decant system will be installed at the PKCA so that excess water can be discharged (pump will be removed every winter unless water can be reclaimed to the plant site over the winter period).
- 1st Quarter 2007 (winter). Depending on the actual water management requirements, the North Dam will be constructed. However, if the water management does not require the construction of these dams in 2007, the construction of the North Dam and the contingency raises on the East and Southeast Dams can be deferred until later (to be reviewed annually).
- 3rd Quarter 2007 (summer). The reclaim pipeline will be installed between the PKCA and the processing plant.
- Regular operations over the mine life. Internal dykes, including the divider dyke, will be constructed at the PKCA as required to retain the tailings at the east end of the PKCA and to enhance the quality of the water that reports to the decant system at the west end. Also, depending on the beach slope, coarse PK and/or mine waste rock will be used to increase heights of the East and Southeast Dams, thereby providing higher discharge elevation points for subaerial deposition.

2.4 Fuel Storage

One large fuel storage area will be constructed for all fuel requirements and will be located near the processing plant. The fuel farm will contain a number of tanks that will be shipped in pieces and erected on site. As well, the existing nine tanks used for underground exploration will be utilized for fuel storage purposes. The fuel farm will be bermed to hold a minimum of 110% of the capacity of the largest tank. The berm will be lined with an impermeable, petroleum-resistant geomembrane.

2.5 Open Pit

The mine plan, as currently envisaged, is provided below. Adjustments to the mine plan may occur as the project advances to detailed engineering.

Mining will be by conventional open pit methods potentially followed by underground mining using open benching or sub-level caving methods.

The first four years of mining will be by conventional open pit methods with a combination of loaders and off-highway trucks. Trucks will be 86 tonne capacity. Loaders and hydraulic shovels with 5 to 10 m^3 buckets will be used, with a front-end loader for back-up. Kimberlite ore will be initially mined from a starter pit followed by two successive 40 m pushbacks over a period of 4 years. The bench height in the open pit will be 10 m, with double benching to 20 m in granite and single benching in all other materials. Triple benching to 30 m in granite is possible, as 30 m is the standard final benching height at Ekati. The berm widths will typically be 8 m (10 m in overburden). The open pit will be approximately 350 m wide and 400 m long, covering an area of approximately 10 hectares (ha). Permafrost extends to a depth of approximately 540 m. It is assumed that groundwater seepage into the pit will be limited to the active layer and will, therefore, be relatively minor. A mining contractor will carry out the open pit mining.

Once open pit mining is complete, an underground decline will be driven at a -15% gradient to access kimberlite ore from elevations of 310 to 230 m. Open benching or sub-level caving will be used to extract the ore. An unheated ventilation system will be used to minimize thawing of permafrost in the underground workings. Operating efficiencies and economics experienced during initial open pit operations will dictate the final level for transfer to underground mining.

2.6 Waste Dump and Stock Piles

There will be two waste dumps (site 1 for waste rock and site 2 for overburden and waste rock), and three stockpiles (one each for low grade ore, coarse PK and recovery plant rejects). The layout of the waste dumps and stockpiles has been optimized in order to minimize the number of catchments affected by the facilities, control seepage, provide a suitable buffer distance with the nearest large lake (Carat Lake), conform generally with the natural relief and minimize haul distances.

Foundation conditions at the waste dumps and stockpiles typically consist of bedrock with isolated small pockets of granular colluvial soils or till with, in some locations, a thin veneer of organic soil.

The dumps and stockpiles will be unlined. Due to uncertainties regarding the geochemistry of the recover plant rejects, this material will be stored on a small lined pad capable of capturing leachate or in a location where the leachate runoff is naturally directed to the PKCA. In addition, due to the likelihood that the overburden will flow if it thaws, a waste rock containment buttress will be constructed around the overburden.

The waste dumps and stockpiles have been designed in order to meet appropriate physical stability criteria and to facilitate access by wildlife. Slopes will, in most cases have 15 m wide benches at 10 m vertical increments, which will provide an overall average slope of about 2.6H:1V. Exceptions to this include the upstream side of waste dump site 1 and the slopes at the recovery plant rejects stockpile. At the upstream side of waste dump site 1, the dump height is lower than its overall average and the natural ground at the dump toe is rising. These factors significantly improve the stability and, as a consequence, the slope angle on the upstream side of the dump will be the angle of repose (about 1.4H:1V). At the recovery plant rejects stockpile, the material is expected to be moved to the coarse PK stockpile once testing has demonstrated the extent to which blending with the coarse PK is required. Due to its temporary nature at this location, the slopes on the recovery plant rejects will be at the angle of repose (about 1.5H:1V).

Additional information can be found in the Waste Rock Management Plan located in Appendix T.

2.7 Plant Operations

The kimberlite ore will be processed in a 330,000 tonnes per annum (tpa) processing plant using conventional diamond extraction methods. The process consists of crushing, scrubbing, dense media separation (DMS), x-ray sorting, clean-up and sorting of the diamonds. With the exception of the dense media (ferrosilicon), which is recovered from the residues using high efficiency magnetic separation, the process is entirely mechanical. Waste products will include coarse PK, recovery plant rejects, fine PK and associated slurry water. The coarse PK will be comprised of particles with grain sizes from 0.1 to 19 mm, while the recovery plant rejects will be comprised of particles from 1 to 8 mm (sand to gravel sizes). Therefore, both of these materials will be managed using mechanized equipment and land-based stockpiles. The fine PK and the associated slurry water will be managed in the processed kimberlite storage area (PKCA), which is discussed in the accompanying report *"Design of the Processed Kimberlite Containment Area"* (SRK 2004a).

2.8 Land Fill and Land Farm

The landfill will be located adjacent to Waste Dump Site1 (see Drawing 1CT004.06-G13) through most of the mine life. In Year 1, the location will be as shown on Drawing 1CT004.06 – G10. As Waste Dump advances on the site the landfill will be moved to it's permanent location. The first landfill site will be covered with Waste Dump 1. The landfill site is in an area of rocky tundra and upslope from water bodies (Carat Lake and Lake C4). The area is well above any historical evidence of flooding from either Carat Lake or Lake C4.

The landfill design presented in this plan is based on the approach used at Ekati Diamond Mine™ whereby use is made of permafrost to provide an impermeable barrier to water leaching into the subsoil. Figure 1 shows a cross section and plan of the landfill.

The area for landfilling will be prepared by removing surface debris, large rocks, and brush. A pad of run-of-mine rock will be laid down. Crushed rock and or esker material will be spread over the landfill pad and levelled. The initial design will be for an area 100 m by 100 m (10,000 m^2) at the north end of Waste Dump 1. The area will be graded to slope toward a catchment area for runoff (the open pit). A ditch or berm will be used to direct any runoff water if required. Water quality will be monitored at the open pit and the water treated if necessary as discussed in the project water management plan (under separate cover). A layer of esker material or crushed rock will be placed on top of the pad.

Recycling opportunities for non-hazardous wastes are limited at Jericho because of the remoteness of the site. However, the mine will have take advantage of any practical recycling opportunities available. This will be largely determined by what is practical to backhaul to Yellowknife over the winter road. Hazardous wastes will not be landfilled.

The landfill will be capped and closed progressively as final elevations are achieved. Final elevations will be field fit so that stability of the dump is maintained. Rounded tops will be established on all completed portions of the landfill so that water does not accumulate on tops and percolate through the waste piles. With increase in the perimeter berm height, additional lifts of waste may be stored.

Final closure of the landfill will be undertaken once the site can no longer be used dictated by site conditions (not anticipated) or when the mine closes as part of mine closure activities. Final closure will consist of pushing waste rock over the landfill to a depth to allow permanent freezing and encapsulation in permafrost. Pursuant to regulations in force at the time of closure of the landfill, notification will be provided to the Nunavut Water Board, Department of Sustainable Development and DIAND in advance of closure.

If required, the Company will pursue the use of landfarming to remediate soils that have become petroleum stained. Landfarming is a form of bioremediation that uses naturally occurring micro organisms (yeast, fungi or bacteria) to metabolize or break down petroleum hydrocarbons. Natural processes include volatilization, aeration, biodegradation and photolysis. End products are microorganism protein, carbon dioxide and water. Stimulation of microbial growth and activity for hydrocarbon removal is accomplished primarily through the addition of air and nutrients (metabolism of hydrocarbons is mediated predominantly through aerobic microbes). The plan adopted for this project is based on the experience at the EKATI mine. A complete report on the proposed land farming activities can be located in Appendix G.

2.9 Roads, Airstrip and Winter Road

A Road network will be developed for the site to enable vehicular traffic to move about the site as required. The road will be developed to handle the quantity and type of traffic that is anticipated for this project. Roads will be built from waste rock that is removed during the construction of the open pit.

The site currently has a one kilometre long airstrip that will be used for the transportation of people and supplies to and from the site. The airstrip may be extended, if required, in order to accommodate larger aircraft at the site.

A winter road will be constructed from the Jericho site to connect to the annual Tibbet- to Contwoyto Lake winter road. The winter road will be used as the primary source of transportation of materials and supplies to and from the site, during the winter months that it is open. The Company will enter discussions with the existing partners in the operation of the winter road in order to ensure the use of the road.

OPERATIONS PHASE

3.0 MANAGEMENT AND MITIGATION PLANS

3.1 QA / QC Plan

Field Protocol: To check on the precision of the samplers, triplicate water samples will be submitted for testing. Sequential triplicate samples will be collected for 10% of the total number of samples per sampling session. A sequential triplicate requires that the collector fill three sampling sets (group of bottles from three different samples at the same depth). Since sampling will take place over three seasons, no spatial bias towards any specific site or temporal bias towards any season will be incorporated into the sampling program. The sampling program will submit blind triplicates for analysis (i.e., triplicate samples not labeled with the location).

To ascertain whether contamination had reached the samples, field blanks will be incorporated into the sampling process. A field blank is a set of bottles filled with demineralized, de-ionized water (supplied by the lab) and processed in the same manner as a collected water sample. These blanks will be used for each sampling session. All blanks will be filled in the field to ensure that they undergo the same conditions and procedures as the water samples. One field blank will be processed for each sample collection period.

The third level of quality control will be a check on the laboratory's precision and accuracy by preparing a split sample in the field. A split sample is a discrete water sample separated into two identical tests. The water sample is collected at one time and at a specific depth. In theory, the same results should be achieved when analyzed by the laboratory. One split will be processed for each sample collection period.

Laboratory Protocol: Laboratory quality assurance/quality control (QA/QC) will consist of a routine program to check the accuracy and precision of the analyses and to ensure that laboratory contamination will not contribute to the results. This program will be conducted in-house by the laboratory. It involves checking every 20 to 25% of the total number of samples being analyzed. It also includes triplicate, blank and split samples collected in the field.

Sampling protocols will be adhered to ensure consistency in sampling technique for each parameter. Fish metal contaminants sampling will follow safeguards to prevent contamination as follows:

- Use of sterile stainless steel instruments.
- Tissue cups rinsed in 5% nitric acid solution.
- Covering the work area in plastic.

