

October 4, 2003  
1CT004.04

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

**Attention: Greg Missal**

Dear Mr. Missal

**Technical Memoranda - Jericho Project, Nunavut**

Please find attached the 11 Technical Memoranda that have been prepared as supplementary information in response to reviewers' comments on the EIS for the Jericho Diamond Project. The title and scope of each memorandum are provided below.

**Technical Memorandum A  
Supplemental Geotechnical Data**

Technical Memorandum A summarizes the geotechnical programs that have been completed to date in relation to the project infrastructure, exclusive of the pit slope geotechnical studies. The programs include drilling programs and test pits as early as 1996 and, most recently, surficial mapping, drilling programs and test pits from August 2003. The logs and laboratory from these programs are compiled as attachments.

**Technical Memorandum B  
Supplemental Permafrost Characterization**

Technical Memorandum B provides a review of the permafrost conditions at the Jericho site. A summary of the site climatic data is provided, followed by comments on the potential changes due to global warming. Available thermistor data is summarized, including the data from the Lupin Mine and thermistors installed at the Jericho site in 1996 and August 2003. The data has been analysed in order to characterize the permafrost at the site. The report concludes with a discussion of the implications of the permafrost regime to the design and performance of select structures at the site.

**Technical Memorandum C  
Supplemental Climate and Hydrology**

This memorandum documents a range of analyses undertaken to characterize the climate and hydrology of the proposed mine development. The section on climate provides estimates of air temperature, precipitation, snowpack and evaporation. The analyses related to precipitation made use of a new database prepared by the

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Asia  
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Denver 303.985.1333  
Elko 775.753.4151  
Fort Collins 970.407.8302  
Reno 775.828.6800  
Toronto 416.601.1445  
Tucson 520.544.3668

Meteorological Service of Canada that corrects precipitation records for various types of instrumental errors. These errors result in measurements that significantly underestimate the true precipitation in the Arctic. The climate was characterized using a combination of site-specific data and data monitored at regional climate stations. Reference was also made to a detailed evaporation study made at the neighbouring Lupin Mine.

The section on hydrology focuses on techniques for estimating average and flood flows at ungauged locations around the Jericho site. Emphasis was placed on characterizing the flood regime of the mine development. One technique is presented for estimating 10-year and 100-year flood volumes for a range of durations from 1 to 365 days. Another technique provides estimates of the peak instantaneous discharge of floods with return periods of up to 200 years. The average flow estimates were validated using data collected at a network of streamflow monitoring stations operated at the Jericho site. Data collected at the Ekati operation were also incorporated into the hydrological analyses.

### **Technical Memorandum D**

#### **Supplemental Information on Waste Dumps and Stockpiles**

Technical Memorandum D presents supplemental information on the materials that will report to the waste dumps and stockpiles. The memorandum commences with the current understanding of the physical characteristics and production rates of these materials. The current layout of the waste dumps and stockpiles is presented along with the foundation conditions and the relative capacity and geometry of each facility. The proposed construction procedures are provided. Stability analyses have been performed on the larger of the two waste dumps and on the low grade stockpile. Details regarding the assumptions, methodology and results of these analyses are presented.

### **Technical Memorandum E**

#### **Supplemental Information on the PKCA and Settling Pond**

Technical Memorandum E provides supplemental information in relation to the processed kimberlite containment area and its adjacent settling pond. A review of tailings production and storage requirements is provided, followed by the layout of the proposed facilities. The next section of the memorandum provides a comparison of the selected layout with an alternative layout received as a result of the EIS review.

The current layout of the PKCA and the settling pond are presented along with the foundation conditions at each of the dam sites. A summary of the design criteria is provided, followed by analysis of the embankment design options. The remainder of the memorandum discusses the design, construction, operation and closure of the PKCA.

### **Technical Memorandum F**

#### **Site Water Balance and Load Concentration Model**

Technical Memorandum F presents an overall site water balance and load concentration model for the Jericho project site. The continuous simulation spreadsheet model has monthly time steps and includes process parameters, updated site hydrologic values, and average and maximum water quality source concentrations derived for all project components.

