APPENDIX E

APPENDIX E DESKTOP GEOTECHNICAL ASSESSMENT

April 10, 2006 EBA File: 1100060.002

Tahera Diamond Corporation
Suite 1900, 130 Adelaide Street West
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Attention: Mr. Dan Johnson
Executive Vice President, Operations

Subject: Fuel Storage Facilities – Set 3
Desktop Geotechnical Assessment
Jericho Diamonds Project

1.0 INTRODUCTION

EBA Engineering Consultants Ltd. (EBA) has carried out a desktop geotechnical review of the earth foundations and liner design for the proposed expansion to the Jericho Tank Farm Facilities (Figure 1). This expansion is for the third set of fuel storage tanks and is herein referred to as Set 3. Authorization to carry out this work was provided by Mr. Tony Loschiavo of Tahera Diamond Corporation (TDC).

EBA provided geotechnical design guidelines for Set 1 and Set 2 tank farms described in our letter to TDC dated February 11, 2005.

This letter outlines the information that EBA has reviewed and provides recommendations based on the available information. Recommendations for additional work are provided in Section 6.0.

2.0 AVAILABLE INFORMATION

Available information reviewed included:

- Technical Memorandum A, Supplemental Geotechnical Data, Jericho Project, Nunavut, dated October 2003. Prepared by SRK Consulting Engineers and Scientists (SRK).
- Footprint of Proposed Tanks Development prepared by Nuna Logisitics (provided by Mr. Anthony Bayduza of Nuna Logistics).
- 1:20,000 Scale Aerial Photographs provided by Mr. Mike Johnson.
- Black and White Aerial Photographs provided by Mr. Mike Johnson.
- Letter, Drilling Investigation, Plant Site Facilities, Jericho Diamond Project dated April 15, 2005. Prepared by EBA Engineering Consultants Ltd. (EBA).

The SRK Report (2003) is a compilation of factual geotechnical information collected by SRK and others, since 1996. Although none of the subsurface investigation borehole

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information pertains directly to the area of the Tank Farm, the report provides 1:20,000 scale surficial geology mapping prepared by Thurber Engineering Ltd. (TEL) in September 2003 and draft results of a 1996 borrow investigation by Bruce Geotechnical Consultants Inc (BGC).

EBA's letter, dated April 15, 2005, details six boreholes drilled for the Set 2 tank farm expansion between March 23 and 27, 2005. Boreholes were drilled at the centre of each tank location and two additional holes were drilled adjacent to the centre of the southeast tank.

3.0 DESCRIPTION OF TANK FARM

Set 1 and Set 2 Fuel Storage Areas were completed by October 2005. The existing Set 1 and Set 2 tank farm layouts and proposed Set 3 tank farm layout, were prepared by Nuna Logistics Ltd. (Nuna). Figures 1 and 2 show the Nuna layout overlain on the available topography (Figure 1) and aerial photo (Figure 2). Figure 3 shows a schematic cross-section that includes the Set 3 tank area.

Probe holes were drilled at the center of each of the four Set 2 tanks. Approximately 2.1 m of ice-rich silty sand was observed at Probe Hole 110 under the southeast tank. Two probe holes, 128 and 129, were drilled about 2 m west and east of 110. Both of these probe holes showed additional silty sand overburden to depths of 1.8 and 3.3 m (includes a 0.6 m boulder), respectively. The silty sand appears to be ice-rich. Probe Hole 111 (southwest tank) has a reduced overburden thickness of 0.75 m. Probe Hole 112 (northeast tank) had shallow overburden of 0.3 m; at Probe Hole 113 (northwest tank) there was about 2.4 m of run-of-mine fill overlying bedrock.

Based on this information, it appears that the natural terrain underlying the Set 3 tank farm is relatively flat-lying and poorly drained. Available surficial geology mapping suggests that bedrock may be near surface but this is not definitive. The most recent surficial geology by TEL describes the area to be "undifferentiated metamorphic and volcanic bedrock. Several columnar jointed dykes strike across the eastern map area. Very complex areas of bedrock and colluvium occur on north facing slopes located directly south of Carat Lake." TEL indicate, in their terrain assessment, that bouldery colluvium, organic deposits and possible alluvium can interfere with differentiation between till and bedrock from aerial photographs.

The Set 3 Tank Farm will also overlie placed rockfill near the shoulders of the Set 2 Tank Farm and the road embankment located immediately north of the Set 2 Tank Farm.

4.0 BORROW SOURCES

EBA understands that the granular fills used for construction of the Set 3 Tank Farm will consist of ROM granite from Jericho pit. Processing of the ROM will be necessary to obtain the specified 150 mm and 20 mm materials.

Should winter construction be undertaken, best practices for resourcing granular materials for winter construction will require careful selection of materials and sorting to extract sand or sand and gravel that are very weakly bonded at freezing temperatures and free of any excess ice.

5.0 EVALUATION AND RECOMMENDATIONS

5.1 GENERAL

The proposed design described herein is based on assumptions made by EBA on the subsurface conditions at the proposed tank farm site.

