DEPARTMENT OF NATIONAL DEFENCE
SPECIFICATIONS FOR THE CLEAN UP OF THE CAM-M - CAMBRIDGE BAY DEW LINE SITE

ENVIRONMENTAL PROTECTION PLAN

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LIST OF ACRONYMS

CCME	Canadian Council of Ministers of Environment
CEPA	Canadian Environmental Protection Act
DCC	DEW Line Clean Up Criteria
DCL	Defence Construction (1951) Ltd.
DEW Line	Distant Early Warning Line
DIAND	Department of Indian Affairs and Northern Development
DND	Department of National Defence ("Owner")
EARP	Environmental Assessment and Review Process
EPP	Environmental Protection Plan
GNWT	Government of Northwest Territories
IATA	International Air Transport Association
IMDGC	International Marine Dangerous Goods Code
LRR	Long Range Radar
LSS	Logistic Support Site or Station
MOU	Memorandum of Understanding
MSDS	Material Safety Data Sheets
NFC	National Fire Code
NTI	Nunavut Tunngavik Incorporated
NWS	North Warning System
NWT	Northwest Territories
PCB	Polychlorinated biphenyl
PMO	Project Management Office
POL	Petroleum, Oils and Lubricants
SRR	Short Range Radar
SUR	Site Use Restrictions
TDGA	Transportation of Dangerous Goods Act
TFN	Tungavik Federation of Nunavut
WHMIS	Workplace Hazardous Materials Information System

1.0 INTRODUCTION

1.1 SCOPE AND OBJECTIVES

.1 This Environmental Protection Plan (EPP) has been prepared to detail mitigative measures for potential environmental impacts associated with the construction and clean up activities at the CAM-M, Cambridge Bay site as identified during the Environmental Screening Process. Environmental Screenings are a formal part of the Federal Environmental Assessment and Review Process (EARP). These screenings and all available environmental and engineering information were used to prepare the EPP. Although the *Canadian Environmental Assessment Act* is now in effect, this project was initiated under EARP and is subject to the requirements of the process.

.2 The EPP is to be implemented by the Contractor through appropriate actions and the application of contingency plans. The EPP is designed to be used during clean up activities in conjunction with the Contract Drawings and Specifications. It forms part of the Contract Documents and reference to it can be found throughout the Contract Specifications.

.3 The EPP provides:

.1 an overview of the activities involved in construction of a work camp, clean up and demolition activities, and closure of those portions of the DEW Line site not required as part of the North Warning System (NWS) (Section 2.0);

.2 an overview of the regulatory environment which includes legislation and regulations from federal and territorial authorities. It also describes the requirements of other regional agencies. (Section 3.0);

.3 a description of the general environmental protection measures required to minimize or avoid potential adverse effects (Section 4.0);

.4 a description of protection measures required for specific valued environmental components at the CAM-M, Cambridge Bay site (Section 5.0);

.5 details related to environmental inspection responsibilities and procedures (Section 6.0); and

.6 contingency plans describing emergency actions and reporting requirements (Section 7.0).

.4 The protection measures described herein are to be implemented by the Contractor to minimize or avoid potential adverse environmental impacts. These procedures are considered appropriate for known and anticipated situations and conditions. However, should certain procedures or protection measures prove impractical, imprudent or insufficient in field situations, appropriate modifications or substitutions are to be proposed by field personnel, reviewed and approved by the Engineer in consultation with regulatory officials.

2.0 PROJECT DESCRIPTION OVERVIEW

2.1 PROJECT RATIONALE

.1 In March 1985, Canada and the United States signed a Memorandum of Understanding (MOU) agreeing to modernize the North American Air Defence System. The memorandum sets out the requirements for replacement of the Distant Early Warning (DEW) Line with an upgraded system called the North Warning System (NWS).