To check the analytical precision and accuracy of the laboratory for fish metal contaminants one split tissue sample will be submitted from each monitored lake.

The following QA/QC procedures will be used to ensure the integrity of the data.

1. Constancy of identifications will be achieved by using the same person to analyze all samples.
2. Ten percent of samples, or check samples, will be analyzed by other qualified persons to ensure the accuracy of identifications and counts.
3. Split samples will be collected from 5% of the samples.
4. When subsampling is required, confirmation that subsampling is random, will be tested by comparing the subsample with a Poisson distribution (Prepas 1984).
5. For benthic invertebrates residues of 10% of the samples will be examined to determine the proportion of benthic invertebrates left behind.
6. Use of reference keys and/or reference collections to ensure standard taxonomic identifications.
7. All samples will be archived for future reference.

For tissue metal contaminant analysis QA/QC procedures used will include running certified reference materials (including NBS1566A-oyster tissue, DORM-2, and DOLT-2) and sample duplicates at a minimum ratio of 1 per 20. Acceptance criteria for CRM's is within 30% of nominal at >10 times the LOD. For duplicates, acceptance criteria is that the sample and its duplicate are within ± 20% of the average value at >10 times the LOD.

3.2 Tailings/ PKCA

The PKCA reservoir will have sufficient storage capacity to absorb at least two year's runoff from all site facilities at the start of operations assuming, as a contingency, no releases over the first two years of operations. An emergency spillway will be provided to protect the containment dams against overtopping. The spillway has been designed to safely pass runoff from a 24 hour Probable Maximum Precipitation (PMP) assuming a full pond at the start of the PMP. Base case water management operations (see Section 3.2) assume that releases of excess water by pumping from the PKCA to Stream C3 will begin in the first summer of operation. Closure pond elevations will be significantly lower than the maximum potential operating pond level. The spillway level and pond level will be lowered further for closure to minimize or eliminate water storage volumes during closure and to facilitate placement of cover materials over the deposited fine kimberlite tailings.

3.1 Water Management Plan

3.1.1 Water Collection System

Diversion Channel and Clean Water Ditch: The primary purpose of the diversion channel and clean water ditch is to divert clean natural runoff water away from Waste Dump Site 1 (C4 Ditch) and the open pit (Diversion C1). All other project facilities are located in the upper parts of the local catchment and will not require any diversion works. Diversion channels have been designed to convey peak flows from a 200 year return period event plus a minimum 0.3 m freeboard allowance. A 200 year return period event is an appropriate and conservative design event for small water-conveying channels where there is no credible threat to human life and no likelihood of catastrophic environmental damage due to failure of the channels. Diversion C1 also incorporates fisheries enhancement features (see Section 2.3.1) to maximize available fish habitat in the diverted stream. Diversion channels will require regular inspections and maintenance to ensure proper operation. In particular, ditches should be inspected in late winter/early spring, and any snow and ice blockages should be removed to allow diversion of the spring snowmelt away from project facilities.

Collector Ditches: Collector channels from Areas A, B and C will direct collected runoff to the open pit. The channels will be designed for 200-year peak flows and will generally be constructed in conjunction with mine roads. Channels will be monitored and maintained as for the diversion channels.

Collection Ponds: As a possible contingency, a system of three main collection ponds designated A, B and C has been developed to control sediment from the site facilities and, if necessary, to collect and convey site runoff to the PKCA. Each pond will include allowances for the storage of sediment and the temporary storage of runoff flows, and will have sufficient installed pumping capacity to convey runoff to the PKCA. Water quality at each pond location will be monitored during operations. If water quality at a pond satisfies discharge limits, pumping to the PKCA could be discontinued and outflows from the pond could be directed by gravity towards Carat Lake. The pond would continue to operate as a sediment control pond. Sizing of the pond volumes and pumping capacities has been based on the maximum inflow month with a 200 year return period. The maximum inflow month was assumed to be June, corresponding to the maximum snowmelt period. The average installed pump capacity will be sufficient to remove the design total annual inflow volume over a four month period. Additional peak pumping capacity of 1.5 to 2 times the average capacity will be available to handle peak snowmelt and/or rainfall-runoff inflows in conjunction with available storage volumes. Each collection pond includes an emergency spillway to protect against overtopping of the containment berms. The spillways are designed for a 200 year event assuming a full pond at the start of the 200 year event. Emergency spillway outflows from the ponds would be directed towards the open pit.

Pit Pond: A sump or sumps will always be available within the open pit to keep the working area of the pit dewatered and to pump runoff inflows from the pit to the PKCA. The location and size of the sump(s) will vary as the pit is developed. Typically in-pit sumps are designed for rainfall-runoff events with return periods of 10 to 25 years. Pumping capacity from the pit and sump storage volume(s) will be developed in conjunction with mining engineers based on estimated inflows and the risk to mining operations of exceeding available storage capacity at each stage of development.

Other Ponds and Sumps: Smaller collection ponds/pump sumps will be located near key infrastructure facilities such as the plantsite, fuel farm and ore stockpiles. These ponds will make use of natural topographic features wherever possible and will serve as sediment control ponds with low flows pumped to the PKCA. Drawings 1CT004.06-G-10 and 1CT004.06-G-11 show a typical sump located in a natural depression between the low grade stockpile and the coarse PK stockpile. Pumping distances and pumping heads to the PKCA would be lower for these smaller ponds than for water pumped from the pit. Overflows from the smaller ponds during extreme rainfall-runoff events, or high rates of snowmelt, would flow by gravity towards Pond C and the pit.

3.1.2 Recycle from PKCA

The ability to reclaim water from the PKCA has been included in the water balance, but the actual implementation of the water reclaim system will be staged. This will afford Tahera the opportunity to evaluate whether year-round reclaim is feasible. To the extent that the pond and ice conditions allow, reclaim will be carried out throughout the year. However, in the event that reclaim to the process plant and decanting of excess water to Stream C3 is only occur during the summer months, the pump barge will be removed from the pond and stored during the winter. In addition, the decant and reclaim pipelines will be winterized.

3.1.3 Discharge Plans

The water balance “base case” assumes that excess water will be discharged from the PKCA annually during the summer months to Stream C3. Geochemistry data suggests that the PKCA water supernatant chemistry will be suitable for discharge to Lake C3 during operations and, as such, discharges are planned to commence in the first summer that the mine is in operation. All discharges will be in a controlled manner via a pump/pipe system, which will allow flow volumes to be monitored and chemistry to be sampled.

Release rates from the PKCA will follow the approximate shape of the natural hydrograph in the creek as shown in Table 10.1. The actual release rates will be slightly higher in July and August than indicated by the regional analysis.

Table 3.1 (from Appendix W): Annual Water Monthly Percentages Release Rates

	Monthly % of Annual Flow			
	Regional Analysis	Water Balance Model	Releases at	
			Point Where PKCA Discharges to Stream C3 (Downstream toe of West Dam)	Mouth of Stream C3
May	3%	4%	0%	1%
June	65%	56%	62%	61%
July	11%	15%	15%	15%
August	8%	17%	15%	16%
Sept	13%	8%	8%	7%

Flows out of the PKCA and associated lake systems have been evaluated to establish the baseline flows, i.e. pre-mining and then the likely operational flows, as shown in Table 10.2. These flows are based on the following scenarios that consider monthly averages and average precipitation conditions:

- Case A - Monthly flows, pre-mining, Stream C3 downstream of West Dam (55 ha area);
- Case B - Monthly flows, pre-mining, Stream C3 at the mouth (outlet to Lake C3) (100 ha);
- Case C - Monthly flows at the point where the PKCA discharges to Stream C3 (downstream toe of the West Dam), during operations (includes flows from Ponds A/B/C, PKCA, open pit, plant area, etc);
- Case D - Monthly flows at the mouth of Steam C3, during operations; and
- Case E - Monthly flows at the West Dam assuming no releases for two years, all excess water released in one year immediately following the second year of “no release” conditions (similar to case presented at NIRB Hearings but all excess releases over one year instead of two).

3.1.4 Water Balance Calculations

A continuous simulation water quantity and quality model was developed for the Jericho Project site. The spreadsheet model used monthly time steps to simulate inflows and outflows from the various project components. These include: the open pit mine area; Waste Dump Sites 1 and 2; ore storage areas including the low grade stockpile, the central lobe stockpile, and the north lobe stockpile; the coarse tailings storage area; the processing plant, sewage treatment plant, accommodations complex and surrounding area; areas draining to potential collection ponds A, B and C; and the PKCA drainage area including the processed kimberlite slurry flow. Figure W1 shows a schematic of the project site components and the flow relationships used for the water balance model during mine operations. Figure W2 (Appendix S: SRK Drawings) shows a schematic site flow diagram for the closure period.

The model is flexible and process parameters, hydrological variables, and operational plans may be adjusted to evaluate water quantities and water quality for a range of variables at all key locations. The following input parameters are required:

- Average annual and monthly precipitation, rainfall and snowfall, lake evaporation and evapotranspiration;
- The monthly distribution of the annual spring snowmelt in May, June and July;
- Annual precipitation for a range of return periods from a 10 year return period dry year up to a 200 year return period wet year;
- Estimated evaporative losses from disturbed ground and undisturbed ground around the site as a function of lake evaporation rates;
- Process parameters including processed fine kimberlite slurry percent solids, settled dry density and specific gravity, and the maximum potential reclaim rate from the PKCA to the processing plant;
- Estimated flows including potential seepage rates from storage facilities, freshwater inflows to the system, groundwater flow into the open pit, sewage flows, and other potential flows;
- Maximum and minimum limits on water storage volumes in the PKCA;
- Ore and waste rock processing rates for each year of operation;
- Catchment areas for each component, divided into ground areas covered with water, disturbed ground, and undisturbed ground.
- Water quality associated with runoff from all project component areas. Source water quality was estimated by SRK (Technical Memorandum I, SRK 2003d), as summarized in Attachment 1 for 35 parameters including physical parameters, major ions, nutrients, dissolved metals and total metals.
- Elevation-storage volume relations for the PKCA (Figure W3), the Settling Pond (Figure W4) and the open pit (Figure W5).

Parameters which may be adjusted in the model on a year-by-year basis are:

- The return period of the annual precipitation for the year;
- Months in which decant releases or reclaim are allowed from the PKCA;
- The location to which flows are directed from Ponds A, B and C, the Pit Pond and Diversion C1 during active mining operations and during the closure period.

Water quantities are calculated monthly in the model based on input values for process-related flows including tailings slurry flow, void losses in deposited fine kimberlite tailings, other process inflows, sewage, and seepage flows. Net runoff volumes are calculated for each catchment and each type of ground cover (disturbed and undisturbed ground and pond areas) based on monthly precipitation and evaporative losses appropriate for the ground type. The annual snowmelt runoff is distributed over May, June and July with the bulk of the runoff occurring during June, similar to flows in the natural environment. Snowmelt is generated from the cumulative snowfall from September through May each year.

