Defence Construction Canada
Project Description for the Clean Up of CAM-5, Mackar Inlet DEW Line Site

Road from Lower to Upper Site at CAM-5

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1.0 Site Description

1.1 Location

CAM-5 is one of the 21 Department of National Defence (DND) DEW Line sites to be cleaned up as part of the DEW Line Clean Up (DLCU) Project. An NTS map segment is included in Appendix A showing the location of the CAM-5 site, as well as the property boundaries and land ownership.

CAM-5 (68° 17' N, 85° 07' W) is located on the western shore of Melville Peninsula in the Committee Bay area of the Nunavut Territory. The station is approximately 7 km inland from the west side of the peninsula. The upper site includes the module train, warehouse, garage, storage areas and POL storage facilities. The lower site area includes the airstrip facilities, an air terminal building, storage areas, and POL storage facilities

1.2 History

The CAM-5 site was constructed in the 1950's as part of the Distant Early Warning (DEW) Line, which provided radar surveillance of the northern approaches to North America. In March 1985, Canada and the United States agreed to modernize the North American Air Defence System by closing the remaining 21 DND DEW Line sites by the early 1990's, and build the North Warning System (NWS).

In 1992, the DEW Line Clean Up Protocol was developed by the Environmental Sciences Group (ESG) of the Royal Military College of Canada and was reviewed and approved by federal and territorial environmental officials. The protocol includes procedures for dealing with contaminated soil, waste oil, landfills, wastewater, debris and hazardous materials. In 1998, the Environmental Provisions of the Cooperation Agreement between DND and Nunavut Tunngavik Incorporated (NTI) were implemented to provide the approach necessary to restore the sites to an environmentally safe condition and prevent the migration of contaminants into the Arctic food chain

1.3 Project Activities

The purpose of the proposed project is to provide remedy for previous activities that occurred as a result of the operation of the former DEW Line site. Specifically, the clean up is to prevent the release of physical debris and/or contaminants into the environment.

In general, during the construction phase of the clean up, existing facilities no longer required for the operation of the NWS will be demolished. The demolition wastes will be segregated into hazardous and non-hazardous materials and disposed of appropriately. Contaminated soils identified during the previous field investigations will be excavated and properly disposed of in on-site engineered landfills or at off-site facilities if characterized as hazardous. Scattered surface debris and partially buried debris on-site will also be collected and disposed of. New landfills will be constructed to contain the non-hazardous contaminated soil and demolition waste generated during the clean up. Existing landfills at the site will be remediated, as required. Disturbed areas will be physically restored to a stable condition shaped to match the existing terrain. A detailed work program is provided in Section 5.

1.4 Schedule

CAM-5 underwent detailed site investigations in 2000 and 2002, and is scheduled for clean up beginning in 2006 as part of the DLCU project, with completion expected in 2010. The contractor will mobilize to the site in August 2006, by cat-train or airlift and set up a temporary construction camp. Clean up activities are expected to continue through to 2010, depending on the contractors' approach and weather

conditions. The expected duration of annual clean up activities on site will generally be from July to October. During the winter months, work will cease and equipment and facilities on site will be winterized. It is expected the contractors' workforce and accessory personnel will mobilize to and from the site from nearby northern communities. Completion of the clean up and demobilization of the contractors' facilities and equipment is anticipated for October 2010. Long-term monitoring of the landfills will begin upon completion of the clean up (2010) and will continue for a 25-year period. After 25 years, the monitoring requirements will be re-evaluated.

2.0 Background Information

2.1 Contact Information

Defence Construction Canada
(on behalf of the Director General Environment, Department of National Defence)
Constitution Square, Suite 1720
350 Albert Street
Ottawa, ON K1A 0K3

Contacts regarding this submission for the DEW Line Clean Up Project are provided in Table 1

Table 1: List of Contacts

Defence Construction Canada		
Project Manager: LCol. Daniel Paquet	(T) 613-998-9523	(F) 613-998-0468
Environmental Officer: Philip Warren	(T) 613-998-7288	(F) 613-998-0468
UMA Engineering Ltd.		
Environmental Scientist: Eva Schulz	(T) 403-270-9220	(F) 613-998-0468

2.2 Lead Authorizing Agencies

The lead agency for this project is the Department of National Defence, represented by the Director General Environment. The management of this project is being provided by Defence Construction Canada. These agencies will be responsible for obtaining permits, except in those cases where the clean up contractor is required to do so by legislation.