.2 Of the original 42 DEW Line sites, 21 sites were closed in 1963 and are currently under the administration of the Department of Indian Affairs and Northern Development (DIAND). Of the remaining 21 DEW Line sites in the Canadian Arctic, eight were converted to NWS Long Range Radar (LRR) sites, eight to NWS Short Range Radar (SRR) sites, and the remaining five were decommissioned completely. CAM-M, Cambridge Bay is a LRR/LSS site and will continue to be occupied.

.3 Environmental investigations of the DEW Line sites were carried out to identify the principal contaminants and determine the impact of these substances on the Arctic ecosystem. In addition, an evaluation of past waste disposal practices, specifically landfill locations, contamination sources and potential for contaminant migration, were conducted at each site. Based on the information obtained during the environmental studies, the DEW Line Clean Up Protocol was developed and provided a consistent approach to the clean up of the sites.

.4 Following the environmental investigations, engineering site assessments were conducted to obtain the information required to develop clean up drawings and specifications, and included surveys of contaminated areas, characterization of debris and landfill areas, investigation of proposed landfill development areas and identification of granular borrow sources.

.5 The environmental and engineering surveys at the CAM-M site were carried out over the period of 1989 to 1994 and documented the environmental implications and potential effects of the clean up work. An environmental and engineering site investigation was carried out in 1996 with the objectives of more accurately delineating known contaminated areas, characterizing stained areas, and verifying overall site conditions. The need for mitigation, monitoring and/or actual project activity modifications was also identified.

.6 Specific to the CAM-M, Cambridge Bay site, the primary clean up requirements are as follows:

- demolition and disposal of infrastructure no longer required for the operation of the NWS LRR/LSS site;
- excavation and disposal of contaminated soils;
- closure of four existing landfills; and
- cleanup of one dump site/landfill area.

2.2 PROJECT ACTIVITIES

.1 The clean up activities are based on the DEW Line Clean Up Protocol which targets contaminated soil, landfills, and demolition and exposed debris for cleanup. The following sections outline the major activities to be performed in the clean up of the CAM-M site. Detailed requirements are described in the Contract Specifications and Drawings. It is intended that the EPP be read in conjunction with these documents to determine all project requirements.

.2 The major clean up activities include the following:

- mobilization;
- establishment of a construction camp, including:
  - access and supply routes,
  - water supply,
  - waste management,
  - fuel handling and storage,
  - equipment and vehicle use, storage and maintenance;
- excavation of contaminated soil;
- collection and disposal of site debris;
- disposal of hazardous material;
- disposal of non-hazardous materials;
- construction of a Tier II soil disposal area;
- demolition of existing facilities;
- closure of existing landfills;
- development of granular borrow areas;
- site grading; and
- demobilization.

.3 Construction Camps

.1 Siting

.1 Two alternatives are available for camp accommodations at CAM-M: commercial facilities in the Hamlet of Cambridge Bay, or establishment of a separate construction camp on the site.

.2 The construction camp shall meet all requirements of Section 01591 of the Contract Specifications.

.3 Locate the construction camp and/or associated storage areas in areas of previous disturbance, or as proposed on the Contract Drawings, to minimize damage to previously undisturbed areas.

.2 Access

.1 Access to the CAM-M site is provided by regularly scheduled aircraft, charter aircraft and barge.

.2 Local access to construction, demolition, clean up and other work areas is generally via existing road networks. Graded areas, located near the beach landing area, and/or in the vicinity of the Station Area, are to be used for temporary storage of materials.

.3 Do NOT interfere with NWS operations at the site.

.3 Water Supply

.1 The existing water supply lake at the CAM-M site may be used as a potable water source, providing that the cumulative water withdrawal rate by NWS and the Contractor does not adversely affect fish habitat. An alternative water supply is to be located, tested and approved in accordance with the Water Use License. The Contractor shall routinely monitor water quality to ensure that it meets or exceeds the Guidelines for Canadian Drinking Water Quality.

.4 Waste Management

.1 Provide waste management for all facilities operated by the Contractor.

.2 Only domestic and human waste shall be collected and disposed of in a wastewater treatment system. This excludes items such as waste oil and liquids containing hazardous material. The wastewater shall be disposed of in accordance with the wastewater discharge criteria provided in Section 01560 of the Contract Specifications.

