9. ENVIRONMENTAL PROTECTION PLAN

The main focus of the project environmental management program during the clean up is based upon a site specific Environmental Protection Plan. The requirements outlined in this plan are the end result of the EARPGO/CEAA environmental assessment process, and include those mitigative measures designed to reduce or eliminate potential harmful effects. The Environmental Protection Plan (EPP) for CAM-3 is provided in the following sections.

9.1 Scope and Objectives

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

The EPP provides a description of the general environmental protection measures required to minimize or avoid potential adverse effects, a description of protection measures required for specific valued environmental components at the CAM-3 site and details related to environmental inspection responsibilities and procedures.

The protection measures described herein are to be implemented by the Contractor to minimize or avoid 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 DCC Contract Coordinator in consultation with regulatory officials.

9.2 Environmental Inspection

9.2.1 General

As part of its overall commitment to a strategy of environmental protection and quality assurance, the Owner intends to employ dedicated environmental inspection staff to monitor its own compliance with the EPP and all applicable laws, regulations, permits, guidelines and standards. The environmental inspection staff will be a part of the DEW Line Clean Up Project Management Office (PMO). The PMO has been formed as per the Terms of Reference of the Memorandum of Understanding between the Director General Environment and Defence Construction Canada (DCC). The Owner will be represented at the site by the Engineer who will report to the DCC Contract Manager. Environmental inspection staff at each site will report to the On-Site Coordinator. The Contractor will maintain regular contact with the environmental inspection/Quality Assurance team. This will include, but is not limited to:

- attendance at regular meetings as scheduled with the inspector;
- immediately reporting concerns over any aspect of this EPP; and
- immediately reporting any spills or other event that may have an effect on human or environmental health and/or safety.

9.3 General Environmental Protection Measures

9.3.1 General

The lands associated with the CAM-3 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.

9.3.2 Site Operations

The Contractor will establish a construction camp on the site. The campsite will be located in an area with minimal vegetative ground cover. The construction camp will be located 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. Surface drainage is not to be impeded, and a distance of at least 30 metres from the nearest body of water is to be maintained. Ice-rich substrates are to be avoided, where possible. Permafrost will be protected by construction of gravel pads and/or elevation of heated buildings on wooden structures. Areas containing archaeological resources are to be avoided. Do not interfere with LRR activities, and comply with provisions of the Site Use Restrictions (SUR).

Vehicle and mobile equipment travel will be restricted at the site to established roads, stream crossings and work pads unless specifically exempted by the DCC Contract Coordinator. Recreational use of vehicles, including all terrain vehicles (ATVs) is not permitted off of the existing trail network. Overland movement of equipment and vehicles will be minimized where damage to the vegetation or underlying soils may occur. 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 DCC Contract Coordinator.

Mobile equipment and vehicle operators are to yield the right-of-way to wildlife where safe to do so. Vehicles will not be operated in a manner that harasses any species of wildlife. Vehicle and equipment servicing is to be performed in designated areas only, where special care can be taken to contain, handle, and dispose of maintenance fluids, parts, and waste. Fuelling and lubrication of equipment is to be conducted in a manner that avoids spillage of fuels, oils, greases and coolants. When refuelling equipment, leak-free containers and reinforced rip-and puncture-proof hoses and

nozzles will be used. Operators are to remain in attendance for the duration of the refuelling operation and ensure that all storage container outlets are properly sealed after use.

9.3.3 Storage and Handling of Fuel and Other Hazardous Substances

Fuel storage facilities are to be located as designated by the DCC Contract Coordinator such that there is no interference with LRR activities. Fuel is to be stored in self-dyking, double-walled containers, or positioned over and impervious liner and surrounded by an impervious dyke of sufficient height to contain not less than 110% of the capacity of the tank. 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 are to be avoided. Archaeological resources are also to be avoided. Smoking is prohibited within 7.5 metres of the fuel storage facility. Appropriate signage will be posted around the fuelling facility. Fuel storage facilities will be inspected at least once each week for the duration of the project. Fire-fighting equipment will be available for immediate access at each fuel storage facility. All barrels containing fuel and other similar materials will be stored in an elevated position either on their side with bungs facing the 9 and 3 o'clock positions or on pallets, in an upright position. All barrels will be individually identified with all information necessary for health and safety, and environmental purposes. Material Safety Data Sheets for all material maintained in the construction camp will be available to all personnel. All waste petroleum products including used oil filters are to be treated as hazardous material, and handled and disposed of accordingly. Waste oil will not be used for dust suppression. All fuel spills are to be reported to the DCC Contract Coordinator and, as provided by legislation, to the applicable government authorities.