2.3 Environmental Assessment Process

The initial environmental assessment was completed under the Environmental Assessment and Review Process Guidelines Order (EARPGO) and updated in accordance with the requirements of the Canadian Environmental Assessment Agency (CEAA) and the Nunavut Impact Review Board (NIRB), in support of this project. The potential environmental impacts were assessed based on the valued ecosystem components identified during the initial scoping exercise.

The following sections provide a summary of the activities that were undertaken during the completion of the initial environmental assessment

2.3.1 Scoping

As a self-directed environmental assessment, the first step was to conduct a series of social and ecological scoping exercises designed to:

- Determine the temporal and spatial boundaries of the assessment; and
- Focus the analysis on the environmental issues directly related to the clean up project itself (i.e., identification of valued ecosystem components).

In scoping the project, clean up activities to be assessed were identified. Possible additional activities were examined using the Canadian Environmental Assessment Agency's "Principal Project/Accessory "

test, which is used to determine if other activities demonstrate an interdependence, linkage and/or geographical/ecological proximity with the primary clean up.

The scoping exercise included a determination of the environmental effects to be assessed and the effects that are to be considered in making decisions regarding the project. The following table provides an outline of the scope of the project and of the assessment.

Table 2: Project Scope and Assessment

Project	Clean Up of the CAM-5, Mackar Inlet DEW Line Site
EA Trigger	Funding from the Department of National Defence; Federal permits required.
Scope of the project – principal project	Physical clean up of the CAM-5 site, including: demolition of facilities, removal of waste materials (including hazardous), contaminated soil removal, debris disposal, and construction of landfills and hydrocarbon contaminated soil treatment facilities.
Accessory physical works	Mobilization and demobilization of contractor's equipment and personnel, and temporary construction camp set up.
Other undertakings in relation to the physical work	None.

The scope of the environmental assessment is to consider the effects of all project related activities (i.e., those related to the clean up of the site) and associated physical works on both biophysical (terrestrial, aquatic) and socio-economic factors.

The following factors were identified for assessment:

- Evaluation of environmental effects of the project, including those relating to cumulative effects that are likely to result from carrying out this project.
- Project undertakings performed in conjunction with other off-site projects/activities that have been or will be carried out.
- The relative levels of significance.
- Public comments.
- Mitigation measures deemed to be technically and economically feasible.

Interested parties were identified and consulted during the development of the project definition process including:

- 'Expert' federal departments (Environment Canada, DIAND, GNWT Natural Resources, GNWT Health);
- 'Other' federal departments (DND, Defence Construction Canada, Parks Canada);
- Aboriginal organizations (Nunavut Tunngavik Incorporated, Nunavut Planning Commission) and the Regional Inuit Association; and
- Community leadership of the various eastern Arctic hamlets, including residents of Hall Beach, Igloolik and Kugaaruk.

Since the initial project identification process, other departments have been consulted to ensure the project and interested parties are kept up to date with the project and the processes. These parties include Environment Canada, Indian and Northern Affairs Canada, Fisheries and Oceans Canada, the Nunavut Water Board, the Nunavut Tunngavik Incorporated, the Nunavut Planning Commission and Transport Canada

Section 4 of this Project Description provides a detailed outline of the Public Consultation process.

2.3.2 Assessment of Environmental Effects

The next step following the scoping exercise was to determine the possible environmental effects of the project. This assessment involves providing a detailed overview of the project, a description of the existing environment (including inventories and ecological processes) and, the identification of project-environment interactions.

