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Project Description for the Clean Up of Three Landfills at the PIN-M, Cape Parry DEW Line Site

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1. INTRODUCTION

1.1 Background

Canada and the United States signed a Memorandum of Understanding (MOU) in March 1985, 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 to be called the North Warning System (NWS). The DEW Line facilities in Canada include 42 radar stations located in the Arctic, 21 sites are under the jurisdiction of the Department of National Defence (DND) and 21 sites are governed by the Department of Indian Affairs and Northern Development (DIAND). The DND DEW Line stations are situated on lands that are located in two land claim regions: 6 stations are located within the Inuvialuit Settlement Region (ISR) and the remaining 15 stations are located in the Nunavut Settlement Area (NSA). An agreement was signed between the Department of National Defence and the Inuvialuit Regional Corporation (IRC) regarding the requirements for the physical restoration of the sites as well as the employment opportunities for Inuvialuit peoples located within the ISR (a copy is provided in Appendix I).

Eight of the DEW Line sites have been downsized and operate as NWS Long Range Radar (LRR) sites. The site at Cape Parry, NWT, known as PIN-M, operates as an LRR site. Only two LRR sites, CAM-M and FOX-M continue to be staffed on a permanent basis.

Closure of the remaining 13 DEW Line sites began in 1991 and was completed in 1993. North Warning System involvement continues at eight of these sites as Short Range Radar (SRR) stations, either at the former operations site or nearby. The SRR stations are remotely operated and personnel will be on-site for short periods for maintenance and inspection. The remaining five DEW Line sites have been decommissioned and are to be completely removed.

PIN-M, Cape Parry is a DND reserve identified in the Inuvialuit Final Agreement as an Annex R site, which is a federal reserve on Inuvialuit owned land. As per the DND/IRC Cooperation

Agreement, the reserve status is to be removed from Annex R sites that are no longer required by NWS and DND is to follow the Inuvialuit Land Administration (ILA) Rules and Procedures.

1.2 Project Location

PIN-M, Cape Parry is located on the Parry Peninsula, one of the most northerly points on the North American continent. It is located within the Northwest Territories and extends into Amundsen Gulf at 70°10'18"N latitude and 124°43'42"W longitude.

The nearest community to PIN-M is Paulatuk, approximately 100 km to the southeast. PIN-M is within the Inuvialuit Settlement Region and is adjacent to a federal Migratory Bird Sanctuary.

1.3 Project Goals

The aim of the DEW Line Clean Up (DLCU) Project is to decommission those facilities used by the former DEW Line which have been deemed surplus to the requirements of the new North Warning System and to restore the sites to an environmentally safe condition. While the main component of the clean up work was completed in 1998, there are some clean up components yet to be completed. The environmental restoration of this area includes the setting of remediation objectives that are designed to minimize the continued migration of contamination into the Arctic ecosystem/food chain.

1.4 Schedule

A summary of the remediation/construction schedule is as follows:

- The Contractor will mobilize to the site in July or August 2002, by barge or sealift and set up a temporary construction camp.
- Remediation activities are expected to continue through October 2002, depending on the Contractor's approach and weather conditions.

- Completion of the West Landfill remediation, regrading at the West Point Landfill and the Main Landfill, construction of the Station Area Landfill extension, and demobilization of the Contractor's facilities and equipment is anticipated for the end of the 2002 construction season.
- Monitoring of the performance of the remaining landfills will continue for 25 years.

1.5 Regulatory Overview

During the implementation of the DLCU Project at PIN-M, all applicable environmental laws, regulations and requirements of federal, territorial and other authorities will be adhered to. The following list provides an overview of the laws and regulations pertaining to the DLCU Project at PIN-M:

- The **Canadian Environmental Protection Act** is a comprehensive environmental legislation that regulates toxic substances from their production or import, to consumption, storage and disposal. Key regulations within this Act are the **Chlorobiphenyl Regulations** and the **Storage of PCB 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, negative alteration or disturbance, or impediments to fish movement.
- The **Arctic Waters Pollution Prevention Act and Regulations** govern the 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.

- 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.
- The **Canada Wildlife Act** provides for the involvement of the Canadian Government in cooperative research and management programs involving wildlife species or species such as caribou, which seasonally move across various regulatory boundaries.
- The **Canada Shipping Act** regulates shipping activities under the jurisdiction of Canada. Regulations cover technical standards of operation safety and pollution prevention aspects related to shipping activities in Canadian waters.
- The **Constitution Act** is the enabling legislation for the Inuvialuit Final Agreement (IFA). The IFA in turn details the terms and conditions for developments and other uses of lands within the Inuvialuit Settlement Region.
- 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 the authority for administering and protecting lands under the direct control of the Minister of the Department of Indian Affairs and Northern Development. The following regulations are pursuant to this Act:
 - The **Territorial Land Use Regulations** provide regulatory control for maintaining sound environmental practises 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-ways, 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.

- **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.
- **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)** 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 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 NWT Explosive Use Act** provides controls for surface blasting other than for mining purposes.
- **The NWT Wildlife Act** provides for the protection of wildlife and wildlife habitats as well as regulated harvest of selected species.
- **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 offences and penalties are defined. The Act applies only to situations not authorized by other Canadian Acts in the NWT.

- **The Spill Contingency Planning and Reporting Regulations** outline requirements for filing a contingency plan and reporting spills.
- **The Northwest Territories Archaeological Sites Regulations**, pursuant to the Northwest Territories Act, protects archaeological sites in the NWT from disturbance and prohibits the removal of archaeological specimens, except under permit.
- **Occupational Health Regulations** outline the health and safety standards to be maintained at the workplace to ensure the health and safety of persons.
- **National Guidelines for Decommissioning Industrial Sites** provides the recommended process for undertaking site assessment studies.
- **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 discharge from existing and proposed Federal installations.
- **National Guidelines for the Landfilling of Hazardous Waste** 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.
- **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 Practise 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 practises.
- **Canadian Drinking Water Guidelines** outlines the drinking water quality criteria for specified uses of water, including contaminated sites.

2. ENGINEERING SCOPE OF WORK

The scope of work includes the additional environmental clean up of landfills at the PIN-M, Cape Parry DEW Line site that have been identified since 1998.

The construction of new access roads will not be required, as the site remains operational, and some infrastructure remains. However, the Contractor may be required to make special provisions to protect tundra vegetation.

Table 1 outlines the DEW Line Clean Up Criteria. All concentrations are in parts per million (ppm).

Table 1
Summary of Clean Up Criteria

Substance	Tier I	Tier II	Hydrocarbon Criteria
Arsenic	-	30	
Cadmium	-	5.0	
Chromium	-	250	
Cobalt	-	50	
Copper	-	100	
Lead	200	500	
Nickel	-	100	
Zinc	-	500	
Polychlorinated Biphenyls	1	5	
Type A Hydrocarbons (lubricating oil & grease)			2500
Type B Hydrocarbons (fuel oil)			2500

A topographic map segment and drawings outlining the project layout and the work to be completed at the site have been included in Appendix II.

2.1 West Point Landfill

There is a small amount of exposed debris and barrels along the southeast and southwest edges of the area previously regraded. The work is to include placement of additional granular fill to extend coverage over the debris area.

2.2 West Landfill

There are four areas at the West Landfill, totalling approximately 2700 square metres that contain buried material and debris that will be excavated. Excavation of soil and debris totalling approximately 4000 cubic metres will be completed. The excavated material will be sampled, tested and sorted into clean material, non-hazardous components and hazardous material. The non-hazardous material will be disposed of in an extension to the existing Station Area Landfill. Hazardous material and DCC Tier II contaminated soil will be containerized and shipped to Hay River, NWT, where it will be sent to disposal firms in Alberta. The clean material will be replaced in the excavation. Additional granular fill will be placed in the excavation and the backfill will be completed with the addition of select granular fill for surface erosion protection. Low areas adjacent to the excavation will be regraded with granular fill.

2.3 Main Landfill – West

The Main Landfill – West was previously designated a debris area and debris was removed and the area regraded. Drainage through the area has created several erosion channels where a small amount of debris has been exposed. Work in this area will consist of removing all visible partially buried debris, regrading designated areas with additional granular material and placing erosion resistant granular material in drainage channels. The debris removed from this area will be placed in the extension to the Station Area Landfill.

2.4 Station Area Landfill

The Station Area Landfill will be extended toward the south and closed after the following:

- Placement of non-hazardous waste, site debris and DCC Tier I contaminated soil within the landfill;
- Compaction of landfill debris;
- Placement and compaction of granular fill over the landfill extension;
- Grading to promote positive drainage away from the landfill.

2.4.1 Instrumentation

The extension to the Station Area Landfill will require the installation of groundwater monitoring wells and temperature thermistors. The required nominal depth of each monitoring well is assumed to be 8 metres. A follow up program will require monitoring of this landfill annually for the first five years after construction, and subsequently after seven, ten, fifteen, and twenty-five years.

2.5 Development of Borrow Sources

Existing borrow areas will be sourced to supply approximately 1100 cubic metres of granular material for erosion protection plus approximately 9500 cubic metres of Type 2 granular material for regrading at landfill and extending the Station Area Landfill.

2.6 Contractor Support Activities

Additional activities required to support the Contractor's work include:

- Use of existing beach landing area, airstrip and roads at site for equipment transport, movement and access to work areas.
- Set-up of construction camp and equipment storage area.
- Sewage from the camp will be handled with, at a minimum, primary treatment (settling tank and lagoon), and discharged to ground surface. Sewage treatment and disposal will be in accordance with the Land Use Permit and Water Use License.
- Domestic waste is to be disposed, after incineration, in the Station Area Landfill extension.
- Demobilization of the construction camp following the end of the project.
- Vehicle traffic to work areas is to be supported by the existing access roads that traverse the site.
- Labour and equipment requirements are anticipated to include 10 to 15 personnel, 5 pieces of heavy construction equipment, and 1 support vehicle.
- Duration of work is anticipated to be approximately 6 to 8 weeks.

3. PROJECT IMPLEMENTATION

3.1 Site Access and Transportation Methods

Off-site activities in support of this project will be in the form of transportation associated with the transport of materials, equipment and personnel to the site. These activities are described below:

- **Air Transport** – most transportation by air is expected to utilize existing charter services into and out of the site. Depending on the Contractor's schedule, minimal use of chartered aircraft will occur (i.e. one flight per week using a Twin Otter).
- **Sealift Transport** – it is anticipated that the Contractor will utilize sealift to transport bulk materials and equipment (vehicles, heavy equipment, etc.) to/from Cape Parry.
- **Land Transport** – it is anticipated that overland transport will be required between the site and boat dock for mobilization/demobilization of materials and equipment.

3.2 Contingency Plan

For each site, contingency plans for the prescribed course of action to be followed in the event of fuel or chemical spills. These plans will enable persons that encounter a contingency situation to maximize the effectiveness of the environmental protection response and meet regulatory requirements for reporting to the appropriate agencies. The detailed spill response plan has been prepared by the North Warning System, which has operational control of this site. A copy of the spill contingency plan is in Appendix III.

3.3 Clean Up Contract

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, and must comply with the provisions of the IRC/DND Cooperation Agreement, and the clean up specifications.
- The contract will be awarded 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.

4. DESCRIPTION OF THE ENVIRONMENT

Environmental conditions at PIN-M were documented by UMA (1991) and RMC (1996). Those environmental components potentially impacted by, or influencing cleanup operations are summarized below.

4.1 General Geology and Hydrology

PIN-M, Cape Parry is located on the north end of the Parry Peninsula, one of the most northerly points on the North American continent. It extends into the Amundsen Gulf, and is almost completely surrounded by deep water. Regionally, the area lies within the Horton Plain subdivision of the Interior Plains. The area is underlain by a Palaeozoic sequence which outcrops in the immediate area. The eastern portion of Parry Peninsula is comprised of an extensive, north trending end moraine formed by the retreat of an early Wisconsinan ice sheet. It is predominantly covered with sands, gravels and cobbles, but there are some outcrops of bedrock.

The station area is located along a coastal topographic high, elevation 86 metres above sea level (masl). Further inland, the station is bounded by low-lying, poorly-drained terrain within which lakes and ponds are common. The site itself is well-drained, consisting of partially indurated marine sediments.

4.2 Flora

The landscape at PIN-M appears grey due to the scarcity of vegetation cover. Vegetation cover in the vicinity of the site is typically 10 to 20 percent and comprised of isolated clumps and small patches of *Dryas* spp. (including *D. integrifolia*), grasses, and lesser amounts of *Salix* spp. Isolated small, damp depressions contain 70 to 90 percent vegetation cover that is dominated by sedges (including *Eriophorum* spp. and *Carex* spp.), grasses, *Equisetum* spp., and occasional clumps of *Salix*

spp. Other incidental species found on the site include *Papaver radicum*, *Melandrium affine*, *Armeria maritima*, *Pedicularis* spp., *Saxifragia oppositifolia*, *S. tricuspidata*, *S. caespitosa*, and *Chrysanthemum* spp.

4.3 Fauna

Barren-ground caribou (*Rangifer tarandus groenlandicus*) regularly visit the site in small numbers. This particular group of animals are part of the Bluenose Herd. The calving grounds are located approximately 100 km southeast. Other large mammals such as polar bears and muskoxen do not commonly occur in this area.

Arctic foxes (*Alopex lagopus*) are regularly observed at this station. Signs of arctic hare (*Lepus arcticus andersoni*) were also observed in the vicinity of the station.

Marine mammals are expected to occur in the waters surrounding Cape Parry; however, no large concentrations of marine mammals are noted for this area. Ringed seals (*Phoca hispida*) are commonly observed in this area during the spring.

4.4 Avifauna

King Eiders (*Somateria spectabilis*) and Common Eiders (*S. mollissima*) have been observed in large concentrations in this region during aerial surveys, and were noted on the emergency water supply lake and in the ocean surrounding the site during a site visit in 1990.

The Cape Parry Migratory Bird Sanctuary is located at Cape Parry and extends from Police Point, immediately north of the station, and includes the headlands of Cape Parry, and a headland midway along the coast between Cape Parry and Police Point. The Sanctuary contains the only known nesting colony of Thick-billed Murres (*Uria lomvia*) in the western Canadian Arctic. Black Guillemots (*Cepphus grylle*) were also observed at this location, which was noteworthy as this species is not common to the Western Arctic.

4.5 Fish

Station personnel fish for arctic char (*Salvelinus alpinus*) and lake trout (*Salvelinus namaycush*) in lakes southwest of the station, but productive areas for these species are not found in lakes in the immediate vicinity.

4.6 Heritage Resources

The facilities associated with PIN-M cover a large area, most of which has been inspected for archaeological remains. Two previously recorded Thule villages occur within the immediate vicinity of the station. The Vaughn Site, consisting of a large house mound with associated midden and a second, indistinct house ruin was test excavated by W. Taylor in 1963. All that remains is one heavily disturbed feature. Most of the surrounding area has been bulldozed and used as landfill; the feature itself has been looted for souvenirs. The Jackson site, recorded by W. Taylor in 1963, was not located and has probably been totally destroyed.

Four previously unrecorded sites were identified. Two possible caches were observed east of Police Point, and an unidentifiable mound was recorded near the main station.

4.7 Socio-Economic Setting

The nearest permanent community is Paulatuk, located 100 km to the southeast. Other communities in the general region are Holman and Sachs Harbour. Hunters from Paulatuk pass through this area in winter on snowmobile. Hunting for polar bears, seals, and grizzly bears occurs throughout this area in winter and spring.

4.8 Land Use

PIN-M lies within the Inuvialuit Settlement Region, and is located on Inuvialuit lands as defined in Section 9 of the Inuvialuit Final Agreement.

The site is adjacent to a federal Migratory Bird Sanctuary located on the peninsula north of the site and along nearby cliffs.

It is recognized that hunting and the relationship to the land are of profound cultural and spiritual importance to the Inuit. Hunting itself provides a means for linking modern day lifestyles and culture with the past. Hunting is valued by the Inuit as it contributes to both independence and community well-being.

5. IDENTIFICATION OF ENVIRONMENTAL EFFECTS

As part of the preparation for the clean up of the landfills at the PIN-M site, potential interactions between the project components and the environment were identified. The focus was on the location, sensitivity, seasonal presence and abundance of these components (i.e. bird nesting areas). Through this assessment, Valued Ecosystem Components (VECs) were identified, which can include physical, biological, socio-economic, historical or cultural components. The VECs identified for this project are discussed in the following sections.

5.1 Environmental Effects

5.1.1 Value Ecosystem Components vs Project Components

Table 2 summarizes the interaction and potential impacts between Valued Ecosystem Components and the various activities associated with the clean up.

Table 2
Potential Impacts on Various Activities

VEC	Activity	Description of Impact
Air Quality	Hazardous Materials Removal	The removal of the contaminated soil from the environment will reduce the risk of negative impact to air quality.
	Site Grading / Borrow Source Development	The extractions of granular materials and grading activities have the potential to create dust and impact air quality.
Soil Quality	Landfill Development/ Landfill Closure	Landfill closure/remediation will minimize or eliminate the risk of contaminants coming into contact with soil, thereby improving soil quality. The development of an extension to the Station Area Landfill may degrade soil quality if not properly constructed.
	Contaminated Soil Disposal / Hazardous Materials Removal	The removal of the contaminated soil and hazardous materials from the environment will improve soil quality.

VEC	Activity	Description of Impact
Soil Quality (Cont'd)	Removal and Transport of Hazardous Material, Fuel and Contaminated Soil	The potential exists for accidental release of hazardous materials (which may include contaminated soil) during handling and transport. An accidental release could impact the soil quality.
	Contractor Support	The operation of the construction camp will include treatment and disposal of waste. The potential exists for waste to impact soil quality, if not properly handled.
Water Quality	Landfill Development/ Landfill Closure	The development of an extension to the Station Area Landfill may degrade water quality, both surface and groundwater if not properly constructed.
	Contaminated Soil Disposal / Hazardous Materials Removal	The removal of the contaminated soil and hazardous materials from the environment will reduce the risk of contamination of water (both surface and groundwater) quality.
	Removal and Transport of Hazardous Material, Fuel and Contaminated Soil	The potential exists for accidental release of hazardous materials (including contaminated soil) during handling and transport. An accidental release could impact water quality.
	Site Grading/Borrow Source Development	Erosion and sedimentation of waterbodies during grading and gravel extraction activities may impact water quality. Terrain and drainage to be improved as a result of grading disturbed areas.
	Contractor Support	The operation of the construction camp will include treatment and disposal of waste. The potential exists for waste to impact water quality, if not properly handled.
Terrain	Landfill Development	Excavation required for the closure of the West Landfill may degrade permafrost.
	Landfill Closure / Site Debris Disposal	The development of the extension of the Station Area Landfill and removal of debris from the West Landfill, West Point Landfill and Main Landfill may disturb the existing terrain at the landfill locations.
	Site Regrading	Terrain and drainage to be improved as a result of grading disturbed areas. Previously disturbed areas will blend into the natural environment

VEC	Activity	Description of Impact
	Borrow Source Development	The extraction of granular material will alter the terrain of the borrow areas.
Terrain (Cont'd)	Contractor Support	Movement of Contractor's equipment and personnel around the site may disturb the tundra.
	Contaminated Soil Disposal	The excavation of contaminated soil may degrade permafrost.
Terrestrial Animals and Habitat	Contaminated Soil Disposal/Hazardous Materials Removal	The removal of hazardous materials and contaminated soil from the environment reduces the risk of exposure of terrestrial animals.
	Landfill Development	Loss of habitat, specifically vegetation, may result because of the development of the extension to the Station Area Landfill in previously undisturbed areas.
	Borrow Source Development	The extraction of granular material requiring disturbance of the ground may impact terrestrial habitat (including vegetation).
	General Clean Up Activities	The presence and movement of people around the site has the potential to disturb the animals identified around the site.
Aquatic habitat and animals	Landfill Closure	The proximity of the West Landfill to the marine environment may impact aquatic habitat due to sediment or contaminated materials entering the water during removal of the landfill. The potential would then exist for impacts on aquatic animals. Removal of the West Landfill removes the risk of chronic exposure to the aquatic environment.
	Site Regrading/Borrow Source Development	The extraction of granular material and grading adjacent to waterbodies (both fresh and marine) has the potential to impact aquatic habitat due to sediment entering the water. The potential would then exist for impacts on aquatic animals.
	Contaminated Soil Disposal/Hazardous Materials Removal	The removal of contaminated soil and other hazardous materials from areas close to waterbodies, reduces the risk of exposure to aquatic animals.

VEC	Activity	Description of Impact
	Removal and Transport of Hazardous Material, Fuel and Contaminated Soil	The excavation of contaminated soil from the beach area may impact the aquatic environment in the event of an accidental release and may also impact aquatic animals due to close proximity to the marine environment.
Aquatic habitat and animals (Cont'd)	Contractor Mobilization to and From Site via marine transport	The transportation to/from the site has the potential to disturb aquatic animals.
Health and Safety	Landfill Closure/ Site Debris Disposal/ Facility Demolition/ Removal and Transport of Hazardous Material, Fuel and Contaminated Soil	The excavation of potential hazardous materials from the landfills, the collection and disposal of potential hazardous debris, and the general handling of hazardous materials has the potential to impact health and safety of workers.
	Contaminated Soil Disposal/Hazardous Materials Removal	The removal of contaminated soil and other hazardous materials from the environment reduces the risk of exposure of people.
Archaeological	General Clean Up Activities	The presence and movement of people around the site has the potential to disturb the archaeological resources identified around the site.
Land Use	General Clean Up Activities	Clean up activities may disturb traditional land use, i.e. hunting and fishing activities that would occur during the summer months. Conversely, the clean up will improve the safety of people using the land area by removing potentially unsafe buildings, contaminated soil and hazardous materials.
Aesthetics	General Clean Up Activities	Clean up of the landfills will improve the aesthetics of the site by removing unsightly debris and restoring the site to a more natural state. The use of heavy equipment in various aspects of the landfill closure and landfill extension will increase noise levels, which has the potential to disturb wildlife. Marine transportation to and from the site has the potential to disturb marine mammals.

VEC	Activity	Description of Impact
Economy	Contractor Support	The Contractor will be required to have a minimum Inuit content in the workforce and subcontractors for the clean up. This will provide employment benefits and related economic benefits.
	General Clean Up Activities	It is likely there will be requirements for training and employment that will benefit the local community.

5.1.2 Impact of the Environment on Project

The implementation of a clean up project, such as the clean up of the landfills at PIN-M, in an Arctic environment brings unique logistical issues. The potential exists for delays in the clean up associated with bad weather. These delays may include work stoppage on-site or delays in the transportation to and from the site of personnel and supplies. Conditions related to the Arctic climate, such as ice and frozen ground may also delay clean up activities. Ice may delay marine transport to and from the site. Clean up activities which are best completed at maximum thaw may be delayed depending on seasonal climate changes.

6. IDENTIFICATION OF CUMULATIVE ENVIRONMENTAL EFFECTS

Cumulative effects have been defined as changes to the biophysical, social, cultural or economic environments caused by a project component in combination with any on-going, past or future activities. Cumulative effects can occur as interactions between project components (either from the same or more than one site) and/or between environmental components. Effects can occur in one of four ways:

- Physical or chemical transport mechanisms;
- “Nibbling loss” (i.e. gradual disturbance);
- Spatial or temporal crowding;
- Growth induction initiated by the project.

6.1 Analysis of Cumulative Environmental Effects

Four steps in the analysis of the cumulative environmental effects of this project include scoping, analysis of effects, mitigation measures, and significance.

6.1.1 Scoping

Scoping includes the identification of issues of potential concern, VECs that could be affected and boundary setting. The activities considered included the operation of the PIN-M North Warning System Long Range Radar site.

The spatial boundaries included impacts over a larger (regional) area including the crossing of jurisdictional boundaries. As some landfills will remain on site, temporal boundaries extended beyond the time frame required to complete the clean up work.

6.1.2 Analysis of effects

The analysis included an evaluation of baseline data and possible effects on VECs. The combined interactions between the clean up activities and future land use and those VECs which are similar were identified.

