

Appendix H

Progressive and Final Reclamation Work Undertaken

Year: 2015

Reference: 3BC-ALT1015, Part B, Item 1e.

Progressive Reclamation Work Undertaken in 2015:

A. Contaminated Sites In-Situ Bioremediation Work:

The National Research Council of Canada, on behalf of DND, collected soil samples for chemical and microbiological analyses. This work included laboratory studies involving microcosm mineralization assays for the in-situ bioremediation study on petroleum hydrocarbon biodegradation at the following sites:

- 1) Oxidator Building;
- 2) Baker's Dozen.

B. Rotation of Soils in the ALT-11 Landfarm (Biopile) Treatment Facility:

Soils contained at ALT-11 were aerated by rotation to increase oxygen content in the contaminated soil. This effective method promotes microbial and bacterial degradation of contaminants to remediate contaminated soils within the landfarm.

C. Glycol Monitoring of Runway De-Icing Area:

The sampling team collected three water runoff samples down gradient of the runway de-icing area in July 2015. The samples were sent to the CALA accredited laboratory for analysis.

D. Main Station Day Tank (ALT-10) Area

DND submitted a Licence Amendment & Renewal Application in 2015 that identified the newly constructed landfarm at ALT-10 as "ALT-10 Landfarm". The purpose of the "ALT-10 Landfarm" is to conduct remediation work of fuel-contaminated soils at the area excavated to the footprint of the Day Tank Facility. No physical work was conducted in 2015.

Future works proposed for 2016:

A. Contaminated Sites In-Situ Bioremediation Work:

Continuation of the pilot scale in-situ bioremediation study for petroleum hydrocarbon biodegradation at the following sites:

- 1) Oxidator Building;
- 2) Baker's Dozen.

Soil samples will be collected for chemical and microbiological analyses including laboratory studies involving microcosm mineralization assays.

B. Reclaim of Soils in the Landfarm (ALT-11) Treatment Facility:

Potential removal of 80% (approximately 3,000 m³) of the treated reclaimed soil at ALT-11, this activity is pending the results of the final confirmatory sampling, which is expected to be delivered to DND in March 2016 by the National Research Council of Canada. The final report will be in the form of a Final Closure Report, as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation (March 2009) and the Government of Nunavut's A Property Owner's Guide to the Management of Contaminated Sites (February 2015). The ALT-11 reclaimed soil (formerly hydrocarbon impacted) will be returned to their sites of origin with no other purposes, under a Tier 1 – Criteria-Based Approach. The reclaimed soil is based on 9 years of hydrocarbon bioremediation treatment with quality guidelines established under the industrial criteria of the Canadian Council of Ministers of the Environment's Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.

If this activity proceeds, DND will submit a separate application, with the Final Closure Report, to the NWB (INAC Inspector) and the Government of Nunavut's Department of Environment for approval and guidance of this activity, as per the requirement under Part I, Item 5 of the former 3BC-ALT1015 conditions.

C. Rotation of Soils in the Landfarm (ALT-10-11) Treatment Facilities:

Continuation of the microbial nutrient augmentation and aeration process in summer 2016 to increase oxygen content in the contaminated soil to promote microbial and bacterial activity within the landfarm facilities. This will be conducted at the ALT-10 and ALT-11 Landfarms.

D. Glycol Monitoring of Runway De-Icing Area:

To continue monitoring the effects of de-icing activities on the areas immediately adjacent to, and down gradient of, the runway de-icing area.

E. In-Situ Bio-Containment Pilot Research Study:

As indicated with the INAC Inspectors during the 2015 Inspection, DND is taking a proactive approach, developing novel bio-containment barriers, to treat runoff and subsurface waters generated and passing through the boundaries of Federal Contaminated Sites. This activity will be conducted, and the effectiveness assessed, through a pilot research project with the National Research Council of Canada. The general purpose of these bio-containment barriers is to develop a microbial technology solution for bioremediation of runoff and subsurface waters that pass through and/or are generated from contaminated sites prior to reaching the Arctic Ocean. This work has applicability for the entire Canadian Arctic environment.