Water quality is modeled by simple dilution calculations for each catchment area and each collection pond area in the system. All contaminants are assumed to remain in the water. The water quality parameter to be modeled is selected for a given run and concentrations for each source location are determined from a data input table. For a given parameter, the concentration of a mixture of various streams of water at a given location is determined in the model using the following relation:

$C_{mixture} = [(Q_1 \times C_1) + (Q_2 \times C_2) + \ldots + (Q_n \times C_n)]$ divided by $[Q_1 + Q_2 + \ldots + Q_n]$

Where Q_i equals the volume of water (m^3) in flow i with an associated parameter concentration of C_i (mg/L)

3.1.5 Contingencies

3.1.5.1 Storage

The PKCA has more than ample storage to, if necessary due to water quality concerns, store all site area runoff (all component area runoff plus pit inflows plus PKCA area runoff) for the first two years of operations without any releases.

3.1.5.2 Water Treatment

If processed kimberlite settling characteristics within the PKCA are less efficient than expected, additional flocculants (Appendix E) could be used and the Settling Pond could be constructed to serve as a final settling and polishing pond for PKCA releases.

Depending on actual PKCA water quality during the first one or two years of operation, pilot testing of a spray irrigation scheme would be carried out. The removal of water from the PKCA for possible spray irrigation trials has not been included in the water balance.

3.2 Hazardous Materials and Hazardous Waste

The purpose of the Hazardous Materials and Hazardous Waste manual is to provide a consolidated source of information on the safe and environmentally sound storage and handling of the major hazardous products used at the Jericho Diamond Mine, except explosives which are detailed in the Ammonium Nitrate and Explosives Management Plan (under separate cover). In combination with the Emergency Response, and Spill Prevention, Countermeasures and Control Plan, the Hazardous Materials Management Plan provides instruction on the prevention, detection, containment, response, and mitigation of accidents resulting from hazardous materials handling.

Materials handling practices at Jericho Diamond Mine will comply with existing regulations to prevent, to the greatest extent possible, both accidental release of these substances to the environment and accidents resulting from mis-handling or mishap. Further, materials handling practices focus on prevention, as does the spill plan, through inspection of facilities by Tahera Diamond Corporation and contractors, periodic drills to test systems, and a program of review and continual improvement combined with training and refresher courses for all employees.

All staff are required to report materials management concerns to their supervisors who may notify the Health and Safety Committee and senior site management. All staff are encouraged to participate in procedures improvements and to bring ideas and suggestions to the Health and Safety Committee so that they may be reviewed and incorporated into procedure revisions as appropriate.

The complete Hazardous Materials and Hazardous Waste report can be located in Appendix F.

3.3 Spill Contingency Plan

This plan is written to meet Tahera Diamond Corporation's (Tahera's) requirements for a spill prevention and emergency response plan for the Jericho Diamond Project (Jericho) Mine Site. It covers the following key areas:

- Tahera policy statement;
- purpose and scope of the plan;
- pre-emergency planning;
- emergency recognition, prevention and response;
- training and practice;
- plan evaluation; and
- plan updates.

The purpose of this plan is twofold:

- to provide a practical source of information required to assess spill risks, develop an effective countermeasures program, and respond in a safe and effective manner to spill incidents; and
- to set out procedures and processes to be followed in the event of an emergency at the mine.

The plan covers the mining, processing, and ancillary operations (airstrip, sewage treatment plant, explosives manufacture, catering). It encompasses the activities of all Tahera and contractor employees as well as visitors to the mine site.

The main goals of the plan are:

- to provide education and training for staff at the Jericho Mine in emergency preparedness;
- to enable staff to respond to an emergency in a co-ordinated manner minimizing injury and loss of property; and
- to allow the Jericho Mine to maintain operations at a level as close as possible to normal and restore normal operations quickly and efficiently.

The plan was specifically developed for the Jericho Mine Site operations and is not intended to be used, without careful assessment of applicability, by people trained in spill response at other facilities operated by Tahera or a third party. In addition, the a spill contingency plan has been included that is used on the Tibbet to Contwoyto Lake Winter Road used by trucking operator RTL Trucking and is included in the Spill Contingency plan as Appendix 5.1.

The Spill Contingency Plan can be found in its entirety as Appendix J.

4.0 WATER WITHDRAWAL

AMEC Earth & Environmental contacted the proposed road contractor, Nuna Logistics, for an estimate of the amount of water that will be withdrawn each winter season when the winter road from Contwoyto Lake to the Jericho site is built. The road will take off from the bay in Contwoyto Lake, follow up Lynne Creek to Lynne Lake, across Lynne Lake and overland again from the end of Lynne Lake to Jericho. Map A from the Jericho Final EIS shows the approximate route and is attached for reference. As you are aware, some details of the mine general arrangement have changed resulting in a shorter Lynne Lake – Jericho segment than shown on Map A principally due to the arrangement of minesite all weather roads. AMEC understands that the final alignment will be field fit, but that physical constraints fairly tightly restrict where the winter road can be placed. AMEC also understands that an identical winter road was constructed for the bulk sample obtained in 1997.

A summary of AMEC's finding is that there will be no measurable effects on either Contwoyto or Lynne Lake water levels from winter road construction. The reasoning behind this conclusion is detailed below.

Nuna Logistics informed AMEC that a total of 5700 m^3 of water would be required to construct and improve the road surface on land portions of the route. Land portions of the route are from Contwoyto Lake to Lynne Lake west shore and from Lynne Lake east shore to the mine site. Most of the water will be required to make snow for the portion of the road up Lynne Creek as the upper segment is in an open swale where snow naturally accumulates. The land segments are the following lengths:

Contwoyto Lake to Lynne Lake	1,050 m
Lynne Lake to the minesite roads	750 m

The volume of Contwoyto Lake was not measured but will be tens of millions of cubic metres. The volume of Lynne Lake, based on an unpublished bathymetric survey conducted by Canamera in1996 using a recording echosounder with one metre resolution and a differential GPS is 1,070,000 m^3. Assuming half the water required comes from Contwoyto Lake (conservative since the first segment of the road will require the majority of the water to make snow), results in an estimated 2850 m^3 being required from Contwoyto Lake and an equal amount from Lynne Lake. The effect of this much water withdrawal on Contwoyto Lake would be miniscule. An estimated 0.27% of the volume of Lynne Lake would be withdrawn. From this it can be readily determined that no measurable effects on lake levels would result from water withdrawal for winter road use.

5.0 RESIDUAL IMPACTS

5.1 Receiving Water Quality Estimates

The revised receiving water quality estimates were derived using additional dilution modelling to estimate the potential build-up of TDS, specific TDS components, nutrients and metals in Lake C3 and Carat Lake during mining and into the post-closure period. Minor changes in the discharge flow and water quality estimates resulting from minor revisions to the layout of the mine site facilities and water management plans are incorporated, and post-closure water quality estimates are provided.

The revised receiving water quality estimates are compared to the available CCME guidelines for receiving water quality and potential impacts to freshwater aquatic life and human health are discussed. A review of the potential environmental effects of TDS is also provided.

The updated water and load balance provided in the accompanying report "*Site Water Management*" (SRK 2004a) was used to estimate discharge flows and concentrations from the Processed Kimberlite Containment Area (PKCA) during operations. It should be noted that these differ slightly from the results presented in *"Technical Memorandum F – Water and Load Balance"* (SRK 2003a) of the supplemental EIS, due to minor changes to the layout of the waste rock dumps and water management plans. In addition, as requested by technical reviewers, specific components of the TDS are also included in the estimates. However, the total loading from the site, and therefore potential impacts to the receiving environment resulting from these changes, are lower than predicted in the EIS. Further discussion of the revised water and load balance, including the derivation of source concentrations for the TDS components, is provided in SRK 2004a.

Monthly discharge flows for average and low flow conditions used in the dilution modelling are presented in Table 1 (Appendix U). It should be noted that these flows are approximately 5% higher than the final values presented in *"Site Water Management"* (SRK 2004a) due to adjustments made to the contributory catchment areas after the dilution modelling work had been initiated. The annual and monthly release volumes presented in SRK 2004a are considered final. Therefore, actual dilution is expected to be slightly higher and actual receiving water concentrations slightly lower than indicated in this report. Annual discharges from the site are expected to be approximately 510,000 m^3 for an average year, or 366,000 m^3 for a low flow year. The flows would be paced with receiving water flows to maximize dilutions in the receiving environment.

Discharge concentrations reflect maximum concentrations expected in the PKCA discharges over the life of the mine. Concentrations will increase over the first few years of the mine life, and will fluctuate seasonally due to seasonal inputs. For simplicity, the calculations used to estimate the changes in PKCA discharge concentrations over time assumed that the waste rock dumps and ore stockpiles would be fully in place starting in Year 1, and that seepage and runoff would reach peak concentrations in the first year of operations. In reality, the build-up of concentrations in the PKCA will be more gradual due to staged construction and wetting-up of these facilities over the first few years of the mine life. Therefore, it is expected that the initial concentrations will be substantially lower and that the build-up of concentrations in the PKCA discharges will be gradual.

Under base-case operating assumptions, water meeting the discharge criteria for the site will be released directly from the PKCA via Stream C3 to Lake C3 starting in the first year of operations. However, if necessary, the PKCA has sufficient capacity to store water for one to two years of operations, which will allow additional time in the PKCA for settling, attenuation and mixing with other inflows, all of which would result in improved water quality. The provision for storage would also allow sufficient time to develop the spray irrigation system, currently proposed as a contingency plan for water treatment.

5.1.1 Post-Closure

Immediately following operations, flows from the waste rock dumps, coarse processed kimberlite (coarse PK) stockpile and low-grade stockpile will be directed to the open pit. Discharges from the PKCA will be reduced to a nominal level reflecting local runoff to the PKCA (Table 4). As noted in the preceeding section, the flows differ slightly from the values presented in "*Site Water Management"* (SRK 2004a) due to some minor adjustments in areas. The values in SRK 2004a are considered final, and the changes have a negligible effect the dilution modelling results.

The current closure plans for the PKCA call for placement of a cover of approximately 0.5 m of coarse PK on top of the fine PK, and possibly placement of soil or overburden to promote revegetation. As freezing of the underlying fine PK progresses, interaction between local runoff and materials in the PKCA will be dominated by the coarse PK layer, and discharge water quality will reflect interaction with this relatively thin layer of coarse PK and soil.

The closure plan assumes that all discharges from the waste rock dumps and stockpiles will be directed to the open pit following cessation of mining operations. Flows in Stream C1 will be maintained to a level that is sufficient to support fish habitat. Calculations from the water and load balance indicate that it will take 15 to 20 years for the pit to fill. This will allow sufficient time for flushing and removal of any blasting residues from the active layers of the pile. 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 "lock-up" porewater, and therefore available loading from the rock. These processes are accounted for in the post-closure estimates of waste rock and pit lake water quality presented in Appendix B of the Abandonment and Restoration Plan (SRK 2004b, *in* AMEC 2004c). The post-closure water quality estimates indicate that concentrations of some metals could exceed CCME guidelines for freshwater aquatic life or CCME/Health Canada guidelines for drinking water in the pit lake.