.3 Non-hazardous solid wastes, generated as part of the operation of the construction camp, are to be disposed of on site in an extension to an existing landfill. Domestic non-hazardous wastes may be incinerated and disposed of, as described above.

.5 Fuel Handling and Storage

.1 Transport fuel to the site and store in approved facilities, as described in Section 4, at the construction camp, storage compound or existing fuel storage facilities, if available.

.6 Equipment and Vehicle Use, Storage and Maintenance

.1 Transport equipment and vehicles to the site, store in approved locations, use only for contracted work, and maintain as required.

.4 Excavation of Contaminated Soil

.1 The definition of contaminated soil has been established in accordance with the DEW Line Clean Up Criteria as shown in Table 2.1. Soils contaminated at levels above DCC Tier I but less than DCC Tier II criteria are to be landfilled on site. These criteria are designed to be protective of the Arctic ecosystem.

.2 Complete all work related to the excavation and disposal of contaminated soils in accordance with Section 02066 of the Contract Specifications.

TABLE 2.1
DEW LINE CLEAN UP CRITERIA (DCC)
FOR CONTAMINATED SOIL

Substance	Criteria	
	DCC Tier I (ppm)	DCC Tier II (ppm)
Arsenic (As)	--	30
Cadmium (Cd)	--	5
Chromium (Cr)	--	250
Cobalt (Co)	--	50
Copper (Cu)	--	100
Lead (Pb)	200	500
Mercury (Hg)	--	2
Nickel (Ni)	--	100
Zinc (Zn)	--	500
Polychlorinated Biphenyls (PCBs)	1	5

.5 Disposal of Hazardous Materials

.1 "Hazardous" materials are defined as follows:
Hazardous materials are wastes or materials that are designated as "hazardous" under Northwest Territorial, or Federal legislation: or as "dangerous goods" under the *Transportation of Dangerous Goods Act* (TDGA). The *Canadian Environmental Protection Act* (CEPA) also regulates material containing PCBs at greater than fifty parts per million (ppm). Specifically identified hazardous materials include: batteries:

asbestos; fuel tank bottom sludges; solvents; PCB-containing liquids; fuels and lubricating oils; alcohols and glycols; and heavy metal-contaminated liquids. Disposal requirements for these hazardous materials are outlined in Table 2.2.

TABLE 2.2
HAZARDOUS MATERIAL DISPOSAL REQUIREMENTS

Hazardous Material	Disposal Requirement
• batteries • heavy metal-contaminated organic liquids • liquids containing organic compounds with chlorine concentrations > 1000 ppm • liquids containing organic compounds with PCB concentrations > 2 ppm and < 50 ppm • liquids containing organic compounds other than those described above	licensed treatment/disposal facility
• asbestos	double bag and dispose of in on-site engineered landfill
• fuel tank bottom sludges • fuels, lubricating oils, alcohols and glycols	licensed treatment/disposal facility or on-site incineration
• liquids and solids containing organic compounds with PCB concentration > 50 ppm	licensed storage, or disposal at the Alberta Special Waste Management System Facility - Swan Hills, Alberta

.2 Hazardous materials may be encountered during sorting of site and demolition debris. Collect and sort hazardous materials using equipment suitable for the task.

.3 If a substance is discovered that is suspected to be explosive, immediately eliminate all ignition sources in the area (including smoking, flares or flames in the immediate area). Clean up the material and dispose of only under the supervision of a permitted explosives expert. If fire or heat threatens the area of the potentially explosive material, all personnel will move to a distance of at least 1000 m from the material. Implement the procedure outlined in the Contractor's Contingency Plan for dealing with such substances.

.4 Test any suspected radioactive material and handle, package and dispose all confirmed radioactive materials as outlined under the TDGA and the Atomic Energy Control Act.

.5 Transport hazardous materials in accordance with the Transportation of Dangerous Goods Regulations, as applicable.