The aim of describing the project is to clearly outline the constituent components and activities that will occur at the CAM-5 site. Activities include mobilization, project layout and design, plans and scheduling, specifics related to each of the activities (i.e., how would contaminated soil be identified, excavated, transported and disposed of), operating procedures, control procedures and demobilization plans.

During the scientific studies described above, the relevant information concerning the existing environmental components of the study area was collected. This information included a description of the physical, biological and social characteristics of the study area.

Using the information that was obtained on the project and the existing environmental setting, the assessment study determined interactive links between these two components. Particular concern focused on the location, sensitivity, seasonal presence and abundance of these components. Also included in the assessment of environmental effects were possible impacts relating to socio-economic factors (heritage, culture, archaeological, employment and business opportunities), and human health.

During the assessment stage, conclusions were made as to the type of impact (i.e., level of adversity) and its level of significance, based on scientific judgement and comments received during the public consultation process.

2.3.3 Identification of Mitigation Options

The third stage of the assessment process was identifying mitigation measures that would result in a reduction or elimination of likely environmental effects associated with the clean up of CAM-5. In the case of this project, all potential adverse effects were addressed, not just those deemed to be significantly adverse. Mitigative actions now form part of the overall project design and planning documentation, which resulted in the preparation of an Environmental Protection Plan (EPP), outlined in Section 8. The requirement for on-site personnel to adhere to these mitigative measures is part of the clean up contract.

2.3.4 Significance

The environmental assessment considers activities associated with project activities that could result in adverse environmental effects with respect to the likelihood of occurrence and implementation of appropriate mitigation measures. In determining whether there are adverse environmental effects, the following factors are considered:

- Loss of rare or endangered species;
- Reduction in biological diversity;
- Loss of critical/productive habitat;
- Fragmentation or interruption of movement corridors and migration routes;
- Transformation of natural landscapes;
- Discharge or presence of persistent and/or toxic chemicals;
- Toxicity effects on human health; and
- Effects on cultural issues.

2.4 Regulatory Overview

2.4.1 Introduction

The clean up will comply with all applicable environmental laws, regulations and requirements of Federal, Territorial, and other regional authorities, and any permits, approvals, and authorizations that may be required under this contract. The contractor is subject to and must comply with all permits and approvals obtained on behalf of and by DND to conduct this work. Through all project phases, the project will work in close cooperation with regulatory authorities and DND will enforce compliance.

2.4.2 Federal Acts, Regulations and Guidelines

Several Federal Acts, regulations and guidelines affect project activities across all Canadian jurisdictions. The most relevant to the DLCU Project are outlined below:

The **Canadian Environmental Protection Act** regulates toxic substances from their production or import, to consumption, storage and disposal. This Act also incorporates, amongst others, the Temporary PCB Storage Regulations.

The **Transportation of Dangerous Goods Act and Regulations** promote public safety in the transportation of dangerous goods. The Act applies to all handling, offering for transport and transporting of dangerous goods by any means of transport whether or not the goods originate from or are destined for any place or places in Canada

The **Fisheries Act** protects fish and fish habitat from pollution, harmful alteration, disturbance and destruction, and impediments to fish movement.

The **Arctic Waters Pollution Prevention Act and Regulations** govern development and shipping activity in Arctic waters adjacent to the mainland islands of the Canadian Arctic to ensure the continuing welfare of the residents of the areas, and to protect the ecological balance in water, ice and land areas.

The **Migratory Birds Convention Act** provides for the protection of designated migratory species, their habitats, and the regulated harvest of certain species.

The **Canada Wildlife Act** provides for the involvement of the Government of Canada in cooperative research and management programs involving wildlife species normally the responsibility of provinces or territories. This is particularly relevant to rare and endangered species or species such as the Peary caribou, which seasonally move across various regulatory boundaries.

The **Species at Risk Act** aims to protect wildlife from becoming extinct or lost from the wild, with the objective of helping the numbers recover. The act covers all wildlife species listed as being at risk nationally and their critical numbers.

