ANNEX C

Nasittuq (NWS) Spill Contingency Plan

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List of Acronyms and Abbreviations

CFB	Canadian Forces Base
CMO	Contractor Management Office
DND	Department of National Defence
EPM	NWS Environmental Protection Manual
EPP	Environmental Protection Plan
ERT	Emergency Response Team
FMT	Facilities Maintenance Technician
Hazmat	Hazardous Materials
IATA	International Air Transport Association
LHCN	Long-Haul Communication Network
LOGS	Logistics Department
LRR	Long Range Radar
LSS	Logistics Support Site
NWO	North Warning Order
NWS	North Warning System
NWSCC	North Warning System Control Centre
NWSSC	North Warning System Support Centre
NWSO	North Warning System Office
NWT	Northwest Territories
O&M	Operation and Maintenance
PCBs	Polychlorinated biphenyls
PGS	Power Generating System
PMI	Preventive Maintenance Inspection
POL	Petroleum, oil and lubricants
SCADA	Supervisory Control and Data Acquisition
SM Section	Systems Maintenance Section
SMT	Systems Maintenance Technician
SOW	NWS O&M Contract Statement of Work
SRD	Short Range Radar Development Site
SRR	Short Range Radar
TDG	Transportation of Dangerous Goods
TSB	Technical Services Building
WHMIS	Workplace Hazardous Materials Information System

XVI SPILL CONTINGENCY PLAN

1.0 PURPOSE

This plan establishes policy, responsibilities and instructions for response to spills of petroleum, oil and lubricants (POL) and other hazardous materials (Hazmat) 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. Full definitions of 'spill' and 'Hazmat' are provided in Section 4.0 below.

The purposes of this plan are to:

a) provide a clear statement of procedures which will be carried out in response to POL & Hazmat spills;

b) minimize the environmental impacts of POL & Hazmat spills by establishing pre-determined responses and plans of action;

c) protect the health and ensure the safety of (i) personnel involved in POL & Hazmat spill response activities, and (ii) local communities;

d) provide a reporting network for POL & Hazmat spills;

e) ensure site environmental restoration through appropriate remedial activities;

f) identify the roles and responsibilities of all parties involved in POL & Hazmat spill response activities; and

g) identify sufficient personnel, materials and equipment needed to make an adequate response to POL & Hazmat spills.

2.0 SCOPE

This plan applies to all activities and facilities pertaining to NWS sites, except Logistics Support Site (LSS) Goose Bay and the North Warning System Control Centre (NWSCC), as discussed below. This includes:

a) Short Range Radar (SRR) sites which operate unattended;

b) Long Range Radar (LRR) sites which operate unattended with occasional staff visits;

c) LSSs which are staffed to support SRR and LRR operations;

d) the North Warning System Support Centre (NWSSC) and Short Range Radar Development Site (SRD) in North Bay, Ontario.

This plan is not applicable at the Goose Bay LSS located at Canadian Forces Base (CFB) Goose Bay, Labrador. This site will report POL spills to the Base Fire Hall. In addition LSS-G will notify NWSCC and the Contractor Management Office (CMO) as per PRO-4.9-37. Spill reporting and response will be actioned by the Base and will conform to the requirements of the 1 CAD HQ Uniform Spill Reporting Protocol and the 5 Wing Emergency Response Plan. NWSCC will notify NWSO of the spill, and the NWSO will liaise with the Wing Environmental Officer, as necessary.

This plan is also not applicable to spills at the NWSCC located at CFB North Bay, Ontario. These spills are reported to the Senior Director – 21 Squadron, and will conform to the requirements of the 1 CAD HQ Uniform Spill Reporting Protocol. Spill response action will be taken by the local community emergency response service.