Monitoring of seepage and runoff during operations and the post closure filling period will be needed to refine the 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 diversion will be breached, the upper part of Stream C1 will be allowed to flow into the pit, and the pit will be allowed to spill into the original Stream C1 channel. If the revised estimates indicate the pit will not meet CCME guidelines, but could be discharged without significant impacts at the shore of Carat Lake, the diversion will be maintained, and water will be discharged via a constructed channel to the northeast of Stream C1 (see accompanying Drawing G-14). 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 levels acceptable for discharge (*"Jericho Post Closure Pit Lake Water Treatment"* (SRK 2004c), *in* AMEC 2004c).

Stream C1 flows and pit discharge rates were estimated from the water and load balance. The timing of the peak flows from the pit was delayed by two weeks relative to that in Stream C1 to reflect storage in the waste dumps and open pit during the initial part of freshet. Final flow estimates are presented in Table 6. Current estimates of post-closure concentrations in the pit discharges are presented in Table 7.

5.1.2 Water Quality Impacts on Lake C3 and Carat Lake from PKCA Discharges during Operations

5.1.2.1 Typical Operating Conditions (Average Discharge Flows)

Expected dilutions and receiving water quality estimates for three key locations in the Lake C3/Carat Lake system during normal operations (i.e. dilution modelling Scenarios 1 and 4) are provided in Tables 12 and 13. For consistency with the EIS, summaries of predicted aluminum, copper, cadmium and uranium concentrations are provided in the following tables, and values that exceed the criteria are shown in bold.

The receiving water quality estimates based on **average source concentration estimates** (Table 12) indicated potential exceedances of CCME guidelines are predicted only for cadmium as follows:

Parameter	Stream C3 outlet + 200 m (mg/L)	Lake C3 Outlet (mg/L)	Carat Lake (mg/L)	CCME Guideline (mg/L)	Background Concentrations (mg/L)
Aluminum	0.077	0.063	0.061	0.1	0.052
Cadmium*	**0.000091**	**0.000068**	**0.000064**	**0.000017**	**<0.00005**
Copper	0.0030	0.0024	0.0023	0.002 to 0.004	0.002
Uranium	0.0063	0.0029	0.0023	0.02	0.0002

Notes: * Assumes background concentrations are at the detection limit of <0.00005. Actual concentrations could be significantly lower.

Predicted cadmium concentrations are only marginally above the background concentration of <0.00005 mg/L. However, because the background concentration is at the analytical detection limit, and is approximately three times higher than the CCME guideline, it is not possible to determine whether CCME guidelines for cadmium are currently exceeded or whether they can be met in this system. It should be noted that the CCME guideline for this parameter is an interim guideline, based on applying a ten times safety factor to the lowest measured effects level for the most sensitive aquatic organism (i.e. 0.00017 mg/L). A review of toxicity data for cadmium completed as part of this project (Attachment O1 of "*Technical Memorandum O: Proposed Discharge Limits for the Jericho Project, Nunavut*" (SRK 2004) indicated that aquatic effects would be unlikely to occur at concentrations of 0.000091 mg/L at a hardness of approximately 50, which is the expected hardness at a dilution of 20. All of the estimated concentrations are below this value.

The background concentration for copper is approximately 0.002 mg/L, which is at the CCME guideline for waters with low alkalinity. The predicted copper concentrations would be only marginally above this value during mining operations. A review of toxicity data for copper completed as part of this project (Attachment O1 of "*Technical Memorandum O: Proposed Discharge Limits for the Jericho Project, Nunavut*" (SRK 2004) indicated that aquatic effects would be unlikely to occur at concentrations of 0.004 mg/L.

Predicted aluminum and uranium concentrations are below the CCME guidelines.

The receiving water quality estimates based on **maximum source concentration estimates** (Table 13) indicated potential exceedances of CCME guidelines are predicted only for cadmium and uranium as follows:

Parameter	Stream C3 outlet + 200 m (mg/L)	Lake C3 Outlet (mg/L)	Carat Lake (mg/L)	CCME Guideline (mg/L)	Background Concentrations (mg/L)
Aluminum	0.097	0.072	0.068	0.1	0.052
Cadmium*	**0.00011**	**0.000075**	**0.000069**	**0.000017**	**<0.00005**
Copper	0.0030	0.0025	0.0024	0.002 to 0.004	0.002

Uranium	**0.034**	0.015	0.012	**0.02**	**0.0002**

Notes: * Assumes background concentrations are at the detection limit of <0.00005. Actual concentrations could be significantly lower.

Concentrations of cadmium are predicted to be slightly higher than in the preceding scenario due to higher discharge concentrations. Uranium concentrations at the edge of the mixing zone could slightly exceed the CCME guideline for drinking water supplies in which there is ongoing and sustained use of the water by humans. However, the concentrations are well below levels where occasional use of this water would result in impacts to human health. Therefore, no impacts are predicted. Aluminum and copper would remain below the CCME guidelines. These concentrations represent probable maximum concentrations in the discharge and were estimated using several conservative assumptions.

TDS concentrations are expected to be 65 mg/L and 93 mg/L at a distance of 200 metres from the stream outlet, for average and maximum source concentrations respectively. Concentrations of individual TDS components (i.e. Ca, Mg, Na, K, SO4, and Cl) are well below criteria for chloride and sulphate that have been proposed in other jurisdictions. A discussion of the potential impacts of TDS on the receiving environment presented indicates that there would be little potential for toxicological effects at TDS concentrations below 400 mg/L.

The complete report pertaining to water quality is located in Appendix U.

5.1.2.2 Contingency Release of Stored flows from the PKCA

Expected dilutions and receiving water quality estimates at various locations in the Lake C3/Carat Lake system for the release of one year stored flow (i.e two years worth of discharges) into average receiving water flows (i.e. dilution modelling Scenarios 2 and 5) are provided in Tables 14 and 15.

The receiving water quality estimates based on **average source concentration estimates** (Table 14) indicate potential exceedances of CCME guidelines are predicted for aluminum and copper at the edge of the mixing zone, and cadmium in all three locations as follows:

Table 14 (from Appendix U, Technical Memorandum N: Estimates of Receiving Water Quality)

Parameter	Stream C3 outlet + 200 m (mg/L)	Lake C3 Outlet (mg/L)	Carat Lake (mg/L)	CCME Guideline (mg/L)	Background Concentrations (mg/L)
Aluminum	**0.10**	0.072	0.062	0.1	0.052
Cadmium*	**0.00013**	**0.000083**	**0.000066**	**0.000017**	**<0.00005**
Copper	**0.0040**	0.0028	0.0024	0.002 to 0.004	0.002

Uranium	0.012	0.0051	0.0026	0.02	0.0002

Notes: * Assumes background concentrations are at the detection limit of <0.00005. Actual concentrations could be significantly lower.

The receiving water quality estimates based on **maximum source concentration estimates** (Table 15) indicate potential exceedances of CCME guidelines are predicted for aluminum, cadmium, copper and uranium at the edge of the mixing zone, uranium throughout Lake C3, and cadmium in all three locations, as follows:

Table 15 (from Appendix U, Technical Memorandum N: Estimates of Receiving Water Quality

Parameter	Stream C3 outlet + 200 m (mg/L)	Lake C3 Outlet (mg/L)	Carat Lake (mg/L)	CCME Guideline (mg/L)	Background Concentrations (mg/L)
Aluminum	**0.14**	0.088	0.070	0.1	0.052
Cadmium*	**0.00016**	**0.000095**	**0.000072**	**0.000017**	**<0.00005**
Copper	**0.004**	0.0028	0.0024	0.002 to 0.004	0.002
Uranium	**0.069**	**0.028**	0.014	0.02	0.0002

Notes: * Assumes background concentrations are at the detection limit of <0.00005. Actual concentrations could be significantly lower.

As indicated in Tables 14 and 15, TDS concentrations are expected to be 118 mg/L and 174 mg/L at a distance of 200 metres from the stream outlet, for average and maximum source concentrations respectively. As discussed in the above section, concentrations of individual TDS components would be well below the applicable guidelines and toxicity thresholds, indicating little potential for toxicological or environmental effects.

5.1.3 Post-Closure Discharges from the PKCA to Lake C3

After closure, discharges from the PKCA will be limited to direct precipitation and local runoff to the PKCA. Therefore flows from the PKCA will be approximately six times less than during operations, and overall dilution in Lake C3 will be approximately 170. Post-closure concentrations from the PKCA will also be significantly less than during operations. Therefore, impacts to Lake C3 and Carat Lake are expected to be negligible after closure of the facility.

5.1.4 Post-Closure Discharges from the Open Pit to Carat Lake

Break-up of the ice, discharges from the shoreline are expected to disperse and mix rapidly, reaching a minimum of five times dilution within 40 metres of the outfall, a minimum of ten times dilution within 80 metres of the outfall, and a minimum of sixty times dilution at the Jericho River outlet of Carat Lake. Estimates for the two-week period period prior to break-up indicate that locally lower dilutions could occur, but these are highly dependent on fine-scale mixing processes that cannot be accurately simulated in any of the available models. Tracer studies during operations can be used to quantify the near shore mixing processes well in advance of the pit reaching its spill point, should refined estimates of post-closure water quality indicate that the discharges from the pit lake would not meet receiving water quality.

Post-closure receiving water quality estimates at these locations are provided in Table 16. Although copper concentrations are predicted to approach the upper CCME guideline, cadmium is the only parameter predicted to exceed the CCME guideline as follows:

Table 16 (From Appendix N Estimates of Receiving Water Quality)

Parameter	40 m from Channel (mg/L)	80 m from Channel (mg/L)	Outlet of Carat Lake (mg/L)	CCME Guideline (mg/L)	Background Concentrations (mg/L)
Aluminum	0.083	0.067	0.055	0.1	0.052
Cadmium*	**0.00011**	**0.000081**	**0.000055**	**0.000017**	**<0.00005**
Copper	0.0039	0.0029	0.0022	0.002 to 0.004	0.002
Uranium	0.013	0.0065	0.0013	0.02	0.0002

Notes: * Assumes background concentrations are at the detection limit of <0.00005. Actual concentrations could be significantly lower.

Predicted TDS concentrations were 85 and 48 mg/L at 40 and 80 metres distance respectively. As in the previous estimates, these are well below the available guidelines and toxicity thresholds defined for any individual TDS component, and are not expected to result in adverse effects to the aquatic ecosystem.

5.1.5 Summary and Conclusions

Dilution modelling was used to estimate receiving water concentrations for TDS, major ions, metals and nutrients during mining operations and through the first 25 years of closure. The results indicate that, under typical operating conditions, concentrations of all parameters except cadmium are close to background, or within CCME guidelines. Cadmium is the only parameter, which may exceed the CCME guidelines for freshwater aquatic life beyond a 200 metre mixing zone from the outlet of Stream C3. However, the predicted cadmium concentrations based on assuming background cadmium concentrations are at the detection limit of 0.00005 mg/L, are only slightly higher than the detection limit for cadmium, and are below the lowest effects level reported in the CCME guidelines fact sheet. Local exceedances of aluminum, copper and uranium may occur near the edge of the mixing zone under worst-case discharge conditions, or if effluent concentrations approach the probable maximum values estimated for this site.

