1. Tier II Soil Disposal Facility

1.1 Landfill Summary

A DCC Tier II Soil Disposal Facility has been constructed at the Gladman Point site for the disposal of Tier II soil excavated during the clean-up. The Facility is located at the northwest corner of the former station area, and about 50m south of the Station Area Landfill. The design of this landfill included a double containment system consisting of a liner system and the placement of sufficient surface fill to promote freezing of landfill contents. The liner was placed over the bottom of the landfill, over the perimeter berms, and then over top of the landfill contents. Thermistor strings were installed within the landfill and monitoring wells were installed around the landfill perimeter. The landfill configuration and sample locations are shown on Figure C-1. The long term monitoring plan consists of visual monitoring, collection of soil and groundwater samples, and monitoring of subsurface ground temperatures in the berms and in the main body of the disposal facility.

For 2008, the monitoring requirements for the DCC Tier II Disposal Facility included visual inspection, soil sampling, groundwater sampling, and thermal monitoring.

1.2 Visual Monitoring

A visual inspection of the Tier II Landfill was completed on August 20, 2008. Based on the visual inspection, the Tier II Soil Disposal Facility appears to be in reasonably good condition overall. The condition of the landfill is substantially unchanged since 2007. Previously noted tension cracks and areas of minor surficial erosion (noted at the time of the 2007 inspection) appear to have stabilized and show no indication of further degradation.

The granular cover appears to be self armouring and resistant to erosion. Areas of previously observed minor surficial erosion, described as washing out of fine-grained material from the coarse granular matrix in the 2007 inspection report, appear to have stabilized and show no indication of further degradation. There are no erosional features that warrant remediation at this time.

Photos 1 thru 15 provide general overview documentation of the landfill slopes and upper surface. Photos 16 thru 30 document the observed tension cracks.

Numerous thin tension cracks, typically on the order of 1mm to 5mm width, were observed around the crest and perimeter of the north and west sides of the Tier II landfill. In all instances, the cracks were roughly parallel to the toe of slope and in multiple locations there were several roughly parallel sets of cracks between the toe of slope and crest. The tension cracks along the lower portion of the slope are essentially continuous, although portions of the crack were largely obscured by sediment infilling associated with fines washing out of the granular fill and being deposited in the cracks. Many of the tension cracks that were observed in 2007 appear to have been infilled with fines and could not be

located in 2008. The cracks that were observed showed clear signs of weathering (rounded sides, partial infilling) and no indications of recent movement.

Based on a visual assessment, the granular cover material appears to contain sufficient fines (i.e., >5% silt sized particles) to make it potentially frost susceptible. Given the gradation of the granular cover, it is anticipated that some of the observed tension cracks may be related to freeze/thaw processes. The orientation and spacing of the tension cracks suggests minor slope movement, however, the landfill slopes appear to be stable and do not appear to be in imminent danger of large-scale movement.

Given the relatively large number of hairline cracks that were observed in 2007, combined with the tendency of washed fines to obscure visual identification of the tension cracks over time, it would appear that the bulk of the tension cracks that were observed in 2007 were recent. However, the cracks that were observed in 2008 appear to be the weathered remnants of the earlier cracks with little indication of recent movement.

From the visual inspection during the site visit, there does not appear to be any significant erosion or cover issues that require immediate attention or that would be expected to lead to degraded cover performance in the near term. No immediate action is warranted. The tension cracks have been documented in detail to facilitate on-going monitoring. The overall preliminary stability assessment of the Tier II landfill is marginal.

Figure C-1 Tier II Soil Disposal Facility

1.3 Soil Sampling

Soil samples were collected at the designated locations of MW-1, MW-2, MW-3 and MW-4. The sampling locations are shown on Figure C-1. Two samples were collected at each location at approximately 0.1m below ground and between 0.4-0.5m below ground. A photograph of the test pit at each location sampled is shown in Appendix C3.

AECOM did not identify any hydrocarbon odours, staining, or free product, at any of the sampling locations at the Tier II Soil Disposal Facility. No detectable concentrations of TPH (C6-34) were found in the soil samples collected from the Tier II Soil Disposal Facility. The laboratory results show a detectable level of PCB (0.125mg/kg) in the soil sample collected from the MW-1 location. AECOM does not consider the detected PCB level to be of significance; however it is recommended that it is evaluated in the context of the DEW Line Landfill Monitoring Plan. Low levels of copper, lead, zinc and chromium were detected in the various soil samples from the Tier II Soil Disposal Facility, however none of the results are considered to be of significance. It is recommended that these results be evaluated in the context of the DEW Line Landfill Monitoring Plan.

Analytical results and depths of samples are provided in Table C-1 and the laboratory certificate is provided in Appendix E.

Table C-1 Summary of 2008 Soil Analysis – Tier II Soil Disposal Facility

1.4 Groundwater Sampling

Groundwater depths and monitoring well conditions were documented for wells MW-1, MW-2, MW-3 and MW-4. The monitoring well development records are provided in Appendix C4. Generally the monitoring wells appeared to be in good condition during AECOM's site visit.

All of the wells at the Tier II Soil Disposal Facility contained sufficient water for sampling. Wells were purged and samples were collected at a maximum flow rate of 100mL/min using a peristaltic pump, and disposable LDPE tubing at each well. The groundwater samples were not filtered and not preserved as per the Terms of Reference, and were analyzed for total concentration of inorganic elements, TPH (C6-C32) and PCB.

The laboratory results revealed no detectable levels of petroleum hydrocarbons (TPH) or PCB and only very low concentrations of cobalt, zinc, and chromium. AECOM does not consider any of the detectable levels to be of significance. It is recommended that these results be evaluated in the context of the DEW Line Landfill Monitoring Plan.

The results are presented in Table C-2 and the laboratory certificate is provided in Appendix E.

Table C-2 Summary of 2008 Groundwater Analysis – Tier II Soil Disposal Facility

1.5 Thermal Monitoring

The manual readings taken from each thermistor from the Tier II Soil Disposal Facility are provided in the completed Maintenance Records located in Appendix C5. Selected data has been plotted into graphs for each thermistor which are provided as Graphs C-1 through C-4 located in Appendix C6.

Data were downloaded from all thermistors, and the data-loggers were reset in accordance with instructions provided by DCC. Batteries were not replaced as instructed by DCC. The batteries were last replaced in 2007.