3.0 APPLICABLE DOCUMENTS

This plan is an integral component of Nasittuq's Environmental Protection Plan (EPP), consistent with the requirements and provisions of:

i) Nasittuq's Corporate Environmental Policy;
ii) Nasittuq's Corporate EPP for the O&M of the NWS;
iii) NWS O&M Contract SOW; and
iv) NWS Environmental Protection Manual.
v) Nasittuq's NWS Incident Reporting Procedure, PRO-4.9-37

4.0 GENERAL

4.1 Spill Definition

For the purposes of this EPP, a 'spill' is defined as *the accidental and/or unwanted discharge of any volume of POL or Hazmat from its storage container or structure, vehicle, pipe or other container: (a) into the natural environment or (b) within a building.*

This definition covers all discharges including 'leaks' and 'weepage'. The discharged substance can be in solid, liquid or gaseous form. A POL spill involves petroleum, oil or lubricants; a Hazmat spill may involve one or more of the following substances:

a) polychlorinated biphenyls (e.g., PCB-containing oil or paint)
b) chlorinated and non-chlorinated solvents (e.g., cleaner-degreasers)
c) flammable gases (e.g., acetylene)
d) waste petroleum products (e.g., used engine oil)

e) corrosives (e.g., battery acid)
f) glycol (e.g., antifreeze)
g) asbestos (e.g., pipe insulation), and/or
h) halocarbons (e.g., CFC-12, FM-200).

There may be circumstances where the discharge of a substance not on the above list may be considered hazardous by personnel discovering the spill, e.g., large volumes of spilled wastewater. When in doubt, report the spill to the LSS Manager, who in turn can seek guidance from the Environmental Services Supervisor. Reporting procedures for Halocarbon release are in Section 5-XIV, Halocarbon Management Plan.

4.2 Spill Risk

Nasittuq has expended considerable effort to reduce the likelihood and limit the impact of Hazmat spills. For example, only a limited number of Hazmat products may be purchased and stored on NWS sites, on approval of the Environmental Services and NWSO (these products appear in the *Hazardous Materials List* in the North Warning System Information System (NWSIS)).

Except for the large volumes of glycol used in power generation/heating systems, most hazardous products are stored and used in small quantities, e.g., 'consumer-sized' packages/containers such as an aerosol can. Furthermore, it is likely that any Hazmat spill will occur indoors given the controlled storage requirements for these materials.

By far the biggest risk, in terms of likelihood of occurrence and volume of potential spilled material, is that associated with POL spills, particularly Jet A-1 fuel. Millions of litres of fuel (and thousands of litres of oil and lubricants) are transported, transferred, stored, and consumed annually by the NWS.

In recognition of this risk, the details of this Spill Plan tend to focus on issues related to fuel spills. Nevertheless, the procedures described herein apply to all manner of POL or Hazmat spills. Alternative or additional procedures will be clearly indicated where requirements differ significantly between POL and Hazmat spills (e.g., Spill Crew wearing Personal Protective Equipment when handling toxic substances).

4.3 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 flammable with a flash

point of 38°C. It contains paraffin, olefin, naphthalenee and aromatics. The aromatics and naphthalene fractions are both highly volatile and toxic.

Due to its high volatility and low density, Jet A-1 will rapidly disperse on top of a water surface, is easily carried by 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 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.