After closure, discharges from the PKCA will be limited to direct precipitation and local runoff to the PKCA. Therefore flows from the PKCA will be much lower and dilution in Lake C3 will be substantially higher. Post-closure concentrations from the PKCA will also be significantly lower than during operations. Therefore, impacts to Lake C3 and Carat Lake will be minimal after closure of the facility.

After closure, discharges from the waste dumps and stockpiles will be directed to the open pit. Post-closure discharges from the pit would only occur after the pit reaches its spill point. Depending on the quality of the pit water, the discharge may be returned to the original Stream C1 channel, or directed via a constructed channel directly to Carat Lake. Modelling of the constructed channel discharge indicates that the available dilution after break-up of the ice would be on the order of five to ten times at distances of 40 to 80 metres from the channel outlet. With the exception of cadmium, all parameters would meet CCME guidelines for freshwater aquatic life and human health beyond this mixing zone. In the case of cadmium, the predicted concentrations are below the lowest effects levels reported in the CCME (1999) guidelines. The available dilution prior to break-up of the ice depends on the development of the ice-free lead along the shoreline and fine scale mixing processes that cannot be accurately quantified by the available models. Should refined estimates of post-closure water quality indicate that discharges from the pit lake would not meet receiving water quality guidelines, a tracer study could be conducted to quantify the available dilution.

5.2 Proposed Discharge Limits

The proposed discharge limits for the site are “water quality based discharge limits” intended to protect the aquatic life and drinking water quality in the receiving environment. The proposed limits were developed on the basis of: 1) guidelines, objectives or site specific thresholds that ensure minimal impacts to aquatic resources in Lake C3 and Carat Lake, and 2) dilution modelling to determine the assimilative capacity at key locations in the receiving environment. The proposed limits also consider discharge limits in water licences from the other northern diamond mines, including the Ekati Diamond Mine™, the Diavik Diamond Mine, and the Snap Lake Project.

With this approach, the proponent recognizes that they will need to carefully manage discharge flows to ensure that the expected minimum dilutions are maintained.

Aquatic thresholds were established on the basis of guidelines, or site specific objectives that were selected to ensure minimal impacts to aquatic resources in Lake C3 and Carat Lake. For the majority of the parameters, values presented in the Canadian Council of Ministers of the Environment (CCME) Guidelines for freshwater aquatic life and drinking water (CCME 1999) were adopted without modification.

The CCME Guidelines for aluminum, cadmium, copper, and nitrite were considered to be overly conservative with respect to protection of aquatic life. Therefore, site specific objectives were proposed on the basis of a detailed literature review prepared by AMEC (Attachment O1). CCME does not have a recommended guideline for Total Dissolved Solids (TDS) concentrations, nor, with the exception of sulphate (Health Canada drinking water guideline of 500 mg/L), any of the components of TDS (i.e. chloride, bicarbonate, calcium, magnesium, sodium, and potassium). Therefore, a literature review was completed to determine appropriate thresholds for TDS in the receiving environment. The results of the literature review on TDS are provided in Attachment N5 of "*Technical Memorandum N: Estimates of Receiving Water Quality for the Jericho Project, Nunavut*" (SRK 2004b). Brief summaries of these reviews are provided as follows:

- Aluminum: A site specific receiving water quality objective of 0.16 mg/L has been proposed. This value represents a two-fold factor of safety below the lowest effects levels identified in the literature for waters with similar pH conditions (Attachment O1). This value is considered to be conservative with respect to potential for aquatic effects because the majority of the aluminum is expected to occur as fine suspended silicate minerals, which are not biologically available. This is in contrast to the toxicity tests, typically completed using soluble aluminum salts. The aluminum in those tests speciates to Al^{3+} or $Al(OH)_4^-$, which are considered to be the more toxic forms of aluminum.

- Cadmium: A hardness based site specific receiving water quality objective has been proposed, ranging from 0.000075 mg/L (at a hardness of 40 mg/L) to 0.00017 (at a hardness of 100 mg/L) (Attachment O1). At the mixing ratio of 10:1 used in the derivation of discharge water quality objectives (see Section 3), the hardness is expected to be in the range of 100 mg $CaCO_3$ eq/L, and the site specific cadmium objective would be 0.00017 mg/L. These values were derived by dividing the lowest effects level measured in toxicity testing by two. Although it is incidental to derivation of the water quality guidelines, the proposed threshold would be in the range where it would be possible to detect any changes above the current detection limit of 0.00005 mg/L using standard and verifiable laboratory methods, which is an important practical consideration in the monitoring programs.

- Copper: A site specific receiving water quality objective of 0.004 mg/L has been proposed for the Jericho site (Attachment O1). This value has been proposed on the basis of chronic toxicity data from the U.S. Environmental Protection Agency (EPA), which indicates only one test with adverse effects at copper concentrations of less than 0.004 mg/L (the effect level in this test was at 0.0039 mg/L). Baseline copper concentrations in the Jericho River system are already at 0.002 mg/L. Therefore, the proposed water quality objective represents only a slight increase above current levels.

- Nitrite: A site specific receiving water quality objective that varies over a range of chloride concentrations has been proposed for the Jericho site, ranging from 0.10 mg/L nitrite (at a chloride concentration of 5 mg/L) to 0.25 mg/L nitrate (at chloride concentrations of >20 mg/L). At the mixing ratio of 10:1 used in the derivation of discharge water quality objectives (see Section 3), chloride is expected to be in the range of 48 mg/L, and the site specific objective would be 0.25 mg/L nitrate.

- TDS: The review of potential aquatic effects from TDS ("*Technical Memorandum N: Estimates of Receiving Water Quality for the Jericho Project*", SRK 2004b), indicated that there would be negligible effects at concentrations below 400 mg/L bulk TDS. The most stringent guidelines for TDS components are from British Columbia, at 150 mg/L for chloride and 100 mg/L for sulphate. These values are below the lowest effects levels identified in the literature. Effects levels for the cations (i.e. calcium, magnesium, potassium, and sodium) present in the PKCA discharge are generally below the lowest effects levels. Therefore, minimal dilution is required to ensure concentrations are below effects levels in the receiving environment.

The Aquatic Thresholds proposed for this project are summarized in Table 2.1. The table includes all of the parameters specified in recent water licences issued for Ekati, Diavik and Snap Lake, plus additional parameters raised as potential concerns at this site. However, consistent with these other applications, aquatic thresholds for TSS and phosphorus are not applicable. Therefore, the discharge criteria for these parameters are based on precedents set for other northern water licences that are also considered to be protective of the receiving environment.

Table 5.1: Selected Aquatic Thresholds (From Appendix V Technical Memorandum O: Proposed Discharge Limits)

Parameter	Aquatic Threshold	Derivation
Major Ions		
TDS	400 mg/L	Proposed Site Specific Objective (see Attachment N5 of Technical Memorandum N).
chloride	150 mg/L	B.C. chronic aquatic life guideline (BCMWLAP, 2003)
Nutrients		
ammonia	0.59 mg/L	CCME (1999)**, assumes total ammonia. (Concentrations in N equivalents)
nitrite	0.25 mg/L (at chloride concentrations of >20 mg/L)	Proposed Site Specific Objective – see Attachment O1. The proposed objective is linked to chloride concentrations. Chloride concentrations of 24 to 48 mg/L are predicted for the edge of the mixing zone, assuming 10 to 20 times dilution. (Concentrations in N equivalents)
nitrate	3 mg/L*	CCME (1999), (Concentrations in N equivalents)
Total Metals		

Parameter	Aquatic Threshold	Derivation
aluminum	0.16 mg/L	Proposed Site Specific Objective – see Attachment O1.
arsenic	0.005 mg/L	CCME (1999)
cadmium	0.00017 (at a hardness of 100 mg/L)	Proposed Site Specific Objective – see Attachment O1. The proposed objective is linked to hardness. A hardness of 100 mg CaCO3 eq/L is predicted for the edge of the mixing zone.
chromium	0.0089 mg/L	CCME (1999)
copper	0.004 mg/L	Proposed Site Specific Objective – see Attachment O1.
lead	0.001 mg/L	CCME (1999)
molybdenum	0.073 mg/L	CCME (1999)
nickel	0.025 mg/L	CCME (1999)
uranium***	0.02 mg/L	CCME (1999)
zinc	0.030 mg/L	CCME (1999)

Notes:

* Ammonia, Nitrite and Nitrate thresholds are presented in units of mg N/L, consistent with standard laboratory protocols

** CCME 1999 guidelines tables were updated in 2002. The 2002 values are used in this summary.

*** The threshold for uranium is for the protection of drinking water supplies that are used on an ongoing and regular basis.

During operations water will be discharged from the PKCA through Stream C3 to Lake C3. The discharge flows will be controlled to match the pattern of flows in the Jericho River, and will occur from early June through to the end of September. Lake C3 flows into Carat Lake. Carat Lake discharges into the Jericho River, which connects downstream to the Burnside River system. The drainage basin area upstream of Carat Lake is 148 km^2 and thus there is substantial natural flow generated before the proposed Jericho Mine is reached. Receiving water bodies, Lake C3 and Carat Lake, have volumes of approximately 4.5 and 27 million cubic metres, respectively. Based on average flow conditions Lake C3 flushes on average five times per year and Carat Lake once.

Dilution modelling was completed as part of the assessment of impacts to receiving water quality *"Technical Memorandum N: Estimates of Receiving Water Quality"* (SRK 2004b). A simple box model approach was used to estimate whole lake dilutions for Lake C3 and Carat Lake on a monthly basis throughout the mining operations. However, because it assumes complete mixing of the discharges, the box model does not adequately simulate spatial variations in concentration resulting from time dependent mixing processes. Therefore, the output from this model was used as a starting condition for additional modelling using the Princeton Ocean Model to simulate spatial variations in the lakes. Details on the model inputs and scenarios are provided in "*Technical Memorandum N: Estimates of Receiving Water Quality"* (SRK 2004b).

The results of the box model indicated that under base case conditions (Scenario 1), minimum whole lake dilutions in Lake C3 would reach approximately 50 within one season of discharge and minimum dilutions in Carat Lake would reach approximately 58 within three seasons of discharge. A Princeton Ocean model simulation (Scenario 4) was completed using the above dilutions as starting concentrations, and the same assumptions of discharge and receiving water flows. The simulation indicated that minimum dilutions of approximately 20 could occur within 200 metres of the mouth of Stream C3 for a period of approximately 1 week prior to break-up of the ice (assumed to be June 18th in the modelling), and would increase to approximately 40 by mid-July. At the outlet of Lake C3, minimum dilutions would be on the order of 30 for a few weeks immediately after the wind begins to mix the lake (on June 19th), and would also increase to approximately 40 by mid-July.