6.1.3 Mitigation Measures

Mitigation measures were identified for project environment interactions.

6.1.4 Significance

The interactions are defined as having a low (L), moderate (M) or high (H) probability of occurring. The next step is to determine the likelihood of significant adverse effects, taking into account appropriate mitigation measures.

6.2 Identification of Mitigation Measures and Residual Impacts

Mitigation measures resulting in a reduction or elimination of potential adverse effects associated with the clean up were identified. Table 3 summarizes the mitigation measures identified for the potential adverse environmental impacts detailed above. Taking into account the mitigation measures, the significance or anticipated residual impacts were identified for all potential adverse impacts.

Table 3
Summary of Mitigation Measures

Potential Impact	Mitigation Measure	Significance
The extractions of granular materials and grading activities may create dust and impact air quality.	Implement dust control measures. Waste oil will not be used for dust suppression.	Low.

Potential Impact	Mitigation Measure	Significance
The migration of leachate from the new landfill extension may degrade soil and water quality.	<p>The extension to the Station Area Landfill is to contain non-hazardous waste only.</p> <p>The cover will be graded to promote surface run-off.</p> <p>Facilities will be sited away from natural drainages.</p>	Low significance due to design criteria for landfill development and closure.
Accidental release of hazardous materials (including contaminated soil) could impact the soil and water quality.	<p>Implement proper handling, storage and transportation procedures for hazardous materials.</p> <p>All workers to be trained in proper handling procedures for all hazardous materials on site.</p> <p>Do not store hazardous materials, including fuel, on beach.</p> <p>Adhere to contingency plans. Ensure all materials and equipment to implement contingency plans are available on-site.</p>	Potentially significant impacts are prevented provided mitigation measures are implemented.
The operation of the construction camp will include treatment and disposal of waste, which may impact the soil and water quality.	<p>Do not dispose of hazardous materials in camp waste system.</p> <p>Disposal of all sewage to be in accordance with applicable regulations and guidelines.</p>	Low.
Erosion and sedimentation of waterbodies during grading and gravel extraction activities may impact water quality.	<p>Prevent siltation by use of berms or silt fences.</p> <p>Do not operate equipment within water bodies.</p> <p>Disturbed areas adjacent to water to be stabilized and re-vegetated if required.</p>	Potentially significant impacts are prevented provided mitigation measures are implemented.

Potential Impact	Mitigation Measure	Significance
Excavation required for the closure of the West Landfill may degrade permafrost.	Minimize time permafrost is exposed. Minimize surface area of exposed permafrost or active zone.	Low.
Disturbance of the terrain and drainage due to extraction of granular material, the development and closure of the landfills, movement of Contractor's equipment and personnel around the site and removal of site debris.	Regrade and reshape disturbed areas to match existing terrain and drainage paths. Use existing roads for movement around the site.	Not significant provided mitigation measures are implemented.
The use of heavy equipment in various aspects of the clean up including, landfill development and closure, grading and transportation, will increase noise levels, and may disturb wildlife. Marine transportation to and from the site may disturb marine mammals.	Survey for wildlife concentrations. Avoid known wildlife colonies or bird nesting areas. Employ minimum distance/height restrictions for transportation activities. Mitigation measures to be implemented to minimize noise impacts in event of wildlife on site.	Not significant provided mitigation measures are implemented.
Loss of habitat, specifically vegetation as a result of the development of the new landfill extension.	Regrade and reshape the disturbed areas to match existing terrain to facilitate recovery of ecosystem components. Re-vegetate where required.	Low.

Potential Impact	Mitigation Measure	Significance
Impact on aquatic habitat due to sediment and/or hazardous materials entering an aquatic environment, the extraction of granular materials, grading and handling of contaminated soil and other hazardous materials The potential would then exist for impacts on aquatic animals.	Visually inspect aquatic habitat for fish and marine mammals prior to work beginning. Avoid work during periods of wildlife concentrations. Implement mitigation measures to prevent deleterious substances from entering the aquatic environment.	Potentially significant impacts are prevented provided mitigation measures are implemented.
The transportation to/from the site may disturb aquatic animals.	Obtain information regarding wildlife concentrations in work areas. Cease transportation activities during periods of wildlife concentrations/migration. Transportation of any hazardous materials to be in accordance with Transportation of Dangerous Goods Regulations. Follow designated routes for shipping activities.	Potentially significant impacts are prevented provided mitigation measures are implemented.
The excavation of hazardous materials from the West Landfill may impact health and safety of workers.	Develop and implement a comprehensive health and safety plan. Workers are to wear and use appropriate personal protective equipment. Workers to be trained in use of personal protective equipment and proper handling procedure for hazardous materials. Proper procedures for working around heavy equipment to be implemented.	Potentially significant impacts are prevented provided mitigation measures are implemented.

Potential Impact	Mitigation Measure	Significance
The presence and movement of people around the site has the potential to disturb archaeological resources in the area.	Clearly mark the archaeological resources identified in previous assessments. Avoid resources. Contact authorities in the event new resources are discovered or a known resource is disturbed.	Low.
Clean up activities may disturb traditional land use, hunting and fishing activities that would occur during the summer months	Contact local hunters and trapper organization to coordinate clean up activities and traditional land use.	Low.

7. DEMOBILIZATION PLAN

The contract documents for the DLCU Project will require the Contractor to clean up and remediate the area in which their activities took place. Following the completion of clean up activities at the landfills, all vehicles and equipment, remaining fuel, supplies, and construction camp are to be removed from the site by the Contractor. The construction specifications provide for a percentage of the payment for mobilizations/demobilization to be withheld pending a satisfactory withdrawal from the site.

The Contractor will be required to arrange for demobilization, which usually coincides with the annual sealift.

8. MONITORING AND MAINTENANCE PLANS

As part of the overall DLCU program, DND will undertake an extensive multiple year post clean up monitoring program at each site. This monitoring program is contained in the IRC/DND Cooperation Agreement. The purpose of this program is to ensure that environmental objectives, particularly those related to landfill remediation, continue to be met. The specific tasks related to the monitoring of each landfill are based on the associated risk. A site specific monitoring plan has been developed for this site, and will be updated to address the extension to the Station Area Landfill. Because the West Landfill is to be completely removed and remediated, there will be no monitoring at this location. The Environmental Working Group reviews the results of each monitoring event and provides recommendations.

9. CONCLUSIONS AND RATIONALE

The overall impact of the final cleanup activities at PIN-M will be the physical restoration of the site to its quasi-natural state (including drainage), the mitigation of the potential effects contaminants and hazardous materials may have on the human and ecosystem health, and the northern economic benefits gained from the employment of workers and contractors from nearby communities during cleanup operations.

Some of the proposed cleanup activities have the potential to impact adversely on the environment, particularly, breeding and foraging habitat for a number of Arctic birds and mammals, and human and ecosystem health. Nevertheless, the integration of proper mitigation procedures that will be established in the environmental protection plan and the positive impacts indicated above outweigh the potential negative effects in the long term, in addition to facilitating the restoration of ecosystem components lost during cleanup and previous site activities.

10. INFORMATION SOURCES

Canadian Environmental Assessment Agency. 1994. Addressing Cumulative Environmental Effects. Minister of Supply and Services, Ottawa.

Canadian Environmental Assessment Agency. 1994. Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects. Minister of Supply and Services, Ottawa.

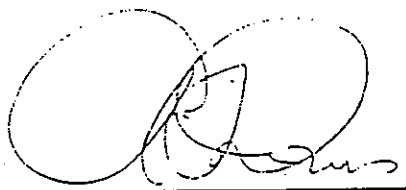
UMA. 1991. Environmental Clean-Up Study of 21 DEW Line Sites in Canada, Volume 7 PIN-M Cape Parry, NWT. Prepared by UMA Engineering Ltd., in association with Hardy BBT Limited and Jacques Whitford Group. June 1991.

UMA. 2002. Specifications for the Clean up of the West Landfill at the PIN-M, Cape Parry DEW Line Site. Prepared by UMA Engineering Ltd. in association with The SGE Group Inc. March 2002 – draft.

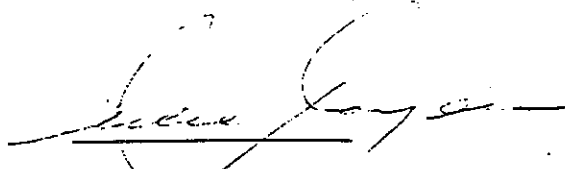
APPENDIX I

Cooperation Agreement between the IRC and DND

COOPERATION AGREEMENT
BETWEEN
THE INUVIALUIT REGIONAL CORPORATION
AND
THE DEPARTMENT OF NATIONAL DEFENCE
CONCERNING THE RESTORATION AND CLEAN-UP
OF DEW SITES
WITHIN THE INUVIALUIT SETTLEMENT REGION

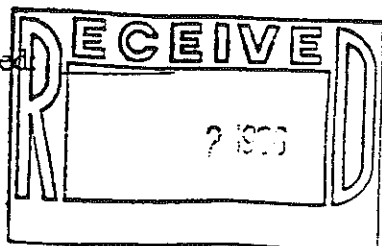


Director General Environment
Department of National Defence

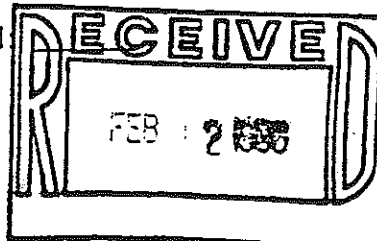


Chairman
Inuvialuit Regional
Corporation

Dated



Dated



PREAMBLE

Whereas the Government of Canada, herein referred to as Canada, has modernized the air defence of Canada through a joint USA/Canada project referred to as North American Air Defence Modernization (NAADM);

And whereas, NAADM includes the conversion of certain Distant Early Warning (DEW) radar sites to North Warning System (NWS) radar sites;

And whereas DEW facilities, and portions of the associated land use areas are no longer in use, and require extensive restoration and clean-up;

And whereas certain DEW sites are located on Inuvialuit Lands and certain other DEW sites are located on Crown lands within the Inuvialuit Settlement Region (ISR);

And whereas the rights and responsibilities of the Inuvialuit and Canada pertaining to Inuvialuit Lands are detailed in the Inuvialuit Final Agreement (IFA);

And whereas the Inuvialuit have a general interest in all activities that occur within the ISR;

And whereas, pursuant to Sections 7, 10 and 16 of the IFA, the Inuvialuit shall be afforded the opportunity to participate meaningfully in development activities upon Inuvialuit Lands and within the ISR;

And whereas, DND and the Inuvialuit are voluntarily entering into this Cooperation Agreement, hereinafter referred to as the "Cooperation Agreement" or the "Agreement", to establish a broad framework for participation of the Inuvialuit in the restoration and clean-up of the DEW sites within the ISR;

And whereas, this Cooperation Agreement, supplemented by specific details included in Participation Agreements concluded by DND or its contractors and the Inuvialuit Land Administration (ILA) on behalf of the Inuvialuit Regional Corporation (IRC) as and when required, will constitute and fulfil the Participation Agreement requirements detailed in Section 10 of the IFA;

Now therefore, in consideration of the premises and mutual covenants contained herein, the Parties agree as follows:

1. DEFINITIONS

Contractor

Means a party who has contracted with the Government of Canada contracting agency to carry out a restoration or clean-up activity.

DEW Sites

Means the Distant Early Warning Sites under the administration and control of DND as listed in paragraph 2(1).

DIAND

Means the Crown represented by the Minister of Indian and Northern Affairs or his delegate.

DIAND/DND MOU

Means the Memorandum of Understanding Between The Department of Indian Affairs and Northern Development and The Department of National Defence For the Restoration Of Distant Early Warning System and North Warning System Sites effective on July 5, 1989.

DND

Means the Crown represented by the Minister of National Defence or his delegate.

General Protocol

Means the General Protocol For DEW Line Clean up developed by DND and DIAND in 1991 and attached in Schedule 1.

Inuvialuit

Means those people known as Inuvialuit who are beneficiaries under the Inuvialuit Final Agreement and, where the context requires, includes the Inuvialuit Regional Corporation, the Inuvialuit Development Corporation (IDC), the Inuvialuit Community Corporations and any other corporations or trusts

controlled by the Inuvialuit that may be established by or pursuant or subsequent to the IFA and for the purposes of the Cooperation Agreement are represented by the Chairman of the Inuvialuit Regional Corporation.

Inuvialuit Business(es)

Means corporations, joint ventures, partnerships or proprietorships that are 50% or more owned by the Inuvialuit.

Inuvialuit Final Agreement

Means "The Western Arctic Claim - The Inuvialuit Final Agreement" dated June 5, 1984 agreed to by the Government of Canada and the Inuvialuit. The Government of Canada gave effect to the IFA by the Western Arctic (Inuvialuit) Claims Settlements Act, being Chapter 24 of the Statutes of Canada, 1984, and as amended by an Act To Amend the Western Arctic (Inuvialuit) Claims Settlement Act, being Chapter 16 of the Statutes of Canada, 1988 and such further amendments that may be made during the currency of this Agreement.

Inuvialuit Lands

Means those lands to which the Inuvialuit have been granted title pursuant to clauses 7(1)(a) and 7(1)(b) of the Inuvialuit Final Agreement.

Inuvialuit Settlement Region

Means that portion of the Northwest Territories, Yukon Territory and adjacent offshore area shown in Annex A and described in Annex A-1 of the Inuvialuit Final Agreement.

Parties

Means the Inuvialuit Regional Corporation and the Department of National Defence.

Provisions

Means any warranty, term, agreement or representation set out in this Agreement.

PWGSC

Means the Crown represented by the Minister of Public Works and Government Services or his delegate.

Rules

Means the ILA Rules and Procedures adopted pursuant to the IRC by-laws on April 1, 1986 for the management and administration of the Inuvialuit lands.

Subcontractor

Means a party who contracts with a Contractor or Subcontractor to perform any part of the Contractor's obligations on a particular contract. The Contractor is accountable for the work performed by the Subcontractor.

Work

Means the materials, services, matters and things done or furnished or required to be done or furnished to perform a DEW site clean-up or restoration activity within the ISR.

2. GENERAL

2(1) Precedents

This Cooperation Agreement specifically relates to cooperation between DND and the Inuvialuit for the restoration and clean-up of the DEW Sites, and related activities, occurring at all sites located within the ISR. The DEW Sites which are within the ISR are as follows:

- BAR 1 - at/near Komakuk Beach
- BAR 2 - at/near Shingle Point
- BAR 3 - at/near Tuktoyaktuk
- BAR 4 - at/near Nicholson Peninsula
- PIN M - at/near Cape Parry
- PIN 1 - at/near Clinton Point

This Agreement is not to be construed as a precedent for interpreting any federal government or military obligations pursuant to the IFA; neither is it a precedent for such activities occurring outside the ISR. It is also not to be

construed by other developers as a precedent for any other construction activities in the ISR. For greater certainty, this Agreement including but not limited to the protocols and standards provided for in Schedule 1, shall not be construed as a precedent for any sites other than those listed above.

2(2) Time Is Of The Essence

The Parties mutually agree to recognize the urgency of the matters dealt with in this Cooperation Agreement and to perform all required actions expeditiously.

2(3) Objectives

The objectives of this Agreement are to establish a broad framework for participation of the Inuvialuit in the clean-up of the DEW Sites in the ISR in accordance with the goals and objectives set out in the IFA and to achieve efficient and cost effective DEW Site clean-up and restoration in accordance with Federal laws and guidelines regarding environment and health protection.

2(4) Representation

For the purposes of implementing and administering this Cooperation Agreement, the respective Parties shall be represented as follows:

- a. the Inuvialuit shall be represented by the Chairman of the Inuvialuit Regional Corporation; and
- b. DND shall be represented by the Director General Environment.

Each Party may formally delegate responsibilities to named individuals for specific functions, by doing so in writing.

3. RESTORATION AND CLEAN-UP PLANS

3(1) Site Specific Protocols

All clean-up and restoration operations will be undertaken in accordance with the Protocols in Schedule 1.

3(2) Site Specific Clean-up Plan

A Site Specific Clean-up Plan will be developed by DND in accordance with the Protocols in Schedule 1 and will include an Inuvialuit Employment and Training Plan pursuant to Section 7 of this agreement. Prior to the issuance of any Requests For Proposal, bid invitations or bid solicitations, DND and the IRC will agree upon the Site Specific Clean-up Plan. With the exception of Tuktoyaktuk, unless otherwise agreed to by both Parties, site specific clean-up plans for a site will be submitted to the IRC at least six months prior to the proposed work start up for that site as per Schedule 2. For Tuktoyaktuk, the Site Specific Clean-up Plan will be submitted to IRC by 15 February 1996.

4. IMPLEMENTATION

4(1) Contractual Mechanism

- a. The Government of Canada Contracting Agency will include a term in all contracts for work, that the Contractor will comply with this Agreement and a term that the Contractor will ensure that any Subcontractors will also be bound by similar provisions, wherever applicable.
- b. DND will, where feasible and cost effective, arrange that the Work specified in each contract will, at a minimum, consist of the complete clean-up and restoration of at least one full DEW Site.

4(2) Inuvialuit Final Agreement (IFA)

For all Work the Parties will comply with the IFA.

4(3) Inuvialuit Lands

All use of and access to Inuvialuit Lands by all Contractors and Subcontractors for the purposes of the Work will be subject to the IFA and the Rules where they are not inconsistent with the IFA and/or the legislation giving effect to the IFA. A letter between DND and the IRC is attached at Schedule 5 which provides further information concerning the arrangement agreed to between the Parties respecting DND's reservations on Inuvialuit lands listed on Annex R of the IFA.

4(4) Clean-up Schedules

The commencement and completion of the Work will take place in accordance with the attached Schedule 2 unless operational events or significant budget cuts to the Defence Services Program take place which could have a material impact on this schedule. If there is a significant budget cut, DND will provide the IRC with a written explanation outlining the changes to its budget for the DEW Line Clean-up and the anticipated impact on Schedule 2. In the event of an anticipated delay, the Parties will review the schedule and develop a new schedule which would minimize any delays from the timetable set out in Schedule 2.

4(5) Monitoring and Review

- a. To ensure that the provisions of this Agreement are being implemented to the satisfaction of both Parties, it is agreed that, for the duration of this Agreement, there will be a Review Committee. This Committee shall monitor progress, develop recommendations and suggest alternative solutions for achieving the commitments set in this Agreement by:
- (1) reviewing the plans for Inuvialuit opportunities required in this Agreement in Site Specific Clean-up Plans;
 - (2) reviewing and evaluating the effectiveness of the plans during the implementation;
 - (3) reviewing progress in achieving the commitments set out in this Agreement including an examination of the employment and training programs, and, all employment trends and statistics;
 - (4) identifying training opportunities and organizations and potential sources of funding to provide the said training;
 - (5) reviewing status and issues relating to leases, permits, and other documentation applicable to both Parties;
 - (6) ensuring that any deficiencies with respect to the Work or to this agreement are brought to the attention of the Parties and are expeditiously acted upon; and

- (7) considering other items related to the implementation of the Agreements.

b. The Review Committee shall:

- (1) consist of four members, two to be named by DND and two to be named by IRC;
- (2) be co-chaired by a member from each Party;
- (3) meet as required and at least twice a year;
- (4) meet at locations and at times as mutually agreed upon;
- (5) invite, as appropriate and with mutual agreement, representative(s) of other government departments and non-governmental organizations and contractors to provide advice as required; and
- (6) provide a mutually agreed agenda to the designated Review Committee members not less than ten (10) working days before each scheduled meeting.

- c. For the purpose of carrying out its duties, the Committee shall have the right to obtain from DND and the Inuvialuit all relevant information with the exception of information specifically excluded under the Federal Access to Information Act and information that was provided to the Crown or the Inuvialuit in confidence or information that is classified in accordance with the laws and regulations of Canada.

- d. Each of the participants is responsible for its respective costs involved with participating in Review Committee meetings.

4(6) Review Committee Recommendations

The agreed upon recommendations of the Review Committee will be implemented subject to ratification by DND and the IRC.

4(7) Arbitration

The Inuvialuit and DND shall attempt to resolve any differences without recourse to third parties. However, should circumstances require arbitration the following procedure will apply:

- a. If the Inuvialuit and DND cannot agree on any question of fact (as opposed to a question of law or mixed law and fact) related to the interpretation, implementation, or operation of this Agreement, either Party can submit the disagreement to a determination by arbitration, in accordance with the procedures set out below.
- b. The Arbitration proceedings shall be held in a location agreed upon by the Parties.
- c. Within ten (10) days of a written demand of either Party to refer a dispute to arbitration under the provisions of paragraph 4(7)a above, each Party shall name an arbitrator. The arbitrator shall then choose a third arbitrator who shall chair the Board. If the two arbitrators fail within ten (10) days from the date the last arbitrator was appointed to agree upon and appoint the third arbitrator, then upon written application by either Party such third independent arbitrator shall be appointed by a Judge of the Supreme Court of the Northwest Territories.
- d. The Arbitration Board's procedures shall be determined by the Parties to the arbitration, subject to the following:
 - (1) Unless the Parties to the arbitration otherwise agree, the procedure shall assure a right to at least one oral hearing before the Board said hearing to be held within 60 days of the Board being fully constituted under the provisions of paragraph 4(7)c above, as well as the opportunity to provide written submissions and rebuttal arguments.
 - (2) Unless the Parties to the arbitration otherwise agree, the Board shall have jurisdiction to decide whether any Interested Party shall be invited or allowed to participate in the arbitration, and if so what the rights and obligations of any such Interested Party shall be with respect to the participation of said Interested Party in the arbitration process.

- (3) Unless the Parties to the arbitration otherwise agree, the Board shall render a decision within (30) days after the hearing or within such other period of time agreed to by the Parties to the arbitration. The Board's decision shall be based on the provisions of the IFA and its implementing legislation as amended, this Agreement, all applicable Acts and Regulations, and on the arguments and submissions of the Parties. The decision shall be in writing and shall state the reasons on which it is based.
- (4) Unless the Parties to the arbitration otherwise agree, the Board's decision shall be final and binding on all Parties to the arbitration. However, any error of law and/or excess of jurisdiction on the part of the Board shall be subject to judicial review.
- (5) Unless the Parties to the arbitration otherwise agree, the proceedings as well as the report of the board shall be made public.
- e. Each Party reserves the right to resort to the courts in the case of a dispute over law or mixed law and fact.
- f. Each Party shall provide for remuneration and expenses of the arbitrator appointed by it. Each Party is responsible for their own costs in preparing for and including the costs of their witnesses and attending arbitration hearings. All other costs shall be equally shared by the Parties to this Agreement.

4(8) Amendments

Either Party may propose in writing an amendment during the term of this Agreement. The Parties mutually agree to consider required amendments in an expeditious manner, particularly where the proposed amendment directly affects the conduct of any Work in progress or scheduled to commence in the near term. Any agreed upon amendments will be executed in writing and attached as an appendix to this Agreement.

5. INUVIALUIT PARTICIPATION PLAN

5(1) Opportunities Planning

DND shall require in all project proposals and tenders an Inuvialuit Participation Plan which will include the type, level and value of Inuvialuit supplied goods and services, training and employment that will be solicited pursuant to the provisions outlined in clauses 6 and 7 of this Agreement and the location of offices and other facilities of the firms inside and outside of the region.

5(2)

DND and the Inuvialuit will establish minimum levels of Inuvialuit Participation which must be achieved in all Contractor Inuvialuit Participation Plans. In order for a contractor's tender or proposal for Work to be considered compliant, the Contractor's Inuvialuit Participation Plan must meet the agreed upon minimum levels of Inuvialuit participation.

6. BUSINESS OPPORTUNITIES AND COMMITMENTS

The following reasonable measures to encourage Inuvialuit participation with respect to contracts and subcontracts awarded for the Work will be taken:

6(1) Business Opportunities and Procedures

DND and the IRC will identify and advise the Inuvialuit of actual and potential business opportunities arising from the Work, and facilitate Inuvialuit involvement in such activities by following the procedures set out in this paragraph.

