Environment Canada **Environnement Canada**

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RE: NWB4KRK – Department of Public Works and Services (GN) – Kugaaruk Landfarm Project – New- Type 'B'

On behalf of Environment Canada (EC), I have reviewed the information submitted with the above-mentioned application. 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 Government of Nunavut's Department of Community and Government Services (formerly the Department of Public Works and Services) is applying for a Type 'B' water licence for water use and waste disposal associated with landfarm activities in the Hamlet of Kugaaruk. In response to a 2001 soil contamination study of the community's bulk fuel storage facility area, it was deemed necessary to treat 3,500 m^3 of sandy gravel for hydrocarbon pollution. The proponent has decided to construct a landfarm for treating this soil. Its design will consist of two cells, one for contaminated soil and the other for soil water runoff. The construction of this landfarm has been scheduled for completion in the summer of 2005 and operation in autumn of 2005.

The landfarm's selected location is adjacent to the proposed community sewage lagoon and landfill facilities. This location is approximately 1.5 km southeast of Kugaaruk and 1.2 km east of the ocean (St. Peter Bay). Its separation from populated areas and ability to employ existing transportation routes for the transfer of contaminated soils have made it a preferable site. The contaminated soil will be delivered directly to the soil treatment cell by truck.

The soil treatment cell will have a total capacity of 3,500 m^3. It will be surrounded by a 1 metre high earth berm, have a hydrocarbon resistant geomembrane, and have monitoring wells for the analysis of ground water hydrocarbon content. The treatment cell's base and berms will be lined with a geotextile and an impermeable hydrocarbon

resistant liner. Three culverts will be located in the cell's south interior berm and the cell will be sloped in a manner that allows water runoff to flow into the second treatment cell which is capable of holding 1,500 m^3 of water. The water runoff containment cell is also equipped with a geosynthetic liner.

The proponent is aware that arctic conditions are not ideal for landfarming. Arctic soils have poor organic content which is needed to foster the growth of bacterial populations that break apart hydrocarbons. In addition, the relatively low average temperature of Kugaaruk lengthens the time required to remediate soils contaminated with hydrocarbons. It is anticipated that the remediation of the contaminated soils will take six to nine years.

Prior to the removal/disposal of landfarm soil, representative samples will be tested according to the following criteria:

-BTEX-CCME Environmental Quality Guideline for Soil – *commercial site*
-F2 to F4 Hydrocarbon Fractions – Canada Wide Standards (CWS) – *commercial site* – coarse grained soils

The upper 30 cm of soil will be sampled at the end of every treatment season. Full depth core samples will be submitted to a CAEL accredited laboratory for analysis.

Water samples from the water runoff containment cell will be taken in mid-summer of each treatment season. As a means of ensuring adequate storage capacity, this cell will be lowered every year. Prior to the discharge of water, samples will be analysed using the following criteria:

-BTEX-CCME Environmental Quality Guideline – Surface Water – Marine Aquatic Life
-Total Hydrocarbons – (C10 – C16) – Less than 5 mg/L

If the runoff water meets these criteria, it will be pumped over the south corner of the cell's berm onto a splash pad of local rock. The apparent flow pattern will initially follow the route of the existing gravel road to the south and west. As the discharged water passes through or under the road it will follow natural surface drainage patterns to St. Peter Bay. If the water does not meet the discharge criteria it will be sprayed over the soil treatment cell.

When water samples are taken from the water runoff containment cell, the monitoring wells will be checked for the presence of groundwater. If water is present in any of the wells, samples will be sent for laboratory analysis of hydrocarbon content. Before each spring melt, as much snow cover as possible will be removed from the landfarm's cells in preparation for upcoming treatment seasons.

Environment Canada reminds the proponent that all permits and approvals are required prior to the commencement of any work.

Environment Canada requests that the proponent provide the NWB and EC with an explanation as to why soil samples will be analysed at the *commercial* CCME and CWS classification rather than under the *industrial* classification.

Environment Canada is concerned that the landfarm's water runoff containment cell does not have an adequate storage capacity. It is requested that the proponent explain to the NWB and EC what measures will be taken to contain contaminated water if water is not discharged following one or more soil treatment seasons.

The proponent has stated that the discharged water will percolate into the land and gradually flow toward the ocean (St. Peter Bay). Due to the possibility that a community sewage lagoon and clean landfill will be established adjacent to the landfarm, EC is curious to know if the drainage pattern employed by the landfarm will negatively affect the environmental quality of these facilities (i.e., hydrocarbon contamination). If so, are there any mitigation measures to prevent such contamination. There is a possibility that the cell berms (both soil and water runoff containment cells) will breach and result in hydrocarbon contamination of the area which surrounds the landfarm facility.

Furthermore, Environment Canada would like to know where the proponent intends to deposit the landfarm soil once treatment is complete.

Environment Canada recommends that the following conditions be applied throughout all stages of the project:

GENERAL

- 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.

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 if you have any questions or comments with regards to the foregoing at (867) 975-4631 or by email via david.abernethy@ec.gc.ca.

Regards,

David W. Abernethy
Environmental Assessment Technician