Box model results simulating release of one year of stored site flows into average receiving water flows during the second year of operations (Scenario 3a) indicated minimum whole lake dilutions of 27 in Lake C3, and minimum whole lake dilutions of 53 in Carat Lake. A Princeton Ocean Model simulation of this latter case (Scenario 5) indicated that minimum dilutions of approximately 10 could occur within 200 metres of the mouth of Stream C3 for a period of approximately 1 week prior to break-up of the ice (assumed to be June 18th in the modelling). Dilutions would then increase rapidly to approximately 20 by the beginning of July. At the outlet of Lake C3, minimal dilutions would be on the order of 20 for a short period immediately after the wind begins to mix the lake (on June 19th), would increase to approximately 27 by mid-July.

The Princeton Ocean Model concentrations are thought to be lower than those predicted by the Box model for two reasons: 1) Flows into the west arm of Lake C3 do not mix with the effluent, and therefore do not contribute to the dilution; and 2) A large amount of unimpacted water from the Jericho River may pass through the main part of Lake C3 before the ice is off the lake and wind driven mixing begins to take effect. Once mixing occurs, the effluent load originating from the site begins to mix with the Jericho River water, but it takes a few weeks to reach steady state mixing. The Princeton Ocean Model results are considered conservative because observations by field staff (*pers. comm.* Rick Pattenden, Mainstream Aquatics Ltd.) indicate that the ice cover in Lake C3 tends to break-up more rapidly than on Carat Lake (up to one week sooner), therefore wind driven mixing is likely to start sooner than the date specified in the modelling (June 18th). This should result in a less accumulation of loading in the system, and therefore higher dilutions when the wind driven mixing begins.

It should also be noted that the dilution modelling is generally expected to give conservative estimates of dilution because the estimates of release volumes are based on conservative estimates of inflows to the PKCA. Lower discharges will generally result in higher dilutions at all locations in the receiving environment.

Based on the above considerations, a dilution factor of 10 is suggested as a very conservative estimation of the minimum dilution available 200 m from the Stream C3 mouth. It should be recognized that even under worst case conditions with release of excess stored water from the PKCA, dilutions are expected to exceed 20 during the majority of the discharge season in most of Lake C3 and in all of Carat Lake. Consistent with the Snap Lake Type "A" Water Licence issued by the Mackenzie Valley Land and Water Board, a mixing zone of 200 m is suggested.

5.2.1 Operations

A summary of the aquatic thresholds, background concentrations, and calculated provisional discharge limits is presented in Table 4.1 (Appendix V). As indicated in Table 4.1, adjustments to the provisional criteria have been proposed for TDS, chloride, aluminum, uranium and zinc:

- In the case of TDS and chloride, the proposed amendments would conservatively lower the discharge limits to values that are below the thresholds for potential chronic effects in the receiving environment. These amendments are proposed due to uncertainties in the potential for acute toxicity of TDS, and known effects above 1083 mg/L chloride. Effluent toxicity testing proposed as part of the monitoring programs will ensure that the proposed values are non-acutely toxic in the discharge.

- In the case of aluminum, the proposed amendment could lead to occasional and brief exceedances of the aquatic thresholds at the edge of the mixing zone in Lake C3. However, such exceedances would only occur under the worst case discharge scenario, and would only occur just prior to break-up of the lake ice, a maximum of 10 days. Furthermore, as discussed in Attachment O1, the aquatic thresholds for aluminum are based on toxicity tests that used soluble aluminum salts, which speciate to dissolved aluminum (Al^{3+} and aluminum hydroxide complexes) and fine particulates of aluminum hydroxide. In contrast, most of the aluminum in the discharge is expected to occur bound within silicate minerals, which are considered to be significantly less toxic. Therefore, for consistency with the Ekati and Diavik water licences, discharge limits of 3 mg/L (grab) and 1.5 mg/L (average) are proposed.

- In the case of uranium, it may not be possible to achieve the provisional criteria throughout operations. The proposed aquatic thresholds for uranium are based on protection of human drinking water supplies that are used on a regular and sustained basis (i.e. for a lifetime of using the water supply). Therefore the much higher dilutions in Carat Lake (consistently greater than 40, and typically approximately 58) should be considered. At dilutions of 40, discharges could be as high as 1.6 mg/L (grab) and 0.8 mg/L (average). Based on conservative estimates of discharge water quality, concentrations of 1 mg/L (grab) and 0.5 mg/L (average) should be achievable, and would still provide a sufficient margin of safety for workers living at the camp. At these concentrations, Lake C3 could potentially locally reach levels of 0.1 mg/L for short time periods (less than 10 days) when the ice is still on the lake, but only if discharge flows are higher than normal to allow release of stored excess water from the PKCA <u>and</u> discharge concentrations reach the maximum values predicted in the water and load balance. Despite the low frequency and likelihood of these conditions occurring, occasional use of water at these concentrations is not expected to result in acute or chronic health effects on humans.

- The concentration for zinc has been adjusted to a slightly lower value to ensure the proposed value is below acute toxicity thresholds. Actual concentrations are expected to be significantly lower than these values.

Discharge limits have been proposed for the site that will ensure concentrations in the receiving water meet aquatic thresholds within the capabilities and expected performance of current operational controls and contingencies. The proposed discharge limits are based on conservative estimates of dilution in the receiving environment, and reflect a worst case discharge scenario based on release of two times the normal amount of effluent in a single year. In addition, normal estimated effluent volumes are expected to also be conservative (SRK Consulting and Clearwater Consultants, 2004a). Despite this, the limits are within the range of recent precedents set at other northern diamond mines.

The complete report on Proposed Discharge Limits can be found in Appendix V.

6.0 MONITORING

Monitoring will commence with construction (or as indicated) and will carry through the post closure period (or as indicated). A number of management plans have been developed for submission to Nunavut Water Board in support of a Water Licence application for the Jericho Project. Most management plans include a monitoring component or deal strictly with monitoring. The Monitoring Summary Report provides a convenient overview of the proposed environmental monitoring for Jericho.

Subject reports include in the Monitoring Summary Report Include:

- Air Quality Management Plan
- Site Water Management Plan
    - discharge
    - minesite water chemistry
    - minesite solids geochemistry
- Aquatic Effects Monitoring Program
    - water and sediment chemistry
    - aquatic biota
- Wildlife Management Plan
- Abandonment and Restoration Plan

Monitoring and inspections required with respect to hazardous materials and wastes are not included in this summary; see the Hazardous Materials Management and Emergency and Spill Response plans for details.

Table 6-1: Monitoring Summary (From Appendix I Operational Monitoring Summary)

Category	Parameters	Location	Frequency	Mining Phase
Climate[1]	wind speed @ 10 m	airstrip	continuous	construction and operation
	wind direction @ 10 m	airstrip	continuous	
	sigma theta[2]	calculated	continuous	
	temperature @ 3 m &10 m	airstrip	continuous	
	relative humidity @ 3 m	airstrip	continuous	
	net radiation @ 3 m	airstrip	continuous	
	precipitation (tipping bucket; summer)	airstrip	summer continuous	
Air Quality	particulate matter (PM-10, PM-2.5)[3]	between open pit and plant At exploration camp	continuous	operation

Category	Parameters	Location	Frequency	Mining Phase
	lichen metal concentration[4]	eight stations nearfield and farfield	pre-start up and every 3 years after until closure	construction, operation
	vegetation transects[5]	at airstrip and near open pit	pre-start up and every 3 years after until closure	construction, operation
PKCA Discharge Volume	Rate and total volume	PKCA sed pond dam	continuous while discharging	operation
Carat Lake Outlet Discharge	height of outlet stream	outlet to Carat Lake	continuous during open water	operation, closure
Stream C1 Discharge	stream height calibrated to discharge	energy dissipation pool 2	continuous during open water	construction, operation, closure
Site Monitoring	water quality and quantity	ditches and ponds downslope for waste and ore handling facilities	monthly during open water	operation, closure
		pit sump		
		process plant supernatant		
		treated sewage effluent		
		PKCA pond water		
		PKCA discharge		
	solids geochemistry	waste rock: granite/granodiorite, pegmatite, diabase, waste kimberlite	each blast; every other blast for the last 3 years of mining	operation
		coarse and fine PK	once every two weeks for 1^{st} year; monthly thereafter	operation
	ground ice chemistry	open pit	as encountered	operation
	thermal monitoring	waste rock dump, coarse PK, dams	continuous	operation
	visual inspection	dams, ponds, ditches, waste dumps, stockpiles	daily as required	operation
Receiving Water Chemistry	low level metals, nutrients, pH (field/lab), temperature (field), TOC[6]	upstream control, downstream control, nearfield, farfield; Jericho and Lynne Lake drainages[7]	construction and operation: monthly, except summer for streams. Closure: periodically[8]	construction, operation, closure
Receiving Sediment Chemistry	low level metals, nutrients, TOC, particle size[9]	Control, C3, Carat, Jericho, d/s Jericho Lakes[7]	pre-construction and once every 3 years until closure	pre-construction, operation
Aquatic Effects	periphyton: biomass (Chl*a*), abundance, spec ies diversity	upstream, downstream controls; nearfield, farfield[10]	summer/annual	pre-construction, operation
	benthic invertebrates: abundance; species diversity		spring/annual	
	phytoplankton: biomass (Chl*a*), abundance, species diversity		summer/annual	
	zooplankton: biomass, abundance, species diversity		summer/annual	
	fish: tissue metal concentration community characteristics	lakes	every 4 years spring-summer/annual	
	sediment deposition	lakes	annual	pre-construction, construction, operation, closure
Wildlife	incidents	on and off site	as occur	pre-construction, operation, closure
	encounters & sitings			
	raptors	off site	annual in summer	
	joint initiatives	off site	as determined	

6.1 Climate

The climate station established at the airstrip will be continued through the construction and operation phases of mining at the request of DIAND. Temperature, precipitation, relative humidity and net radiation sensors currently at Carat Lake Camp will be re-installed, as required, on the airstrip tower and the datalogger reprogrammed to accommodate the added sensors. All existing sensors will be sent to the manufacturer for service and recalibration prior to re-installation.

6.2 Air Quality

Dual Partisol™ samplers will be used that simultaneously monitor PM-10 and PM-2.5. Their limitation in placement is the requirement for AC power to operate. Two monitors will be installed as shown on Figure 2-1. Environment Canada will be consulted prior to installation to ensure the agency's concerns are taken into consideration.

6.3 Lichen Metals Concentrations

An initial survey of lichen metals levels was conducted by Tahera and reported in the final EIS. For operations, this survey will be expanded to eight stations as shown on Figure 2-2. Stations will be located at near (1 – 2 km) and far (8 – 12 km) from the mine site and at directions of prevalent and non-prevalent wind flows as indicated by the windrose data presented in the final EIS (Figure 2-2 insert). The most common fruiticose lichen at Jericho was found to be *Flavocetraria cucullata* and that species was sampled for the 2000 survey. It is proposed to continue to use this species if possible for the operational monitoring. Initial sampling will be prior to operations start up (Year 1) and the survey will be repeated every three years until mine closure at Year 9 (Years 1, 3, 6 and 9).