4.4 POL Bulk Storage and Distribution System

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

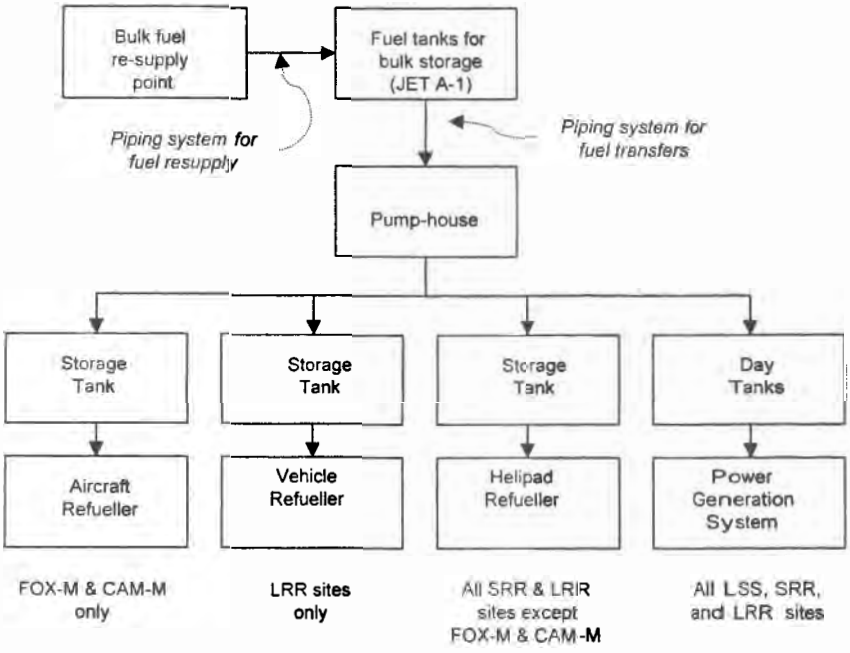

Figure 1. POL storage and distribution system (Note: components of the POL storage and distribution system vary from site-to-site; see site descriptions in Annex A of the EPP for details).

[1] "Fuel resupply" refers to the operation of bringing fuel to the site, typically by ship or aircraft, and storing it in primary on-site storage tanks; "fuel transfer" refers to the pumping of fuel from the primary tanks to secondary storage tanks for short-term use.

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 horizontal, vertical, or "self-dyked" (i.e., with integral secondary containment) types, located inside earthen containment berms or dykes at LRR sites. Tanks which continue to be actively used at LRRs are contained by earthen dykes lined with a geotextile membrane. Bulk storage tanks located at SRR sites, LSS locations and some LRR sites incorporate an integral, external, secondary containment vessel.

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.

4.5 Fuel Re-supply and Use

Bulk fuel re-supply 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). The FOX-3 LRR site and some SRR sites are re-supplied by airlift. Contractors and sub-contractors engaged in fuel resupply operations must have their own POL Spill Contingency Plans to cover their area of responsibility (see Section 5.4, Division of Responsibility). 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 re-fuelling, (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 re-fuelling, and (c) furnaces.

5.0 RESPONSIBILITY & AUTHORITY

The contracting agency, the contractor and sub-contractors, where applicable, will be involved in POL and/or Hazmat spill prevention, detection, and response actions during NWS O&M activities. The roles and responsibilities of the parties are described below.

5.1 Nasittuq

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

a) Maintaining an up-to-date Spill Contingency Plan (this document);

b) Practicing spill prevention through (i) regular maintenance of all POL systems and (ii) use of proper methods for handling POL and Hazmat products;

c) Maintaining operational competence through staff training;

d) Identifying the requirements of sub-contractors involved in NWS O&M activities; and

e) Responding appropriately to POL and Hazmat spills.

When a POL or Hazmat spill is reported at an NWS site, Nasittuq will mobilize personnel, materials and equipment to respond immediately upon receipt of the spill report or as soon as practicable. The conditions at a spill site, i.e., with respect to weather, temperature, season and availability of transportation, may impose significant delays in response times.

In-house resources will be used for most spills unless the circumstances of the spill are deemed, by the Environmental Services Supervisor, to require external resources (e.g., a very large spill clean-up of particularly toxic materials). Details of individual responsibilities are provided in Section 6.0.

When required, additional assistance will be requested from: (i) other NWS sites, (ii) the Department of National Defence (DND), and/or (iii) the Canadian Coast Guard. Additional assistance may also be hired from: (i) Northern residents, (ii) local communities, and (iii) commercial spill response firms.

Nasittuq will also consider lending assistance to other agencies or local communities when requested.

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.

5.3 Fuel Re-supply 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[2] 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;
   iv. materials and equipment available for deployment; and

[2] This document will serve as the source document for all contractor and sub-contractor POL Spill Contingency Plans.

b) Provision of sufficient personnel, materials and equipment for adequate response to any POL spills which may occur during fuel resupply operations.

In the event that a spill occurs during fuel resupply operations, Nasittuq personnel, material and equipment will assist in spill response activities to the fullest extent, when and where possible. Detailed contents of POL Spill Response kits are listed in the site descriptions in Annex A.