The **Canada Shipping Act** regulates shipping activities under the jurisdiction of Canada. Regulations cover technical standards of operation safety and pollution aspects related to shipping activities in Canadian waters.

The **Navigable Waters Protection Act** pertains to the erection of structures or facilities used to support or impede navigation in waters under the jurisdiction of Canada.

The **Territorial Lands Act** provides authority for administering and protecting lands under the direct control of the Minister of Indian and Northern Affairs Canada (INAC). The following regulations are pursuant to this Act:

- The **Territorial Land Use Regulations** provide regulatory control for maintaining sound environmental practices for any land use activities on Territorial lands. These regulations require that land use permits be issued for such operations as work involving the use of heavy equipment, establishment of camps, use of explosives, and clearing of lines, trails and rights-of-way, including construction of access roads.
- The **Territorial Quarrying Regulations** establish the procedures for extracting Crown-owned limestone, granite, slate, marble, gypsum, loam, marl, gravel, sand, clay or stone from Territorial lands. The regulations specify permits, applications, staking and dimensions of quarries.

The **Nunavut Land Claim Agreement Act** provides for the use, management and conservation of land, water, and resources of Nunavut.

The **Nunavut Waters and Nunavut Surface Rights Tribunal Act** provides the Nunavut Water Board with the power to issue water use licenses. The Water Board evaluates the potential of detrimental effects occurring because of the use of water or a deposit of waste in water on other users.

Canada Labour Act and Regulations contains the Labour Code for all Federal employees or activities on Federal owned or controlled land. Private Provincial or Territorial employees are governed by the Provincial/Territorial Labour Acts, even when working on Federal lands or facilities. The Labour Acts control such things as statutory holidays, maximum work hours and minimum wages.

Atomic Energy Control Act and Regulations describe the packaging requirements and approvals needed for the transportation of radioactive materials.

Explosives Act and Regulations define explosives, the permitting requirements needed to use explosive substances, packaging, handling and transporting requirements, and safety requirements.

National Fire Code (NFC) established the standard for fire prevention, fire fighting and life safety in buildings in use, including standards for the conduct of activities causing fire hazards, maintenance of fire safety equipment and egress facilities, standards for fire extinguishers, etc. In addition, the NFC established the standard for prevention, containment and fighting of fires originating outside buildings which may present a hazard to a nearby community, and sets the standards for the storage and handling of dangerous goods, flammable liquids and combustible liquids.

The following guidelines were used as a reference in the development of the DLDU Protocol and contract specifications. These guidelines are identified as reference materials only.

The document, **An Approach for Assessing and Managing Wastewater Effluent Quality at Federal Facilities – Final Report June 1, 2000**, indicates the degree of treatment and effluent quality that will be applicable to wastewater discharged from existing and proposed Federal installations.

Freshwater Intake End-of-Pipe Fish Screen Guidelines provide instructions for the protection of anadromous and resident fish where freshwater is extracted from fish-bearing waters.

National Guidelines for the Landfilling of Hazardous Waste are to be used by regulators, designers, owners, and operators of hazardous waste facilities. The guidelines cover site selection, design, construction, closure and post-closure care, monitoring and operation. They are intended for new, not existing facilities.

Guidelines for Preparation of Hazardous Material Spill Contingency Plans identify factors that should be considered in the development of hazardous material spill contingency plans and the information that should be incorporated into a comprehensive contingency plan.

Code of Good Practice on Dump Closing or Conversion to a Sanitary Landfill at Federal Establishments outlines the guidelines to improve operation and properly close existing dumps. It is intended to promote a consistent approach to the clean up of existing dumps to prevent contamination of water, air, and land and to ensure that the best particular control technology is used.

Code of Good Practice for Used Oil Management in Canada describes environmentally sound options for the handling, storage, collection, transportation, recycling, reuse and disposal of used oils in Canada. It is intended to provide guidance for used oil generators and to regulatory authorities in the formulation of provincial or regional used oil management strategies.