5.2 SITE PREPARATION

The tank farm will comprise a lined, bermed spill containment area, for a set of two, 14.63 m diameter by 9.75 m high, tanks (Set 3). The Set 3 tanks will be filled for the first time during the winter of 2006/2007. The facility is expected to be in use for about 10 years.

It is possible that thick natural deposits of ice-rich glacial till materials exist discontinuously over bedrock in the tank farm footprint, similar to the terrain beneath Set 2 Tank Farm. If allowed to thaw under the weight of the proposed fills and tanks, these materials would be susceptible to differential thaw settlement. Assuming that ice-rich soil exists, the design objective is to construct fills that will preserve the native soils in a frozen condition. This can be accomplished by constructing a sufficiently thick non-frost susceptible granular fill pad.

Seasonal freeze thaw depths in well drained coarse grained fills at the Jericho site are estimated to be about 3.5 m and therefore a minimum fill thickness of 3.5 m is recommended.

It is understood that a crusher is available to facilitate the production of aggregates.

Observations of the native undisturbed ground conditions in the tank farm should be made on site by EBA prior to the placement of fills. Disturbance of the natural ground should be minimized for winter construction except for leveling purposes. It is strongly recommended that the site preparation commence by benching into the toe of any existing Set 2 tank farm fills so that the new tank farm fill is keyed into competent existing fills.

5.3 FILL MATERIAL PLACEMENT

The recommended design cross-section incorporates a combined minimum thickness of 3.5 m of granular fill placed above a level grade to the elevation of the bottom of the liner, as shown in Figure 3. The Run of Mine (ROM) material from Jericho pit would be adequate for constructing the first 3.0 m of granular fill, provided it is placed using best construction practices. A controlled rockfill, constructed using best practices, ordinarily implies some maximum rock size (ideally about 600 mm diameter) with a consistent distribution of particles sizes and consistent methodology for placing the fill.

It is recommended that at least a 500 mm thick layer of 150 mm minus crushed material be placed over the surface of the ROM to reduce the possibility of any loss of liner bedding materials into the voids of the rockfill. Bedding material used below the liner may be either manufactured crushed materials or imported sand. Typically either 20 mm maximum size crushed materials or 50 mm maximum size granular materials with rounded particles may be used. Sharp aggregates in the crushed sand and gravels that are greater than 20 mm diameter can cut liner materials. A thin layer of sand and/or a heavy weight (12 ounce) non-woven fabric can be used to provide protection to the liner from aggregates of 20 to 50 mm diameter size. Crushed granular fills with 50 mm maximum size should also be used to construct the interior and perimeter berms. Use of a 50 mm material for the berms makes excavation of an anchor trench for the liner installation more practical. All materials placed should be observed and recorded by qualified geotechnical personnel.

Some material placement may occur during winter conditions. It is imperative that all fill materials be compacted as they are placed. Research and past experience has shown that winter compaction of dry coarse granular fill materials can significantly increase the in situ density even though it is impractical to moisture condition these materials to the optimum moisture content. It is also imperative that all snow be carefully cleared from the ground surface before any fill materials are placed such that it does not become part of the embankment and then lead to settlement during the summer following construction. Any snow that accumulates during fill placement or during periodic storms must be removed as well. Fill materials with snow in them should be rejected. Certainly, winter placement of the fill materials will lead to lower densities than could be achieved in the summer.

Past experience has shown that compaction of coarse rockfill is not feasible with normal compaction equipment because it is very hard on the equipment. EBA has observed fills constructed using 600 mm maximum size material. The most effective technique employed with this material has been compaction with a large dozer and loaded haul trucks. All remaining granular materials materials should be compacted with large smooth drum vibratory compactors.

All aspects of fill placement should be monitored. A spotter should be positioned beside the dozer to monitor the placement and thickness of the backfill. Close monitoring of the fill placement is critical to reduce the risk of puncturing the liner. Hand excavation of small test pits to check backfill depths and liner integrity may be necessary.

6.0 RECOMMENDATIONS FOR ADDITIONAL WORK

Settlement performance of the tanks should be monitored until such time as the tanks settlement performance has been established. In spite of the application of best practices, settlements may occur. Settlements related to the thaw of isolated pocket of frozen fills with excess ice are most likely to occur in the first year.

7.0 LIMITATIONS

The recommendations provided herein are based on our review of the information described in Section 2.0. It is recommended that site preparation and observation of the fill placement for the tank farms, be monitored by qualified personnel under the direction of a geotechnical engineer. Quality control of the liner materials and installation should be undertaken by liner specialists.

Although the recommendations in this report are intended to provide the guidance necessary to complete design and reduce the likelihood of changes at the time of construction, changes may be required.

This letter report has been prepared in accordance with generally accepted foundation engineering practices. No other warranty is made, either express or implied. Reference should be made to EBA's Geotechnical General Conditions, attached to this letter report, for further limitations.

8.0 CLOSURE

EBA trusts that this report satisfies your present requirements. If you require any additional information please contact us.

EBA Engineering Consultants Ltd.

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Attachments Figures
EBA Geotechnical Report – General Conditions

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