Regular inspections are to be conducted of all machinery hydraulic, fuel, and cooling systems and any leaks will be repaired immediately. Emergency spill equipment will be pre-assembled and maintained 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. All

barrels, redundant fuel storage facilities and associated materials and equipment are to be removed from the site at the conclusion of the work.

9.3.4 Water Management

The existing water supply at CAM-3 may be used as a potable water source providing such use does not adversely affect the water levels of the lake. Potable water, where required, will be treated to protect human health. Potable water will be tested for bacteria as required by the appropriate public health ordinances.

A Water Use License will be obtained from the Nunavut Water Board for the development of alternative water supply sources. All conditions of the license must be complied with. Water withdrawals must not endanger fish or draw down the water level so as to adversely affect fish habitat. Water withdrawal rates will not exceed 10% of existing stream flow or 10% of total water body volume. All water hoses will be equipped with screens with a mesh size of 2.5 millimetres or less to prevent the intake of fish.

9.3.5 Domestic Waste Management

All kitchen wastes and other non-hazardous wastes will be disposed of in the existing site landfills unless otherwise specified. The landfill selection is to be determined jointly by the Contractor and the DCC Contract Coordinator. The location is not to interfere with NWS operations. Kitchen wastes will be temporarily stored in metal, animal-proof containers to prevent scavenging of waste by wildlife and to reduce scattering of debris. The Contractor, in consultation with the DCC Contract Coordinator, will determine acceptable options for sewage disposal. Each construction camp will provide, at minimum, primary sewage treatment, with a minimum retention time of 24 hours prior to discharge. Sewage effluent must meet the criteria outlined in the water used license prior to discharge.

9.3.6 Road Construction and Maintenance

Existing roads and trails provide access to most sources of aggregate. The 1984 DIAND report "Land Use Guidelines: Access Roads and Trails" will be followed to emphasize preservation of the permafrost regime, vegetation patterns, existing surface drainage patterns, water quality and stream flows. Establishment of new roads off site is subject to the terms of the Land Use Permit and approval of the DCC Contract Coordinator. Archaeological resources are to be avoided during clean up operations. Roads will not be sited within 30 metres of any other ecologically sensitive areas. Ice-rich soils, especially peatlands, are also to be avoided during road construction. The road bed will be prepared with a sufficient thickness of fill to prevent terrain damage. Culverts will be installed to maintain natural cross drainage and prevent ponding. These culverts will be removed from such roads and drainage restored at the end of the clean up operations. Access roads will be monitored for signs of erosion and remedial action will be taken where necessary. Oil will not be used for dust control. Dust suppression, if required, is to be acquired with water only.

9.3.7 Stream Crossing and Diversion

The Contractor is to 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. The Owner will contact Fisheries and Oceans Canada to determine if an authorization is required for any works or undertakings affecting fish habitat including alterations, diversions, or crossings identified in the Drawings and Specifications. Authorizations for any additional works employed by the Contractor are the responsibility of the Contractor.

Siltation of waterways and disruption of streambeds will be prevented using the following procedures:

- Minimize activities adjacent to watercourses.

- Install cofferdams, silt barriers, or other suitable barriers.
- Do not operate equipment in waterways.
- Do not use streambeds for borrow material.
- Do not dispose of excavated fill, waste material or debris in waterways.
- Avoid concentrations of fish during activities adjacent to waterways.
- Do not ford streams at or immediately upstream of locations containing concentrations of fish.

9.3.8 Borrow Pit and Quarry Development and Operation

Environmental protection measures must be used for the purpose of minimizing the impact of development and extraction activates on surface drainage patterns, water quality, soil erosion, and in some cases, wildlife or fish. The number of borrow areas opened will be minimized by using existing borrow areas, roads and building pads where feasible. Use of alternative sources is subject to the approval of the DCC Contract Coordinator. All archaeological resources will be avoided during the siting of borrow areas. All terms and conditions of the Quarry Permit are to be complied with, including recontouring/reclaiming and site clean up prior to site abandonment.