- a. The IRC shall prepare and maintain a complete list of Inuvialuit Businesses which could provide services to DND, any Contractor or any Subcontractor. Such list shall contain a brief description of the equipment or services provided by the Business, the business experience, address and contact name.
- b. DND shall include as a term in all contracts between DND and a Contractor for Work that, where the Contractor intends to sub-contract or procure goods for Work, the Contractor will first solicit bids from qualified businesses on the list of Inuvialuit Businesses referred to in paragraph 5(2)a. This process shall not limit other qualified Inuvialuit businesses from bidding as well. At the same

time, solicitation documents shall also be provided to the IRC. DND and its Contractors shall be held blameless if qualified Inuvialuit Businesses were not solicited because their name did not appear on the list provided by the IRC.

- c. DND shall include as a term in all contracts between DND and a Contractor for Work that where, following a solicitation for bids, a qualified Inuvialuit Business(es) offer(s) a compliant and competitive bid within the time specified in the solicitation documents, and the Contractor decides to execute a contract for that work, the contract will be offered to an Inuvialuit Business. The length of time provided to Inuvialuit businesses to prepare a bid will take into consideration the size and complexity of the work being solicited. In any event, not less than fifteen (15) business days shall be provided for a bid response from the date the solicitation documents are delivered. The Contractor shall determine whether a bid is compliant and competitive and this decision is not subject to the arbitration procedures specified in this Agreement. If it has been determined that a bid response contains minor variances which cause it to be considered not technically compliant or not competitive, the company which submitted the bid will be provided an opportunity to clarify the scope of work and revise its bid accordingly (if required). However, if a Contractor repeatedly determines that Inuvialuit bids are non-compliant in a conscious effort to subvert the objectives of this Agreement, the IRC shall have recourse to the Review Committee and if necessary paragraph 4(7) of this Agreement.
- d. If a sub-contract is not awarded pursuant to a solicitation within the ISR the Work shall be tendered in accordance with the Contractor's or the Subcontractor's policy.
- e. DND shall include as a term in all contracts between DND and a Contractor that if the above procedures relating to the award of sub-contracts have not been followed, or an Inuvialuit Business' offer has not been accepted, the Inuvialuit Business may request, and shall receive within 30 days, a written explanation setting out the reasons why the offer was not accepted. Subject to prior approval by the Inuvialuit Business, a copy of the explanation shall be provided to the IRC.

- f. It is understood that business opportunities provided to the Inuvialuit under this section will be dependent upon these Businesses meeting the required standards and providing the capacity, capability and expertise to supply goods and services in a competitive manner.

6(2) Specific Business Opportunities

DND will include as a term in all contracts between DND and a Contractor for Work that the following specific business opportunities for the provision of goods and services associated with the Work shall be provided through the Contractor or Subcontractors as set out in the subclause hereunder. The Contractor will provide the companies, listed below, a length of time to prepare a bid which takes into consideration the size and complexity of the work being solicited. In any event, not less than fifteen (15) calendar days shall be provided for a bid response from the date the solicitation documents are delivered. Where, following a solicitation for one of the services set out in this clause, the corresponding Inuvialuit Business has submitted a bid that is technically compliant, competitive and based on the lower of published tariffs (where applicable) or most favoured customer rates (where applicable), and the Contractor decides to execute a contract for that Work, the contract shall be offered to that Inuvialuit Business. If it has been determined that a bid response contains minor variances which cause it to be considered not technically compliant or not competitive, the company which submitted the bid will be provided an opportunity to clarify the scope of work and revise its bid accordingly (if required).

- a. Aklak Air will have the first opportunity to bid on all contracts for the transportation of personnel and freight by fixed wing aircraft for flights originating and terminating within the ISR or Inuvik;
- b. The Inuvialuit Projects Inc./Canadian Helicopters Ltd. Joint Venture will have the first opportunity to bid on all contracts for the transportation of personnel and freight by rotary wing aircraft for flights originating and terminating within the ISR or Inuvik;
- c. NTCL will have the first opportunity to bid on all contracts for marine transportation and barging of equipment and supplies;
- d. Inuvialuit Projects Inc. will have the first opportunity to bid on all contracts for camp facilities which are required in addition to any DND owned camp facilities presently located at DEW Sites;

- e. Stanton Distributing will have the first opportunity to bid on all contracts for groceries and foodstuffs required in association with any camp facilities provided for the Work; and

6(3) Granular Material

- a. Contractors and Subcontractors shall obtain gravel from the Inuvialuit for all sites on Inuvialuit lands. The specific gravel requirements will be determined by the Contractors and Subcontractors. The gravel required in excess of gravel which has already been quarried and used for other purposes (eg. runways) at the time of the signing of this Agreement shall be provided by the IDC in accordance with Schedule 3. All other granular material will be procured in accordance with the procedures outlined in Clause 6(1).

6(4) Disposal of Tier II Soils

- a. Subject to 6(4)b, DND will dispose of Tier II soils from DEW Line sites at a disposal site outside the ISR. NTCL will provide the marine transportation and barging of the soils from Nicholson Peninsula, Cape Parry and Shingle Point to Hay River in accordance with the prices set out in Schedule 4. Transportation rates for soils from the remaining DEW Line sites in the ISR will be established six months prior to soil transportation from these sites and will reflect a similar discount over published tariffs as is the case for Nicholson Peninsula and Cape Parry.
- b. Should it no longer be economical to dispose of the Tier II soils outside the ISR, or, it is no longer possible to dispose of the soils outside the ISR, DND reserves the right to pursue, through the applicable processes, approval for the construction of a Northern Disposal Facility. DND recognizes that the IRC is opposed to the construction of a Northern Disposal Facility within the ISR at the time of the signing of this Agreement.

6(5) Business Opportunity Reporting

DND shall file annually with the IRC a list of all contracts for goods and services awarded to Inuvialuit and non-Inuvialuit businesses pursuant to the Inuvialuit Participation Plans and the aggregate value of these contracts.

7. INUVIALUIT EMPLOYMENT AND TRAINING PLANNING

DND and the IRC will identify and advise the Inuvialuit of actual and anticipated employment opportunities arising from the Work and facilitate Inuvialuit involvement in the widest possible range of job classifications by following the procedures set out in this subsection.

7(1) Planning Activities

- a. The IRC will develop and maintain a current list of Inuvialuit available for employment during the clean-up and restoration of DEW Line sites, together with a brief description of the skill and experience of each Inuvialuk. DND will provide the list to its Contractor(s), who in turn will provide the list to all Subcontractors;
- b. Pursuant to clause 3.2, each Site Specific Clean-up Plan will include an Inuvialuit Employment and Training Plan which contains the following elements:
 - (1) the type, level and value of anticipated Inuvialuit employment opportunities;
 - (2) the timing of anticipated Inuvialuit employment opportunities;
 - (3) the identification of education and skill requirements associated with anticipated employment opportunities;
 - (4) the anticipated training and apprenticeship opportunities and the time required to complete such training and apprenticeship;
 - (5) training programs currently available; and
 - (6) specific training commitments by type and level of opportunities.
- c. DND will prepare the Inuvialuit Employment and Training Plan and undertake the following activities:

- (1) develop a pilot project for the purpose of training a group of Inuvialuit to qualify them for particular types of employment; and
- (2) develop a basic orientation course for the clean-up project.

The above measures will be undertaken at least six months in advance of Work or such other time as may be agreed by the Parties taking into account any impact on the Schedule 2 to facilitate the access by Inuvialuit of available positions for Work.

- d. DND will cooperate with the IRC to identify possible funding sources and Government programs which could enhance the development of management and technical skills of the Inuvialuit.

7(2) Implementation Activities

To implement the planning activities for Inuvialuit employment and training, the following measures will be undertaken:

- a. DND will expend up to \$25,000 per site for specific training provided by Contractors and Subcontractors.
- b. DND will provide up to \$25,000 per site to the IRC for Inuvialuit to enrol in training courses related to 7(1)c(1) and 7(1)c(2), for specific training programs, and to provide general vocational counselling to the Inuvialuit.
- c. DND will support IRC applications for funding from established programs administered by other Federal Government Departments;
- d. DND will work cooperatively to encourage Federal Government Departments to tailor existing programs or establish new programs to assist the Inuvialuit in meeting the skill requirements of the Work;
- e. DND and the IRC will work with the Section 16 Committee to identify additional measures which could be undertaken by other Federal Departments and the Territorial Government for enhancing Inuvialuit participation in employment and training opportunities.

f. DND shall require in all project proposals and tenders an Inuvialuit Participation Plan which will include:

- (1) the type, level and value of commitments for on the job training and skills development of Inuvialuit, including apprenticeship arrangements, orientation courses, and opportunities for advancement; and
- (2) level and value of Inuvialuit training and employment, and any measures for optimizing Inuvialuit employment, including training and other support undertakings.

The Inuvialuit Training and Employment Plan will be made available to guide Contractors in the preparation of their Inuvialuit Participation Plan.

g. Pursuant to the Contractor's Inuvialuit Participation Plan, vacancies and employment opportunities will be processed as follows:

- (1) each available position shall first be posted at the IRC offices in Inuvik, and sent to qualified Inuvialuit identified on the list developed by the consultant (clause 6(1) (a); and
- (2) if a qualified Inuvialuk has not been found for the position within five business days of the first notice, then the position may be filled by any qualified non-Inuvialuk.

This procedure will be followed as and when additional vacancies and employment opportunities arise.

h. Any Inuvialuk whose employment is terminated by a Contractor or Subcontractor is entitled to a full explanation for the dismissal. Subject to prior approval by the Inuvialuk, a copy of the explanation shall be provided to the IRC.

i. DND shall provide to the IRC on a semi-annual basis a report containing the following information pursuant to the Inuvialuit Employment and Training Plan:

- (1) the total number and value of Person Years (PYs) worked by Inuvialuit;

- (2) percentage of total hours and total PYs worked by Inuvialuit; and
- (3) a description of training programs and number of hours of training received by Inuvialuit and provided by the Contractor, the percentage of Inuvialuit who successfully completed the training, and the number of graduates who were subsequently hired by Contractors and Subcontractors.

DND and the IRC will periodically review the success of the measures undertaken in this clause, and develop, where necessary, alternative measures provided that DND's total financial obligation for training will not exceed that set out in 7(2)a and 7(2)b.

8. MISCELLANEOUS

8(1) Term

The term of this Agreement is until the clean up of the six DEW Line sites in the ISR is completed in accordance with the provisions of this Agreement. A Party may terminate the Agreement after providing at least one year's written notice to the other Party.

8(2) Invalidity of Provision

The invalidity of any particular provision of this Agreement shall not affect any other provision of it but the Agreement shall be construed as if the invalid provisions had been omitted.

8(3) Severability

Each provision of this Agreement is intended to be severable. If any provision or portion thereof, shall, to any extent, be invalid or unenforceable for any reason whatsoever, the remainder of this Agreement shall not be affected.

8(4) Waiver

No waiver of any provisions of the Agreement by either party shall be deemed or shall constitute a waiver of any other provisions nor shall such waiver constitute a continuing waiver unless expressly provided.

8(5) Notices

- a. Where any Party is obliged or entitled to give any notice, request, approval, demand, consent, direction or other communication (hereinafter collectively called "Notice") to the other Party, such Party shall first communicate the substance thereof personally or by telephone, as expeditiously as possible, but Notice shall not be sufficiently given until sent in writing to the addressees at the address below. Any Notice may be delivered personally or sent by registered mail or telefacsimile and will be effective upon receipt by the addressee.
- b. Notices to DND shall be sent to:

Director General Environment
National Defence Headquarters
101 Colonel By Drive
Ottawa, Canada K1A 0K2
- c. Notices to the IRC shall be sent to:

Chairman
Inuvialuit Regional Corporation
Box 2120
Inuvik NW X0E 0T0

SCHEDULE 1: GENERAL PROTOCOL, REVISED SITE SPECIFIC PROTOCOLS AND THE BARREL PROTOCOL

INTRODUCTION

PREFACE TO SCHEDULE 1

1. For the six DEW sites in the ISR, should any additional debris, contaminated soils (as defined in the protocol at Schedule 1), or equipment, be found within close proximity of the DEW sites that is attributable to the operation DEW Line, during the planning or completion of the DEW Line clean up, additional testing will be undertaken, as required in consultation with the IRC, to establish the extent and effect of any contamination. Clean-up of these locations will be dealt with by DND in accordance with the protocols in Schedule 1.
2. The clean-up of debris or material in sea or ocean water greater than two metres in depth is not part of the protocol. Where there is reasonable evidence that DEW Line related debris has been disposed of in inland water bodies, DND and the IRC will mutually agree on sites to investigate in order to determine the effect of the contamination. All work will be done in accordance with the protocols at Schedule 1.
3. For the six DEW sites in the ISR, all existing structures, tanks pipelines and related infrastructure which are scheduled for demolition will be dealt with in accordance with protocols at Schedule 1.
4. DND will perform long term monitoring programs in accordance with this Schedule and maintain responsibility for the landfills at the DEW sites identified in 2(1) of this Agreement. Should any test results indicate that the conditions at a DEW site no longer comply with the clean-up Protocols in Schedule 1, DND will effect a clean-up in accordance with the clean-up Protocol of this Agreement.
5. Site Specific Clean-up Plans shall include plans for mitigating impacts associated with borrow excavation.
6. Site Specific Clean-up Plans shall consider the proximity of the DEW Line Site to known harvest areas, Inuvialuit camps, communities and ecologically sensitive areas.

DEW LINE CLEAN UP PROTOCOL

The DEW Line Clean Up (DLCU) Protocol was originally endorsed by various government agencies including Environment Canada, Indian and Northern Affairs, Government of the Northwest Territories and Fisheries and Oceans at a meeting in Victoria, B.C. in October 1991. This revised version (April 1994) has been slightly modified as a result of:

- Presentations (1992, 1993, 1994) to the Legislative Assembly of the Northwest Territories;
- Community consultations at ten northern communities in 1992 and twelve in 1993;
- Further scientific studies including analytical field testing, leachate testing and barrel sampling;
- Engineering designs for a landfill leachate control system and a contaminated soil containment facility in permafrost;
- Continuing discussions with regulatory agencies, including a second major workshop held in March 1993; and
- Changes in staffing requirements at the North Warning System sites.

The DLCU Protocol, which is divided into three main areas, provides a strategy for dealing with chemical contamination and physical debris at the DEW Line sites.

Contaminated Soils

Remediation is to be applied to soils and sediments where inorganic elements and/or PCBs have been found to be present at concentrations in excess of the DEW Line Cleanup Criteria (DCC); this includes soils contaminated by sewage in outfall areas and lagoons. The

DCC (Table 1) are a combination of the CCME R/P¹ and Quebec B² criteria and were determined, on the basis of site specific investigations, to be protective of the Arctic ecosystem.

Table 1: DEW Line Cleanup Criteria

Substance	Units	DCC Tier I	DCC Tier II
Arsenic	ppm	-	30
Cadmium	ppm	-	5.0
Chromium	ppm	-	250
Cobalt	ppm	-	50
Copper	ppm	-	100
Lead	ppm	200	500
Mercury	ppm	-	2.0
Nickel	ppm	-	100
Zinc	ppm	-	500
PCBs	ppm	1.0	5.0

- Soils containing contaminants above the DCC Tier II level should be excavated.
- Soils containing PCBs and lead at concentrations between the DCC Tier I and Tier II levels may be placed in an on-site engineered landfill.

¹ Interim Canadian Environmental Quality Criteria for Contaminated Sites as of 1991 produced for the Canadian Council of Ministers for the Environment (CCME).

² Quebec Soil Contamination Guidelines as of 1991.

- Special attention should be given to soils that act as sources of contaminants to nearby aquatic environments - even if the concentration of contaminants are below the DCC criteria.
- Soils containing PCBs above the 50 ppm level in contravention of the Canadian Environmental Protection Act (CEPA) must be treated as per the regulation.
- Confirmatory testing will be carried out at the DCC Tier I criteria following the removal of Tier II soils or unstained Tier I soils. Visibly stained contaminated soils will be excavated to a distance extending a minimum of .5 m beyond the boundary of the stain.
- Hydrocarbon stained areas greater than 3 square metres in size will be tested for PAH and chlorinated hydrocarbons. If levels exceeding 1×10^{-6} g/g dry weight for PAH and/or 5×10^{-6} g/g dry weight for chlorinated hydrocarbons are found, the stained area will be dealt with as a Tier II soil. If free product is found in the soils it will be removed or remediated by soil washing or another acceptable method. Uncontaminated hydrocarbon stained soils will be regraded.

Landfills

These fall into one of three categories:

- Those located in an unstable, high erosion area must be relocated. Contents should be treated as per the procedures for contaminated soils and physical debris.
- Those located in a suitable location with no evidence of contaminated leachate may remain as is; additional granular fill may be required to ensure erosion protection and proper drainage.

- Those located in a suitable location but which are acting as a source of contaminated leachate must be stabilized by the installation of a suitably engineered containment system.

Physical Debris

Visible debris should be sorted into hazardous and non-hazardous components. This includes all unburied material and debris resulting from building demolition.

- Hazardous debris should be dealt with according to appropriate regulations.
- Non-hazardous materials should be buried in an engineered landfill on-site provided that there is a suitable location and sufficient gravel is available.

Hazardous debris may include but not necessarily be limited to: radioactive materials, batteries, wastes containing toxic chemicals at potentially harmful levels, and ash produced by the combustion of waste material - such materials should be shipped south for disposal. Asbestos can be suitably wrapped and buried in an on-site engineered landfill.

POL tank sludge, waste oil, petroleum products, antifreezing agents, solvents and barrels are treated as per the DLCU Barrel Protocol.

DLCU POST-CLEANUP LANDFILL MONITORING PLAN

I. General

Several different types of landfills will be created during the DEW Line Cleanup project:

1. landfills which will be closed by the addition of granular fill and regraded. In some cases existing landfills will be extended in order to accept additional non-hazardous debris;
2. four landfills which will be constructed in order to accommodate landfill/dump relocation requirements;
3. ten landfills will include a leachate containment feature during closure; and,

Each of these different landfill types present a different potential risk to the environment. Therefore, different degrees of monitoring will be required.

Monitoring can include: visual inspection, thermal monitoring and active layer water testing.

Visual inspection should suffice for landfills in the first two categories. All such landfills are located on terrain such that there is minimal risk to the environment should, for example, a barrel of waste oil rupture within the body of the closed landfill at some future date. New landfills will be engineered and only contain non-hazardous debris. Landfills currently known to be leaching will require the full monitoring program.

II. Frequency

Monitoring should be considered as a short term requirement that can be suspended or down-graded as acceptable performance is confirmed. The program should consist of visual and active layer water monitoring in the mid to late summer, preferably at a time when the active layer has reached maximum penetration.

Monitoring should initially be carried out once every year for the first 3 years. After this period, the results should be reviewed and a decision regarding future monitoring made on the basis of the visual observations (of landfill stability), the rate of freeze-back, and the presence or absence of contaminated leachate. If there is no

evidence of contaminated leachate after the initial three year monitoring period, two follow-up tests will be conducted; one at year six, and one at year 9. Should the test at year 9 confirm that no contaminated leachate is present, monitoring will be suspended unless there is evidence of changing thermal conditions at the landfill.

III. Visual Inspection

The physical integrity of the landfill should be inspected and reported using photographs (from the air as well as ground level) and hand drawn sketches. Documented observations should include:

- Signs of damage from settlement, ponding, frost action, erosion, and lateral movement.
- Sloughing of berms, thermal contraction cracks etc.

If problems of stability are encountered, then an experienced engineer with knowledge of northern conditions should be consulted and appropriate actions taken to stabilize the landfill.

Visual inspections of all landfills will be undertaken by representatives of DND and the ILA. Reporting to DND and the ILA will be done in a standardized format.

IV. Thermal Monitoring

Provisions for thermal monitoring - placement of thermistors, requirements for data loggers etc - have been incorporated into the DLCU specifications. For existing landfills, where there is potential for the escape of contaminated leachate, a thermistor will be placed at the toe of the landfill.

The thermal performance of the sites will be dependent on a number of site-specific factors. Thermal and physical data obtained from the inspection of the landfills with leachate containment will be reviewed by a geotechnical engineer mutually agreed to by DND and the ILA, who has expertise in geothermal modelling. The results of this review will be submitted to DND and the ILA.

V. Active Layer Water Testing

Active layer water monitoring is recommended for landfills requiring leachate containment. Active layer water monitoring is also recommended for landfills in close proximity to known harvest areas, Inuvialuit camps, communities and ecologically sensitive areas. The program should include the determination of background, or up

gradient, concentrations for specific parameters. Background (naturally occurring) values may be obtained from samples collected from areas that have not been directly influenced by activities at the DEW Line site but which are indications of the prevailing geochemistry. For landfills currently leaching, samples should be collected prior to construction in order to determine current, or baseline, concentrations of contaminants.

The approximate locations and installation requirements of monitoring wells are described in the 95% Submission Design Drawings.

Prior to obtaining any samples within the monitoring well, the following should be measured/observed:

- Water elevation.
- Depth of water.
- Presence of hydrocarbons and thickness of the layer.

Water samples should then be withdrawn and the color, odor and other physical characteristics noted. Using a portable pH/ORP meter the pH, conductivity and temperature of the sample should be measured in the field.

The water sample should be filtered and transported to the laboratory in appropriate containers. Analysis shall be carried out by an independent federally accredited laboratory mutually acceptable to DND and the ILA. Parameters to be analyzed for are as follows:

- Inorganic elements (arsenic, cadmium, chromium, cobalt, copper, lead, nickel and zinc).
- PCBs.
- If a hydrocarbon layer is present determine its nature and constituents. Parameters to be analyzed may include TPH, TEH, PAH.

If the landfill could affect the drinking water of a known Inuvialuit camp or community, the following additional tests will be undertaken.

- Inorganic elements (ICP scan for total metals plus arsenic, selenium and mercury)
- Extractable organic chlorides (EOX)

- Total petroleum hydrocarbons (IR)
- Major ions and hardness
- Total dissolved solids
- Dissolved organic carbon

If hydrocarbons are detected by IR, the nature and constituents of the organic component shall be determined. Parameters to be analysed shall include:

Total purgeable hydrocarbons
 Total extractable hydrocarbons
 PAH's by constituent
 Total Phenols
 Total Glycols

An appropriate quality assurance/quality control program should be implemented for the analyses.

VI. Criteria

The analytical results obtained from water testing should be interpreted in terms of the established background (naturally occurring) and baseline values. If the levels are found to exceed these, a further comparison should be made with the criteria listed below.

The tabulated criteria are based on the CCME Environmental Quality Criteria for Contaminated Sites, Remediation Criteria for Irrigation Water. Territorial and federal regulatory agencies have approved the adoption of these discharge criteria in the DND DEW Line Cleanup specifications. If, for some reason, additional substances are found for which there are no irrigation water criterion, CCME Remediation Criteria for Drinking Water shall be used.

Substance*	Concentration(ug/L or ppb)
Arsenic	100
Cadmium	10
Chromium	100
Cobalt	50
Copper	200
Lead	200
Nickel	200
Zinc	1000
PCBs	5**

- * These substances have been found to be the most common contaminants at DEW Line sites. ** information on the uptake of PCBs by Arctic vegetation indicates that this level is tolerable.

VII. Inspections & Review of Data

The monitoring will be undertaken by a third party, mutually acceptable to DND and the IRC. DND and the IRC will agree upon actions taken in response to the results of the monitoring program. Such activities to the extent possible, will be in accordance with the protocol.

VIII. Communication of Program Results

The results of the monitoring programs shall be released and discussed on a regular basis by representatives of DND and the ILA with appropriate federal, territorial and Inuvialuit agencies and organizations. The timing and content of such communications to these agencies and organizations will be as agreed between the IRC and DND.