.6 Conduct all work related to hazardous materials in accordance with Section 02090 of the Contract Specifications.

.3 Areas not to be disturbed include the operating LRR facilities including satellite ground terminals and fuel storage tanks, as described in the Contract Specifications and Drawings.

.13 Demobilization

.1 Following the completion of clean up activities, remove all equipment, remaining fuel, supplies, and the construction camp from the site.

3.0 REGULATORY OVERVIEW

3.1 INTRODUCTION

.1 The Contractor shall comply with all applicable environmental laws, regulations and requirements of Federal, Territorial, and other regional authorities, and will acquire and comply with such permits, approvals and authorizations as may be required. The Contractor is subject to and must comply with those permits and approvals obtained on behalf of and by DND to conduct this work. The Contractor, through all project phases, shall work in close cooperation with regulatory authorities and DND to ensure compliance.

3.2 FEDERAL ACTS, REGULATIONS AND GUIDELINES

.1 Several federal Acts, regulations, and guidelines affect project activities across all Canadian jurisdictions. The most relevant to the DEW Line Clean Up EPP are outlined below:

.1 The *Canadian Environmental Protection Act* (CEPA) is a comprehensive piece of environmental legislation that regulates toxic substances from their production or import, to consumption, storage and disposal. This Act also incorporates the former Ocean Dumping Regulations and PCB Storage Regulations.

.2 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.

.3 The *Fisheries Act* protects fish and fish habitat from pollution, negative alteration or disturbance, or impediments to fish movement. Fisheries and Oceans Canada will be given the opportunity to review permit applications or restoration plans submitted by other agencies.

.4 The *Arctic Waters Pollution Prevention Act and Regulations* govern development and shipping activity in Arctic waters adjacent to the mainland and 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.

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

.6 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 caribou which seasonally move across various regulatory boundaries.

.7 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.

.8 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.

.9 The *Territorial Lands Act* provides the authority for administering and protecting lands under the direct control of the Minister of Department of Indian Affairs and Northern Development (DIAND) (Territorial Lands). 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 fee schedule and 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.

.10 The *Northwest Territories Waters Act* and Regulations provide for the conservation, development and use of the water resources of the Northwest Territories and for the establishment of a Water Board to license all such water usage and waste disposal activities.

.11 *Canada Labour Act* and Regulations under the Act is the Labour code for all Federal Employees or activities on Federally owned or controlled land. Private Provincial or Territory 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.

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

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

.14 National Fire Code (NFC) establishes 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 establishes 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.

.2 The following guidelines were used as reference in the development of the DEW Line Clean Up Protocol and Contract Specifications. These guidelines are identified as reference materials only.

.1 Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments indicate the degree of treatment and effluent quality that will be applicable to all wastewater discharged from existing and proposed Federal installations.

.2 National Guidelines for the Landfilling of Hazardous Waste (CCME Report, April 1991) are to be used by regulators, designers, owners, and operators of hazardous waste facilities. They cover site selection, design, construction, closure and post-closure care, monitoring, and operation. They are intended for new, not existing facilities.

.3 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.

.4 Code of Good Practice on Dump Closing or Conversion to Sanitary Landfill at Federal Establishments (1977) 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.

.5 Code of 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.

.6 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 bench marks against which to assess the degree of contamination at a site.

.7 Canadian Drinking Water Guidelines are also compiled by CCME for Canadian Drinking Water Quality for specified uses of water likely of concern at contaminated sites.

3.3 NORTHWEST TERRITORIES ACTS, REGULATIONS AND GUIDELINES

.1 The Territorial Government and DIAND jointly administer the part of the NWT which contains the CAM-M DEW Line site. The Territorial seat of government and the DIAND regional office are in Yellowknife. The DIAND district office is located in Iqaluit. In addition to the Federal and Territorial Acts and Regulations identified in Clause 3.2, the clean up of the CAM-M site is governed by the following:

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

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

.3 *The NWT Environmental Protection Act* provides for 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 offenses and penalties are defined. The Act applies only to situations not authorized by other Canadian Acts in the NWT. The following guidelines under the NWT Environmental Protection Act may be applicable to the cleanup of the CAM-M site:

- Guideline for the Management of Waste Antifreeze;
- Guideline for the Management of Waste Asbestos:
- Guideline for the Management of Waste Batteries:
- Guideline for the Management of Waste Solvents:
- Guidelines for the General Management of Hazardous Waste in the NWT; and
- Guideline for the Management of Waste Paint.