Borrow areas must be located at least 30 metres from the nearest water body providing potential fish habitat, and other sensitive resources. In consultation with the DCC Contract Coordinator a 30 metre buffer zone will be marked out prior to commencement of gravel quarrying operations. Organic overburden, if present, will be stripped and stockpiled separately for use in restoring the borrow area. Following excavation, the area will be recontoured to restore natural drainage patterns and overburden will be worked into the recontoured borrow area to prevent erosion. Drainage and

run-off control will be provided using diversion ditches and sediment filters, as required, to prevent sediment-laden run-off from reaching water bodies.

During aggregate extraction, vehicle and equipment operations will be controlled in areas adjacent to the borrow pit to minimize the extent of disturbance. Aggregate will be stockpiled on ice-poor, well drained ground such that surface drainage is not impeded. The stockpile will be located in an area a minimum of 30 metres from archaeological resources, water bodies, and other sensitive resources. If archaeological features or artifacts are encountered during borrow pit operations, the DCC Contract Coordinator is to be notified, the area of the find avoided, and activities to other areas of the pit restricted until further instructions are received (See Section 9.6).

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

9.3.9 Hazardous Waste Material Processing Areas

A hazardous waste material processing area will be developed for the processing of hazardous materials. The hazardous waste material processing area will be located a minimum of 30 meters from any archaeological site or water body, on ice-poor, well drained soil, and as close to the location of work as is practical. Movement of vehicles and equipment between the hazardous material processing area and work site will be minimized to prevent the spread of potentially hazardous material along roadways.

9.3.10 Contaminated Soils

DEW Line Clean Up Criteria (DLCC) has been established as remediation criteria for soil contaminated with inorganic elements and PCBs. Clean up of hydrocarbon-contaminated soil at CAM-3 is based on an overall risk management approach and a preliminary evaluation criterion of

2500 parts per million (ppm) total petroleum hydrocarbons (TPH). The locations of contaminated soil are shown on the Drawings in Appendix I. Soils exceeding the DLCC and hydrocarbon criteria are to be removed as detailed in the Contract Specifications and Drawings. Disturbance to adjacent areas during excavation of contaminated soils will be minimized. Spillage of material during transportation between the excavation site and the stockpile/treatment location is to be avoided and any spillage will be cleaned up to the satisfaction of the DCC Contract Coordinator. Following excavation of DCC Tier II contaminated soil and hydrocarbon contaminated soil, excavation equipment will be decontaminated. All workers will wear appropriate protective clothing/equipment when handling contaminated soil. A program of sampling and confirmatory testing of specific contaminated areas will be carried out by the Owner. A landfarm facility for the treatment of Type B hydrocarbon contaminated soils will be constructed.

9.3.11 Hydrocarbon Contaminated Soils

The requirements for remediation of hydrocarbon-contaminated soil at the CAM-3 site were developed using a risk management approach. Locations of hydrocarbon contaminated soil are indicated on the Drawings in Appendix I and levels of hydrocarbon contamination are provided in the Contract Specifications. Hydrocarbon contaminated soil areas designated for clean up are to be excavated and treated/disposed of as detailed in the Contract Specifications and Drawings.

Disturbance to adjacent areas during excavation will be minimized. Spillage of material will be avoided during transportation from the excavation site and the disposal/treatment facility location. Excavation equipment will be decontaminated following excavation of the hydrocarbon contaminated soils. A program of sampling and confirmatory testing of hydrocarbon contaminated areas will be carried out by the Owner. A treatment facility for the remediation of Type B hydrocarbon contaminated soils will be constructed at the CAM-3 site. The treatment facilities will be located in areas with minimal vegetative ground cover, and in an area that is as close as practical to the main areas of hydrocarbon contaminated soil excavation. Where possible, the treatment facilities will be located on an existing gravel pad or former borrow area. Surface drainage will not

be impeded and a distance of at least 100 m will be maintained from the nearest surface water body. The minimum distance required between the treatment facility and construction camp, On-Site Coordinator office and site laboratory is 300 metres. Areas with overall sloped greater than 6% and those containing archaeological features will be avoided.

The treatment facility will be constructed and operated in accordance with the Contract Specifications. A program of sampling and analytical testing of the hydrocarbon contaminated soil in the landfarm will be carried out by the Owner. All workers will wear appropriate protective equipment/clothing when handling hydrocarbon-contaminated soil. Avoid releasing any contaminated soil or contact water into the environment during the transport, handling, treatment and/or disposal of hydrocarbon contaminated soils.

9.3.12 Landfill Closure and Development

The landfills will be covered with gravel to provide a minimum cover thickness as indicated on the Drawings. The landfill areas will be regraded and restored to natural drainage patterns and topography. Geo-synthetic liner systems will be installed where indicated on the Drawings. The landfills will then be covered with gravel.