SCHEDULE 2: WORK START-UP AND COMPLETION DATES

<u>DEW SITE</u>	<u>START-UP</u>	<u>COMPLETION</u>
BAR 3 TUKTOYAKTUK	APRIL 1996	APRIL 1998
PIN M CAPE PARRY	APRIL 1997	APRIL 1999
BAR 4 NICHOLSON PEN.	APRIL 1998	APRIL 2000
BAR 1 KOMAKUK BEACH	APRIL 1999	APRIL 2001
BAR 2 SHINGLE POINT	APRIL 2000	APRIL 2002
PIN 1 CLINTON POINT	APRIL 2001	APRIL 2003

SCHEDULE 3: SUPPLY OF GRAVEL BY THE INUVIALUIT DEVELOPMENT CORPORATION

Gravel will be supplied for the Nicholson Pen. DEW Site by Inuvialuit Projects Inc. (IPI), a 100% owned subsidiary of the Inuvialuit Development Corporation (IDC) in accordance with the following terms:

- 1.0 IPI to supply gravel in a stockpile adjacent to the existing Nicholson DEW line site air strip.
- 2.0 Gravel will be transported to the site during the winter by ice road from a location along the shoreline of Wood Bay approximately 12 to 15 miles from the existing DEW Line site.
- 3.0 Gravel supplied will be of similar quality to the gravel previously supplied to the site for Bot Construction during the construction of the SRR Site in the winter of 1990.
- 4.0 IPI will be responsible for the supply of all equipment and personnel necessary to do the work.
- 5.0 IPI will supply all necessary transportation of personnel and mobilization of equipment to the site.
- 6.0 IPI will be responsible for any accommodation requirements for its personnel.
- 7.0 IPI will construct and maintain any ice roads necessary to complete the work.
- 8.0 IPI will obtain any ILA permits necessary to complete the work. Costs for such permits and royalties are included in the quoted unit prices.
- 9.0 Measurement of gravel quantities for payment will be by 'truck box' measurement. Gravel ticket receipts will be signed by DEW Line Cleanup contractor representative and IPI representative for each load hauled to the site.

10.0 The Price Per Cubic Metre of Gravel is as follows:

- a) 5,000 - 10,000 cu. metres = \$57.00/cu.m.
- b) 10,000 - 15,000 cu. metres = \$52.00/cu.m.
- c) over 15,000 cu. metres = \$42.00/cu.m.

The price per cubic metre includes the following allowances:

- a) ILA permit fees of \$20,000
- b) ILA royalties of \$3.25/cu metre
- c) Mobilization cost of \$100,000
- d) Ice Road from Quarry to site of \$35,000
- e) Demobilization cost of \$70,000.

11.0 The above pricing is subject to the following conditions:

- a) A minimum of 5,000 cubic metres ordered.
- b) The work proceeding during the winter of 1995-96 or 1996-97.

12.0 Terms of payment are full payment without holdbacks net 30 days upon receipt of invoice.

SCHEDULE 4: NTCL BACKHAUL RATES

The following rates will apply for the transportation of Tier II soils to Hay River from the listed DEW Line Site in the ISR:

<u>DEW SITE</u>	<u>YEAR</u>	<u>RATE</u>
1. Nicholson Pen. (Bar 4)	1996/97	\$189.80/short ton
2. Cape Parry (PIN-M)	1997/98	\$189.80/short ton
3. Shingle Pt. (Bar 2)	1998/99	\$189.80/short ton

SCHEDULE 5: ANNEX R LANDS

1003-INVIALUIT-5 (DN)

October 1995

Mr. Robert Kuptana
Chairman
Inuvialuit Regional Corporation
P.O. Box 2120
107 MacKenzie Road
Inuvik, Northwest Territories
X0E 0T0

Dear Mr. Kuptana,

DND and the Inuvialuit have had many discussions concerning the status of the Annex R lands. Below, for your review and concurrence is a proposal from DND. If you concur with the proposal, I ask that you sign the release attached to this letter. I also propose that a copy of this letter, including the release be attached to the DEW Line Clean-up Cooperation Agreement as Schedule 5.

DND is prepared to agree, without prejudice to the Government of Canada's legal position, to the following:

- (i) DND will pay the outstanding gravel invoice and pay the royalties on gravel for the work planned this summer at NWS sites located on Annex R lands. Any subsequent gravel requirements will be obtained in accordance with ILA Rules and Procedures.
- (ii) DND will arrange for the removal of the Annex R status on lands no longer required for the operation of the NWS sites by January 1, 1997.

On the condition that:

- (i) site specific clean-up protocols acceptable to DND for the DEW Line sites in the ISR will be developed and attached to the Cooperation Agreement prior to signature of the Agreement by the IRC and DND;

- (ii) the IRC will cooperate with DND in any subsequent approval process for the clean-up project as required under the IFA;
- (iii) the Inuvialuit recognize the validity of the Annex R reservations at Cape Parry and Nicholson Peninsula, and that normal operation and maintenance of the NWS sites on these lands will continue without the necessity of obtaining ILA permits or other approvals from the Inuvialuit; and
- (iv) the Inuvialuit will not invoice Canada for royalties on past gravel use on Annex R lands with the exception of the outstanding invoice referred to above.

Yours sincerely,

Fred McGuire
Director Negotiations

Encl: 1

RELEASE

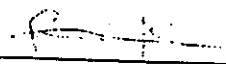
The Inuvialuit, as represented by the Inuvialuit Regional Corporation and the Inuvialuit Land Administration, on behalf of themselves and their heirs, executors administrators, successors and assigns (hereinafter collectively called "the Inuvialuit people"), do hereby waive, remise and forever release HER MAJESTY THE QUEEN IN RIGHT OF CANADA, Her officers, servants, members of Her Armed Forces, Her and their heirs, executors, administrators, successors and assigns (hereinafter called "Her Majesty") from all manner of claims, actions or demands of any kind of nature that the Inuvialuit ever had, now have, or may hereafter have, regarding the payment or non-payment of any manner of fees, levies, taxes, investments, royalties or other similar charges related to the quarrying or use of gravel for any purpose whatsoever within the Inuvialuit Settlement Region that occurred at any time prior to 1 August 1995.

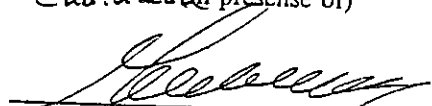
This Release shall be effective only when Her Majesty shall have paid to the Inuvialuit Land Administration the sum of \$32,874.70 and _____ invoiced by the Inuvialuit land Administration for quarrying at Cape Parry during August 1995.

The Inuvialuit acknowledge that Her Majesty does not admit any liability to the Inuvialuit by the acceptance of this release or the payment of the said sum of money.

IN WITNESS WHEREOF the corporate seals of the Inuvialuit Regional Corporation have been affixed under the hands of its authorized officers,
this _____ day of _____ A.D. 1995.

SIGNED, SEALED AND DELIVERED)
on behalf of the Inuvialuit Regional)
Corporation by)


_____)
Chairman (in presense of))


_____)
(Witness))

(Name of Witness)
GERALD B. ROY
Barrister & Solicitor
Northwest Territories

(Address of Witness)

APPENDIX II

Figures and Drawings



LEGEND:



REFERENCE FROM MAP SHEET 97F, MALLOCH HILL , EDITION 3
ARMY SURVEY ESTABLISHMENT, R.C.E. 1958-60

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uma **UMA Engineering Ltd.**
Engineers, Planners & Surveyors
2540 Kensington Road N.W., Calgary, Alberta, Canada T2N 3S3

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NORTHWEST TERRITORIES

PIN-M
CAPE PARRY
TOPOGRAPHIC MAP SEGMENT

UMA JOB No.
0171-095-68-08

ACAD FILE No.
EW-174

FIGURE 1

ISS/REV
0

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DARNLEY BAY

WEST POINT

FRANKLIN BAY

NORTHEAST BEACH —
GRAVEL BORROW AREA

NORTH BEACH AREA

— RUNWAY

ACCESS ROAD .

LRR SGTs

STATION AREA

RSTRIP AREA

DND RESERVE BOUNDARY —
(REF. DWG. S2-0428, DEPT.
OF THE AIR FORCE, USAF)

— POTENTIAL GRANULAR BORROW SOURCE

MIDDLE 8

MIDDLE BORROW PIT - A

WATER SUPPLY LAKE

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BORROW AREA
BORROW AREA
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SOUTH BORROW PIT

B-10

~ CAPE PARRY VILLAGE
ARCHAEOLOGICAL FEATURE.



Headquarters
Quartier général

General Notes:

1. SITE PLANS AND TOPOGRAPHIC INFORMATION ARE BASED ON SURVEYS CARRIED OUT IN 1992 AND 1993 BY THOMSON UNDERWOOD MCLELLAN SURVEYS LTD. OF YELLOWKNIFE, N.W.T. CONDITIONS MAY HAVE CHANGED FROM THAT DATE AND MAY NOT BE AS SHOWN.
2. BORROW AREAS AND TEST PIT INFORMATION IS SHOWN ON THE DRAWINGS AND IN THE SPECIFICATIONS HAS BEEN PROVIDED BY EBA ENGINEERING CONSULTANTS LTD. OF EDMONTON, ALBERTA, BASED ON A 1992 SITE INVESTIGATION.

Legend:

TEST PIT LOCATION

 BODY OF WATER

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PROJECT - PROJECT

PIN-M CAPE PARRY

DEW LINE CLEAN UP

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MINISTER OF NATIONAL DEFENCE

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SUBJECT - SUJET

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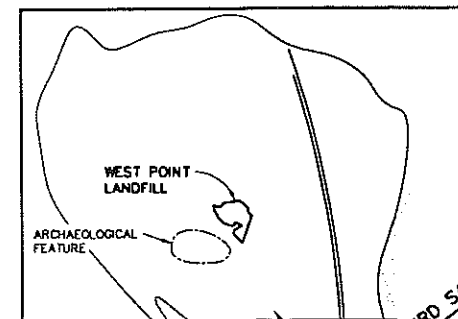
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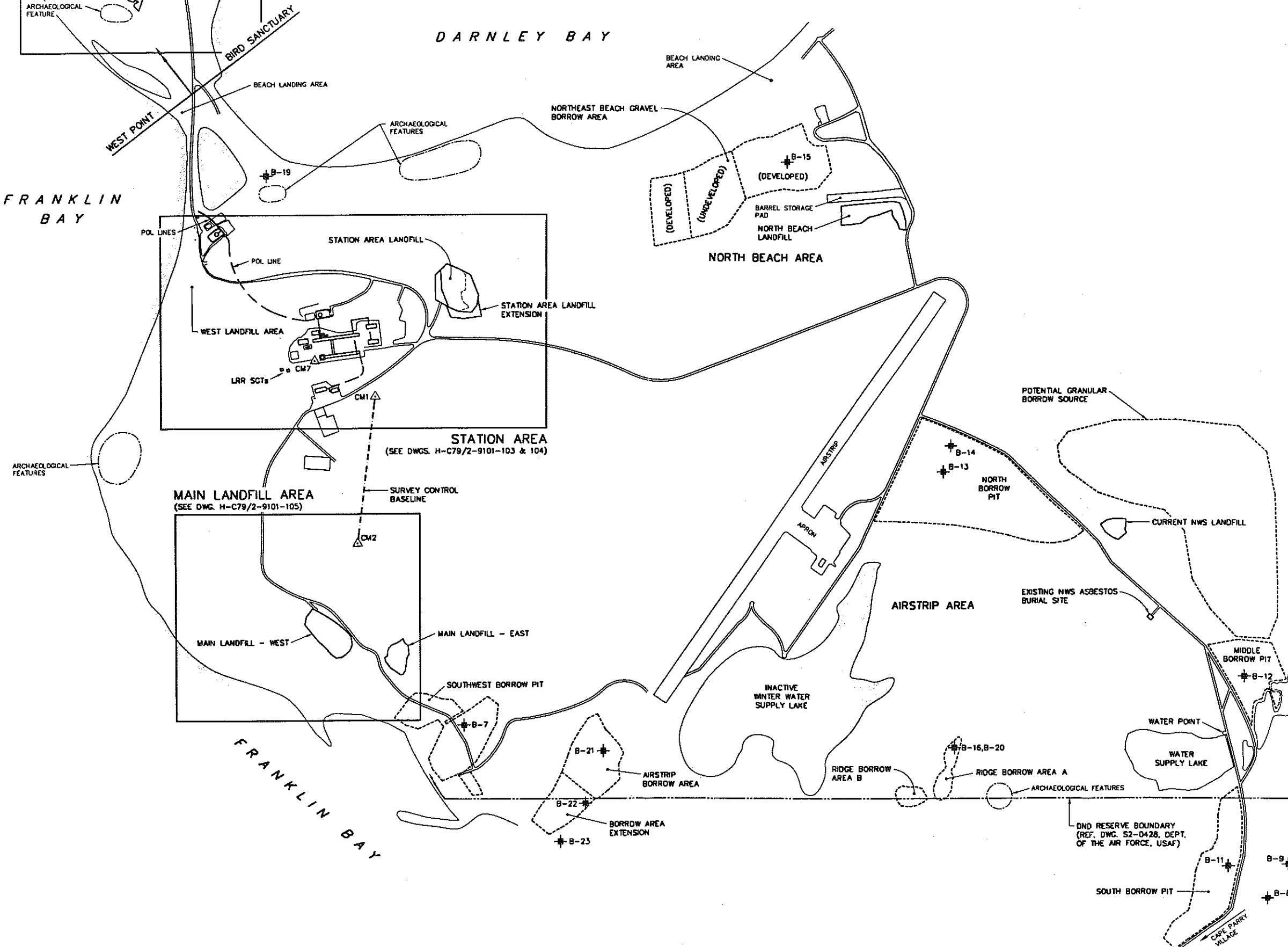
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EDUCATION

WEST POINT LANDFILL AREA (SEE DWG H-C79/2-9101-106)



DARNLEY BAY

FRANKLIN BAY



SURVEY CONTROL MONUMENTS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
1	10 000.000	10 000.000	76.401	PIN-M BASELINE STA. 7+42.8
2	9 540.768	9 944.090	63.387	PIN-M BASELINE STA. 22+57.8
7	10 111.914	9 811.316	94.896	MONUMENT - DMA 11808

NOTE: BASELINE STATIONS SHOWN ARE IN IMPERIAL UNITS.

National Défense nationale

Headquarters
Quartier général

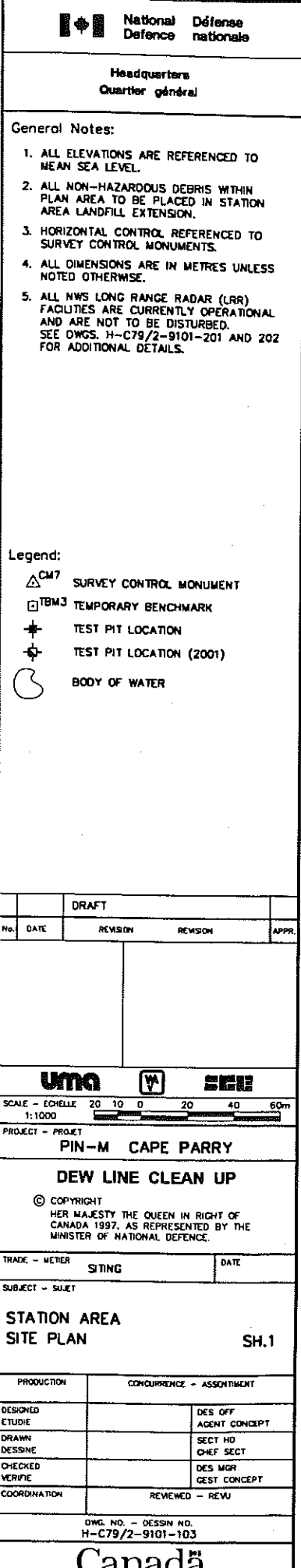
- General Notes:
1. ARCHAEOLOGICAL FEATURES LOCATED AS PER ENVIRONMENTAL CLEAN UP STUDY OF 21 DEW LINE SITES IN CANADA, VOL. 7, UMA 1991.
 2. ALL ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL, (REF. DWG. MAP-1, DEPT. OF THE AIR FORCE, USAF).
 3. HORIZONTAL CONTROL REFERENCED TO SURVEY CONTROL MONUMENTS.
 4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
 5. ALL NWS LONG RANGE RADAR (LRR) FACILITIES ARE CURRENTLY OPERATIONAL AND ARE NOT TO BE DISTURBED. SEE DWG. H-C79/2-9101-201 AND 202 FOR ADDITIONAL DETAILS.

- Legend:
- △ CM1 SURVEY CONTROL MONUMENT
 - ✦ TEST PIT LOCATION
 - BODY OF WATER

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PROJECT - PROJET			
PIN-M CAPE PARRY			
DEW LINE CLEAN UP			
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SUBJECT - SUJET			
PROJECT LAYOUT			
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CONCLUSION



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PRINT DATE

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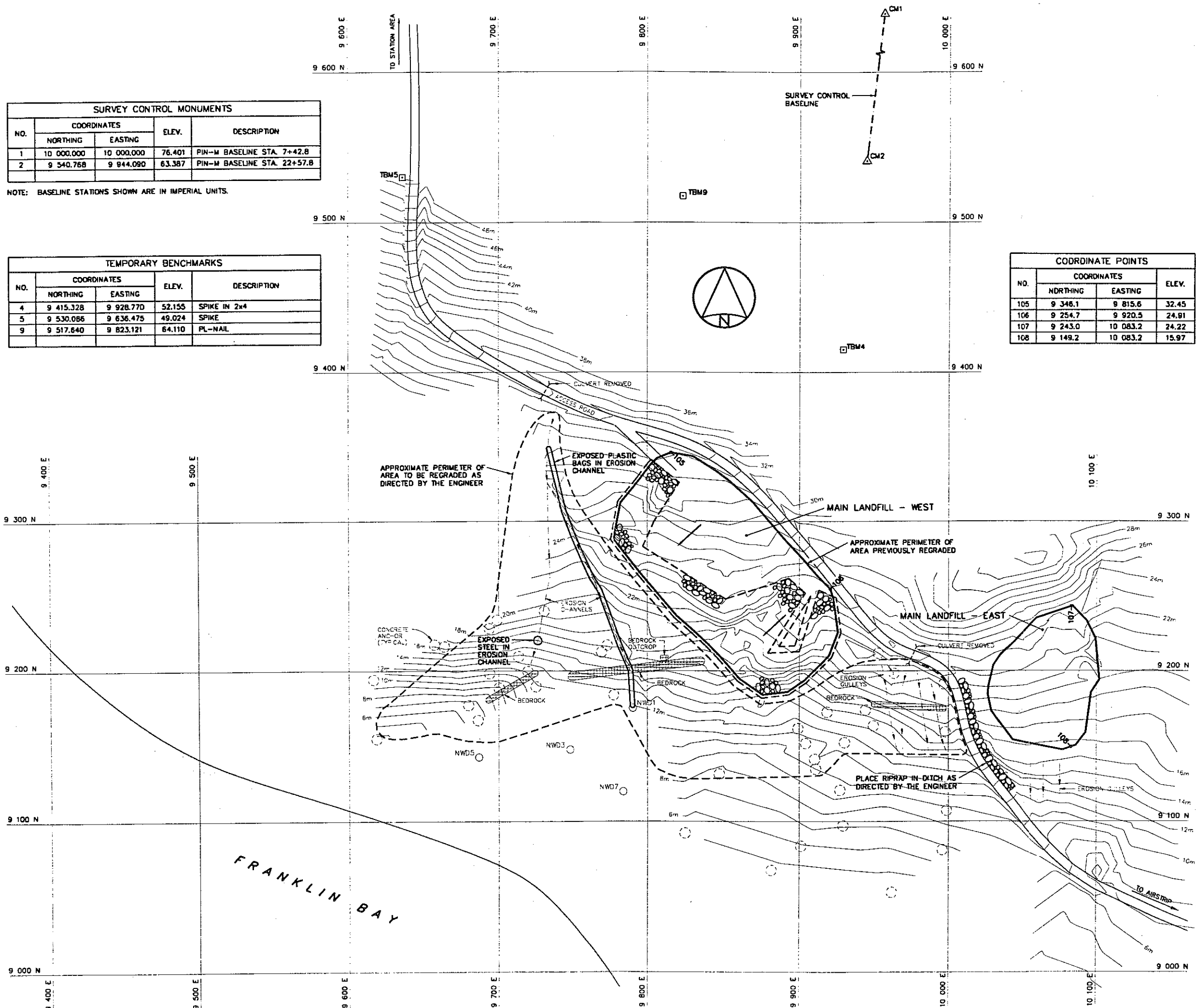
UMA
EDMONTON

SURVEY CONTROL MONUMENTS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
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2	9 540.768	9 844.090	63.387	PIN-M BASELINE STA. 22+57.8

NOTE: BASELINE STATIONS SHOWN ARE IN IMPERIAL UNITS.

TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
4	9 415.328	9 928.770	52.155	SPIKE IN 2x4
5	9 530.086	9 636.475	49.024	SPIKE
9	9 517.640	9 823.121	64.110	PL-NAIL

COORDINATE POINTS			
NO.	COORDINATES		ELEV.
	NORTHING	EASTING	
105	9 346.1	9 815.6	32.45
106	9 254.7	9 920.5	24.91
107	9 243.0	10 083.2	24.22
108	9 149.2	10 083.2	15.97



National Défense nationale

Headquarters
Quartier général

General Notes:

1. ALL ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL.
2. ALL NON-HAZARDOUS DEBRIS WITHIN PLAN AREA TO BE PLACED IN EXISTING MAIN LANDFILL - WEST.
3. HORIZONTAL CONTROL REFERENCED TO SURVEY CONTROL MONUMENTS.
4. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

Legend:

- CM2 SURVEY CONTROL MONUMENT
- TBM4 TEMPORARY BENCHMARK
- 105 COORDINATE POINT
- 108 BODY OF WATER

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No. DATE REVISION REVISION APPR.

