Hamlet of Tuktoyaktuk

Water

Water Licence Reporting

Sewage

September 2004 Landfill Condition Assessment

Solid Waste

EarthTech
A tyco International Ltd. Company

July, 2005

Tuktoyaktuk Landfill

Condition Assessment Report – Fall 2004

Prepared 2005 07 29

1.0 Background

1.1 Site Description

The Tuktoyaktuk Solid Waste Disposal site is a large fenced-in facility on the Tuktoyaktuk Peninsula, approximately 3 km south of the Hamlet (See Figure 1, Facility Location). It has been in operation since the early 1970's, as a replacement to the dump formerly located at the end of the community airstrip. The facility covers an area of approximately 20 hectares, but only a portion of the area is currently in use.

The active area, at present, is the area for municipal solid waste (MSW) disposal (See Figure 2, Landfill Site). The centre of the site, and the vast majority of the surface area of the site is covered by a pond (lagoon) containing surface runoff. The pond water is retained on the eastern edge by a 250 m long gravel/clay berm.

Wastes are dumped in the active area by the Hamlet garbage collector and residents, but there are only limited signs indicating where waste should be deposited, or what types of waste, if any, are prohibited at the landfill site. Scavenging of wastes at the landfill is common activity.

1.2 Site History

In the period from the 1970s to 1984, the disposal area was on the northern side of the site and the area was covered with fill. There has been uncontrolled dumping of debris of various descriptions throughout the entire fenced area, including this abandoned section. The south side of the site had limited use as a disposal area. The southwestern corner contains large pile of bulky waste, mostly comprised of derelict vehicles, and metal construction debris.

During the peak oil exploration period Tuktoyaktuk was home to as many as five base camps at any one time. Tuktoyaktuk was also the location of a DEW Line site until the facility was permanently closed in 1993. Many of these operations used the Hamlet's landfill to dispose of their waste.

In 1986, a plan was developed to fill in the areas prone to flooding with a layer of compacted debris (to an elevation above sea level), and then cover the debris with fill. It was recommended that separating the wastes into areas should continue, that the landfill should be secured, and that uncontrolled dumping should be prohibited.

In 1992, it was proposed to build an impermeable berm along the western side of the site to prevent the ingress of storm tidewaters, and the outflow of landfill debris. The berm was intended to be high enough to prevent flooding under typical storm conditions. The Hamlet built the berm using community resources.

The operating area of the landfill for MSW, until 2002, was in the northeast portion of the site. This area was closed and remediated in 2003, and the current operating was opened in the southeast portion.

1.3 Land Use and Environmental Factors

The historical use and management of the Tuktoyaktuk landfill site has in many ways dictated the current condition of the site, and the environmental and land use factors. Although the current site is not ideal from its proximity to land use features such as the airport, the Reindeer Point subdivision, and the community itself, it is an improvement over the original landfill location at the end of the airport runway.

The landfill proximity to the airport is not so much of an issue with regard to distance, as it is with regard to the potential flight paths of birds in the area. The expected movement of birds from the community core to and from the landfill crosses the centreline of the runway, and this creates a potential bird hazard to aircraft. The ultimate hazard is also dependent upon the type of aircraft (propeller versus jet propulsion), and the type of birds frequenting the landfill and the community.

The landfill proximity to the Reindeer Point subdivision is currently a visual aesthetic issue, and may become a health issue with the planned development of the adjacent subdivision to the west of Reindeer Point. A portion of this subdivision will be within the 450 setback regulation for landfills of the Public Health Act.

The environmental factors associated with the landfill include surface water pollution, and subsurface water pollution. Surface water pollution is a concern with any landfill, and in the case of Tuktoyaktuk, the extensive "Environmental Assessment of the Tuktoyaktuk Solid Waste Site" by the Royal Military College(RMC) (March, 1997 Report) produced the following conclusions.

1. "The level of contaminants found in water in the landfill lagoon were below the guidelines for the Discharge of Municipal Wastewater in the NWT".
2. "The assessment of the surrounding marine environment indicated that it has not suffered any adverse effects from the landfill".