A new landfill will be constructed for the disposal of non-hazardous wastes generated during the clean up of the CAM-3 site.

Drainage controls such as diversion ditches and sediment filters will be provided, as required, to prevent runoff from reaching water bodies during closure, remediation and construction of landfills. All earthworks will be conducted in accordance with Section 5.4. Monitoring equipment will be installed as indicated on the Drawings of as directed by the DCC Contract Coordinator.

9.3.13 Disposal of Site Debris

Site debris will be collected, sorted into hazardous and non-hazardous materials and disposed of accordingly. The contents of any intact barrels will be tested and disposed of as described in Section 5.8. Any asbestos containing materials will be handled and disposed of according to the methods described in the Contract Specifications. Workers are to wear appropriate protective clothing when handling potentially hazardous waste material. Off-road activity should be minimized during collection of site debris. The spill contingency plan (Section 10) is to be followed in the event of a spill or other emergency.

9.3.14 Demolition of Buildings and Structures

Demolition, sorting, and disposal of hazardous and non-hazardous waste will be carried out in accordance with Section 5.7, 5.8 and 5.9. All residual debris is to be removed from the site down to grade. Structures will be demolished to the top of concrete foundation level. Regrade gravel pads and other foundations to restore natural drainage patterns and to match adjacent topography.

9.3.15 Marine Vessel Movements

Marine vessels can adversely affect wildlife. Sea mammals and flocks of waterfowl are to be avoided by all shipping. To minimize disruption to hunting and fishing activities, vessel traffic will be restricted to within traditional shipping lanes, where they exist. Marked fishing gear that may be encountered near shore will be avoided. All marine vessel operators will be informed of all applicable EPP requirements when scheduling arrangements are made or at other appropriate periods prior to the arrival of the vessel at the site.

9.3.16 Aircraft Movements

It is anticipated that fixed wing chartered aircraft will be used to transport personnel, perishable supplies and various construction materials and equipment to and from the site. Where concentrations of birds or mammals are known to be near the construction sites, charter pilots will be advised to maintain an altitude of at least 500 metres and preferably 1,000 metres, above ground or water, when passing over these areas. Low-level flights to observe or photograph wildlife will not be permitted. All charter aircraft pilots will be informed of all applicable EPP requirements when scheduling arrangements are made or at other appropriate periods prior to the arrival of the aircraft at the site.

9.3.17 Handling of Dangerous Goods and Hazardous Waste Materials

Treatment, disposal, and storage of hazardous and non-hazardous waste materials will be in accordance with Section 5.10. Each storage area will be separated from the nearest water body by a 30 metre buffer zone; at beach storage areas consideration must be given to the reach of sea ice and storm tides.

Packaging: The Transportation of Dangerous Goods Act (TDGA) Dangerous Goods Regulations govern the packaging and shipment of dangerous goods within Canada. If shipping out of Canada, Canadian regulations and the regulations of the destination country both apply. Requirements of the International Marine Dangerous Goods Code (IMDGC) must be addressed in international waters (e.g. near Greenland). Any material classified by the TDG must be accompanied by the appropriate TDG shipping documents. The documents must include, at least: the shipper, the receiver and all carriers involved in the transport of the shipment. Non-hazardous materials are also to be accompanied by a document indicating ownership and responsibility of the receiver. The Contractor should refer to the TDG regulations for more details regarding shipping document requirements. All dangerous goods will be packaged in accordance with the Transportations of Dangerous Goods Regulations.

Waste manifests will be initiated for each shipment, specifying a unique reference number and DND's waste generator number to accompany the shipment to the final destination. The Department of Sustainable Development administers the manifesting system in Nunavut and is responsible for issuing the generator numbers. Any waste of unknown TDGA hazard will be tested to determine whether any transport hazard exists according to the regulations. Any substance that is considered hazardous will be packaged under the TDGA in accordance with the regulations and the national standard Performance Packaging for Transportation of Dangerous Goods. The TDGA regulations specify the packaging requirements for dangerous or hazardous goods according to risk.

Labelling: Each hazardous item will be labelled and placard packages according to class and division of the hazardous item. A label or placard design is unique to each classification. All packages will be labelled as specified in the TDGA regulations. Large containers will be placard as defined by the class and division with the TDG product identification number clearly displayed. The product identification number is indicated by the substance name in the regulations.