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

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

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

.7 Guidelines for Removal of Materials Containing Friable Asbestos outline guidelines to be used to remove friable asbestos.

3.4 NUNAVUT

.1 In 1990, leaders of the federal and territorial governments, and the president of the Tungavik Federation of Nunavut (TFN) signed an Agreement-in-Principle establishing Nunavut, a land claim settlement area incorporating almost two million square kilometres of the present NWT. Inuit ratification of the document was achieved in November 1992, and the Land Claim Agreement was signed by the Federal government, GNWT and TFN in May 1993. Nunavut Tunngavik Incorporated (NTI), established on April 1, 1993, is an Inuit corporation in charge of implementing the Nunavut Land Claims Agreement.

.2 There are no Nunavut specific requirements for work being conducted within the DND DEW Line site reservation. As a partner in the clean up process, there will be, however, representatives from the NTI present on the site. It should be noted that certain activities may result in reporting requirements. These would include reporting any archaeological finds to the Inuit Heritage Trust. The Contractor shall comply with any reporting requirements outlined in the Nunavut Land Claims Agreement.

3.5 OTHER

.1 Transportation and disposal of hazardous wastes is to be conducted by licensed waste handlers, in compliance with the appropriate legislation.

3.6 PERMITS

.1 The Contractor involved in the site clean up process will be required to acquire and pay for all necessary permits, approvals and authorizations associated with the Contractor's site operations, and with the handling, transport and disposal of hazardous material. A partial list of these requirements is presented in Table 3.1.

TABLE 3.1
LIST OF APPLICABLE AUTHORIZATIONS FOR CLEAN UP ACTIVITIES

Authorization	Authority	Activity to Which Authorization Applies	Contact	Minimum Turnaround Time	Responsibility for Permit Application
Land Use Permit	Territorial Land Use Regulations (NWT)	Camps, heavy equipment, explosives, new roads, fuel storage and use, landfill, terrain protection, waste disposal.	Indian and Northern Affairs Canada P.O. Box 1500 Yellowknife, NT X1A 2R3 (867) 920-8165	42 days	DND
Quarrying Permit/ License	Territorial Quarry Regulations (NWT)	Extraction, staking, dimensions.	Indian and Northern Affairs Canada P.O. Box 1500 Yellowknife, NT X1A 2R3 (867) 920-8165	42 days	DND
Authorization for Works or Undertakings Affecting Fish Habitat	Fisheries and Oceans Canada (NWT)	Stream crossing, culverts, drainage, siltation and erosion control, effluent discharge.	Government of Canada - Dept. of Fisheries and Oceans (867) 920-6640	1 week	Contractor
Transportation Permits	Transportation of Dangerous Goods Act	Shipping.		Advance notification 30 days	Contractor
Transportation Permits	International Air Transport Association Dangerous Goods Regulations	Air transport.		Advance notification 30 days	Contractor

TABLE 3.1
LIST OF APPLICABLE AUTHORIZATIONS FOR CLEAN UP ACTIVITIES

Authorization	Authority	Activity to Which Authorization Applies	Contact	Minimum Turnaround Time	Responsibility for Permit Application
Water Use and Waste Disposal Licenses	Northwest Territories Water Act	Water use and waste disposal.	NWT Water Board (867) 920-8191	8 weeks	Contractor - for camp operation requirements and clean up activities, as required.
Archaeological Research Permit [1]	Northwest Territories Act, Archaeological Sites Regulations	Investigation of archaeological sites, mitigation, monitoring.	Prince of Wales Northern Heritage Centre (867) 920-8084	3 weeks	DND
Fishing Licenses	Department of Renewable Resources	Recreational fishing.			Personal applications only.
Firearms Acquisition Certificates	RCMP	Use and storage of firearms.	Any RCMP detachment	6 weeks	Personal applications only.