This information supports a recommendation in the RMC Report that "it is permissible for the landfill lagoon to be discharged into Kugmallit Bay inlet adjacent to the site". A controlled seasonal discharge from the pond was an operating condition added to the community's water licence in 2002.

2.0 Access

The landfill site is accessed from one entrance along the adjacent road at the southeast corner; the road provides access to the MSW area (See Figure 3, Landfill Site September 15, 2004)). This access does not have a gate to limit community access at any time. The access road is in reasonably good condition.

The landfill site has a 1200 meter perimeter fence around the entire land side of the landfill site. The ocean side of the landfill site to the west does not have a perimeter fence. The perimeter fence is generally in good condition.

3.0 Waste Disposal Areas

The waste disposal area of the landfill site is organized into the MSW area to the southeast (See Figure 3, Landfill Site September 15, 2004). The MSW area occupies an area approximately 70 metres wide and 30 metres deep; the active area of the MSW area is the entire 70 metre width. The area is managed without burning, and with limited compaction, and limited cover. The MSW area has no organized areas for household hazardous waste storage, although some hazardous is stored adjacent to the site.

A former bulky waste area in the southwest corner of the site was remediated in 2004 with cover material. A replacement operating area for the bulky waste site has not been identified.

The MSW area could be better managed with regard to dumping control, and the operating area. The landfill area has very limited signage to define the operating areas and operating limitations. MSW is deposited out into the on-site drainage retention pond, which is not an ideal practice; normally waste would be deposited into "cells" in the active landfill area.

4.0 Drainage Control

The landfill area employs a perimeter berm approximately 250 metres in length to manage or control on-site drainage (See Figure 3, Landfill Site September 15, 2004). The berm was reconstructed in 2004 to repair the ongoing erosion from wave action. The berm does not have any discharge control structure, therefore the drainage accumulates from the site. The perimeter berm also prevents to ingress of the ocean, which in the past has caused debris to float away with the tides.

The on-site drainage area is discharged annually as part of the water licence operational conditions. The area was discharged (decanted) in the fall of 2004 in compliance with the conditions of the licence. Water samples were taken in advance of the discharge, and all of test parameters were acceptable.

The off-site drainage is not managed or controlled, therefore the off-site drainage from the adjacent height of land accumulates within the site. The contributing area from the adjacent height of land is however, quite limited.

5.0 Site Remediation

A considerable effort has been undertaken in the past several years for site remediation in the north central, and north eastern portions of the site. This work continued in 2004 with the remediation of the bulky waste area in the southwest portion of the site.

6.0 Overall Site Management

The landfill area is influenced most significantly by the lack of organization, and management of the MSW area. This area requires organization for MSW disposal, and household hazardous waste storage. The MSW area requires management (signs and barricades) to limit the MSW disposal area into a more manageable (smaller) area. Discrete cells should be constructed in the MSW area to better manage the waste disposal and limit the deposition of waste into the on-site drainage retention pond.

The landfill also requires the identification of a bulky waste area to replace the area that was remediated in 2004.

