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**RE: Tehera Diamond Corporation – Jerhico Landfill Design, Waste & Hazardous Materials Management Plan - 2AM-JER/TR/D6, H5**

I would like to thank the Nunavut Water Board for providing Environment Canada time to review and comment on Tehera Diamond Corporation's Landfill Design and Waste Management Plan. The following specialist advice has been provided pursuant to Environment Canada's mandated responsibilities for the enforcement of the *Canadian Environmental Protection Act*, Section 36(3) of the *Fisheries Act*, the *Migratory Birds Convention Act,* and the *Species at Risk Act*.

The Jericho Diamond Mine is located in the West Kitikmeot region of Nunavut, approximately 350 km southwest of Cambridge Bay, Nunavut. The Proponent has submitted a Landfill Design, Waste & Hazardous Materials Management Plan as a requirement of Part D, Item 6 & Part H, Item 5 of their water license. The mine generates a variety of wastes, both hazardous and non-hazardous. A landfill is used to dispose of non-hazardous wastes that cannot be recycled and is the subject of this landfill management plan. Food wastes are incinerated and hazardous materials are separated, stored and sent off-site for disposal or for the recycling of hazardous recyclables via the winter road.

**Regulatory**

- Environment Canada would like to remind the proponent that in addition to the mandatory regulations listed in section 2.0 *Regulatory Setting,* the *Fisheries Act* shall apply in association with water use for waste disposal and camp operations at the Jericho diamond mine. The proponent shall not deposit, nor permit the deposit of any fuel, chemicals, wastes or sediment into any water body. According to the *Fisheries Act*, Section 36(3), the deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water, is prohibited.

- In section 3.5 *Burning* the proponent is unclear concerning it's commitment to the FSC (2003) guideline. The proponent states "the landfill has been designed to conform to the requirements of the *Guideline"* and "those principals that are applicable have been adopted in the design". Burning is a practice which is strongly discouraged in the FSC (2003) guideline. The proponent should clearly describe the rational behind choosing plan designs which do not adhere to the FSC (2003) guideline. For instance the Plan may be in conflict with the following parts of the FSC (2003) guideline:

**i) Open Pit Burning**

- Environment Canada recognizes that timely disposal of camp waste - specifically food waste - is of critical importance to minimize safety risks associated with wildlife attraction. Timely disposal is

usually achieved through burning. However, burning of waste products releases numerous contaminants to the air, many of them persistent, bioaccummulative and toxic (e.g. polycyclic aromatic hydrocarbons - PAH's - heavy metals, chlorinated organics – dioxins and furans). These contaminants can result in serious impacts to human and wildlife health through direct inhalation and they can also be deposited to land and water, where they bioaccumulate through food chains affecting wildlife and country foods. Therefore, burning should only be considered after all other alternatives for waste disposal have been explored. If burning is the only alternative available, **the proponent should ensure that the waste is burned in a device that promotes efficient combustion and reduction of emissions,** and that the amount of waste burned is reduced as much as possible.

- The proponent should ensure that the installation of an incineration device is capable of meeting the emission limits established under the *Canada-wide Standards (CWS) for Dioxins and Furans* and the *CWS for Mercury Emissions* is required (both the Government of Canada and the Government of the Nunavut are signatories to these Standards and are required to implement them according to their respective jurisdictional responsibility).
- The use of appropriate waste incineration technology should be combined with a comprehensive waste management strategy (especially waste segregation) that is designed to reduce and control the volumes of wastes produced, transported, and disposed of.
    - The **Waste Management Plan** should consider and include:
        - Purchasing policies that focus on reduced packaging,
        - On-site diversion and segregation programs (i.e. the separation of non-food waste items suitable for storage and subsequent transport and disposal or recycling).
        - If incineration is required, ensure diligent operation and maintenance of the incineration device and ensure appropriate training is provided to the personnel operating and maintaining the incinerator.

      The objective should be to ensure that only food waste and food-contaminated waste is burned (the use of paper, cardboard and clean wood as supplementary fuel is acceptable).
- Used absorbent materials, oily or greasy rags, and equipment servicing wastes (such as used engine oil, antifreeze, hydraulic oil, lead acid batteries, brake fluid and other lubricants) should be safely stored and transported in sealed containers (odour free to prevent animal attraction) and safely transported to a facility that is authorized for the treatment and disposal of industrial hazardous wastes.