The memorandum presents monthly water net inflow volumes and storage variability over the life of the mine for the PKCA and Settling Pond. The model conservatively assumes that all site runoff will be directed to the PKCA during mining operations. Maximum PKCA storage requirements are estimated assuming there will be no releases from the PKCA for the first two years. Annual net inflow volumes to the various collection ponds are estimated for a range of precipitation return periods.

Average monthly concentrations of key water quality parameters are calculated at all collection ponds including Ponds A, B, C, the PKCA and the Settling Pond. Estimated average concentrations in the pit pond after closure are estimated assuming all site drainage will be directed into the open pit.

## **Technical Memorandum G Water Management Facilities Design Criteria**

Technical Memorandum G presents supplemental information regarding the design criteria, preliminary sizing and operation of the water management facilities around the Jericho Diamonds Project site. The facilities include diversion channels, collection ponds and related ditches, pumps and spillways.

## **Technical Memorandum H Supplemental Geochemistry**

Technical Memorandum H presents supplemental information on the geochemistry of the waste rock, low-grade ore and processing residues that will be produced at the Jericho project. Additional sampling and testing that was completed as part of the supplemental studies included:

- Water quality analyses on baseline seeps in the vicinity of the proposed waste rock piles, ore stockpiles, and coarse processed kimberlite stockpiles;
- Water quality analyses on seeps from the existing development waste rock pile;
- Fizz tests, contact tests, settling tests and acid base accounting tests on a limited number of waste rock samples from the development waste rock pile, and overburden samples from within the proposed pit area;
- Examination of fractures and joints in the development waste rock and drill core

Responses to issues raised by the project reviewers as part of the intervention process are also presented and discussed in Technical Memorandum H, including discussions on total metal analyses on Fine PK Supernatant, acid base accounting on fine processed kimberlite, geochemical properties of the recovery plant rejects, adequacy of ABA coverage, comments on acidic seepage at the coarse kimberlite rejects storage area at the Ekati Diamond Mine<sup>TM</sup>, freeze concentration of tailings porewater, chrysotile occurrence in the Jericho kimberlites, and comparisons of solid metal analyses to residential soil criteria.

## **Technical Memorandum I Estimates of Source Concentrations**

Estimates of source concentrations for seepage and discharges from each of the mine components were made to support the assessment of potential impacts on surface water quality and aquatic resources for the Jericho project. Technical Memorandum I presents information on the sources of data used in the estimates, the calculation methods, the approach used to narrow the range of predictions, and the proposed estimated source concentrations for each of the mine components.

Estimates of total dissolved salts (TDS), dissolved metals, total metals, and nutrients from blasting residues are presented for the waste rock and overburden piles, ore and low-grade ore stockpiles, and coarse processed kimberlite (coarse PK) stockpiles. Nutrients from sewage are estimated based on information provided by the waste water treatment plant supplier. Estimates of TDS, nutrient and metal concentrations for the other mine site components, including runoff in the open pit, tailings supernatant, ground ice, and runoff from disturbed areas of the site are also discussed.

## **Technical Memorandum J Ammonia Removal**


Technical Memorandum J presents and discusses a contingency strategy for ammonia-N removal from the PKCA and settling pond water. The memo includes a discussion of natural processes of ammonia removal, an assessment of how these processes perform under the conditions expected in the PKCA, and operating strategies for the proposed contingency plan.

## Technical Memorandum K Supplemental Information on Closure Plan

Responses to various comments on the closure and reclamation plan are addressed in Technical Memorandum K, including further information on revegetation and erosion protection, post-closure geotechnical stability, closure of the open pit, contaminated soils, post-closure water quality, closure of the water intake causeway and aesthetics issues. In some cases, the comments refer the reader to sections in other technical memoranda or documents prepared by AMEC.

Yours truly,

**Steffen, Robertson & Kirsten (Canada) Inc.**

A handwritten signature in dark ink, reading "Cameron C. Scott". The signature is fluid and cursive, with a long horizontal stroke extending to the right from the end of the name.

Cam Scott, P.Eng  
Principal