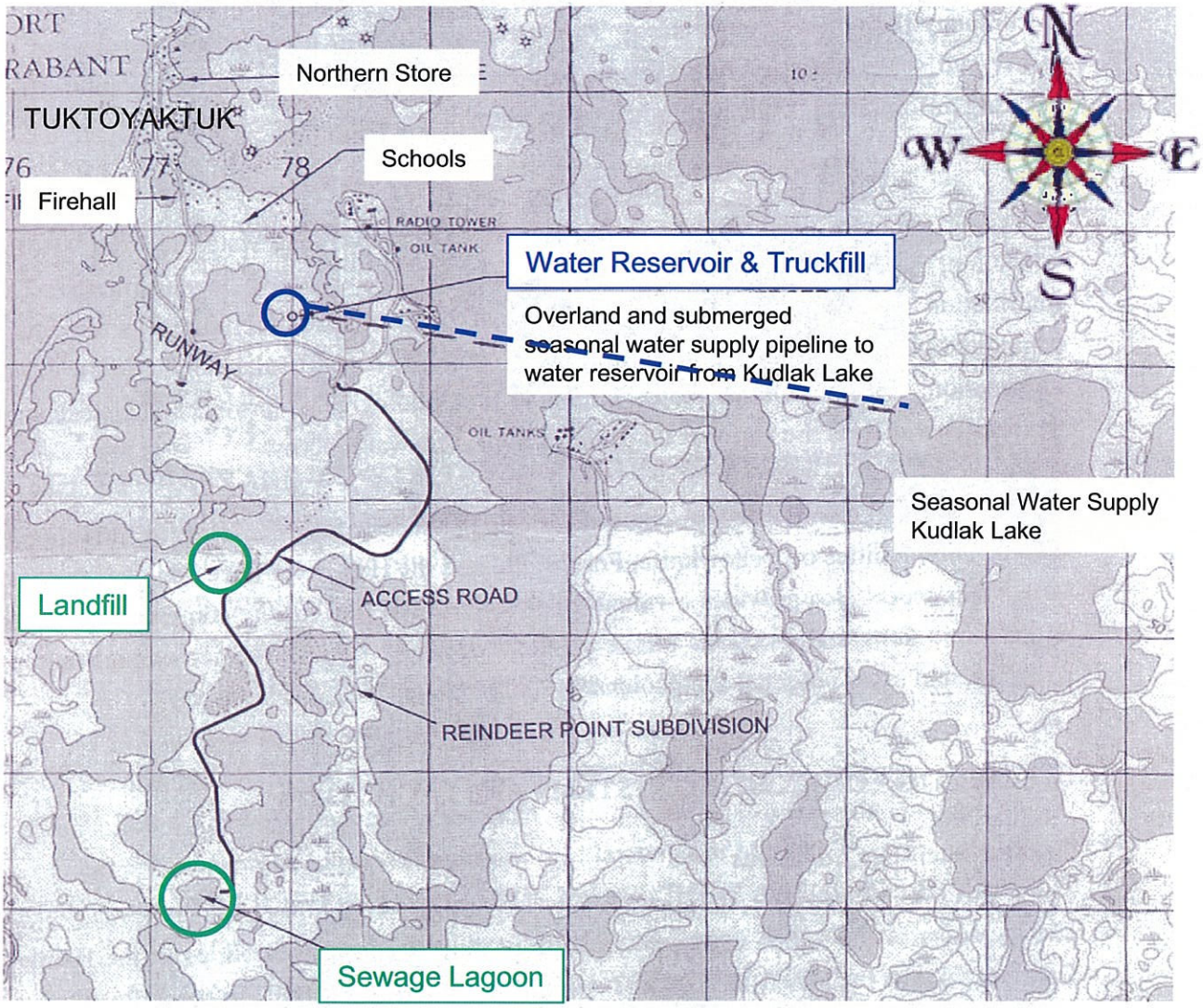

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Figure 1. Facility Location

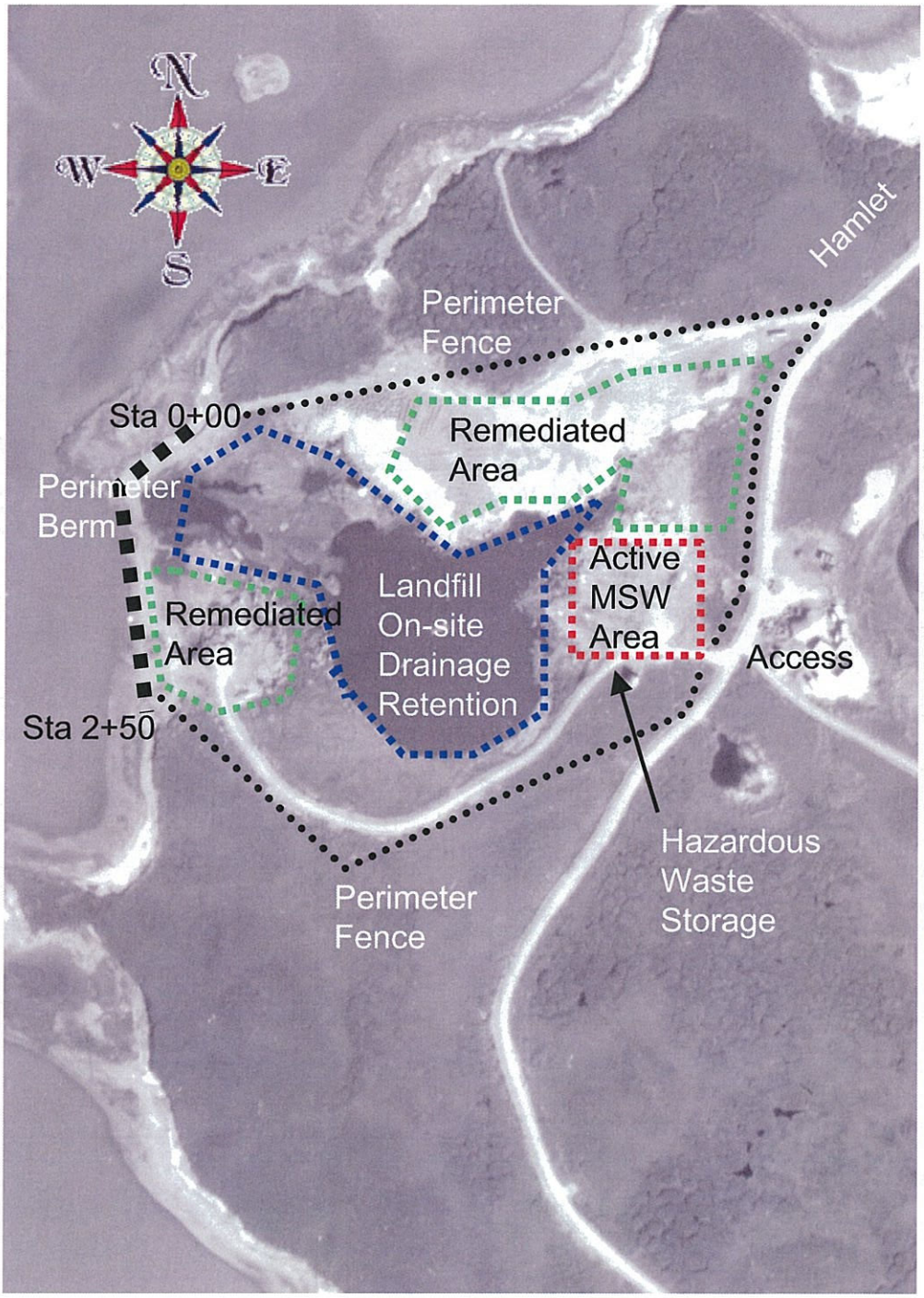

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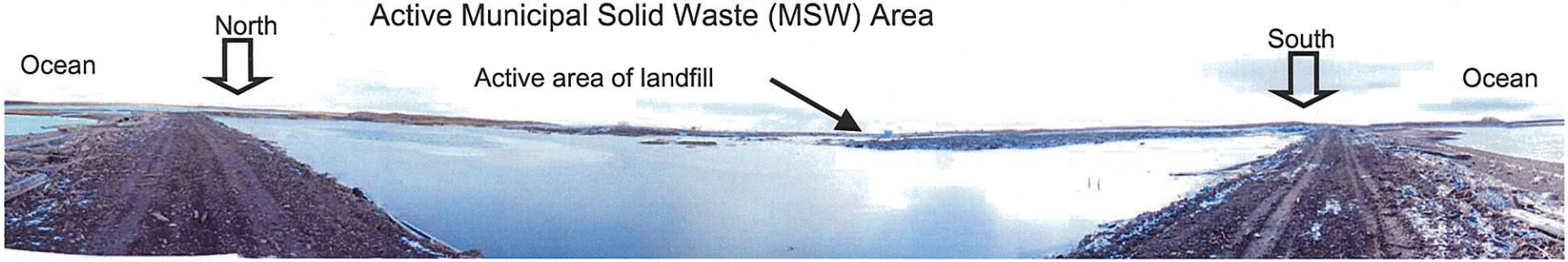
Figure 2. Landfill Site

Entrance to Municipal Solid Waste (MSW) Area

Active Municipal Solid Waste (MSW) Area



Perimeter berm

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Figure 3. Landfill Site
September 15, 2004