Canadian Environmental Quality Criteria for Contaminated Sites, compiled by the Canadian Council of Ministers of the Environment (CCME) provide numerical limits for contaminants in soil and water intended to maintain, improve, or protect environmental quality and human health at contaminated sites. The criteria are intended to provide general technical and scientific guidance to provincial, federal, territorial and non-governmental agencies in the assessment and remediation of contaminated sites across Canada. They serve as benchmarks against which to assess the degree of contamination at a site.

Canadian Drinking Water Guidelines are also complied by CCME for Canadian Drinking Water Quality and provide criteria for water that are protective of human health and also meet aesthetic objectives.

Technical Guidance on the Land Treatment of Petroleum Hydrocarbon Contaminated Soils at Federal Government Facilities or on Federal Crown Land provide information on the required design parameters for landfarms at federal facilities.

2.4.3 Nunavut and Northwest Territory Acts, Regulations and Guidelines

In addition to the Federal Acts and Regulations identified in Section 2.4.2, the clean up of the CAM-5 site is governed by the following:

Guidelines for the Discharge of Domestic Wastewater in Nunavut, by the Nunavut Water Board, outline the requirements for water quality effluent from facilities in Nunavut.

The **Explosives Use Act** provides controls for surface blasting other than for mining purposes.

The **Nunavut Wildlife Act** provides for the protection of wildlife and wildlife habitats as well as regulated harvest of selected species

The **Nunavut Environmental Protection Act** provides for the protection of the environment from the discharge of contaminants, clean up of contaminants and unsightly premises. In addition, the powers of inspectors as well as offences and penalties are defined. The Act applies only to situations not authorized by other Canadian Acts in the Nunavut. The following guidelines under the Nunavut Environmental Protection Act may be applicable to the clean up of the CAM-5 site:

- Contingency Planning and Spill Reporting
- Disposal Guidelines for Fluorescent Light Tubes
- Guideline: Dust Suppression
- Guidelines for the Management of Waste Asbestos

- Guideline for the Management of Waste Antifreeze
- Guideline for the Management of Waste Batteries
- Guideline for the Management of Waste Paint
- Guideline for the Management of Waste Solvents
- Guidelines for the General Management of Hazardous Waste in Nunavut

The **Nunavut Environmental Rights Act** provides the people of Nunavut the right to access information concerning the release or potential release of contaminants into the environment; and also the right to prevent the release or potential release of contaminants into the environment.

The **Spill Contingency Planning and Reporting Regulations** outline requirements for filing a contingency plan and for reporting spills.

The **Nunavut Fire Prevention Act and Regulations** provides for the regulation of decommissioning fuel lines and fuel tanks.

The **Pesticides Act and Regulations** specifies the requirements for use, storage, handling and disposal of pesticides.

The **Nunavut Territorial Archaeological Sites Regulations**, pursuant to the **Nunavut Act**, protects archaeological sites in Nunavut from disturbance and prohibits the removal of archaeological specimens, except under permit

The **Safety Act: Occupational Health Regulations** outline the health and safety standards to be maintained at workplaces to ensure the health and safety of people.

Guidelines for Removal of Materials Containing Friable Asbestos outline the procedures for the removal of friable asbestos.

2.4.4 List of Approvals, Permits and Licenses Requires

The following is a list of permits required for the clean up of the CAM-5 site:

Land Use Permit: As per the Territorial Land Use Act and Territorial Land Use Regulations, a Class A permit, issued by Indian and Northern Affairs Canada (INAC) is required for the activities associated with the clean up of CAM-5. Contact: INAC Land Administration, Iqaluit, NU (T) 867-975-4283.

Quarry Permit: As per the Territorial Land Use Act and Territorial Quarrying Regulations, a Quarry Permit(s), issued by INAC is required for the extraction of granular material required for the clean up. Contact: INAC Land Administration, Iqaluit, NU (T) 867-975-4283.

Water Use License: As per the Nunavut Land Claims Agreement Act, a water use license, issued by the Nunavut Water Board, is required for camp operations and construction activities associated with the clean up of the CAM-5 site. Contact: Nunavut Water Board, Gjoa Haven NU (T) 867-360-6338.