6.4 Site Water Quality

Flows and water quality will be monitored at key locations to determine whether individual flows are acceptable for direct release, and to anticipate any deviations from the conditions assumed in the present water and load balance model that could indicate the need for implementation of contingencies. Monitoring of the waste rock, kimberlite and processed kimberlite solids, monitoring of receiving water quality, and environmental effects monitoring, will complement the site-monitoring program.

Table 5-2 provides a list of water chemistry parameters to be analyzed together with detection limits. Both total and dissolved metals will be analyzed. An accredited laboratory will be chosen for routine water quality analyses. Bacterial analyses will be completed in Yellowknife to eliminate issues associated with excessive holding times.

Table 6-2: Water Chemistry Monitoring Parameters and Detection Limits

Water Quality Parameter	Detection Limits (mg/L or parameter units)	Water Quality Parameter	Detection Limits (mg/L or parameter units)
Physical Tests		**Total & Dissolved Metals**	
Conductivity (umhos/cm)	2	Cobalt (Co)	0.0001
Hardness $CaCO_3$	0.05	Copper (Cu)	0.0001

Water Quality Parameter	Detection Limits (mg/L or parameter units)	Water Quality Parameter	Detection Limits (mg/L or parameter units)
pH	0.01	Iron (Fe)	0.03
Total Suspended Solids	3	Lead (Pb)	0.00005
Total Dissolved Solids	3	Lithium (Li)	0.001
Dissolved Anions		Magnesium (Mg)	0.05
Alkalinity-Total $CaCO_3$	1	Manganese (Mn)	0.00005
Chloride Cl	0.5	Mercury (Hg)	0.00005
Sulphate SO_4	1	Molybdenum (Mo)	0.00005
Nutrients		Nickel (Ni)	0.0001
Nitrate (NO_3)	0.005	Phosphorus (P)	0.3
Nitrite (NO_2)	0.002	Potassium (K)	2
Ammonia (NH_3)	0.005	Selenium (Se)	0.001
Total Dissolved Phosphorus	0.001	Silicon (Si)	0.05
Total Phosphorus	0.001	Silver (Ag)	0.00001
Total & Dissolved Metals		Sodium (Na)	2
Aluminum (Al)	0.001	Strontium (Sr)	0.0001
Antimony (Sb)	0.00005	Thallium (Tl)	0.00005
Arsenic (As)	0.0001	Tin (Sn)	0.0001
Barium (Ba)	0.00005	Titanium (Ti)	0.01
Beryllium (Be)	0.0005	Uranium (U)	0.001
Bismuth (Bi)	0.0005	Vanadium (Va)	0.001
Boron (B)	0.001	Zinc (Zn)	0.001
Cadmium (Cd)	0.00005	**Organic Parameters**	
Calcium (Ca)	0.05	Total Organic Carbon (TOC)	0.01
Chromium (Cr)	0.0005		

Key locations in the site water-monitoring network (Drawing 1CT004.06-G-14, Appendix S) include:

- Temporary or permanent collection ponds A, B and C, which will be used as control structures to direct water to the environment, the pit sump or the PKCA during operations
- The pit sump(s)
- The process plant supernatant
- Treated sewage effluent
- PKCA pond water
- PKCA discharge water

During the first two years of operations, each of the above locations would be established as “routine monitoring stations” for measurement of flow and water quality.

The monitoring locations representing internal flows at the site (i.e. to the pit sump or PKCA) are intended to provide an early indication of how the systems are performing. This information will be used by the mine operator to make adaptive management decisions and projections of PKCA discharge water quality. Sampling of the PKCA inflows would be on a bi-weekly basis during the open water season (generally June to September) for the first two years of operations. The PKCA pond and any inflows that continue through the winter months (i.e. the supernatant and the treated sewage) would be monitored on a monthly basis. Depending on the level of variability observed in the monitoring results, Tahera may request a modification after two years to reduce the sampling frequency for the internal monitoring locations to once per month.

The monitoring locations representing potential discharges from the site are expected to meet a set of discharge limits specified in the Water Licence. Proposed discharge criteria for the PKCA are discussed in *"Proposed Discharge Limits for the Jericho Project, Nunavut"* (SRK 2004d). The PKCA discharge would be monitored on a weekly basis during the discharge period from June through September.

The methods for estimating flow will depend on the final details of the water management facilities. Pump installations would be equipped with totalizer flow meters to record the total volume of water pumped between sampling events. Ditch flows would be monitored using weirs and/or current meter measurements during the summer months. Piped flows discharging by gravity would be estimated using bucket and stopwatch methods. Topographic surveys and soundings of the PKCA in conjunction with regular measurements of the pond elevation would be used to estimate water volumes in storage in the pond.

An annual seepage survey would be completed along the down-gradient side of the waste rock dumps, the ore stockpiles, the coarse PK stockpile, the recovery plant stockpile, and any sumps in the plant area to develop a better understanding of variations in source concentrations from different areas of site. This information would be used to optimize the water management system. For example, seeps that meet discharge criteria may be managed separately from those that do not. This sampling should take place in late August to early September to coincide with expected maximum seepage concentrations. It should be noted that the provision of routine monitoring stations at each of the collection points ensures that seepage and runoff from the waste rock is monitored on a routine basis. Therefore an annual seepage survey is considered sufficient.

All samples would be submitted for testing for the parameters outlined in Table W7. Standard QA/QC procedures for water sampling including collection of field, travel and method blanks and duplicate samples will be included in the program. The results of the seepage monitoring would be provided in an annual seepage and waste rock monitoring report.

6.5 Tailing PKCA/ Geotechnical Monitoring

During the operation of the PKCA, site staff will carry out regular inspections in relation to the performance and condition of the dams. Particular attention during these inspections will be given to the West Dam. Site staff will also inspect the spillway channel in advance of the freshet, so that any blockages or substantial ice accumulations in the spillway inlet area can be removed prior to the freshet.

A geotechnical or civil engineer registered in Nunavut will make an annual inspection of the PKCA facilities each summer. His report will summarize the results of his inspection and his review of the available monitoring data (described below). The report will be filed in a timely manner so that, if required, construction activity or modifications to these structures can be implemented prior to the next freshet.

The monitoring stations for each of the dams are shown on Drawings 1CT004.006 – G14 and 1CT004.006 – 10. They include the following:

- East, Southeast and North Dams – Survey monuments to measure settlement and lateral movement; and

- West Dam – Thermistors and survey monuments.

Survey data from the survey monuments can be completed once every two months for the first year, unless there are signs of stress on the dams that would lead to more frequent surveys. The thermistors should be monitored monthly.

In addition, the volume occupation of the deposited fine PK should be evaluated on an annual basis to determine the dry density of the stored PK and the amount of ice entrainment. This is probably best done in late winter when access onto the PK surface is possible.

Tahera will develop a system for recording and analysing their visual observations and monitoring data, and will assign the responsibility to appropriate personnel. This person will be responsible for completing and analysing the data, for maintaining written records and, where appropriate, for implementing corrective actions. The monitoring data will be reviewed as part of the annual inspection by the geotechnical or civil engineer.

6.6 Aquatics Effects

Components of the aquatic biological community that have been chosen as indicators include periphyton, benthic invertebrates, phytoplankton, zooplankton, and fish (Table 6-1). The first two organisms are used because they are stationary and are likely to reflect changes in the environment more rapidly than the other organisms. The latter reason also applies to phytoplankton and zooplankton. Fish are used as indicators because they have the potential to bioaccumulate some metals and they have a high value to society.

For most invertebrate indicators, monitored parameters will include biomass, abundance, and species diversity.

Table 6-3: Indicators and Parameters to be measured as Part of the AEMP

Indicator	Parameter
Phytoplankton	Biomass (Chl. *a*); abundance; species diversity
Zooplankton	Biomass; abundance; species diversity
Periphyton	Biomass (Chl. *a*); abundance; species diversity
Benthic invertebrates	Abundance; species diversity
Fish[a]	Tissue metal concentration; community characteristics

Site locations are based on the indicator to be monitored and the anticipated discharge from the mine site. For sedentary indicators such as periphyton and benthic invertebrates sampling will occur near point sources, which include the Stream C3 outlet in Lake C3 and the Stream C1 outlet in Carat Lake (Table 6-4; Figure 6-1). For other receptors that are not sedentary (phytoplankton, zooplankton, and fish) sites that represent whole lake conditions will be monitored. Wherever possible, aquatic biota sites correspond to water and sediment sampling sites. Fish sampling will occur in Stream C1 and Stream C3 to monitor changes in community characteristics.

Pre-construction baseline data suitable for monitoring has been collected once. Collection of pre-construction baseline data is scheduled to occur in 2004. Assuming project start-up, annual sampling will commence in 2005.

Aquatic Effects Monitoring Program protocols published by DFO (2002) prescribe actions to be taken in the event that statistically significant effects are manifested in the aquatic environment and these protocols will be followed.

6.7 Wildlife

During the NIRB public hearing process several reviewers identified metals bioaccumulation as an issue. However, with respect to caribou, there is no evidence of metals accumulation in NWT-Nunavut herds (INAC 2003). As well, there is no good vector for measuring metals bioaccumulation in wildlife at Jericho. Ungulates and carnivores are not hunted at the site and therefore there is not an assured method of obtaining organ samples for analyses. Further, the Jericho site is but a small fraction of the range of the subject animals and therefore no conclusions could be drawn about metals levels found. Further, it is unreasonable to assume results would be different from those reported by Governmental studies. Small mammals (microtine rodents) have been suggested but microtine rodents do not live long enough to accumulate metals measurably above background. Tahera is therefore not proposing to monitor metals bioaccumulation in wildlife at the Jericho site.

Any moderately large aggregation of herd animals at the Jericho site in areas that conflict with mining activities will be cause for cessation of affected operations until the herd moves away.

Feeding of animals will be prohibited. Should mine employees be found feeding animals disciplinary action would be taken in consultation with mine management.

Should incidents with large carnivores occur which potentially endanger personnel, the bear-aware program orientation program will be reviewed and improved to address the issue raised.

CLOSURE PHASE

7.0 CLOSURE AND RECLAMATION

7.1 PKCA

The conceptual site closure plan is presented in the *"Abandonment and Restoration Plan"* (AMEC 2004a Appendix A) and shown on Drawing 1CT004.06-G-15 (Appendix S). Figure W2 shows a schematic of water flows during the closure phase. The following water management activities will be undertaken after the completion of mining and processing activities:

- All flows from all the mine components will be directed into the open pit. Channels into the pit will be armoured as required to ensure long-term stability.
- Drainage from reclaimed areas around the process plant site and stockpile areas will be directed into the open pit.
- Part of the flow from the C1 diversion could be directed into the pit if a faster rate of pit filling is desirable (see Section 3.4). Excess flows during the freshet period or other periods of high flow could be "skimmed" into the pit using an overflow weir structure located at the C1 diversion dam. Minimum flows would remain in Stream C1 at all times to satisfy fisheries requirements.
- After the pit has filled (see Section 3.4) and water quality is determined to be acceptable for release, lows from the pit could be directed into the C1 stream channel or could be directed into a separate open channel discharging along the east shore of Carat Lake. The final configuration will be determined once sufficient monitoring data are available to refine the present pit water quality estimates.