[1] Only required in the event that heritage resources are discovered during clean up activities.

4.0 GENERAL ENVIRONMENTAL PROTECTION MEASURES

4.1 GENERAL

.1 The lands associated with the CAM-M, Cambridge Bay site, have distinctive biophysical characteristics associated with arctic environments. Potential impacts related to the clean up of the site include degradation of the permafrost regime, disturbance of existing vegetation, uncontrolled erosion, point source contamination, and disruption of terrestrial and wildlife populations, as well as human health impacts. The procedures and requirements provided in this section are intended to be protective of these ecosystem components.

4.2 CONSTRUCTION CAMP

.1 Siting

.1 At the CAM-M site, the Contractor can elect to use commercial facilities in the Hamlet of Cambridge Bay, or establish a separate construction camp on the site.

.2 Locate the camp site in an area with minimal ground cover. A potential construction camp site has been identified on the Construction Drawings.

.3 Locate the construction camp in an area that is as close as practical to the main area(s) of clean up and where possible, on an existing gravel pad or former borrow area.

.4 Do not impede surface drainage, and maintain a distance of at least 30 metres from the nearest water body.

.5 Avoid ice-rich substrates and protect permafrost by construction of gravel pads and/or elevation of heated buildings on wooden supports.

.6 Avoid areas containing archaeological resources.

.7 Do not interfere with LRR/LSS activities in accordance with provisions of the Site Use Restrictions (SUR).

.2 Equipment and Vehicle Use and Maintenance

.1 Restrict vehicle and mobile equipment travel at the site to established roads, stream crossings and work pads.

.2 Overland movement of equipment and vehicles is not allowed where damage to the vegetation or underlying soils may occur.

.3 Following heavy rains, vehicle and heavy equipment use outside of road and work pad areas is not permitted until the soil has drained sufficiently to prevent excessive rutting, and until authorized by the Engineer.

.4 Mobile equipment and vehicle operators shall yield the right-of-way to wildlife where safe to do so. Do not operate vehicles in a manner which harasses any species of wildlife.

.5 Perform vehicle and equipment servicing in designated areas only, where special care can be taken to contain, handle and dispose of maintenance fluids, parts, and waste.

.6 Conduct fuelling and lubrication of equipment in a manner that avoids spillage of fuels, oils, greases and coolants. When refuelling equipment, operators shall use leak-free containers and reinforced rip- and puncture-proof hoses and nozzles. Operators are to be in attendance for the duration of the refuelling operation and are to ensure that all storage container outlets are properly sealed after use.

.3 Storage and Handling of Fuel and Other Hazardous Substances

.1 Locate fuel storage facilities such that there is no interference with LRR/LSS activities.

.2 Store fuel in self-dyking containers, or position over an impervious liner and surround by an impervious dyke of sufficient height to contain not less than 110% of the capacity of the tank.

.3 Avoid sites that slope towards waterways or other environmentally sensitive areas; exhibit ponding or flooding; or have high groundwater tables, excessive seepage, or ice-rich (thaw-sensitive) soils. Avoid archaeological resources.

.4 Smoking is prohibited within 7.5 metres of the fuel storage facility. Provide appropriate signage as detailed in Section 01546 of the Contract Specifications.

.5 Inspect fuel storage facilities at least once each week for the duration of the project. Make available fire-fighting equipment for immediate access at each fuel storage facility.

.6 Store all barrels containing fuel and/or other hazardous materials in an elevated position either on their side with bungs facing the 9 and 3 o'clock position or on pallets, upright, banded and encased in overpack containers.

.7 All barrels shall be individually identified. The label shall be to industry standards and shall provide all information necessary for health and safety, and environmental purposes. Make available, to all personnel, Material Safety Data Sheets (MSDS) for all materials maintained in the construction camp.