In addition, the successful contractor may require a number of other permits or licenses. These permits or licenses pertain to the operation and maintenance of the contractors' camp or relate to his/her status as an employer. Examples of these permits include those related to the possession of firearms, day-to-day camp operation and federal/territorial labour codes. A partial list of these and other requirements is presented in Table 3.

Table 3: Authorizations

Authorization	Authority	Activity to Authorization Applies	Contact Number	Minimum Turnaround Time*
Land Use Permit (Crown Lands)	Indian and Northern Affairs Canada	All land use activities on Crown land	867-975-4283	3 months
Quarry Permit (Crown Lands)	Indian and Northern Affairs Canada	Granular material extraction activities on Crown land	867-975-4283	3 months
Water Use License	Nunavut Water Board	All water use activities	867-360-6338	6 months
Archaeological Research Permit	Nunavut Land Claims Agreement Act	Investigation of archaeological sites, mitigation, monitoring	867-979-0731	3 months
Transportation Permits	Transportation of Dangerous Goods Act	Shipping		30-day advance notification
Transportation Permits	International Air Transport Association Dangerous Goods Regulations	Air transport		30-day advance notification
Fishing Licenses	Department of Sustainable Development	Recreational fishing		None
Firearms Acquisition Certificates/ Firearms License (course required)	RCMP	Use and storage of firearms		6 weeks

* Minimum turnaround time is defined as the normal time required to process an application following receipt by the issuing authority.

2.5 Previous Environmental Assessments

As a federal proponent, the DND is required to conduct an environmental assessment for the clean up of each DEW Line site. As a planning tool, these assessments were drafted in 1994 by the DND under the auspices of the Environmental Review Process Guidelines Order (EARPGO). These assessments were preceded by extensive on-site environmental and engineering investigations completed by the Environmental Sciences Group (ESG) at Royal Military College and UMA Engineering Ltd. (UMA). The initial investigations, which took place from 1989 to 1994, were used to provide a baseline study of the existing environment (both biological and physical) and ecological pathways and possible transport mechanisms that will exist during the clean up. As well, studies of socio-economic aspects, in particular a detailed archaeological survey of the sites, were completed during this time. The protection of the food chain from DEW Line contaminants was established as the aim of the clean up. These studies confirmed that physical restoration would involve considerable quantities of materials, including limited quantities of hazardous materials such as waste oil, batteries and asbestos. Conclusions reached by independent

analyses indicated that inorganic elements (principally copper, lead and zinc), hydrocarbons and polychlorinated biphenyls (PCBs) pose the greatest risk to the biophysical environment. Therefore, the clean up approach is geared towards removing these contaminants from contact with the environment.

Subsequent changes to overall project planning have been assessed over time and the assessment document updated. An Environmental Screening Report was prepared for 14 of the 15 DEW Line sites in Nunavut (Project Management Office DEW Line Clean Up, 1998). This report was submitted with the Project Description of the 15 DEW Line sites in the Nunavut Settlement Area to the Nunavut Impact Review Board (NIRB) in June 1998 (PMO DEW Line Clean Up, 1998b).

In 2000 and 2001, further investigations were conducted to delineate contaminated areas and obtain environmental and engineering information required to finalize the clean up plans. This information has been reviewed and the environmental screening report section updated to include relevant new information.

During the radar upgrade program in the early 1990's, prior to the start of the DLCU, a number of environmental and engineering investigations were conducted at the DEW Line sites. The objectives of these studies were as follows:

- To identify the type of chemical contamination at the sites;
- To determine the possible impact of these contaminants on the Arctic ecosystem, particularly the food chain; and
- To develop practical environmental clean up strategies appropriate for the Arctic.