UMA SEE

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PROJECT - PROJET

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DEW LINE CLEAN UP

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TRADE - METIER SITING DATE

SUBJECT - SUJET

MAIN LANDFILL AREA
SITE PLAN

PRODUCTION		CONCURRENCE - ASSENTIMENT	
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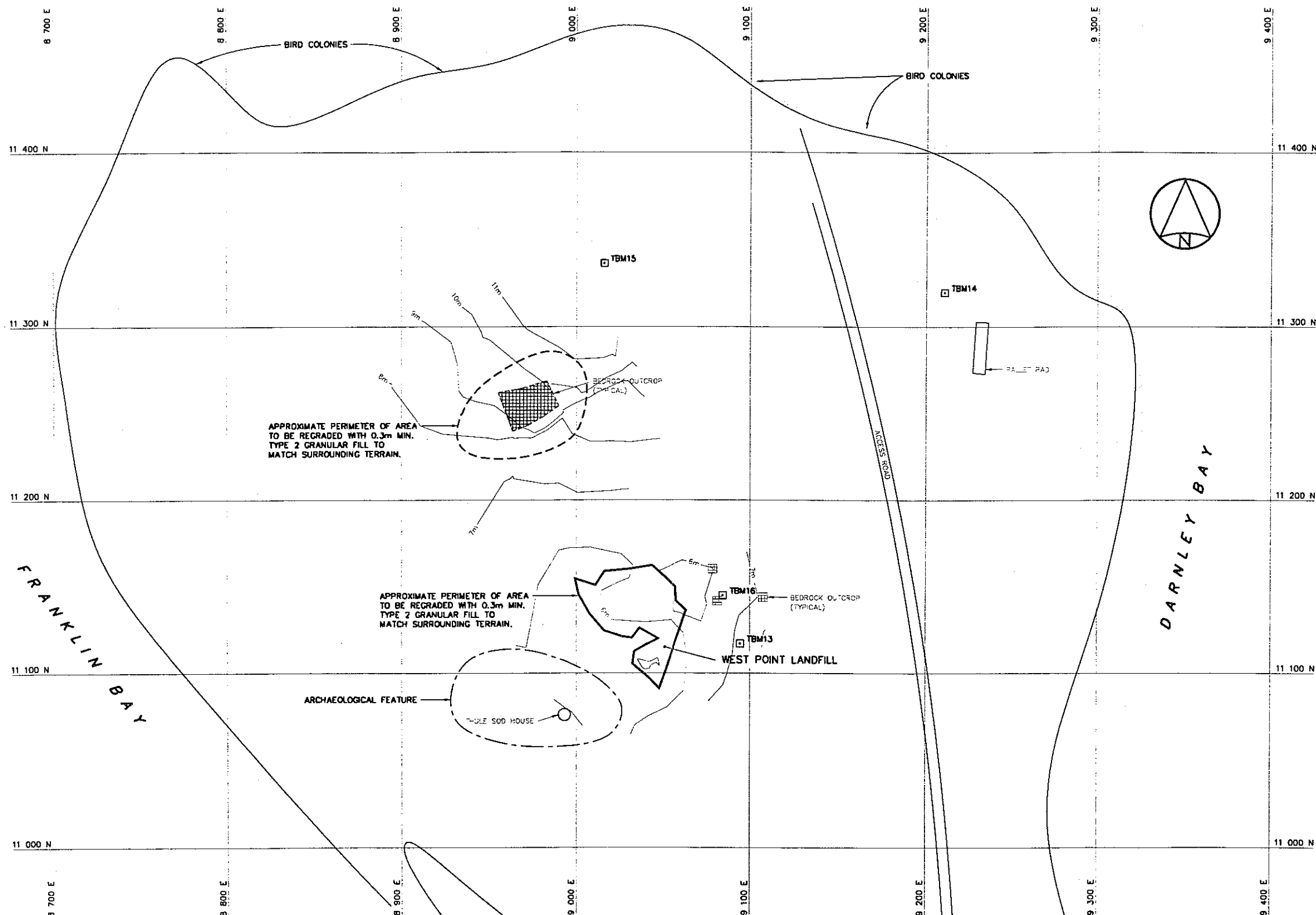
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H-C79/2-9101-105

Canada

PRINT DATE

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SECTION 11



WEST POINT LANDFILL AREA

TEMPORARY BENCHMARKS				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
13	11 117.086	9 094.604	7.630	SPIKE
14	11 319.787	9 210.334	11.474	CUT CROSS IN BEDROCK
15	11 336.277	9 016.175	12.229	CUT CROSS IN BEDROCK
16	11 144.865	9 084.852	6.250	CUT CROSS IN BEDROCK

National Defence
Défense nationale

Headquarters
Quartier général

General Notes:

1. ALL ELEVATIONS ARE REFERENCED TO MEAN SEA LEVEL.
2. HORIZONTAL CONTROL REFERENCED TO SURVEY CONTROL MONUMENTS.
3. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

Legend:

- TBM13 TEMPORARY BENCHMARK
○ BODY OF WATER

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No. DATE REVISION REVISION APPR.

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PROJECT - PROJET

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DEW LINE CLEAN UP

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MINISTER OF NATIONAL DEFENCE.

TRADE - METIER SITING DATE

SUBJECT - SUJET

WEST POINT LANDFILL AREA
SITE PLAN

PRODUCTION		CONCURRENCE - ASSENTMENT	
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COORDINATION		REVIEWED - REVU	

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H-C79/2-9101-106

Canada

APPENDIX III

North Warning System Spill Contingency Plan

POL SPILL CONTINGENCY PLAN

ANNEX G, APPENDIX 2 OF THE NORTH WARNING SYSTEM ENVIRONMENTAL PROTECTION PROGRAM

AMENDMENT #1 MARCH 1998

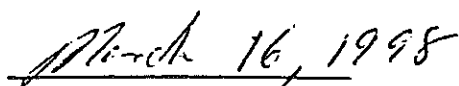
PREPARED BY:

FRONTEC ENVIRONMENT SECTION

Approved For Circulation By:



Andy Ross - General Manager, R&CS



Date

APPENDIX 2

POL SPILL CONTINGENCY PLAN

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ACRONYMS

CFB	Canadian Forces Base
CMO	Contractor Management Office
CRI	Cost Reduction Initiative
DND	Department of National Defence
DNWSO	Director, North Warning System Office
EPP	Environmental Protection Program
ERT	Emergency Response Team
LOCID	Location Identifier
LRR	Long Range Radar
LSS	Logistics Support Site
NWO	North Warning System Order
NWS	North Warning System
NWSCC	North Warning System Control Centre
NWSCC-ECF	North Warning System Control Centre-Electronic Control Facility
NWSCC-MCF	North Warning System Control Centre-Maintenance Control Facility
NWSCC-MCS	North Warning System Control Centre-Maintenance Control Subsystem
NWSCC-NCF	North Warning System Control Centre-Network Control Facility
NWSO	North Warning System Office
NWSSC	North Warning System Support Centre
O&M	Operation and Maintenance
PMI	Preventive Maintenance Inspection
POL	Petroleum, Oil, and Lubricants
ROCC	Region Operations Control Centre
SOP	Standard Operating Procedure
SOW	Statement of Work for the Operation and Maintenance of the NWS
SRD	SRR Development Site
SRR	Short Range Radar
TSB	Technical Services Building

ANNEXES

ANNEX A: NWS Sites Zone Map

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1.0 INTRODUCTION

This plan establishes policy, responsibilities and instructions for response to petroleum, oil and lubricant (POL) spills which may occur at North Warning System (NWS) facilities during operations and maintenance (O&M) activities, as defined by the NWS O&M Contract Statement of Work (SOW), and as performed by the contracting agency, the contractor or subcontractors.

1.1 Exclusions

This plan is not applicable at Short Range Radar (SRR) site BAR-B, Stokes Point, Yukon Territory. This site is located on Parks Canada land and is governed by the document entitled "Method of Conducting Operation and Maintenance, Stokes Point (BAR-B) Short Range Radar Site, Ivvavik National Park, Yukon Territory."

This plan is not applicable at the Goose Bay Logistics Support Site (LSS) located at Canadian Forces Base (CFB) Goose Bay, Labrador. This site will report POL spills to the Contractor Management Office (CMO) and to the Base Environmental Section. This site will conform to the requirements of the Fuel Spill Contingency Plan for CFB Goose Bay.

1.2 POL Spill Contingency Planning Policy

This plan, which is an integral part of FRONTEC's Environmental Protection Program (EPP), is consistent with the requirements and provision of:

- a. FRONTEC's Corporate Environmental Policy;
- b. FRONTEC's Corporate EPP for the O&M of the NWS;
- c. NWS O&M Contract SOW; and
- d. North Warning System Order (NWO) 12.01, North Warning System - Environmental Protection Order.

1.3 Purpose

The purpose of this plan is:

- a. To provide a clear statement of procedures which will be carried out in response to POL spills;

- b. To minimize the potential environmental impact of POL spills by establishing pre-determined responses and plans of action;
- c. To establish a state of preparedness for personnel through a POL Spill Response Training Program;
- d. To protect the health and ensure the safety of :
 - i. personnel involved in POL Spill Response activities; and
 - ii. local communities;
- e. To provide a reporting network for POL spills;
- f. To ensure site environmental restoration through appropriate remedial activities;
- g. To identify the roles and responsibilities of all parties involved in POL Spill Response activities; and
- h. To identify sufficient personnel, materials and equipment needed to make an adequate response to any POL spill.

1.4 Scope

This plan applies to all activities and facilities pertaining to NWS sites, except SRR site BAR-B and LSS Goose Bay. This includes:

- a. Long Range Radar (LRR) sites which operate unattended with occasional staff visits;
- b. Short Range Radar (SRR) sites which operate unattended;
- c. Logistics Support Sites (LSS) which are staffed to support SRR and LRR operations; and
- d. the North Warning System Support Centre (NWSSC) in North Bay, Ontario.

1.5 Roles and Responsibilities

The contracting agency, the contractor and sub-contractors will be involved in Spill Response Actions in the event of a POL spill during O&M activities on the NWS. The roles and responsibilities of these parties are herein described.

1.5.1 FRONTEC

As the O&M contractor, FRONTEC's responsibilities include:

- a. Maintaining an up-to-date Spill Contingency Plan;
- b. Practicing spill prevention by:
 - i. performance of regular maintenance on all POL systems;
 - ii. employing proper methods for the handling of POL products;
- c. Maintaining operational competence through staff training;
- d. Identifying the requirements of sub-contractors involved in NWS O&M activities; and
- e. Providing the personnel, materials and equipment necessary for adequate response to POL spills.

1.5.2 North Warning System Office

As the contracting agency, the North Warning System Office (NWSO) is responsible for ensuring that adequate POL spill detection and response capabilities are in place and monitored for all NWS operations.

1.5.3 Fuel Resupply Contractors and Sub-Contractors

Responsibilities of contractors and sub-contractors engaged in fuel resupply activities at NWS sites include:

- a. Provision of a POL Spill Response Plan which describes:
 - i. spill response action plans for initial response;
 - ii. containment, clean-up, disposal and site remediation of spills;
 - iii. chain of command and responsibilities of personnel; and
 - iv. materials and equipment available for deployment; and
- b. Provision of sufficient personnel, materials and equipment necessary for adequate response to any POL spills which may occur during fuel resupply operations.

In the event a spill occurs during fuel resupply operations, FRONTEC personnel, material and equipment will assist in spill response activities to the fullest extent, when and where possible. Detailed contents of the POL Spill Response kits are listed in Annex C as well as the site specific descriptions located in EPP Part III Annex F.

Note: This document will be the source document for all contractor and all sub-contractor POL Spill Contingency Plans.

1.6 Amendments

This plan will be revised in agreement with changes to federal, provincial and territorial acts, codes and standards. Requests for revisions, submitted by parties associated with or affected by the NWS, will also be reviewed. Provision for incorporation of changes will take the form of amendments to the plan.

1.6.1 Mechanisms

This plan will be amended by the following steps:

a. Initiation:

Requests for amendment of this plan may be initiated by any member or employee of:

- i. FRONTEC;
- ii. NWSO;
- iii. parties associated with O&M activities; or
- iv. federal, provincial or territorial government agencies.

b. Review:

The Environment Section of the Facilities Engineering Department will review all proposed amendments. Recommended proposals will be presented to the Manager, Facilities Engineering and upon acceptance will be forwarded to the Director of the North Warning System Office (DNWSO) for final approval.

c. Approval:

DNWSO will be the final authority over this document. Upon the Director's instruction, the amendment will be incorporated into this plan and recorded on the Record of Amendments sheet.

1.6.2 Submission of Amendments

Any comments or suggestions regarding this POL Spill Contingency Plan should be forwarded, in writing, to:

FRONTEC
North Warning System Project
100 - 170 Laurier Avenue West
Ottawa, ON
K1P 5V5
Attention: Environmental Coordinator,
Facilities Engineering Department

2.0 SPILL PLAN ORGANIZATION

This plan provides:

- a. definition of a POL spill and classifications of spills;
- b. an overview of the NWS and descriptions of:
 - i. methods of fuel resupply;
 - ii. POL storage and distribution systems; and
 - iii. roles and responsibilities of NWSO, FRONTEC and sub-contractors.
- c. measures for prevention of spills;
- d. methods of spill detection;
- e. spill reporting procedures and chain of command;
- f. spill response action plans including:
 - i. response capabilities;
 - ii. procedures for spill containment; and
 - iii. procedures for spill clean-up and methods of disposal of wastes;
- g. procedures for remediation of spill affected areas; and
- h. guidelines for post spill response review.

2.1 POL Spill Definition

For the purposes of this plan, a POL spill is the discharge of petroleum, oil or lubricants:

- a. greater than 20 litres in volume;
- b. from a structure, vehicle, pipe or other container;
- c. within a structure; or
- d. into the natural environment.

2.2 Overview of the North Warning System

The NWS consists of:

- a. Eleven Long Range Radar sites designated as:
 - i. Auxiliary unattended sites, located at:
 - LAB-2, Saglek Bay;
 - LAB-6, Cartwright;
 - BAF-3, Brevoort Island;
 - FOX-3, Dewar Lakes;
 - DYE-M, Cape Dyer;
 - CAM-3, Shepherd Bay;
 - PIN-3, Lady Franklin Point;
 - PIN-M, Cape Parry;
 - BAR-2, Shingle Point; and
 - ii. Main sites, serving also as LSSs, staffed by approximately 15 persons and located at:
 - CAM-M, Cambridge Bay; and
 - FOX-M, Hall Beach.

In accordance with the Cost Reduction Initiative (CRI) the sites began reduced staffing in October of 1994, with unattended operation of the LRRs beginning in April 1995. Upon completion of the transition, the frequency of site visits will be the same as for the SRR sites. Airstrips exist at all LRR sites but are accessible in summer months only for all but the two main sites. As airstrips at auxiliary sites are no longer actively maintained they are used at the pilot's own risk. A helipad is also located at each auxiliary site. A POL Spill Response Kit is located at each site, the contents of which are listed in Annex C as well as EPP Part III Annex F;

- b. Thirty six Short Range Radar sites which operate unattended and are visited between four and nine times annually for:
 - i. Preventive Maintenance Inspections (PMI);
 - ii. bulk fuel resupply; and
 - iii. security patrols by the Royal Canadian Mounted Police or the Canadian Forces Rangers.

A helipad is located at each SRR. In addition abandoned landing strips may be usable by fixed wing aircraft at various SRR sites depending on aircraft type and both site and weather conditions. A POL Spill Response Kit is located in the Technical Services Building (TSB) at each site with additional materials available at the host LSS. The contents of the on-site kits are listed in Annex C as well as in EPP Part III Annex F.

- c. There are five Logistics Support Sites whose staff support O&M of the SRR and LRR sites under the authority of the LSS Manager. The LSSs are accessible by commercial air carriers and a helipad is located at each site. The SRR sites in each of the five NWS zones are supported by a host LSS as follows:

i. Zone 1, Inuvik LSS:

- BAR-1, Komokuk Beach;
- BAR-B, Stokes Point;
- BAR-BA3, Storm Hills;
- BAR-3, Tuktoyaktuk;
- BAR-DA1, Liverpool Bay;
- BAR-4, Nicholson Island;
- BAR-E, Horton River;
- PIN-1BD, Keats Point; and
- PIN-1BG, Croker River;

ii. Zone 2, CAM-M LSS:

- PIN-2A, Harding River;
- PIN-CB, Bernard Harbour;
- PIN-DA, Edinburgh Island;
- PIN-EB, Cape Peel West;
- CAM-A3A, Sturt Point North;
- CAM-1A, Jenny Lind Island;
- CAM-B, Hat Island;
- CAM-2, Gladman Point; and
- CAM-CB, Gjoa Haven;

iii. Zone 3, FOX-M LSS:

- CAM-D, Simpson Lake;
- CAM-4, Pelly Bay;
- CAM-5A, Cape McLoughlin;
- CAM-FA, Lailor River;
- FOX-1, Rowley Island;
- FOX-A, Bray Island;
- FOX-2, Longstaff Bluff; and
- FOX-B, Naduadjuk Lake;

iv. Zone 4, Iqaluit LSS:

- FOX-CA, Kangok Fiord;
- FOX-4, Cape Hooper;
- FOX-5, Broughton Island;
- BAF-2, Cape Mercy;
- BAF-4A, Loks Land; and
- BAF-5, Resolution Island;

- v. Zone 5, Goose Bay LSS:
 - LAB-1, Cape Kakaviak;
 - LAB-3, Cape Kiglapait;
 - LAB-4, Big Bay; and
 - LAB-5, Tukiauk Bay;
- d. Region Operations Control Centre (ROCC) is situated at CFB North Bay and is the location for the North Warning System Control Centre (NWSCC). The NWSCC remotely monitors the operations of the SRR and LRR sites through the following units:
 - i. Maintenance Control Facility (MCF);
 - ii. Maintenance Control Subsystem (MCS);
 - iii. Network Control Facility (NCF); and
 - iv. Electronic Control Facility (ECF);
- e. North Warning System Support Centre (NWSSC), located in North Bay, Ontario, supports the activities of NWSCC. The NWSSC is also responsible for any spills at the SRR Development Site (SRD), a model SRR site located in North Bay, Ontario.
- f. Contractor Management Office (CMO); and
- g. North Warning System Office (NWSO).

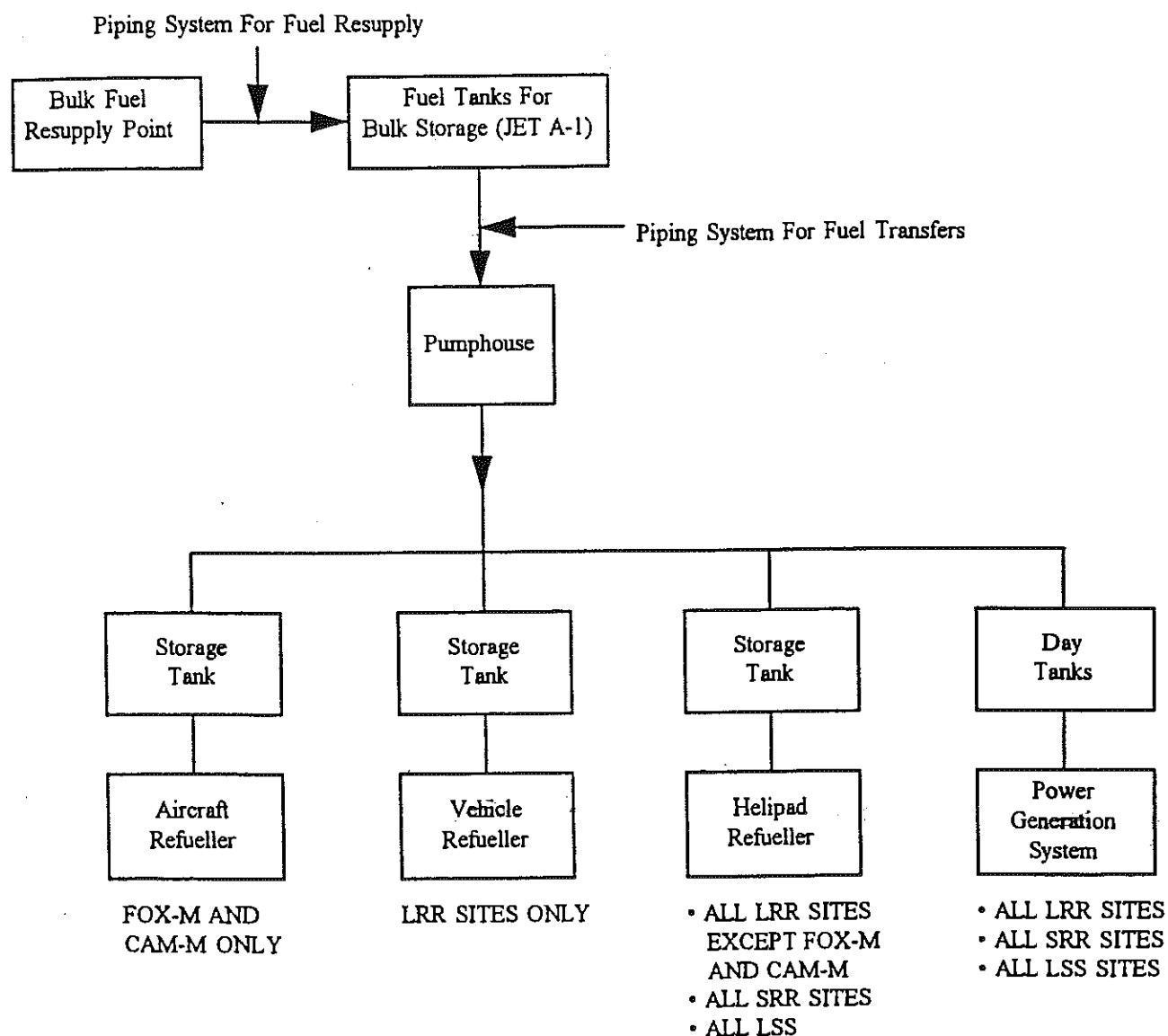
All LSS, LRR and SRR sites are located in the Canadian Arctic or Labrador and are subjected to the extremes of cold temperature, weather and seasons characteristic of these regions. Most LRR and SRR sites operate in remote, isolated locations. LSSs Cambridge Bay and Hall Beach are main LRR sites with communities nearby and LSSs Inuvik, Iqaluit, and Goose Bay are located in communities. Spills at LSSs Inuvik and Iqaluit will be managed by the local fire department, while LSS Goose Bay is subject to the CFB Goose Bay spill plan.

2.3 POL Bulk Storage and Distribution System

Each LRR site, SRR site and LSS has fuel storage tanks and piping systems for fuel distribution. The main components of the POL bulk storage and distribution system are shown in Figure 1.

All fuel tanks are located above ground and range in size from 200 litre capacity to 2.8 million litre capacity. Bulk storage tanks are of both horizontal and vertical types and are located inside earthen containment berms or dykes at LRR sites. Tanks which will continue to be actively used following the transition to reduced staffing, are contained by lined earthen dykes. Bulk storage tanks located at SRR

FIGURE 1 - POL STORAGE AND DISTRIBUTION SYSTEM



NOTE: Components of the POL storage and distribution system vary from site to site. See site specific descriptions in Annex C.

sites, LSS locations and some LRR sites incorporate an integral, external, secondary containment vessel in their design.

Oils and lubricants, used in the operation of power generating systems (PGS) and vehicles, are stored in site specific POL storage areas and in dedicated POL storage sheds. Waste POL products are stored in dedicated areas prior to disposal by incineration or retrograde activity. See site specific maps in EPP Annex F.

2.4 Fuel Resupply and Use

Bulk fuel resupply of all LRR and all SRR sites takes place during the summer season on an annual or bi-annual basis. Bulk fuel is transported to most LRRs and SRRs by sealift, (barges or ships). Some SRR sites receive bulk fuel from tractor trains, and the FOX-3 LRR site and some SRR sites are resupplied by airlift. Contractors and sub-contractors engaged in fuel resupply operations are responsible for providing their own POL Spill Contingency Plans, (see Section 1.5, Roles and Responsibilities). This document will be the source document for contractors and sub-contractors.

Uses of fuel at LRR sites include:

- a. operation of the power generating system;
- b. aircraft/helicopter refuelling;
- c. vehicles;
- d. furnaces and boilers; and
- e. incinerators.

Uses of fuel at LSSs and SRR sites include:

- a. operation of the power generating system;
- b. helicopter refuelling; and
- c. furnaces.

2.5 Bulk Fuel Description and Characteristics

The fuel used for all purposes on the NWS sites is Jet A-1 (3A), Arctic Grade, Aviation turbine fuel, kerosene type. This fuel type is highly flammable with a flash point of 38°C. It contains paraffin, olefin, naphthalene and aromatics. The aromatics and naphthalene fractions are both highly volatile and toxic.

Due to high volatility, Jet A-1 exhibits a high evaporation rate. Due to its light

flowing water and is visibly detectable as a thin sheen. It will sink rapidly into unfrozen ground and will migrate along the active layer and the permafrost zone.

Land spills of Jet A-1 may cause short-term contamination of soil quality. Water spills of Jet A-1 may cause short-term toxicity to aquatic life forms, and potentially long term physical impairment to aquatic ecosystems.

3.0 SPILL RESPONSE REQUIREMENTS

3.1 Spill Classifications

For the purposes of NWS operations, POL spills will be classified by:

- a. Size (volume); and
- b. Type.

The categories of spill size are:

- a. Minor = less than 205 litres (less than 1x45 U.S. gallon drum); or
- b. Medium = 205 litres to 5000 litres (1 to 25 drums); or
- c. Major = more than 5000 litres.

The categories of spill type are:

- a. Land spills; and
- b. Freshwater and marine spills.

3.2 FRONTEC's Spill Response Capability

When a POL spill is reported at an NWS sites, FRONTEC will:

- a. Mobilize personnel, materials and equipment to respond immediately after receipt of the spill report or as soon as practicable. "In-house" resources will be utilized for response to minor and medium size spills and initial response to major spills.