.8 Treat all waste petroleum products including used oil filters as hazardous material, and handle and dispose of following the requirements detailed in Section 02090 of the Contract Specifications. Do not use waste oil for dust suppression. Report all fuel spills to the Engineer and, as provided by legislation, to the applicable government authorities, as indicated in Section 7.0.

.9 Conduct regular inspections of all machinery hydraulic, fuel, and cooling systems. Repair leaks immediately.

.10 Preassemble and maintain emergency spill equipment including at least two fuel pumps, empty 200 litre barrels and absorbent material sufficient to clean up a 1,000 litre spill at all permanent fuel storage sites and work camps (see Contingency Plans, Section 7.0).

.11 Remove all barrels, redundant fuel storage facilities and associated materials and equipment from the site at the conclusion of the work.

.4 Water Management

.1 The existing water supply at CAM-M may be used as a potable water source providing such use does not adversely affect fish habitats.

.2 Potable water must be treated where required to protect human health. The camp water supply shall be remote from sources of contamination.

.3 Provide a standard chlorination or iodisation unit for treatment of potable water, and test potable water for bacteria as required by the appropriate public health ordinances.

.4 Obtain a Water Use Licence from the NWT Water Board for the development of alternative water sources, as required, and comply with all conditions of the license.

.5 Water withdrawals must not endanger fish or draw down the water level so as to adversely affect fish habitat. Water withdrawal rates are not to exceed 10% of existing stream flow or 10% of total water body volume.

.6 Equip all water intake hoses with screens with a mesh size of 2.5 millimetres or less to prevent the intake of fish.

.5 Domestic Waste Management

.1 Dispose of all kitchen wastes and other non-hazardous wastes in an on-site landfill unless otherwise specified. The landfill selection is to be determined jointly by the Contractor and Engineer. The location is not to interfere with NWS Operations.

.2 Temporarily store kitchen wastes in metal, animal-proof containers to prevent scavenging of waste by wildlife and reduce scattering of debris.

.3 The Contractor, in consultation with the Engineer, will determine acceptable options for sewage disposal. Each construction camp shall provide primary sewage treatment, using a portable septic tank system or equivalent, prior to discharge.

4.3 ROAD CONSTRUCTION AND MAINTENANCE

.1 Existing roads and trails provide access to most sources of aggregate, potable water and/or landfill locations. The 1984 DIAND report "Land Use Guidelines: Access Roads and Trails" shall be followed so that road and trail maintenance shall emphasize preservation of the permafrost regime, vegetation patterns, existing surface drainage patterns, water quality and stream flows.

.2 Establishment of new roads off the DND Reserve is subject to the terms of the Land Use Permit.

.3 Avoid any archaeological resources during construction. Do not site roads within 30 metres of any other ecologically sensitive areas. Ice-rich soils, especially peatlands, are also to be avoided during road construction.

.4 Prepare the road bed with a sufficient thickness of fill to prevent terrain damage. Install culverts to maintain natural cross drainage and prevent ponding. These culverts shall be removed from such roads and drainage restored at the end of the clean up operations.

.5 Monitor access roads for signs of erosion and take remedial action where necessary. Do NOT use oil for dust control. Dust suppression, if required, is to be effected with water only.

4.4 STREAM CROSSING AND DIVERSION

.1 Adhere to all government regulations, licensing requirements/procedures and inspections regarding the protection of water quality and stream integrity to prevent destruction of spawning areas. Obtain Authorization from Fisheries and Oceans Canada for any works or undertakings affecting fish habitat including alterations, diversions, or crossings.

.2 Prevent siltation of waterways and disruption of streambeds, using the following procedures:

- .1 Minimize activities adjacent to watercourses.
- .2 Install cofferdams, silt barriers, or other suitable barriers.
- .3 Do NOT operate equipment in waterways.
- .4 Do NOT use Streambeds for borrow material.
- .5 Do NOT dispose of excavated fill, waste material or debris in waterways.
- .6 Avoid concentrations of fish during activities adjacent to waterways.
- .7 Do NOT ford streams at or immediately upstream of locations containing concentrations of fish.