The investigations included:

- An initial environmental clean up study of the DEW Line sites in Canada carried out on behalf of the United States Air Force by a consortium of Canadian consultants. The objectives for this study included: identifying and investigating areas impacted by past waste disposal practices and spills; determining and evaluating remediation alternatives for the waste disposal and spill area and; developing disposal options for debris arising from the demolition of DEW Line structures. The study provided information on the presence of hazardous materials, the biophysical environment, facility details, and the existing landfills.
- An environmental study of 10 of the 21 sites in 1989/90 for the DND. This study provided a detailed physical and chemical inventory of the stations and considered the impact of chemical contaminants in the Arctic ecosystem. This study provided information on the debris found on site, contents of landfills, fuel spills and patterns of contaminant dispersal and impact from the use of drums.
- Two studies designed to assess the impact of the historically common practice of disposing debris into the ocean through ice were carried out in 1994 and 1995 by a consortium of several Canadian government departments. These studies concluded that there were no significant chemical effects arising from the presence of debris on the ocean floor.
- During the final site investigations conducted in 1996 at BAR-3, Tuktoyaktuk and PIN-M, Cape Parry, the DND investigation team discovered that the paint on many of the buildings contained PCBs in excess of 50 ppm. PCB amended painted materials (PAP) are defined as material that is coated with PCB-amended paint, which has been analyzed and the materials (including the paint) determined to contain PCB concentrations in excess of 50 ppm. These PAP materials are regulated under the Canadian Environmental Protection Act. Currently, the PAP materials cannot be placed in a landfill in the north, and are being packaged and transported to a southern disposal facility for destruction and disposal. Prior to transport, PAP material is being stored temporarily at the site in accordance with the Temporary Storage of PCB Materials Regulations.

2.6 Contract Award Process

The following steps outline the contract award procedures:

- A tender package is produced which includes ALL of the work to be completed at the site. The tender package includes instructions for the contractor to attain Minimum Inuit Contractor Content (MICC) in the workforce, as well as Minimum Inuit Employment Content (MIEC), as specified in the DND/NTI Economic Agreement.
- The tender award goes to the most competitive bidder who fulfills all of the requirements as stated in the tender package.
- Once the contract is awarded, the successful contractor can begin plans to start the clean up work.

3.0 Project Planning

3.1 Rationale for the Project and Primary Goals

The process of biomagnification is defined as positively sloped variation in concentrations through increasingly higher trophic levels of the food chain. The process of biomagnification is particularly important in Arctic organisms, where, as a result of their dependency on a high fat content in their diets, are extremely sensitive to contamination inputs, especially chlorinated contaminants such as PCBs. Given the nature of the Arctic ecosystems, it is important that past anthropogenic activities, such as the operation of the DEW Line, no continue to cause any significant adverse effects on any one level of the Arctic food chain. Specifically:

- The limited availability of species at any given trophic level leaves little opportunity for another species to offset the effects of a loss of another.
- Negative biological effects (i.e., plant loss) may lead to physical disturbances, such as damage to permafrost.
- These unmanned sites pose a risk to human and animal health and safety through the presence of physical hazards.

The aim of the DLCU Project is to decommission those facilities used by the former DEW Line which have been declared surplus to the requirements of the North Warning System and to restore the sites to an environmentally safe condition. Environmental restoration includes setting remediation objectives that are designed to preclude migration of contamination (and hence biomagnification) into the Arctic ecosystem/food chain. To accomplish this, remediation will include:

- The excavation of soils in cases where parameters exceed those that have been set for the project (i.e., believed to cause significant input into the lower levels of the food chain, for example, plants and detritus); and
- The remediation of landfills, which may serve as a source of water contamination and may enter the lower levels of the marine food chain (i.e., algae).

3.2 Evaluation of Alternatives to the Project

As a project strictly dedicated to the clean up of these military establishments, the range of alternatives to this project is limited. Three alternatives to the clean up of these sites can be identified. The three alternatives are as follows:

Commercial or other Government use of the facilities: This alternative involves the sale of those facilities no longer required by the Department of National Defence to commercial interests. Two possibilities are present, namely on-site commercial development or sale of the capital assets themselves and movement off-site.