- The PKCA will be reclaimed as described in the *"Abandonment and Restoration Plan"* (AMEC 2004a). The emergency spillway will be lowered or the West Dam will be partially or totally removed to minimize or eliminate stored water within the pond and to facilitate the reclamation activities. Once the water quality of runoff from the reclaimed area has been determined to be acceptable for direct uncontrolled release, the Settling Pond dam (if constructed) will be breached. Runoff will flow over the (lowered) PKCA spillway and directly into Stream C3 draining into Lake C3.

7.2 Waste Rock, Coarse PK, Low Grade Ore Stockpiles

The target end land use for these areas will be wildlife habitat. Therefore, the aim of the reclamation plan is to promote, to the extent practical, rehabilitation of the land to this use. Key elements of the plan are as follows:

- 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 completed throughout the mine life to determine what reclamation prescriptions are most likely to be successful in the Jericho Project area.
- Following the open pit mining phase, the dumps and stockpiles will be re-graded to a slope of 3H:1V (18°) or less to ensure long-term stability and improve access to wildlife. Top surfaces will be compacted from traffic use and will be ripped or scarified to loosen the surface and

provide microhabitat for plants. Where required, overburden or waste rock will be placed on the Coarse PK Stockpile to prevent erosion and dusting.

- If vegetation trials indicate there is potential for successful re-vegetation of the piles, 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. The side slopes, which are expected to be comprised of coarse rock with low moisture retention capability, will remain uncovered to avoid the potential for erosion of fine cover materials.

- Consideration will be given to placement of boulders on the dump top surfaces to provide perches for raptors. Ramps will be built into side slopes to allow safe caribou transit across the dump slopes.

- Drainage from the dumps and stockpiles will be directed into the open pit to increase the rate of filling, and allow sufficient time for further flushing and degradation of any residual blasting products. Depending on the water quality once the pit reaches its spill point, water from the Stream C1 diversion will either be returned to the pit and allowed to discharge via the original Stream C1 channel into Carat Lake, or the Stream C1 diversion will be maintained, and water will be directed through a second channel constructed between the open pit and Carat Lake.

7.2.1 Post Closure Water Quality

After closure, discharges from the PKCA will be limited to direct precipitation and local runoff to the PKCA. Therefore flows from the PKCA will be approximately six times less than during operations, and overall dilution in Lake C3 will be approximately 170. As indicated in Section 2.1.2, post-closure concentrations from the PKCA will also be significantly less than during operations. Therefore, impacts to Lake C3 and Carat Lake are expected to be negligible after closure of the facility.

As discussed in Section 3.2.2, after break-up of the ice, discharges from the shoreline are expected to disperse and mix rapidly, reaching a minimum of five times dilution within 40 metres of the outfall, a minimum of ten times dilution within 80 metres of the outfall, and a minimum of sixty times dilution at the Jericho River outlet of Carat Lake. Estimates for the two week period period prior to break-up indicate that locally lower dilutions could occur, but these are highly dependent on fine-scale mixing processes that cannot be accurately simulated in any of the available models. Tracer studies during operations can be used to quantify the near shore mixing processes well in advance of the pit reaching its spill point, should refined estimates of post-closure water quality indicate that the discharges from the pit lake would not meet receiving water quality.

Although copper concentrations are predicted to approach the upper CCME guideline, cadmium is the only parameter predicted to exceed the CCME guideline as follows:

Parameter	40 m from Channel (mg/L)	80 m from Channel (mg/L)	Outlet of Carat Lake (mg/L)	CCME Guideline	Background Concentrations

				(mg/L)	(mg/L)
Aluminum	0.083	0.067	0.055	0.1	0.052
Cadmium*	**0.00011**	**0.000081**	**0.000055**	**0.000017**	**<0.00005**
Copper	0.0039	0.0029	0.0022	0.002 to 0.004	0.002
Uranium	0.013	0.0065	0.0013	0.02	0.0002

Notes: * Assumes background concentrations are at the detection limit of <0.00005. Actual concentrations could be significantly lower.

Predicted TDS concentrations were 85 and 48 mg/L at 40 and 80 metres distance respectively. As in the previous estimates, these are well below the available guidelines and toxicity thresholds defined for any individual TDS component, and are not expected to result in adverse effects to the aquatic ecosystem.

7.2.2 Discharge Alternatives

The conceptual site closure plan is presented in Appendix A. and shown on Drawing 1CT004.06-G-15(Appendix S). Depending on actual water quality conditions at the time of closure, a number of conceptual water management options exist for this phase:

- Allow the open pit to fill only with direct precipitation plus local runoff supplemented by site component area runoff. For an estimated pit volume of about 6,500,000 m^3, the water balance model indicates that the pit would fill to elevation 480 m in about 19 years.

- Increase the rate of pit filling by directing some of the flow during the freshet period from Stream C1 into the open pit. Minimum flows would be left in Stream C1 at all times to satisfy fisheries requirements. The pit could be filled in about 15 years for this option.

- Minimize the time required to fill the pit by directing some of Stream C1 into the pit as well as pumping water in from Carat Lake. Assuming, for example, pumping from Carat Lake at about 5% of the annual total Jericho River flow volume could result in the pit being filled in less than four years.

- After filling, flows from the pit could be directed into the C1 stream channel or could be directed into a separate open channel discharging along the east shore of Carat Lake. The final configuration will be determined once sufficient monitoring data are available to refine the present pit water quality estimates.

Water quality in the filled open pit is discussed in *“Technical Memorandum O: Post-Closure Pit Lake Quality”* (SRK 2004b *in* AMEC 2004a).

7.3 Site Infrastructure

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 soils where possible and 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.

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

7.4 Reclamation Costs

Reclamation Cost estimates have been provided by Nuna Logistics and can be found in Appendix D AMEC Abandonment and Restoration Plan. The reclamation cost presented by Nuna Logistics represents a 'third-party" cost estimate and is estimated at CDN $9.28 million. Nuna Logistics has extensive experience in Arctic environments having worked at diamond projects in the Northwest Territories and in many years of experience building and operating the annual winter road that runs north of Yellowknife.

The Company, at this time, does not foresee the need for additional environmental insurance for the project based on the low risk of eventual need and the high level of design and engineering criteria that will go into establishing this project.

8.0 LAND LEASES

8.1 Confirmation of Ownership

Mineral tenure for the property that contains the Jericho Kimberlite is currently held under a Mining Lease No.3795, which is administered through Indian and Northern Affairs Canada. The property has been legally surveyed (C.LS. 79108) and was taken to lease in June 1999. This lease provides for the, "exclusive license to search for, win and take all minerals within the meaning of the Regulations in, upon or under the mineral claims described…" (Mining Lease No. 3795). The Mining Lease is held in the name of Benachee Resources Inc., which is a wholly owned subsidiary if Tahera Diamond Corporation. Tahera Diamond Corporation has the full right to act on behalf of Benachee Resources Inc. and has done so for the purposes of this project application.

8.1 Surface Leases

The Company will be pursuing completion of the surface leases with the Kitikmeot Inuit Association (KIA) and Indian and Northern Affairs Canada (INAC). With respect to both parties, previous applications have been filed and accepted by the KIA and INAC for the purposes of obtaining surface leases. It is anticipated that discussion will continue with the KIA and INAC in the weeks to come and that surface leases will be in place prior to the end of 2004.

9.0 COMPENSATION

9.1 Inuit Impact Benefit Agreement

Tahera Diamond Corporation has completed an Inuit Impact Benefit Agreement with the Kitikmeot Inuit Association (KIA). Tahera believes that it has satisfied the issues related to Inuit water rights through reaching an agreement with the KIA by satisfying Article 20 of the NLCA. The KIA will provide the NWB with their acknowledgement of this under separate cover in the coming days

9.2 No Net Loss Plan

A No Net Loss Plan is in the process of being discussed between the Company and the Department of Fisheries and Oceans (DFO). Tahera believes that it can address the requirements of DFO through the No Net Loss Plan and intends to do so. The complete copy of the no net loss plan is included in this submission in Appendix R.

10.0 PROJECT COSTS
10.1 Capital Costs

The following chart shows a summary of the most up to date feasibility study results, which were revised and updated in June 2003. SRK Consulting utilized an average diamond valuation for the base case feasibility study (i.e. mid point between WWW diamond valuation and Tinus Oosterveld diamond valuation). The feasibility study results using the WWW diamond valuation is indicated in the right hand column.

Jericho Diamond Project	**2003 Feasibility Study (C$ 000's, unless otherwise noted)**	
	SRK Consulting diamond valuation (base)	**WWW modeled diamond valuation (upside)**
Total resource	7.1 million tonnes @ 0.84 c/t	7.1 million tonnes @ 0.84 c/t
Indicated resource	3.7 million tonnes @ 1.17 c/t	3.7 million tonnes @ 1.17 c/t
Inferred resource	3.4 million tonnes @ 0.52 c/t	3.4 million tonnes @ 0.52 c/t
Diamond valuation	US$81/ct	US$92/ct
Mineral reserve	2.6 million tonnes @ 1.2 c/t	2.6 million tonnes @ 1.2 c/t
Total carats produced	3,115,000	3,115,000
Carats mined open-pit	2,442,000	2,442,000
Carats mined underground	673,000	673,000
Revenue	364,628	412,451
Operating cost	173,289	173,289
Operating cost per carat (C$/ct)	56	56
Operating cash flow	191,339	239,162
Capital expenditures – open pit Diamond Plant Facilities Ancillary Facilities Site Preparation Mobilization / Demobilization Owners' Costs Pre-production mining Sub-total	 13,995 14,896 5,537 2,954 1,621 8,929 47,932	 13,995 14,896 5,537 2,954 1,621 8,929 47,932
Contingency	4,793	4,793
Total Capital Open pit	**52,725**	**52,725**
Capital – Underground	8,672	8,672
Sustaining capital	2,854	2,854
Contingency	1,152	1,152
Total Project Capital	**65,403**	**65,403**
Cash flow after capex	125,936	173,759
NPV @ 5%	85,510	123,089
IRR	32.7%	43.6%
Mine life (years)	8+	8+

10.2 Water Fees

The Company has previously submitted the $30.00 application fee associated with a water application of this nature, which can be verified by the Nunavut Water Board.

Future water use fees are based on the Northwest Territories Waters Regulations (Section 9(1)(b) of the NWTWR), "…for the first 2 000 m3 per day that is authorized by the licence, $1 for each 100 m3 per day". The capacity of the water intake line to the site facilities is rated at 40 m3 per hour, although it is anticipated that the actual use will be in the 20 – 30 m3 per hour range. Based on 30 m3 per hour (720m3 per day or $7.20 per day), thus the annual fees associated with water intake would be $2,628.00. It is understood that this amount would be due on the finalization of the water permit and due annually on the anniversary of the water permit for the life of the mine (i.e. approximately 8 years totaling $21,024.00).