The conditions at a spill site with respect to weather, temperature, season and availability of transportation, may impose significant delays in response times. The O&M contract SOW allows for a maximum response time of forty eight hours in all cases;

- b. Request assistance, if required, from:
 - i. other NWS sites;
 - ii. DND; and
 - iii. the Canadian Coast Guard,and hire additional assistance, if required, from:
 - iv. Northern residents;
 - v. local communities; and
 - vi. commercial spill response firms.

Acquisition of additional resources may be required to respond to spills which exceed the capabilities of FRONTEC's "in-house" resources; and

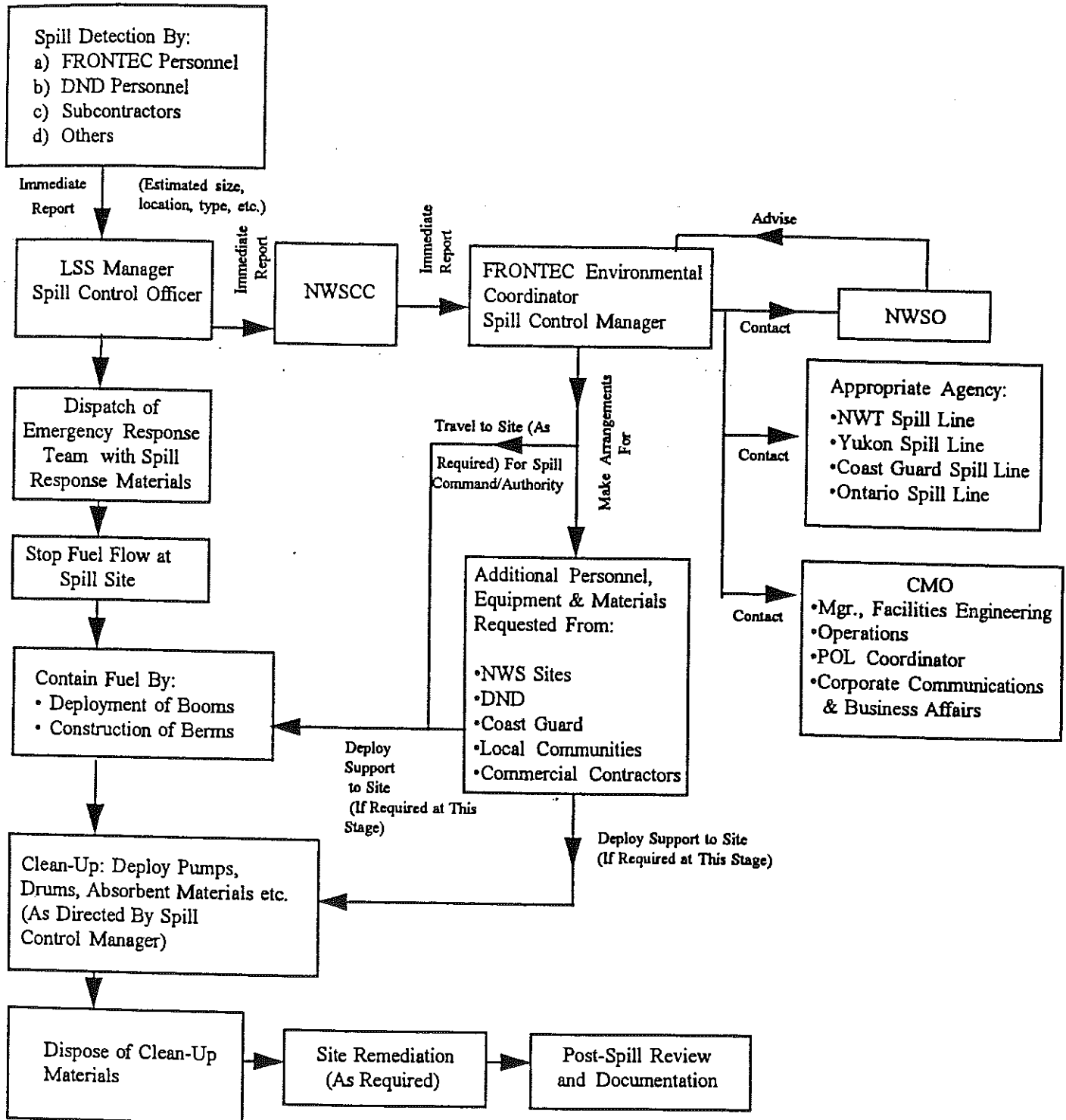
- c. Lend assistance to other agencies or local communities when requested.

3.3 Spill Response Process

Figure 2 illustrates the parties involved, their roles and actions in the spill response process. The spill response process for the NWS includes:

- a. Methods of spill prevention;
- b. Methods of spill detection; and
- c. Action plans for:
 - i. attended sites (i.e. CAM-M and FOX-M); and
 - ii. unattended sites.

FIGURE 2 - SPILL RESPONSE FLOW CHART



NOTE: Spills detected at SRR sites BAR-DA1, BAR-E or PIN-1BD must also be reported to the Inuvialuit Land Administrator by the Environmental Coordinator

3.4 Spill Prevention

Spill prevention minimizes the potential for POL spills at NWS sites through:

- a. Annual site conditions surveys to identify items of concern (e.g. bent pipe, damaged pipe supports, rusting);
- b. Preventive Maintenance Inspections (PMIs) of POL system components (e.g. pumps, valves);
- c. Regular maintenance of bulk fuel storage tanks (e.g. cleaning, inspection and refurbishment);
- d. Training of POL technicians in standard operating procedures (SOP) (e.g. fuel transfers, fuel resupply); and
- e. Safe guards for POL systems at unattended sites (e.g. "Time-Outs" for fuel pumps during transfer operations).

The above are enhanced by "in-house" and NWSO audits of all aspects of NWS operations.

3.5 Spill Detection

Methods employed for detection of POL spills include:

- a. **Visual**
This method is most successful during summer months when day light is abundant and there is an absence of snow cover. Snow cover and reduction of staff at the LRR sites significantly reduce the probability of sighting pools of fuel or stained soils;
- b. **Fuel Dipping**
This method of measurement provides data, which when compared to estimated consumption figures, may indicate a spill occurrence; and
- c. **Remote Monitoring**
Alarms are sent to the NWSCC when fuel levels of indoor, day tanks vary by more than the expected amount or fuel pumps operate with greater than expected frequency at unattended sites.

Remote monitoring of bulk POL storage tanks at NWS sites is not practiced

become available for use in extreme, cold weather environments they will be employed.

3.6 Spill Response - Initial Action

When a POL spill is detected at any NWS site the initial response action will be to report, as shown in Figure 2, to the LSS Manager who will then notify NWSCC. For spills at community based LSSs Inuvik and Iqaluit, the local fire department may also be contacted to assist in management of the spill.

The initial report must include the following information:

- a. Location and time of the spill;
- b. Substance spilled;
- c. Estimated size (volume in Litres, area, and depth);
- d. Cause, if readily identifiable;
- e. Tracking of the spill (movement, speed and direction)
- f. Conditions at the spill site including:
 - i. weather;
 - ii. depth of snow cover (if present);
 - iii. proximity of the spill to bodies of water;
 - iv. wind speed and direction; and
 - v. wave height (if a marine type spill);
- g. Hazards to personnel safety; and
- h. Hazards to the environment.

A written report containing this information, and a sketch map of the spill area, must also be forwarded to the Environmental Coordinator. See Annex B for a copy of the "Environmental Emergency Report FR-06 Spill Report" form.

3.6 Spill Reporting

All POL spills, regardless of size, are to be reported to the appropriate FRONTEC personnel. When a POL spill is detected at any NWS site, the initial response action will be to report to the LSS Manager. The LSS Manager will notify NWSCC, and NWSCC will in turn contact FRONTEC's Environmental Coordinator, as shown in Figure 2. To supplement the verbal report, the LSS Manager will fax a written report to the Environmental Coordinator. The Environmental Coordinator will notify NWSO, other departments at CMO, and outside agencies as appropriate.

The reporting responsibilities of the person discovering the spill, the LSS Manager, the NWSCC, and the Environmental Coordinator are outlined below.

Person Discovering the Spill:

An immediate verbal report of all spills must be made to the LSS Manager.

The report must include the following information:

- a. Location of the spill;
- b. Known or suspected time of the spill;
- c. Substance spilled;
- d. Estimated volume spilled*;
- e. Cause, if readily identifiable;
- f. Tracking of the spill (movement, speed and direction);
- g. Size of area contaminated, and depth of contamination, if possible;
- h. Conditions at the spill site including:
 - i. weather;
 - ii. depth of snow cover (if present);
 - iii. terrain;
 - iv. proximity of the spill to bodies of water;
 - v. wind speed and direction; and
 - vi. wave height (if a marine spill);
- i. Containment of the spill (none, natural, booms, dykes);
- j. Actions taken or proposed;
- k. Hazards to the safety of personnel or property; and
- l. Hazards to the environment.

* Dip tanks to calculate current volume, and estimate consumption since last dip/reconciliation, to determine amount spilled.

Fax a sketch map of the spill area, detailing the location and extent of the spill, to the LSS Manager. Where a fax machine is not available, i.e. at an SRR, deliver the map to the LSS Manager immediately upon returning to the LSS.

These report requirements are also outlined in the Internal Spill Report form.

LSS Manager:

Upon receiving the initial spill report, the LSS Manager must make an immediate verbal report to the NWSCC, which will in turn contact the Environmental Coordinator. The LSS Manager must then fax the Environmental Coordinator a written report containing detailed spill information using the Internal Spill Report form. This written report must be received within 24 hours of the verbal report. This form covers the same topics as those outlined for the verbal report from on-site personnel. The LSS Manager is also to include the reference number of the Work Order raised to respond to the spill. See the following pages, as well as Annex B, for a copy of the Internal Spill Report form.

Regardless of the volume, the NWSCC must be notified of all spills.

For spills at community based LSSs Inuvik and Iqaluit, the LSS Manager may also contact the local fire department to assist in management of the spill.

NWSCC:

The Shift Lead is the usual point of contact for spill reports. Upon receiving a report of a spill, the Shift Lead must immediately notify the Environmental Coordinator. The Environmental Coordinator will be contacted by phone at the CMO office or home, or by pager. If the Environmental Coordinator can not be reached, the Environmental Coordinator Alternate will be contacted. Any decision to file a Significant Incident Report will be made by NWSO.

Environmental Coordinator:

FRONTEC's Environmental Coordinator will assume the position of Spill Control Manager with authority over all spill response activities as shown in Fig. 2, the Spill Response Flow Chart.

Upon notification of a spill, the Environmental Coordinator will contact:

- a. NWSO, which will advise on all spill response activities.
The initial reports, verbal and written, will be followed by regular verbal reports as required;
- b. 24 hour spill line for:

- i. ~~Northwest Territories~~;
- ii. Yukon Territory;
- iii. Canadian Coast Guard; or
- iv. Ontario

These spill lines often have minimum volumes for reporting, meaning a spill of a given substance, under a given volume need not be reported. The Northwest Territories government lists various classes of hazardous substances with their minimum reporting volumes in the *Spill Contingency Planning and Reporting Regulations* (min. 100 L for flammable liquids). The Yukon follows the quantities listed in the federal *Transportation of Dangerous Goods Regulations* (min. 200 L for flammable liquids). Spills of gasoline or associated products under 70 L need not be reported in Labrador (*Storage and Handling of Gasoline and Associated Products Regulations, 1982*). In Ontario, spills of fuel of less than 100 L with no suspected environmental impact need not be reported. Regardless of these minimum volumes, however, site personnel must notify NWSCC of all spills - the Environmental Coordinator will contact the appropriate agencies as necessary.

- c. CMO personnel, including:
 - i. Manager, Facilities Engineering;
 - ii. Operations;
 - iii. POL Coordinator; and
 - iv. Corporate Communications and Public Affairs.
- d. In cases of spills at sites BAR-DA1, BAR-E and PIN-1BD, the lease agreement requires that an immediate spill report also be made to the Inuvialuit Land Administrator.
- e. Spills on airport property at Hall Beach, and spills on airport property or at the beach POL tanks at Cambridge Bay, are to be reported to the NWT Department of Transportation.

FAX COVER SHEET

INTERNAL

SPILL REPORT

TO: ☐ Environmental Coordinator - Sam Cheng fax ext.: 884

☐ Other

FROM: Name:

Title:

Site:

Phone:

DATE & TIME:

MESSAGE:

INTERNAL SPILL REPORT

☐ Initial

☐ Update

REPORT DATE:

DATE AND TIME OF SPILL (known or suspected):

SITE:

LOCATION OF SPILL ON SITE:

FLOW DIRECTION (if spill is moving):

SUBSTANCE SPILLED:

ESTIMATED QUANTITY SPILLED (metric volumes and masses required - attach tank dip data, calculations):

CAUSE OF SPILL:

HAS THE SPILL TERMINATED?

EXTENT OF CONTAMINATED AREA AND DEPTH OF CONTAMINATION (if possible):

FACTORS AFFECTING SPILL OR RECOVERY (temperature, wind, snow, ice, terrain, buildings, etc.):

CONTAINMENT (none, natural, booms, dykes, etc.):

ACTION(S) TAKEN OR PROPOSED TO CONTAIN, RECOVER, CLEAN-UP OR DISPOSE OF SUBSTANCE:

ASSISTANCE REQUIRED? If so, what form of assistance?:

HAZARD(S) TO PERSONS OR PROPERTY OR ENVIRONMENT:
(e.g. fire, drinking water, threat to fish or wildlife)

COMMENTS AND/OR RECOMMENDATIONS:

SKETCH MAP:

REPORTED BY:

Name:

Position:

Location:

Telephone:

WORK ORDER #(s):

03/98

3.7 Spill Response

Implementation of a POL spill action plan will include the following activities:

- a. Stopping the fuel flow;
- b. Containment of the spilled fuel;
- c. Clean up;
- d. Disposal of clean up materials;
- e. Remediation of the spill site;
- f. Final Report; and
- g. Post-spill review

FRONTEC's Environmental Coordinator will assume the position of Spill Control Manager. The LSS Manager will assume the position of Spill Control Officer and have authority over the Emergency Response Team (ERT) activated at, or dispatched to, the spill site. The LSS Manager will also raise the appropriate Work Order(s) to identify and track the necessary repairs, clean-up activities, and disposal actions. Communications will be maintained between the ERT and the LSS Manager throughout the duration of all spill response. ERT composition and responsibilities are shown in Figure 3 and Figure 4.

3.7.1 Cessation of Fuel Flow

The ERT will activate measures to stop further fuel flow. This would include closing isolation valves within the POL distribution system, if not already done so, and other means as determined by the nature of the spill.

3.7.2 Spill Containment

The ERT will deploy materials from the spill control kit and utilize such on-site equipment as may be available to contain the spill, possibly including the construction of temporary berms. In cases where the spill exceeds the capabilities of on-site resources, the Spill Control Manager will make arrangements for additional personnel, equipment and materials from:

- a. other NWS sites;
- b. DND;
- c. the Canadian Coast Guard;
- d. local communities; and
- e. commercial spill response contractors.

Depending on the spill size, the Spill Control Manager may travel to the spill site to supervise response activities.

FIGURE 3 - EMERGENCY RESPONSE TEAM - ATTENDED NWS SITES

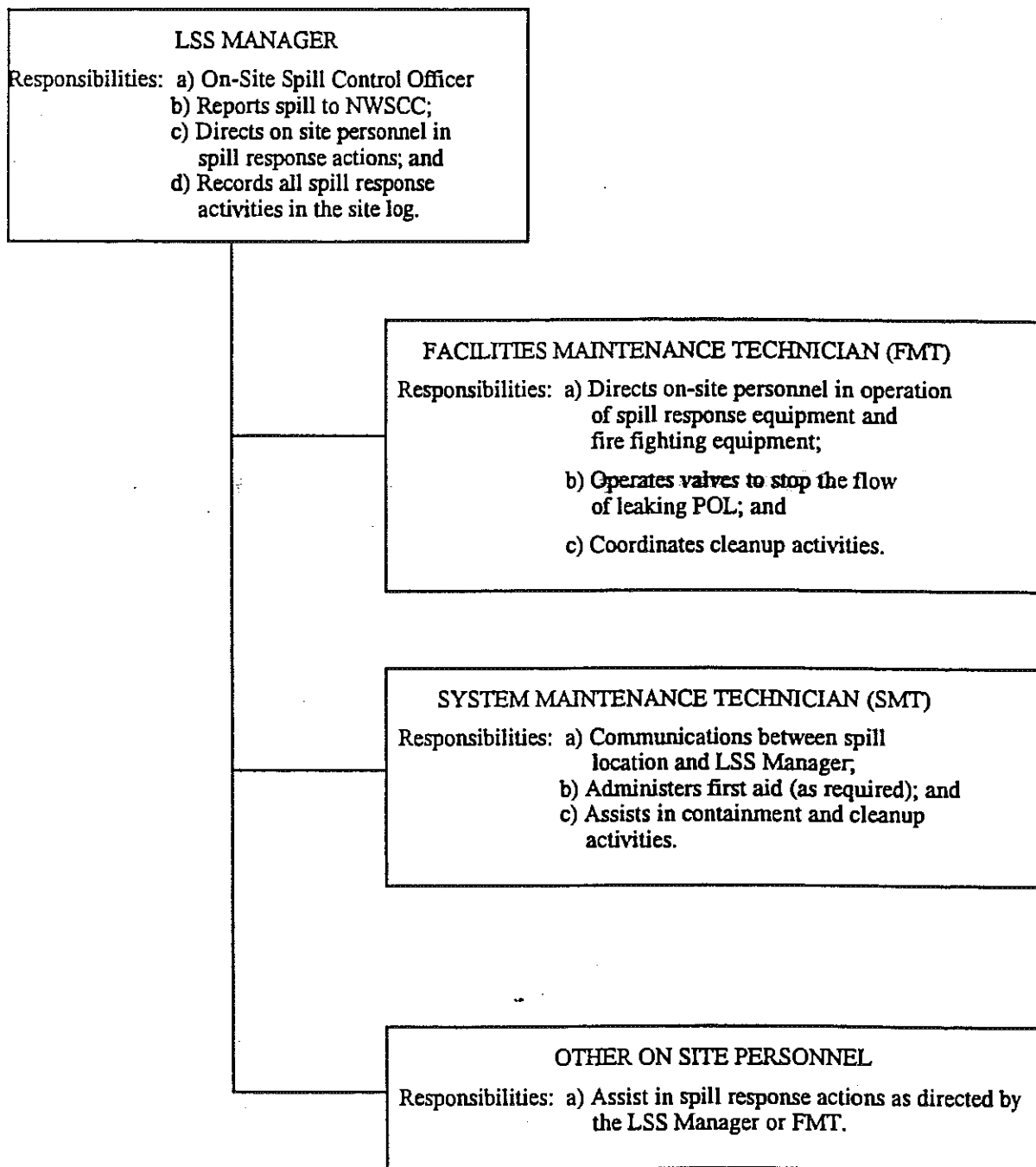
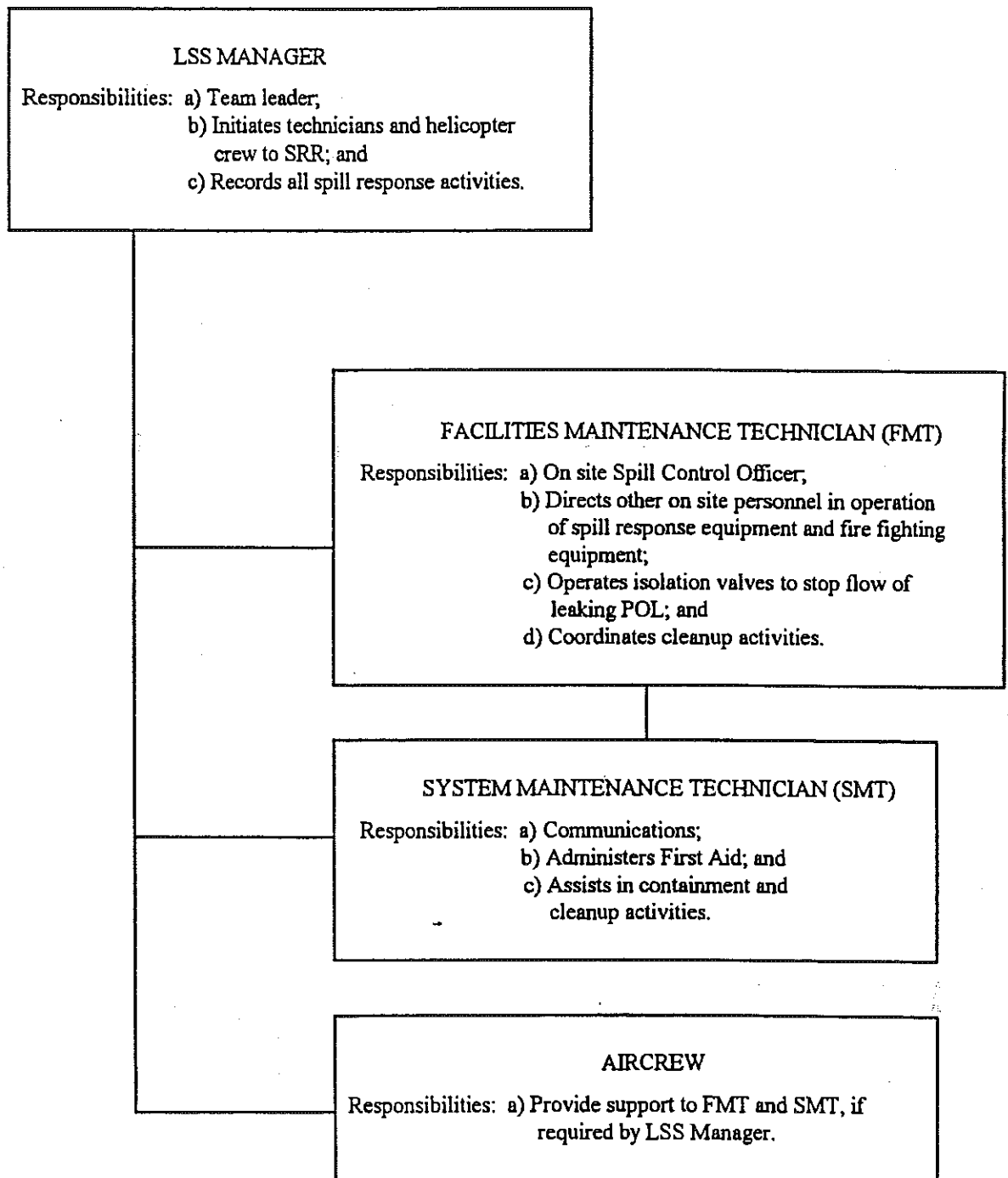


FIGURE 4 - EMERGENCY RESPONSE TEAM - UNATTENDED NWS SITES



3.7.3 Clean Up

Following successful containment of the spill, the ERT will deploy absorbent materials, salvage drums, POL pumps, slip tanks, sorbent wringer and other equipment as available, for recovery of the spilled fuel. Alternately, the Spill Control Manager may elect on-site burning of the spill as a means for spill clean-up.

Additional resources, as stated in 3.7.2, may be dispatched to the spill site by the Spill Control Manager in cases where the spill clean up exceeds the capabilities of the on-site resources.

Clean-up actions are identified and tracked through the spill's Work Order. A spill clean-up Work Order can not be closed until all actions are completed, or the remaining requirements transferred to a separate Work Order.

3.7.4 Disposal of Clean Up Materials

The wastes generated during spill response activities typically include used sorbent materials, POL/water mixtures, contaminated snow and contaminated soil. Each of these wastes has different properties, and although all may be contaminated with the same product, different collection and disposal methods are required. The following procedures are to be implemented by the ERT, in consultation with the Spill Control Manager, following spill clean-up activities.

Note that some equipment and materials will need to be brought to the spill site from the LSS/LRR.