Notification: The Defence Construction Canada Environmental Officer will be notified twenty (20) days prior to shipment of any dangerous goods or hazardous materials.

9.3.18 Explosives

BLASTING SHALL NOT OCCUR UNLESS SPECIFIC PERMISSION IS GRANTED BY THE NORTH WARNING SYSTEM, DND THROUGH THE ON-SITE COORDINATOR. The use of explosives is potentially dangerous to human and animal health. The following procedures apply:

- Comply with all provisions as detailed in the Site Use Restrictions (SUR).
- Obtain all necessary permits and licenses.

- Handle, transport, store, and use explosives and all other related hazardous material in accordance with all applicable laws, regulations and orders of regulating authorities.

- Electric detonation methods are prohibited.

- Restrict use of explosives to authorized and certified/licensed personnel who have been trained in their use.

- Minimize defacement of landscape features and other surrounding objects controlling the scatter of blasted material beyond the cleared working area.

- Minimize shock or instantaneous peak noise levels.

- Prevent scatter from blasting from reaching fuel or hazardous substance storage locations. A minimum distance of 300 meters in rocky terrain, and 1,000 meters in the presence of metal is required.

- Do not conduct blasting in the vicinity of concentrations of wildlife.

- Restrict blasting to above water and a minimum of 100 meters from concentrations of fish.

9.3.19 Work Site Clean Up and Abandonment

The Contractor must comply will all terms and conditions of the Water Use License and Land Use Permit. All temporary buildings, fuel barrels, vehicles, equipment, waste materials and surplus materials will be removed from the site following completion of work. All large earthwork slopes will be stabilized. Gravel access roads required for operation and maintenance may remain. All disturbed areas will be graded to match natural drainage patterns.

9.4 Protection Measures for Valued Environmental Components

This section describes the required protection measured for the valued environmental components identified at the CAM-3 site and must be complied with.

9.4.1 Human Health and Safety

Potential hazards to human health and safety are present at the CAM-3 site in the form of hazardous materials and contaminated soil, difficult local terrain, unpredictable weather conditions, and wildlife encounters. Hazardous material and contaminated soil have the potential to enter water bodies and the food chain, and thereby affect vegetation, fish, wildlife and the health of people who travel, hunt and fish in these areas. Site debris may present a physical hazard to people traveling through these locations.

All necessary precautions will be taken when handling and transporting hazardous material and contaminated soil to ensure that the materials do not come into contact with site personnel. Site workers will wear protective clothing when handling hazardous materials.

All site personnel working on or in the vicinity of clean up operations must be trained in, made aware of, and adhere to the requirements of the Workplace Hazardous Materials Information System (WHIMS) program.

Outdoor recreation activities of site personnel have the potential to adversely affect nearby fish, wildlife and heritage resources. Subject to camp rules and the requirements of territorial fishing licenses and regulations, staff may be permitted to leave the site for recreational purposes. However, recreational use of vehicles, including ATV's, is not permitted off of the existing trail network. Normal precautions for Arctic travel include: provisions for rapidly changing weather conditions; tactics for possible polar bears and other wildlife encounters; filing a trip plan; first aid kit, survival kit and insect repellent.

Personal firearms are not permitted in the construction camp. However, the Contractor's Site Superintendent will keep sufficient weapons (including one for back-up or replacement) for defence in the event of a polar bear encounter that threatens human safety. When not in use, all weapons will be locked as per all applicable legislation and access controlled by the Site Superintendent or the designate.

9.4.2 Local Resource Use

The coastal marine waters in the area of the CAM-3 site are used for hunting seals and birds, and fishing. There is a potential concern involving physical conflicts between ship traffic and fishing nets, near shore pollution incidents during ship-to shore transfer of fuel and equipment, shore-to-ship transfer of hazardous materials, and shoreline terrain damage during beach landing area preparation. Clean up activities and related shipping will not interfere with local resource use in excess of levels normally encountered by established local activities and shipping. To minimize disruption to hunting and fishing activities, vessel traffic will be restricted to traditional shipping lanes where they exist.

Meetings will be scheduled with local associations to discuss the above issues and minimize any potential problems. This will include consultation to confirm the scheduling and locations of hunting and fishing activities. A local contact person will be assigned to address concerns of local residents or resource users.

