# PROJECT SUMMARY

## PROPOSED LANDFARM, KUGAARUK, NUNAVUT
## File No. NWB4RK

An environmental site investigation conducted in 2001 for the Nunavut Public Works and Services Department revealed several areas of soil contaminated with petroleum in the vicinity of a bulk fuel storage facility in the Hamlet of Kugaaruk. The affected area is close to residential buildings and it was recommended that the contaminated soil be excavated and transported off site to ensure the safety and health of the residents.

The site investigation report estimated that 3500 $m^3$ of soil would have to be removed. The soil is contaminated primarily with fuel oil at concentrations exceeding the Canada Wide Standards for residential areas.

To treat the contaminated soil, the Nunavut Public Works and Services Department arranged for the design and construction of a soil treatment landfarm at a location 1.5 km south-east of the community. The site is beside an existing gravel road and to the east of the sanitary landfill and sewage lagoon servicing the Hamlet of Kugaaruk. The landfarm consists of a soil treatment cell and a water retention cell. Both cells are surrounded by compacted earth berms with a height of approximately 1.5 metres. The interior walls of the berms and the base of the cells are equipped with an impermeable liner, a geotextile liner and a sand bed. The treatment cell has been sized to accept the entire estimated volume of contaminated soil at one time. The water retention cell is designed to store any run-off from the treatment cell and has been sized to hold the equivalent of at least one year's precipitation.

The soil will be piled to depth of one metre within the treatment cell. The top 30 cm. will be tilled on a weekly basis during frost free months to promote aeration and breakdown of the petroleum contaminants. Samples of the tilled soil will be taken at the end of each treatment season for lab analysis. If the contaminants have been reduced to acceptable levels, the upper soil layer will be removed to an approved location the following year. In the event that acceptable contaminant levels are not achieved after two treatment season, nutrient and bacterial additives may be worked into the soil to promote better breakdown of the hydrocarbons. Once the upper soil layer has been removed, the same treatment process will be used on the next 30 cm. layer. It is estimated that six to nine years will be required to treat the entire volume of soil in the cell.

Water in the retention cell will be sampled in mid-summer. If the lab results indicate that the water meets appropriate criteria, the cell will be discharged before freeze-up to ensure adequate capacity for the following year. The discharged water will flow over natural surface drainage patterns and ditches and will eventually reach St. Peter Bay. If the water is found to contain unacceptable hydrocarbon levels, it will be sprayed over the soils in the treatment cell.

A series of monitoring wells will be placed around the two downslope sides of the landfarm. The wells will be checked when the water samples are taken from the retention cell. If groundwater has accumulated in the wells, samples will be taken for analysis to confirm that there is not subsurface migration of contaminants from the landfarm.

After all soil has been treated and removed, the landfarm will be dismantled. Liners and berms will be removed, and natural drainage patterns will be restored over the site.

*English Version Prepared by Wardrop Engineering*