3.7.4.1 Used Sorbent Materials

Sorbent materials found on the sites typically take the form of loose material in plastic bags, individual squares of sheet material, rolls of sheet material, and sock booms. Sorbent materials may be "universal" in that they absorb all liquids, or specific. Hydrophobic sorbents adsorb organic liquids such as fuel, but not water. Most sorbent materials adsorb liquids, meaning the liquid attaches to the surface of the sorbent particles, rather than absorb the liquid right into the molecular structure of the sorbent particles. If a liquid is adsorbed by a sorbent it can to some extent be squeezed out. To minimize the amount of used sorbent material requiring disposal, saturated sorbent materials, with the exception of bags of loose sorbent, are to be squeezed through a sorbent wringer and reused. One wringer unit will be stored at each LSS, for mobilization to spill sites as

part of the clean-up materials and equipment. The liquid extracted from the sorbent is to be handled as per section 3.7.4.2, and the wrung-out sorbent dealt with as detailed below.

- a. All used sorbent materials, regardless of type, are to be placed in salvage drum(s) with secure lid. The drum is to be marked as to its contents with permanent marker or spray paint as follows: "Used Sorbent, <substance absorbed (i.e. Jet A1, oil)>, <site>, <date>."
- b. If the spill has occurred at an SRR, the drum is to be transported to the base LRR or LSS by the ERT upon their departure. If space on the helicopter does not permit immediate removal, marked drums are to be stored in the TSB. The drum(s) must be transported to the LSS or LRR within 4 months. Burning of used sorbent, or any other solid waste, at an SRR is prohibited.
- c. At the LRR/LSS, transfer used sorbent from salvage drum to the site's burn bin. If the site does not have a burn bin (e.g. LAB-2 which uses an incinerator), an alternate secure, non-leaking container, such as a drum, may be used. For larger volumes, the top can be removed from a decommissioned day tank to form a burn trough. Do not attempt to burn used sorbent in the domestic refuse incinerators at the east coast LRRs. The burn area must be situated on site property, on a level area at least 30 m (100 ft) from any water body, and a minimum of 15 m down wind from any structures, tanks, or piping.
- d. Rinse salvage drums with water three times, straining rinse water through hydrophobic sorbent material prior to discharge to ground. Rinsing activities are to take place at least 30 m (100 ft) from any water body. Set drums upside down and allow to drain/air dry. Add used sorbent material to burn bin.
- e. Ignite waste in burn bin. If ignition is difficult, a small amount of accelerant, such as Jet A1, may be added. Material is to be "stirred" to encourage burning.
- f. Remaining material which will not burn is to be landfilled.
- g. Return salvage drum(s) to spill site for future use. Notify LSS LOGS personnel as to the spill response kit items which were used and require replacement. Items will be restocked in accordance with Supply Procedures Manual Vol. 1 Section 5.1.1 to maintain the minimum quantities as listed in the LOGS Checklist CL-006.

3.7.4.2 POL/Water Mixture

POL/water mixtures may be dealt with in-place during the clean-up phase, through burning of pooled fuel for example, and/or collected and drummed for treatment/disposal. As decisions regarding clean-up phase activities are at the discretion of the Spill Control Manager, these procedures simply address disposition of collected POL/water mixtures.

As a general rule of thumb, recovery of fuel for reuse is considered practical if more than 200 L of fuel can be collected. Recovered fuel must be dewatered and filtered prior to use, using filter units located at LRRs and LSSs, and can only be used for vehicles. As vehicles are not stored at SRRs, there is no use for recovered fuel at a SRR. Collected fuel must therefore be transported to an LRR or LSS for filtration and use.

Quantities of fuel of less than 200 L must also be recovered from the environment but will be burned rather than treated and reused.

- a. Let mixture sit in 205 L (45 gal) drum(s), allowing mixture to separate into layers. Salvage drums are not to be used, as they are not approved as primary containers for liquids if the drum needs to be transported. Drums are to be situated in a level area at least 30 m (100 ft) from any water body.
- b. Evaluate the POL/water ratio. For instance, coat a dipstick with water indicating paste and insert in drum to determine relative thickness of POL and water layers.
- c. If the POL/water ratio is low, say less than 25 % POL, and the volume of mixture is low, say less than 800 L (i.e. less than four 45 gal drums) then recovery for reuse is not justified. Therefore the POL can be captured and retained with sorbent material.
 - i. Use hydrophobic sorbent sheets to remove as much POL from the top layer of the drum(s) as possible and then strain the mixture through hydrophobic sorbent material. To maximize contact with the surface of the sorbent, coil socks/booms of hydrophobic sorbent material in a drum funnel set over a clean drum or other support, and slowly pour the mixture over the coils. The strained water is then emptied onto the ground. Straining activities are to take place at least 30 m (100 ft) from any water body.
 - ii. Dispose of used sorbent as discussed in 3.7.4.1.
 - iii. Return drum(s) to LRR/LSS. Rinse drums with water three times, straining rinse water through hydrophobic sorbent material prior to discharge to ground. Set drums upside down, allow to drain/air dry and return to stockpile. Rinsing activities are to take place at

- iv. Notify LSS LOGS personnel as to the spill response kit items which were used and require replacement. Items will be restocked in accordance with Supply Procedures Manual Vol. 1 Section 5.1.1 to maintain the minimum quantities as listed in the LOGS Checklist CL-006.
- d. If the POL/water ratio is higher, more than 25% POL, or the volume of mixture is higher, more than 800 L, a fuel/water separator is to be used. This separator would be stored at an LSS and, depending on the volumes of material to be shipped back and forth, the separator may be transported to the spill site, or the drums of mixture may be transported to the separator.
 - i. If the POL/water mixture must be transported for separation, or stored until separation can be conducted, each drum is to be marked as to its contents with permanent marker or spray paint as follows: "<substance>/water mixture, <site>, <date>". The drums are also to be labeled and shipped as flammable liquids, as per Transportation of Dangerous Goods (TDG) requirements.
 - ii. Pump or pour POL/water mixture from drums into separator. Separation activities are to be conducted on site property, a minimum of 30 m (100 ft) from any water bodies, a minimum of 15 m from structures, tanks, or piping.
 - iii. Follow instructions for use included with the separator unit. Designs may vary but most separators are based on separation of the mixture into layers due to differences in fluid density. Water, being "heavier" than POL products, sinks to the bottom and can then be drained off.
 - iv.. Slowly drain water from separator, straining it through a hydrophobic sorbent material to remove any POL residue prior to discharge. To maximize contact with the surface of the sorbent, coil socks/booms of hydrophobic sorbent material in a drum funnel set over a clean drum, and slowly pour the mixture over the coils. The water collected in the clean drum is then emptied onto the ground. Straining activities are to take place at least 30 m (100 ft) from any water body. Dispose of used sorbent as discussed in 3.7.4.1.
- v. Drain recovered POL into 205 L (45 gal) drum(s). Each drum is to be marked as to its contents with permanent marker or spray paint as follows: "Recovered <substance>, <site>, <date>".
- e. If less than a total of 200 L of POL was recovered, the fluid may be burned at the spill site rather than returned for disposal or reuse at an LRR or LSS. Burning must take place in, a secure, non-leaking, open-head drum or other suitable container, on site property, on a level area at least 30 m (100 ft) from any water body, and a minimum of 15 m (50

ft) down wind from any structures, tanks, or piping. Burning of used sorbent or other solid wastes at SRRs, however, is prohibited.

- f. If 200 L or more of POL were recovered, the fuel is to be taken to the LSS or LRR for treatment using the site's filter units. If the spill has occurred at an SRR, the drums are to be transported to the base LRR or LSS by the ERT upon their departure. If space on the helicopter does not permit immediate removal, marked drums are to be stored in the TSB. The drums must be transported to the LSS or LRR within 4 months. Drums of recovered fuel are to be labeled and shipped as flammable liquids as per Transportation of Dangerous Goods (TDG) requirements.

Once dewatered and filtered, the fuel is transferred to the vehicle refueller tank. Recovered fuel must not be placed in PGS or aviation fuel tanks.

- g. Return drum(s) to LRR/LSS. Rinse drums with water three times, straining rinse water through hydrophobic sorbent material prior to discharge to ground. Set drums upside down, allow to drain/air dry, and return to stockpile. Rinsing activities are to take place at least 30 m (100 ft) from any water body. Dispose of used sorbent as discussed in 3.7.4.1.
- h. Notify LSS LOGS personnel as to the spill response kit items which were used and require replacement. Items will be restocked in accordance with Supply Procedures Manual Vol. 1 Section 5.1.1 to maintain the minimum quantities as listed in the LOGS Checklist CL-006.

3.7.4.3 Contaminated Snow

Small volumes of contaminated snow are to be shoveled into an open head 205 L (45 gal) drum, along with a hydrophobic sorbent mat, pillow or sock. Each drum is to be marked as to its contents with permanent marker or spray paint as follows: "Snow with <substance>, <site>, <date>." Drums may be stored in a level area outside to await spring thaw, or moved indoors to speed melting. The melted snow is to be treated as POL/water mixture, as discussed in 3.7.4.2.

Large areas of contaminated snow may be removed/isolated and surrounded with hydrophobic absorbent booms to gradually filter meltwater. Decisions in such a situation will be at the discretion of the Spill Control Manager.

3.7.4.4 Contaminated Soil

Decisions regarding remediation of contaminated soil must be made by the Spill Control Manager on a case-by-case basis. Commonly, a small area of contaminated soil would be left to aerate at the spill site. The area would be "tilled" by hand and the soil spread out in a thin layer, to maximize "evaporation" of fuel from the soil.

Should contaminated soil need to be excavated and contained, the following points are to be noted.

- a. Do not mix soil with other spill wastes.
- b. Do not overfill containers. Drums will need to be moved without the aid of heavy equipment at SRRs. In light of this, use of large (85 gal /320 L) salvage drums is to be avoided.
- c. Each drum is to be marked as to its contents with permanent marker or spray paint as follows: "Soil with <substance>, <site>, <date>".

3.7.4.5 Reporting Disposal Actions

The LSS Manager is to advise the Spill Control Manager of disposal actions taken by the ERT, through e-mail or Internal Spill Report updates. In particular, any spill waste for which disposal actions could not be completed must be flagged for future action (e.g. a drum of waste which could not be removed from the spill site at the time of the ERT's departure). Drums of waste left at an SRR must be transported to the LSS or LRR within 4 months of the spill response. Such information can be tracked through the spill clean-up Work Order.

Spill clean-up Work Orders are to include the removal and disposal actions for spill wastes. A spill clean-up Work Order can therefore not be closed until the disposal actions are completed, or the remaining requirements transferred to a separate waste disposal Work Order.

3.7.5 Site Remediation

Site remediation will be undertaken by trained FRONTEC personnel or by experienced commercial spill response firms. Remediation methods include:

- a. Aeration of soils;
- b. Excavation of the affected area for treatment/disposal;
- c. Natural biodegradation; and

- d. Enhanced bioremediation (under review).

The Spill Control Manager, in consultation with NWSO, will decide upon the most appropriate method of remediation.

3.7.6 Final Report

The final report summarizes the following spill information:

- a. Initial report information;
- b. Confirmation of spill volume;
- c. Actions taken;
- d. Future remediation/monitoring requirements; and
- e. Sketch map and/or photographs of spill area.

3.7.7 Post Spill Review

A joint review of all spill response activities and involved parties will be held by FRONTEC and NWSO in order to:

- a. Document all events from the initial spill report through to site remediation;
- b. Analyse spill response actions taken and their effectiveness in order to:
 - i. Revise action plans as required;
 - ii. Amend spill response procedures as required; and
 - iii. Amend the spill response training program.

A post spill review will take place:

- a. In the case of any major spill; and
- b. In the case of minor or medium spills when requested by FRONTEC or NWSO.

3.8 Spill Response - POL Resupply Activities

Part II Section 6.2 of the EPP describes the bulk POL resupply process for NWS sites. Transportation of the bulk POL is performed by contractors and subcontractors who must each possess their own Spill Contingency Plan.

FRONTEC will report spills related to fuel resupply and fuel transfer to NWSO, even though the contractor's spill plan may apply.

Command structure and spill response action plans for spills during site resupply are shown in Figures 5 and 6. These plans illustrate spill responses during resupply by:

- a. Sealift (e.g. vessel or barge); and
- b. Airlift (e.g. rotary wing or fixed wing aircraft).

Figures 7 through 10 depict response plans for land and freshwater/marine spills at unattended and attended NWS sites.

**FIGURE 5 - FLOW CHART FOR FUEL SPILL RESPONSE
DURING BULK POL RESUPPLY BY SEALIFT**

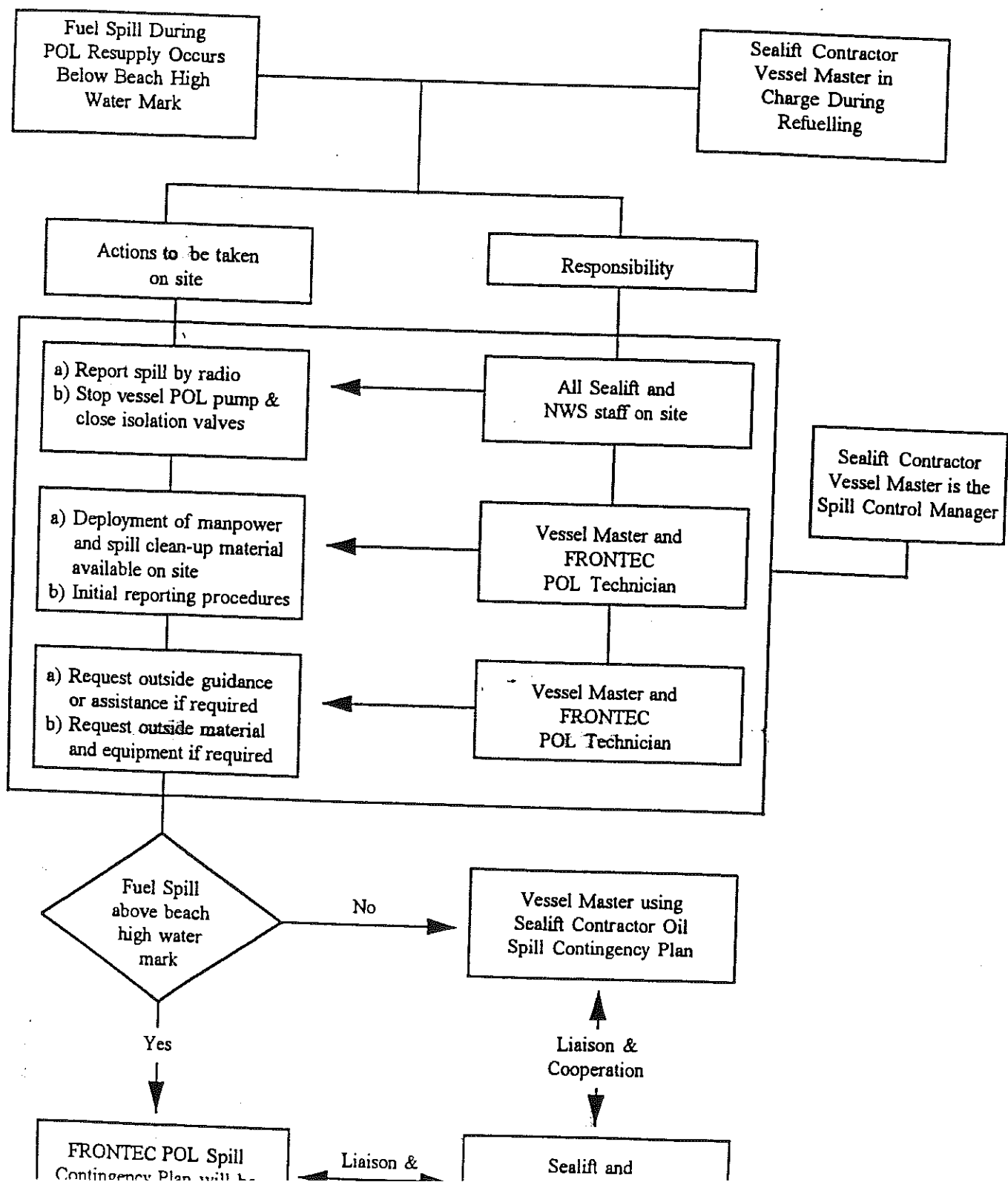
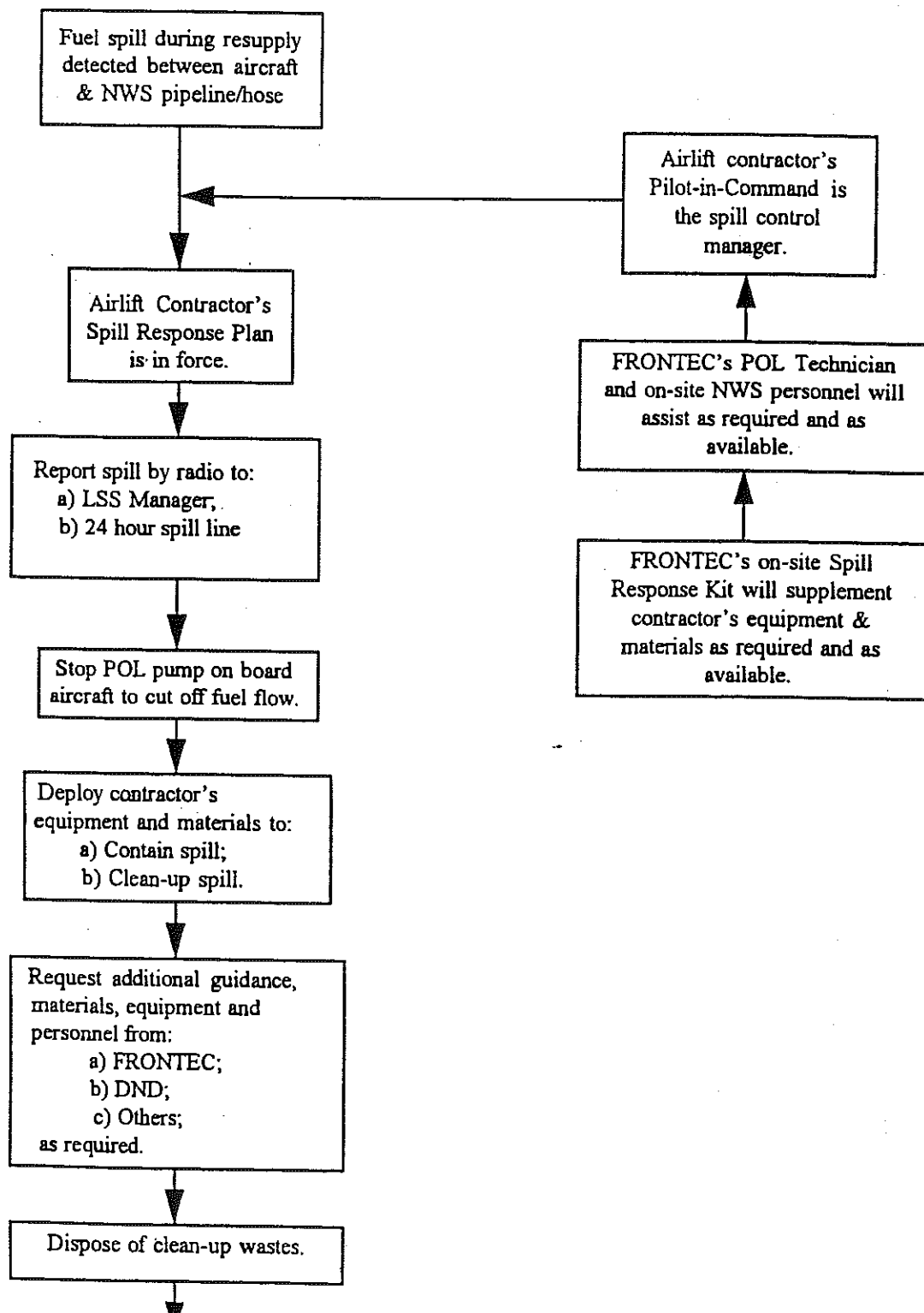
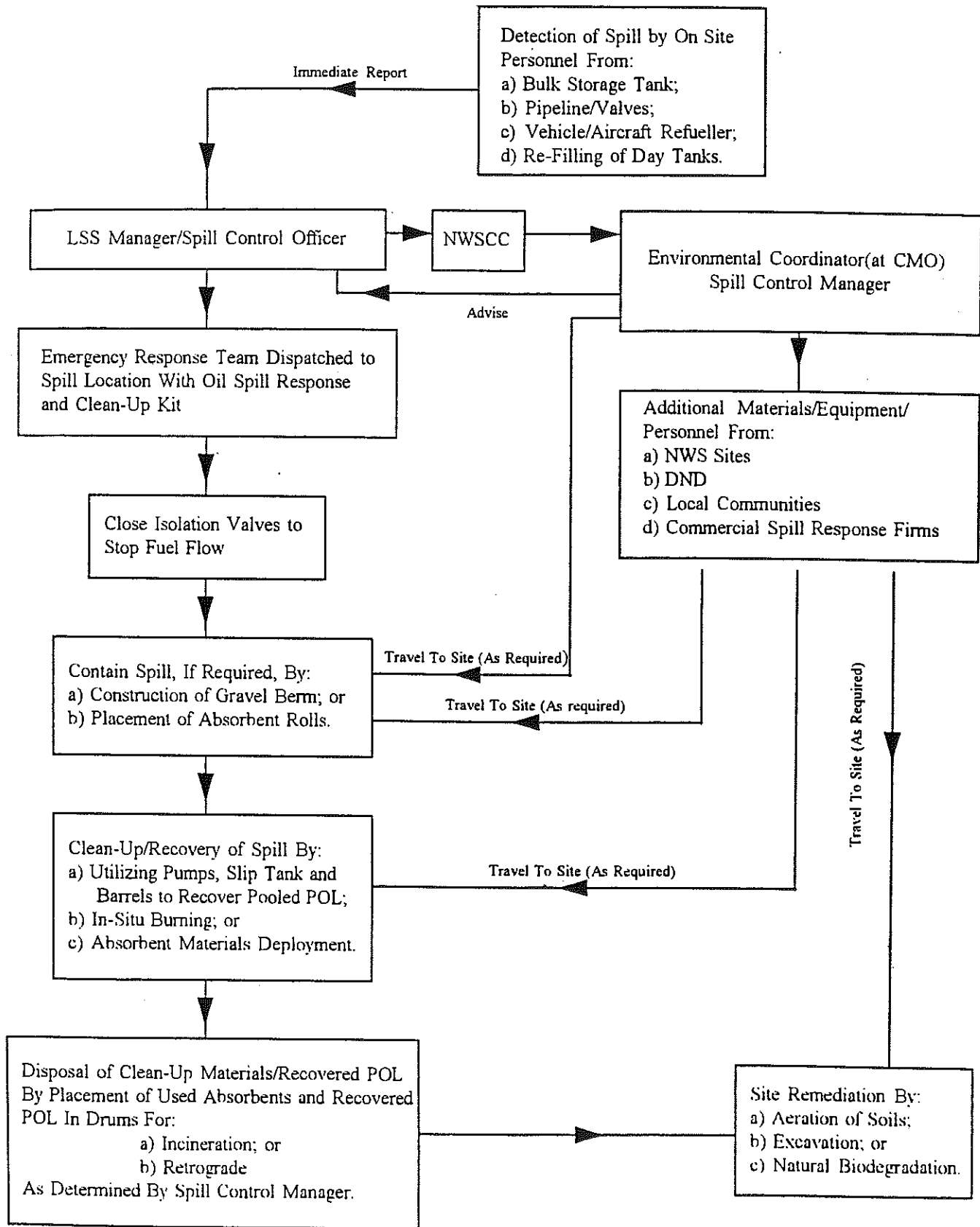