.3 When removing culverts, the following procedures are to be followed to minimize disruption to stream beds and potential fish habitat:

.1 Schedule removal of culverts to avoid concentrations of fish if such concentrations exist.

.2 Install or construct cofferdams of non-erodible material, silt barriers, or other suitable methods to control siltation downstream of the work area.

.3 Reshape site to conform to grade of adjacent stream bank following removal of the culvert.

.4 Use riprap or other suitable methods, if required, to stabilize the bank at the worksite.

.5 Remove all silt controls following completion of work, and ensure the grade of the streambed is restored.

4.5 BORROW PIT AND QUARRY DEVELOPMENT AND OPERATION

.1 The Northwest Territories has specific permit requirements for opening and operating gravel pits and quarries outside the DLCU reservation for CAM-M shown on the drawings. The Quarry Permit can be expected to have site-specific provisions for environmental protection. DIAND issues permits under the *Territorial Quarrying Regulations*. Permit environmental protection conditions are for the purpose of minimizing the impact of development and extraction activities on surface drainage patterns, water quality, soil erosion, vegetation and, in some cases, wildlife or fish.

.2 Comply with all terms and conditions of the Quarry Permit, including recontouring/reclaiming and site clean up prior to site abandonment.

.3 Minimize the number of borrow pits opened by using existing borrow pits and aggregate stockpiles where feasible. Use of alternate sources is subject to approval by the Engineer.

.4 Avoid all archaeological resources during the siting of borrow areas. Borrow areas are to be located at least 30 metres from the nearest water body providing potential fish habitat, and other sensitive resources.

.5 Strip organic overburden, if present, and stockpile separately for use in restoring the borrow area.

.6 Following excavation, recontour the area to restore natural drainage patterns and work overburden into the recontoured borrow area to prevent erosion. Provide drainage and run-off control using diversion ditches and sediment filters, as required, to prevent sediment-laden run-off from reaching water bodies.

.7 During aggregate extraction, control vehicle and equipment operations in areas adjacent to the borrow pit to minimize the extent of disturbance.

.8 Stockpile aggregate on ice-poor, well drained ground such that surface drainage is not impeded. Locate the stockpile area a minimum of 30 metres from archaeological resources, water bodies, and other sensitive resources.

.9 If archaeological features or artifacts are encountered during borrow pit operations, notify the Engineer, avoid the area of the find, and restrict activities to other areas of the pit until further instructions are received. (See Section 5.0.)

.10 Development of additional borrow areas that are not identified on site plans will be at the discretion of the Engineer and shall meet all siting criteria and permit requirements as discussed above.

4.6 HAZARDOUS MATERIAL PROCESSING AREAS

.1 Develop a hazardous material processing area for the processing of hazardous materials in accordance with Section 02090 of the Contract Specifications.

.2 Locate the hazardous material processing area a minimum of 30 metres from the nearest archaeological site or water body, on ice-poor, well drained soil, and as close to the location of work as is practicable.

.3 Control movement of vehicles and equipment between the hazardous material processing area and work site to prevent the spread of potentially hazardous material and contaminated soils along roadways.

4.7 CONTAMINATED SOILS

.1 DEW Line Clean Up Criteria (DCC) have been established as remediation criteria for contaminated soil. Locations of contaminated soil are delineated on the Drawings. Soils exceeding the DCC criteria are to be removed as detailed in the Contract Specifications and Drawings.

.2 Minimize disturbance to adjacent areas during excavation.

.3 Avoid spillage of material during transportation between the excavation site and the disposal location.

.4 Following excavation of DCC Tier II soil, decontaminate excavation equipment as detailed in Section 02066 of the Contract Specifications.

.5 A program of confirmatory testing of contaminated areas will be carried out by the Owner as outlined in the Contract Specifications.