**ii) Surface water**

- A minimum of three sampling stations are required for an efficient surface water monitoring program. (FSC Guidelines). In addition, there is no mention of upstream monitoring included in the plan.

**Sludge Pit**

- Section 3.6 *Sludge Pit* the proponent briefly outlines the use of a sludge pit for the disposal of solids received form the wastewater clarifier (WWC). The solids are placed into a pit adjacent to the landfill within the waste rock dump. Downslope groundwater water quality monitoring is used to maintain a review of any potential changes to surface and subsurface water quality from flows that may come from the rock dump area. All downslope flow is directed to the pit catchment area. Environment Canada has concerns about the operation and performance of this sludge pit. Water of this nature should not be running freely overland. EC recommends that more details be provided to the NWB including how water in the pit will be managed, if a liner is being used to prevent groundwater leaching, how will the water be collected should it run freely from the pit? In addition, Tahera has not adequately addressed mitigation measures for potential changes to surface and subsurface water quality from flows that may come from the rock dump area.

- According to the *Fisheries Act*, Section 36(3), the deposition of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance,

or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water, is prohibited. Successful long-term performance requires pro-active detection and resolution of problems prior to significant environmental impacts. In order to help mitigate further impacts to water quality, EC recommends that this include:

- Tahera shall ensure that all effluent is directed to a sump that is properly constructed and adequately sized to ensure there is no run-off and that water bodies downstream of disposal are not affected. All efforts shall be made to prevent contaminated water from running uncontained from the sludge pit.
- The proponent should have a contingency plan if water quality does not meet defined limits or criteria.
- If elevated concentrations of contaminants are being measured in the receiving environment despite recommended improvements to the sump construction and maintenance identified above, Tahera shall implement alternative methods of containment.

In general, more detail is required for the water sampling program of the sludge pit and landfill to ensure that there is no adverse impact on surface and subsurface water due to the waste. Details in the plan were very limited so it was impossible to confirm whether or not the sampling program is adequate and protective of the environment.

**Fencing**

- Environment Canada recommends that the proponent erect fencing around the entire perimeter of the solid waste disposal area in order to decrease the amount of windblown refuse.
- The Plan states that one of the mitigation measures to limit the number wildlife attractants to the landfill site is by limiting the number of attractants (e.g., food waste, oil products, plastics). It is unclear whether this means the proponent will merely reduce the number of attractants at the landfill site or **totally eliminate** any potential attractants from the landfill site. EC recommends that all potential products that are attractants to wildlife be made inaccessible to wildlife at all times. Camp waste can attract predators of migratory birds (e.g., foxes and ravens) to an area if not disposed of properly.

**General**

- Section 6.0 Landfill Management states “Equipment containing petroleum hydrocarbons will be drained prior to landfilling. The waste petroleum products will be disposed of in waste oil cubes for backhaul on the winter road to a licensed hazardous materials disposal contractor or burned in a waste oil burner”. EC is concerned there are inadequate provisions made to ensure that equipment contaminated with hydrocarbons will be properly cleaned prior to being placed in the landfill. A more rigorous plan should be provided outlining protocol that assures that hazardous materials are not disposed in the landfill.
- The Plan does not address how products contaminated lead will be handled. There are a few options in disposing of these types of contaminates. One is to dispose of the components off site as hazardous waste. The second is to remove any lead paint on site and dispose of with components on site with the non-hazardous waste. If the Proponent anticipates having to dispose of any waste contaminated with lead paint clarification is required regarding which option will be implemented. If the decision is made to remove the lead paint on site, detailed information is required regarding how the lead chips will be contained on site, and if water is used, how the water will be contained and treated.
- All hazardous waste should be removed from the project site and disposed of in an approved disposal facility.
- The Plan should address the total volumes of waste which will be placed in the landfill.
- The documentation should address options for testing for and disposing of contaminated soils.

If there are any changes in the proposed project, EC should be notified, as further review may be necessary. Please do not hesitate to contact me with any questions or comments with regards to the foregoing at (867) 975-4631 or by email at cindy.parker@ec.gc.ca.

Yours truly,

***Original signed by***

Cindy Parker
Environmental Assessment Specialist

cc: (Carey Ogilvie, Manager Environment Canada, EPOD, Yellowknife, NWT)