No clean up action (Null alternative): The second alternative involved examining the environmental impact of maintaining the status quo at the sites. It was quickly realized that failure to address the environmental problems identified during the site investigations could lead to the following:

- Placing the Arctic environment/food chain at risk;
- Possible future legal liabilities for the federal government; and
- Greater clean up costs in the future.

DEW Line Clean Up: This alternative involves cleaning up the sites to the criteria in the DEW Line Clean Up Protocol as agreed to in the DND-NTI Cooperation Agreement, Environmental Provisions. The clean up includes removal of contaminated soil, remediation of landfills, removal of debris, demolition of surplus

buildings and facilities and grading of the site to as natural a state as practical. The clean up objectives in the agreement are considered to be protective of human health and the environment. As such, this is the chosen clean up alternative.

3.3 DEW Line Clean Up Protocol

The purpose of the DEW Line Clean Up Project is to:

- Demolish and remove existing facilities that are not required for the operation of the North Warning System;
- Remove contaminated soils from contact with the Arctic food chain;
- Stabilize existing landfills;
- Clean up surface debris; and
- Physically restore the site to as natural a state as practical.

3.3.1 Protocol Development

In cooperation with several federal departments and the Government of the Northwest Territories, DND initially drafted the General Protocol for DEW Line Clean Up in 1991. This protocol served as the basis for the DND/NTI Agreement on environmental provisions for the clean up of these sites (see Appendix B). At the time of implementation, there were no established environmental standards for the Arctic. As a result, existing federal guidelines, such as the Interim Canadian Environmental Quality Criteria for Contaminated Sites (1991) were modified to reflect both the sensitivity of the Arctic food chain to ecological processes such as biomagnification and the close dependence of the Inuit on the land for food. In addition, a barrel specific protocol was prepared that outlines the process for dealing with barrels and barrel contents found on the DEW Line sites.

3.3.2 Criteria

The protocol outlined in the DND/NTI Agreement was developed from the results of the biophysical, socio-economic, and engineering site assessments, mediated through the DND/NTI Environmental Working Group – EWG. The DLCU Protocol documents contaminant clean up criteria and specific physical actions that are to be undertaken, which are specific to the DEW Line sites. These criteria were developed based on existing federal and territorial criteria in conjunction with studies that show the functional relationships and/or pathways for biological uptakes from soil. The resulting protocol defines two concentration tiers of soil contamination. Soil substrates containing Tier I concentrations may be placed in an appropriate on-site landfill while those soils in excess of the Tier II standard are to be disposed of in a manner that provides additional measures to permanently segregate these contaminants from the Arctic ecosystem. Soils exceeding federal legislative limits (i.e., Canadian Environmental Protection Act and Chlorobiphenyl Regulations) will be disposed of off-site at a licensed disposal facility.

3.3.3 Environmental Working Group

In 1997, the Department of National Defence and Nunavut Tunngavik Incorporated (NTI) agreed to form an Environmental Working Group (EWG). The EWG is comprised of scientific and technical experts representing both the Inuit (NTI) and DND. The purpose of the EWG is to examine environmental issues related to the DLCU project and to provide recommendations to a joint DND/NTI core group consisting of senior management from both organizations. Specific tasks that have been assigned to the EWG include:

- Development of a landfill risk evaluation matrix;
- Evaluation of, and recommendations for, a post-construction/remediation landfill monitoring program;
- Identification of hydrocarbon clean up requirements;

- Establishment of confirmatory testing protocols; and
- Preparation of a list of items suitable for landfilling at the DEW Line sites.

3.4 Final Investigation and Delineation

Prior to the clean up of each site, the Department of National Defence undertakes a final site assessment. The aim of the site visit is several-fold, including:

- To fully delineate the extent of contaminated areas in order to prepare accurate construction documents;
- To confirm the structural and environmental status of buildings and other facilities that are to be demolished;
- To confirm the baseline environmental conditions at the site prior to implementation;
- To examine existing landfills and identify new landfills to confirm details pertaining to the required remediation strategy; and
- To identify areas suitable for the construction of an NHW Landfill and a Tier II Soil Disposal Facility.