9.4.3 Local Economy and Contact With Local Residents

Employment and business opportunities to the north will be maximized. Communication with the local community of Gjoa Haven and Taloyoak will be provided to keep them informed of contracts and significant project developments for which local businesses and individuals may be qualified to work. Regular briefing meetings will be scheduled with all camp personnel to discuss and explain camp rules.

9.4.4 Aesthetic Value

It is anticipated that the clean up activities will have an overall positive effect on the aesthetic value of the CAM-3 site in that redundant buildings and structures will be demolished, and all disturbed areas (landfills, debris piles, sewage outfalls and borrow pits) will be restored as closely as possible to their original appearance. Construction personnel are to ensure that their activities do not contribute to any additional degradation of the local environment.

9.4.5 Surface Water and Fish Habitat

The following applies to work adjacent to waterways:

- Prevent siltation of water bodies supporting fish by the use of berms or silt fences as required, and by minimizing activities adjacent to watercourses.
- Do not operate equipment in waterways.
- Do not use streambeds for borrow material.
- Do not dispose of excavated fill, waste material or debris in waterways.
- Avoid concentrations of fish during culvert removals and work adjacent to waterways.
- Do not ford streams at or immediately upstream of locations containing concentrations of fish. Restrict blasting to above water and more than 100 metres from concentrations of fish.
- Restrict blasting to above water and more than 100 metres form concentrations of fish.
- Where possible, conduct in-stream work during low flow periods.

- When removing culverts: slope banks to conform to grade of adjacent stream bank as applicable; and if required, stabilize bank using erosion resistant material.

Obtain authorization from Fisheries and Oceans Canada for alterations or crossings of any water body constituting fish habitat not already indicated in the Drawings or in the Contract Specifications.

9.4.6 Permafrost Soils

Ice-rich soils are common in areas that are maintained by extensive vegetation cover, and are thus susceptible to permafrost degradation. The top layer provides a protective thermal barrier that prevents permafrost degradation. These soils are susceptible to erosion due to their fine texture and hilly topography. Erosion removes the thermal protection and causes permafrost degradation. Vehicle and equipment traffic, and soil excavation can disturb the surface layer and degrade the permafrost. Disturbance to permafrost soils will be minimized be restricting vehicle and heavy equipment traffic to existing roads and designated work areas unless approved by the Contract Coordinator. Activity in areas adjacent to work areas will also be minimized. Vehicles or heavy equipment will NOT be operated off-road following heavy rain or melting snow until the soil has dried sufficiently to prevent excess rutting. Appropriate drainage and erosion control structures will be installed along access roads, where required. Implement the following procedures during site clean up operations to minimize disruption of permafrost:

- Locate facilities such as work camps and storage areas such that they do not impede surface drainage or result in ponding. Construct gravel pads or use other appropriate methods to protect ice-rich soil from thermal or physical damage.

- Minimize extent of disturbance during excavations.

- Promptly backfill excavated areas with granular fill as indicated on the drawings.

- Minimize the development of new borrow areas.
- Do NOT store materials directly on unprotected ground.
- Regrade disturbed areas to restore natural drainage patterns.
- Repair rutting that impedes local drainage or exposes permafrost in ice rich soils to the satisfaction of the DCC Contract Coordinator.

9.4.7 Coastal Marine Resources

The coastline adjacent to the CAM-3 site may be used by mammals and seabirds for feeding, breeding, and migration. Typical species that may be found in that area of CAM-3 include bearded and ringed seals, shorebirds and numerous gull species. Where concentrations of mammals are known to be near construction sites, advise chartered aircraft pilots to maintain an altitude of at least 500 metres and preferably 1,000 meters above ground or water when passing over these areas. Low-level flights to observe or photograph wildlife shall not be permitted. Inform charter aircraft pilots of all applicable EPP requirements when scheduling arrangements are made or at other appropriate periods prior to the arrival of the aircraft at the site. Marine mammals and flocks of seabirds must be avoided by all shipping. Where feasible ships shall maintain a minimum distance of 1 km from known seabird colonies.

During transfer of fuel to land-based storage tanks, equip the hoses or pipes with properly functioning and approved check valves to prevent backflow of fuel in the case of failure. Attend all fuel transfer operations at all times. In the event of a spill of fuel, implement the appropriate spill contingency plan as detailed in Section 10.

9.4.8 Terrestrial Resources

Caribou, polar bears, Arctic fox, Arctic ground squirrel and lemmings have been reported seasonally or year round at the CAM-3 site. Snowy owls and Rough-legged hawks were observed in the area during the 2000 and 2001 site investigations. There is concern over human/wildlife contact, which could include harassment by project personnel causing disruption of activities such as calving, breeding, nesting, and rearing, all of which may take place on the site proper.