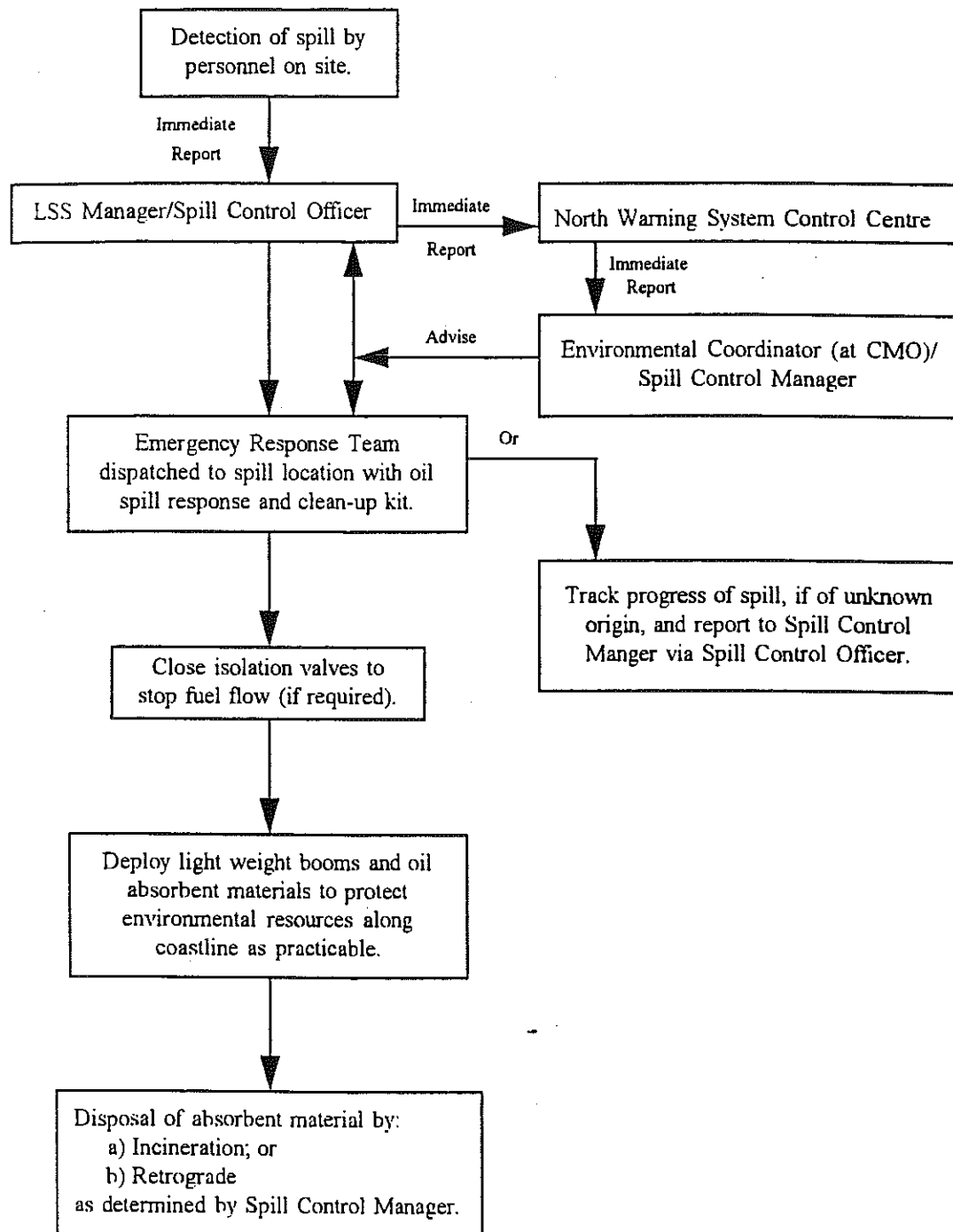
FIGURE 6 - FLOW CHART FOR FUEL SPILL RESPONSE DURING BULK POL RESUPPLY BY AIRCRAFT



**FIGURE 7 - FLOW CHART FOR LAND POL SPILL RESPONSE AT NWS
ATTENDED SITES**

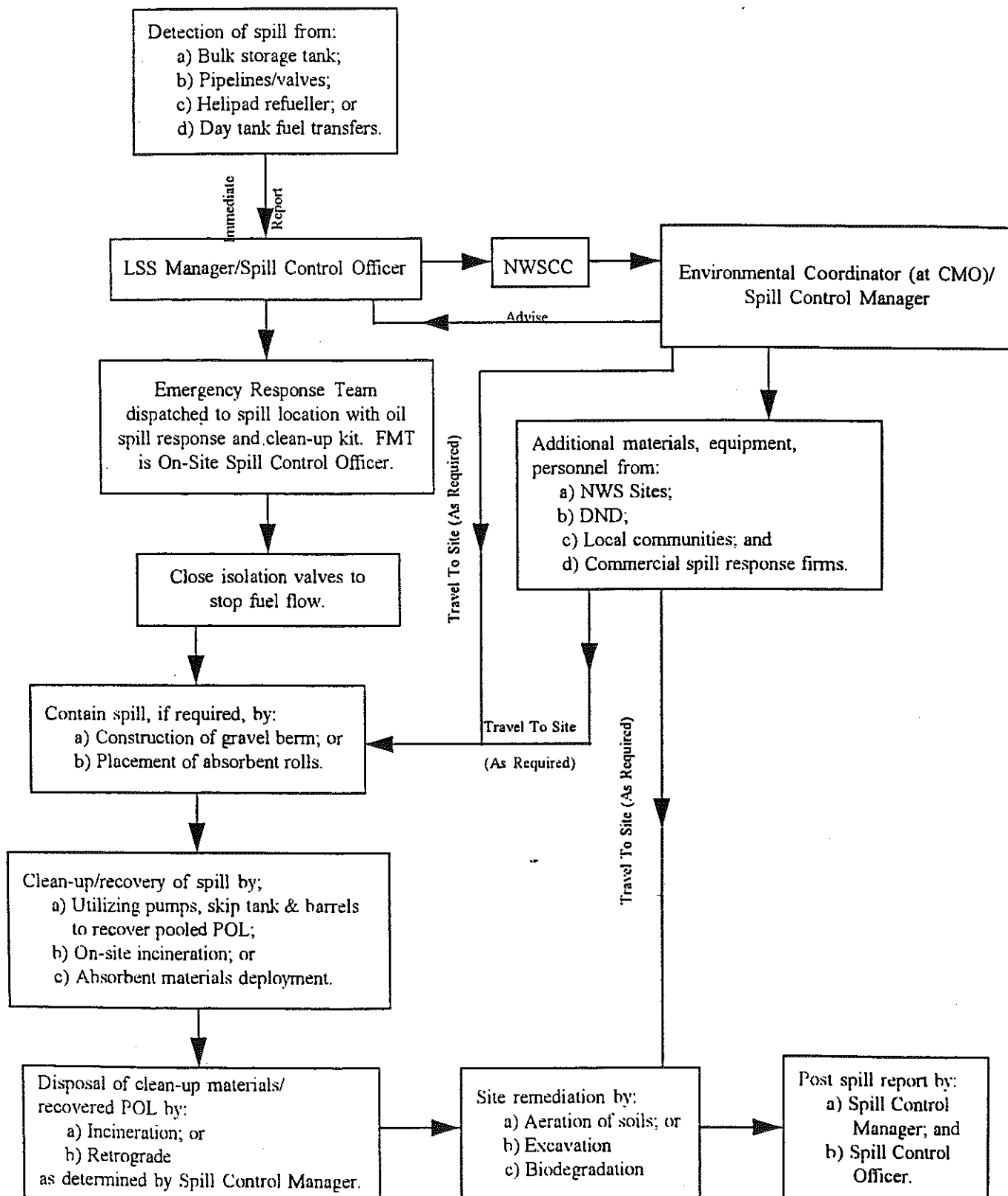


**FIGURE 8 - FLOW CHART FOR FRESHWATER AND MARINE POL SPILL
RESPONSE AT NWS ATTENDED SITES**



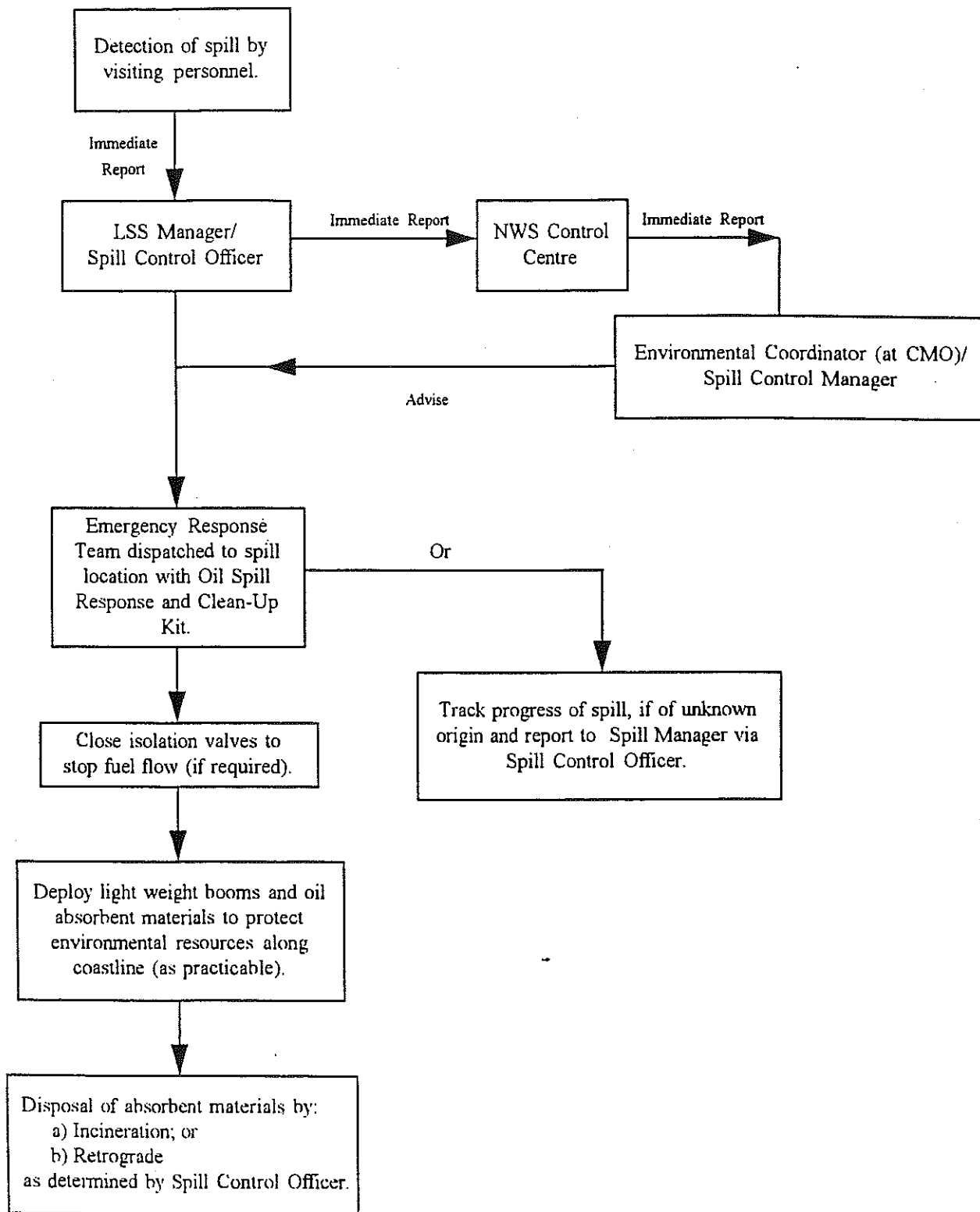
- NOTES: 1) Remediation of the spill affected area by:
a) Evaporation; and
b) Natural dispersion through wave action and wind.
- 2) Bulk fuel re-supply responses are as shown in Figures 5 & 6.
- 3) This spill response scenario assumes that the marine based POL spill originates from O&M activities of the NWS.

**FIGURE 9 - FLOW CHART FOR LAND POL SPILL RESPONSE AT NWS
UNATTENDED SITES**



NOTE: Spills detected at: a) BAR-DA1, Liverpool Bay;
b) BAR-E Horton River; or
c) PIN-1BD, Keats Point
must be reported to the Inuvialuit Land Administrator (See Annex B).

**FIGURE 10 - FLOW CHART FOR FRESHWATER AND MARINE POL SPILL
RESPONSE AT NWS UNATTENDED SITES**



NOTES: 1) This spill response scenario assumes that the freshwater or marine based POL spill originates from O&M activities of the NWS.

2) Spills detected at: a) BAR-DA1, Liverpool Bay;
b) BAR-E, Horton River; or
c) PIN-1BD, Keats Point

must be reported to the Inuvialuit Land Administrator (See Annex B).

4.0 SPILL RESPONSE TRAINING PROGRAM

4.1 Purpose

The POL Spill Response Training Program will provide instruction in all aspects of spill response stated in the plan for:

- a. All NWS site personnel; and
- b. All CMO personnel involved in the O&M of NWS sites.

The training program will further provide information regarding the Spill Response Plan for:

- a. NWSO personnel;
- b. FRONTEC personnel; and
- c. Subcontractors engaged in NWS site O&M activities.

4.2 Contents

Spill Response Training will include the following subjects:

- a. Spill Awareness and Prevention;
- b. Methods of Detection;
- c. POL Storage and Distribution Systems;
- d. POL Products on NWS Sites;
- e. Types of Spill and Seasonal Considerations;
- f. Reporting Procedures and Initial Responses;
- g. Spill Response Kit Familiarization;
- h. Clean-Up and Site Remediation Methods;
- i. Occupational Health and Safety; and
- j. Post Spill Review Process and Documentation.

4.3 Implementation

Instruction methods employed in Spill Response Training will include:

- a. Lectures;
- b. Audio-visual presentations;
- c. Spill simulation and site remediation exercises; and

- d. Distribution of site specific information packages which will include:
 - i. Site maps;
 - ii. Identification of Spill Control Points;
 - iii. Location of spill response equipment and materials; and
 - iv. Site specific, special considerations.

ANNEX B

EMERGENCY SPILL REPORTING

CONTACT LISTINGS and SPILL REPORT FORMS

FRONTEC Emergency Contact List

NWSCC Shift Lead	(705) 494-6011 ext 8044/45
Sam Cheng, Environmental Coordinator	(613) 728-2241 (H) (613) 593-2321 (Beeper)
Barb Thomson, Environmental Coordinator (Alternate)	(613) 567-0155 (H)
Dave Christian, Manager, Facilities Engineering	(613) 748-6594 (H)
Brian Hanly, Director, NWS Operations	(613) 235-7644 (H)
<i>Patie Lundy</i> Jody Langelier , Manager, Operations & Administration	(613) 834-9018 (H)
Dave Briand, Deputy Manager, NWS Operations	(613) 232-1121 (H)
Hank Nemeth, Manager, Logistics	(613) 567-0338 (H)
Paul Deschenes, POL Coordinator	(613) 824-5575 (H)
Chris White, Corporate Communications & Public Affairs	(403) 444-4765 (H)
Lillian Hvatum, Manager, Northern & Business Affairs	(867) 979-2182 (H)

24 Hour Spill Lines

Northwest Territories	(867) 920-8130
Yukon	(867) 667-7244
Newfoundland and Labrador (Coast Guard)	(709) 772-2083
Ontario MOEE (reporting to MOEE is recommended by Environment Canada)	1-800-268-6060

NWSO Emergency Response Contact

<u>Contact</u>	<u>Designation</u>	<u>(W)</u>	<u>(H)</u>
Jim Boissonneault	R&CS 2-3-5	992-9743	1-613-543-3435
Capt. Z. Szabo	R&CS 2-3-2	992-0692	(613) 825-7646
Maj. H. Chan	R&CS 2-3	996-4093	(613) 834-6741
Maj. L.R. Massé	R&CS 2-2	996-0892	(613) 741-7966
Col. J.R. Leitch	DAEPM (R&CS)	996-5705	(613) 834-3735

Newfoundland and Labrador

24 Hour Spill Report Line (Coast Guard) (709) 772-2083

R.C.M.P.

Nain, Labrador (709) 922-2862
Cartwright, Labrador (709) 938-7218

Department of Environment and Labour

Government Services and Land Div. - Regional Office, Goose Bay
Environment/Health Officers - Darrel Johnson, Ken Russell (709) 896-2661
(709) 896-4340 (fax)

Department of Tourism, Culture, and Recreation

Parks Division, Wildlife Biologist (709) 729-2428
Historic Resources, Resource Archaeologist - Martha Drake (709) 729-2462

Canadian Wildlife Service

Manager, St. John's Office - Bruce Turner (709) 772-5585
Seabird Technician - Pierre Ryan (709) 772-4431

Northwest Territories

24 Hour Spill Report Line (867) 920-8130

Inuvialuit Land Administration (867) 977-2202

Inuvik Fire Department (867) 777-5555
Iqaluit Fire Department (867) 979-4422

Environment Canada - Environmental Protection Branch -NWT Division

Manager, Yellowknife Office - Laura Johnston	(867) 669-4700
	(867) 873-8185 (fax)
Water Pollution Specialist - Anne Wilson	(867) 669-4735
Chief Environmental Engineer - Ed Collins	(867) 669-4726

Indian and Northern Affairs Canada

Inuvik Region District Manager - Rudy Cockney	(867) 979-3361
Iqaluit Region District Manager - Dan Elliot	(867) 979-4405

GNWT Department of Transportation

Environmental Affairs, Manager - Leslie Green	(867) 873-7063
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GNWT Department of Resources, Wildlife & Economic Development

Environmental Protection, Manager - Ken Hall	(867) 920-6476
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Baffin Region Renewable Resources Officer Stations

Iqaluit	(867) 979-5017
Broughton Island	(867) 927-8966
Hall Beach	(867) 928-8819

Keewatin and Inuvik Renewable Resources Officer Stations

Regional Office (Coppermine)	(867) 982-7240
Taloyoak (Spence Bay)	(867) 561-6231
Gjoa Haven	(867) 360-7605
Cambridge Bay	(867) 983-7314
Kugluktuk (Coppermine)	(867) 982-7250
Inuvik	(867) 979-7201

GNWT Prince of Wales Northern Heritage Center

Director of Culture and Heritage, Charles D. Arnold	(867) 873-7551
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Yukon

24 Hour Emergency Line

(867) 667-7244
(867) 667-7962 (fax)

Environment Canada

Enforcement and Emergencies Division, Head - George Balmer

(867) 667-3406

Department of Renewable Resources

Parks & Outdoor Recreation Office, Director - Jim McIntyre
Fish and Wildlife Branch, Director - Mark Hoffman

(867) 667-5261
(867) 667-5715

Department of Tourism

Heritage Branch, Director - Jeff Hunston

(867) 667-5363

Parks Canada

Chief Park Warden, Ivvavik National Park - Vikki Sahanatien

(867) 979-3248

Ontario

Ontario MOEE Spill Line

1-800-268-6060

Environment Canada (Toronto) Spill Line

(416) 346-1971

FAX COVER SHEET

INTERNAL

SPILL REPORT

TO: ☐ Environmental Coordinator - Sam Cheng fax ext.: 884

☐ Other

FROM: Name:

Title:

Site:

Phone:

DATE & TIME:

MESSAGE:

INTERNAL SPILL REPORT

☐ Initial

☐ Update

REPORT DATE:

DATE AND TIME OF SPILL (known or suspected):

SITE:

LOCATION OF SPILL ON SITE:

FLOW DIRECTION (if spill is moving):

SUBSTANCE SPILLED:

ESTIMATED QUANTITY SPILLED (metric volumes and masses required - attach tank dip data, calculations):

CAUSE OF SPILL:

HAS THE SPILL TERMINATED?

EXTENT OF CONTAMINATED AREA AND DEPTH OF CONTAMINATION (if possible):

FACTORS AFFECTING SPILL OR RECOVERY (temperature, wind, snow, ice, terrain, buildings, etc.):

CONTAINMENT (none, natural, booms, dykes, etc.):

ACTION(S) TAKEN OR PROPOSED TO CONTAIN, RECOVER, CLEAN-UP OR DISPOSE OF SUBSTANCE:

ASSISTANCE REQUIRED? If so, what form of assistance?:

HAZARD(S) TO PERSONS OR PROPERTY OR ENVIRONMENT:
(e.g. fire, drinking water, threat to fish or wildlife)

COMMENTS AND/OR RECOMMENDATIONS:

SKETCH MAP:

REPORTED BY:

Name:

Position:

Location:

Telephone:

WORK ORDER #(s):

ENVIRONMENTAL EMERGENCY REPORT FR-06

SPILL REPORT

A	Report Date:	Date and Time of Spill (known or suspected):	
B	Location and Map Coordinates (if known) and Flow Direction if moving:		
C	Party Responsible/Responding:	FRONTEC Logistics	
D	Substance(s) Spilled and Estimated Quantities: (metric volumes and masses required)		
E	Cause of Spill:		
F	Spill Terminated or Continuing?:		
G	Extent of Contaminated Area and Depth of Contamination, if possible:		
H	Factors Affecting Spill or Recovery: (temperature, wind, snow, ice, terrain, buildings etc.)		
I	Containment: (none, natural, booms, dykes, etc.)		
J	Action(s) Taken or Proposed to Contain, Recover, Clean-Up or Dispose of Substance:		
K	Assistance Required? If so, what form of assistance?:		
L	Hazard(s) to Persons or Property or Environment: (e.g. fire, drinking water, threat to fish or wildlife)		
M	Comments and/or Recommendations:		
N	Reported By:	Position:	Employer:
	Location:	Telephone:	
O	Reported To:	Position:	Employer:
	Location:	Telephone:	
P	Agencies Contacted, and Date and Time of Contact:		
Q	Work Order #(s):		

ANNEX C

SPECIFICATIONS FOR MATERIALS AND EQUIPMENT

POL EMERGENCY RESPONSE AND CLEAN-UP KITS

POL SPILL RESPONSE AND CLEAN-UP KITS

POL SPILL KIT FOR BAR-B, STOKES POINT

Item Description	U/I	QTY
Absorbent Sheets	Ea	50
Absorbent, oil	Bag	20
Absorbent W	Bag	20
Shovel	Ea	5
Pitchfork	Ea	3
Gloves, rubber lined	Pair	5
Plastic Bags (3 mil)	Bag	20
Salvage drum (85 US gal)	Ea	3

POL SPILL KIT FOR SRRs

Item Description	U/I	QTY
Absorbent, oil (7 kg)	Bag	12
Salvage drum (85 gal)	Ea	2
Shovel	Ea	2
Gloves, rubber lined	Pair	1
Wheelbarrow	Ea	1

POL SPILL KIT FOR LRRs

Item Description	U/I	QTY
M50 Oil spill containment boom 200 mm dia. (package of 40 ft)	Section	8
M90 Oil absorbent roll 36" X 300' X 3/8 inch thick	Roll	10
M75 Oil absorbent sheet 18" X 18" X 3/8 inch thick	Sheet	200
Absorbent, oil: 7 kg	Bag	150
Absorbent, water/oil: 7 kg	Bag	20
Shovel, spade type	Ea	2
Pitchfork	Ea	2
Gloves, rubber lined	Pair	20
Plastic Bags, 3 mil	Bag	100
Plastic, polyethylene, 6 mil: 1000 m ² rolls	Roll	4
Pump, electric transfer 12 volt	Ea	1
Pump, flammable liquids with hoses Gorman Rupp Pump	Ea	1
Pump, hand transfer electric	Ea	1
Sliptank, portable: 100 gal	Ea	1
Polypropylene rope	Ea	1
Dresser couplings, various sizes	Ea	5
Respirator, activated carbon	Ea	3
Safety goggles	Ea	2

LRR SITE

BAR-2
PIN-M
PIN-3
CAM-M
CAM-3
FOX-M
FOX-3
DYE-M
BAF-3
LAB-2
LAB-6

POL SPILL KIT LOCATION

Warehouse/Garage Mezzanine
Warehouse B13C
Hangar
ATB Hangar, Warehouse
Warehouse B13A
Garage, Cold Storage Warehouse
ATB/Warehouse B13A Cage
Radio Terminal Building
ATB
ATB
Water Storage Building