Prevent avoidable conflicts with wildlife using the following procedures:

- Employ a dedicated wildlife monitor(s) at all times.
- Require all on-site personnel to be familiar with the contents of "Safety in Bear Country".
- Do not feed, injure or harass wildlife.
- Ensure that clean up activities do not interfere with wildlife movement through the area.
- Do not disturb birds nesting on-site.
- Vehicle, vessel and aircraft movements shall conscientiously avoid all known concentrations of wildlife or areas known to be frequented by important species or concentrations of wildlife.
- Do not attempt to chase, catch, divert, follow or otherwise harass wildlife by aircraft, vehicle, or boat or on foot.
- Control refuse and make inaccessible to bears and other scavengers.

- In the event of unanticipated or unavoidable contact with mammals, act in accordance with the wildlife encounter contingency plan (see Section 9.5). Familiarize all individuals working at or visiting the site with this plan as part of their orientation to the work site.

- Equipment and vehicles shall yield to wildlife, where possible.

- Except in the vicinity of the airfield, advise charter aircraft pilots not to fly at elevations lower than 500 metres above ground or water.

- In the event that wildlife is spotted from the air, aircraft shall not make descents for observations or photography.

- Domestic or wild pets are not allowed in camps with the exception of controlled watchdogs.

- Project personnel shall not be permitted to possess personal firearms. The only firearms allowed on site shall be for protection from bears and shooting of animals exhibiting aberrant behaviour. The firearms shall be controlled by the Contractor's Site Superintendent.

- Report vehicle collisions with wildlife, encounters with troublesome animals, and/or the presence of potentially troublesome animals to the On-Site Coordinator and to the District Wildlife Officer.

Disruption of avifauna during the nesting period can result in reproductive failure. For this reason, concentrations of nesting birds should be avoided during this period. Impacts on these species can be minimized by scheduling disruptive activities outside of the nesting period and by discouraging nesting at work areas.

The arrival of avifauna at specific locations in the Arctic is influenced by weather conditions and other factors. Inclement weather or a delayed spring melt may delay arrival by several weeks. In general, however, the chronology of arrival, nesting, and departure is relatively consistent. Typically within two weeks of arrival, nesting commences and continues for one to two months until the young leave the nest. Following this, the birds feed in preparation for the fall migration and depart by mid to late September. The migrations and breeding chronology of major groups of birds is shown in Table 9-1. Work will be scheduled to minimize impacts on these species.

Table 9-1: Approximate Nesting and Breeding Chronology for Birds Observed Near DEW Line Stations

Group or Species	Arrival	Nesting Period		Length of Breeding Season	Departure
		From	To		
Raptors	Mid-May to Early June	Early June	Late August	65-75 days	Late September
Waterfowl	Late May to Early June	Early to Mid-June	Mid to late July	25-38 days	Early September
Shorebirds	Late May to Early June	Early June	Early to late July	20-25 days	Late August

9.4.9 Heritage Resources

DEW line sites are often located in areas which have been seasonally settled or visited by Inuit over the past 1,000 years; by their Palaeo-Eskimo predecessors for as many as 3,000 years before the Inuit; and by Europeans and Euro Canadians over the past four centuries. Archaeological sites and recent camps and cemeteries exhibiting evidence of the presence of the former occupants have been found on or adjacent to all of the DEW Line stations. Many of the sites have been disturbed by previous DEW Line activities. The traditional and scientific value of heritage resources is greatly diminished if they are disturbed or moved. Archaeological sites in Nunavut are protected by law, and disturbance of archaeological sites and collection of archaeological specimens is prohibited except under the terms of an archaeological research permit.

Obtain a generic pamphlet from the regulatory authorities for use at the site, which illustrates typical site and artifact types, and describes procedures to follow in the event of encountering an archaeological site. In the event that heritage resources are discovered during clean up activities, the following procedures apply:

- Report discovery of archaeological site or artifacts immediately to the DCC Contract Coordinator.
- Do not disturb archaeological sites or artifacts discovered and cease work in that area until appropriate authorities are notified.
- Report all archaeological finds as described below.
- Do not resume activities in the vicinity of the find until confirmations and direction from appropriate authorities is received.

Reports of archaeological sites found shall include:

- the identity of the person making the discovery;
- description of the site location, including the topography, landmarks, etc.;
- the nature of the activity resulting in the discovery;
- description of the archaeological site, including size, features, or details visible, supplemented by sketches or photographs;
- actions currently taken to protect the archaeological features; and

- extenuating circumstances.

9.5 Wildlife Encounter Contingency Plan

Although polar bear occurrences are not common in the vicinity of the CAM-3 site, bears are a potential hazard to workers at all times and the situation can be aggravated by the presence of any substance that a bear perceives to be food. Dedicated wildlife monitors should be employed at all times during clean up operations.

Be familiar with bear deterrent procedures and ensure that at least one designated staff member is competent with the camp firearms. Be familiar with the GNWT "Safety in Bear Country" manual and make available a reference copy at the site office.

Operators of vehicles and equipment shall make every effort to avoid encounters with large mammals. Congregations of animals near food or garbage are a potential problem that can be overcome by proper disposal of food wastes. Concentrations of scavenging animals such as wolves, foxes and bears increase the risk of diseases, particularly rabies, and danger to personnel. The following precautions and actions are to be taken at each site:

- The killing of wildlife for any reasons at variance with the Wildlife Act and regulations is an offence. Coordinate procedures for handling wildlife problems and incidents with the regional Government of Nunavut (GN) wildlife office.

- Advise personnel to maintain watch for bears and immediately report any sightings to the DCC Contract Coordinator. Immediately notify all personnel of the sighting. If the threat of attack is considered significant, assign a full time wildlife monitor to the specific areas or activities at risk.

- Use vehicles, noisemakers and, if necessary, a firearm to frighten the bear away from the site.

- Shoot a bear only if the bear returns repeatedly, refuses to leave or directly threatens human safety. Killing is considered a last resort and, if at all possible, contact the appropriate wildlife officer and alert them to the problem. If a bear is to be shot, assign the task only to a person familiar with and competent with the camp firearm. Wounded or otherwise aggravated bears can be extremely dangerous.

- Report the death of a bear to the DCC Contract Coordinator and the appropriate GN wildlife officer who will issue instructions as to disposal of the carcass and the formal reporting procedures to be followed.

- Due to the possibility of rabies, shoot any animal that bites a human and retain the carcass intact pending instructions from the appropriate wildlife officer. If possible, notify the wildlife officer before any drastic action is taken. Seek medical advice from the appropriate medical facility for treatment of animal-inflicted wounds.

9.6 Heritage Resource Contingency Plan

All archaeological sites at the CAM-3 site must be avoided during clean up activities. Unrecorded archaeological sites containing such remains as habitation structures, hunting blinds, food catches and graves, and objects such as tools, utensils and butchered animal bone may be inadvertently discovered and disturbed during clean up activities. All site personnel are prohibited from knowingly disturbing any archaeological or other heritage site or collecting any artifacts. Removing artifacts is a criminal offence. In the event of finding heritage resources:

- Cease site work immediately in the area; do not remove any artifacts or other associated objects from the site unless their integrity is threatened in any way.

- Mark the site's visible boundaries and avoid the area during clean up activities.

- Report the discovery of the site immediately to the DCC Contract Coordinator and the Department of Culture, Language, Elders and Youth of the Nunavut Territorial Government by phone or fax any comply with any site protection instructions issued. Do not engage in any archaeological excavation activities.

- Prepare reports of any discovery for the respective regulatory authority and DND/PMO indicating:

  - the identity of the person making the discovery;
  - the nature of the material;
  - the nature of the activity resulting in its discovery;
  - the location of the find including a description of the site location, topography, landmarks, etc.;
  - a description of the archaeological site including size, features or details visible, supplemented by sketches or photographs;
  - protection measures instituted;
  - the present location of any heritage material removed for safekeeping; and
  - extenuating circumstances.

- In the event of discovery of human remains:

- Advise the PMO of the discovery and they will contact the nearest detachment of the RCMP. The RCMP will make the decision as to whether the territorial coroner or archaeological department should be contacted.

- Halt all activities around the area of the discovery. Until determined otherwise, the remains should be treated as evidence in a criminal investigation. If the remains are found in the bucket of heavy equipment, the bucket should not be emptied, as physical evidence may be destroyed.

- Secure the area and designate it as out of bounds to all personnel. Depending on the weather conditions, the human remains should be provided with non-intrusive protection such as a cloth or canvas tarp (non-plastic preferred).

- Prepare a report, as described in Section 9.4.9.