5.4 Division of Responsibility During Re-Supply

The dividing line of responsibility for spill response and reporting between Nasittuq and the sealift/airlift re-supply contractors/subcontractors is the re-supply pipeline beach head or airlift de-fueling head.

a) If a fuel spill occurs between the sealift re-supply pipeline beach head and the ship or barge, the sealift contractor's POL Spill Contingency Plan is implemented. The sealift contractor assumes the role of Spill Control Manager and reports the spill to the required authorities.

b) Similarly, if the spill occurs between the airlift de-fueling head and the aircraft tank or bladder, the airlift contractor assumes the role of Spill Control Manager and reports the spill to the required authorities.

c) In all other instances, the Nasittuq POL & Hazmat Spill Contingency Plan is implemented. The LSS Manager becomes the Spill Control officer, the CMO Environmental Services Supervisor becomes the Spill Control Manager and reports the spill as per Section 6.3.1 below.

d) In all instances, the individual discovering the spill must take steps to ensure that personnel on the ship, barge, airplane or helicopter are contacted to stop the pumps and close the isolation valves, as applicable.

e) In all instances, the LSS Manager must be informed even if the spill has occurred within the contractor's area of responsibility in order to inform the CMO and NWSO. In cases where the responsibility resides with the contractor, Nasittuq will provide assistance, as requested by the sealift or airlift contractor, in implementing their Spill Contingency Plan.

6.0 PROCEDURE

Nasittuq's management of spill risk incorporates three aspects: (1) spill prevention, (2) spill detection, and (3) spill response (including action plans for attended and unattended sites). Spill prevention and detection are discussed briefly below, but this document focuses on spill response. (Details on spill prevention activities are provided in other sections of this EPP.)

6.1 Spill Prevention

Nasittuq has developed comprehensive programs for reducing the likelihood of POL or Hazmat spills. The following measures are taken to minimize the potential for Hazmat spills (see Section 5.0, XIII - Hazardous Materials General Management for details):

a) Establishment of secure storage areas for Hazmat;
b) Labelling of Hazmat following Workplace Hazardous Material Information System (WHMIS) guidelines;
c) Transportation of Hazmat compliant with the Transportation of Dangerous Goods (TDG) Regulations;
d) Packaging of Hazmat compliant with the TDG Regulations; and
e) Training of personnel in correct usage and storage of hazardous materials.

The following measures are taken to minimize the potential for POL spills:

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 (e.g., fuel transfers, fuel resupply); and
e) Safeguards 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 NWS operations.

6.2 Spill Detection

Methods employed for detection of POL spills include:

a) *Visual & odour detection.* The visual method is most successful during summer months when daylight is abundant and there is an absence of snow cover. Snow cover and reduced staffing levels significantly lower the probability of sighting pools of fuel or stained soils. The strong odour of fuel (and other Hazmat) can be an indicator of a spill (but every effort should be taken to limit exposure);

b) *Fuel tank dipping.* This method of measurement provides data comparing actual with estimated consumption figures, which 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 currently practiced due to technological limitations, however, when appropriate technologies become available for use in the Arctic environment they will be employed.

6.3 Spill Response

Details of Nasittuq's spill response procedures are provided below; flowchart summarizing the procedures is provided in Figure 2.

6.3.1 Spill reporting will be in accordance with PRO-4.9-37. All spills (fuel, glycol, etc) that occur or are discovered outdoors, regardless of the volume, are to be reported. Spills that occur indoors must also be reported. Immediate reporting for indoor spills is not required if the spill volume is less than 4 litres, and the spill is contained within an area designed for spills (i.e., a DEG drip tray, or a spill drain tank).

The responsibilities of the different levels of reporting hierarchies are outlined below. (Telephone numbers for key individuals are provided in the Emergency Contact List in Appendix 1.) *The following subparagraphs. 6.3.1.1, 6.3.1.2, 6.3.2.3, and 6.3.1.4 appear in a checklist format to facilitate a stepwise verification of the reporting procedures.*

6.3.1.1 Person Discovering the Spill

Immediate verbal report of all spills must be made to the LSS Manager. The report must contain the following information:

- ☐ a) Location of the spill;
- ☐ b) Known or suspected time of the spill;
- ☐ c) Substance spilled;
- ☐ d) Estimated volume spilled[3];
- ☐ e) Cause, if readily identifiable;

[3] 'Dip' tanks to calculate current volume, and estimate consumption since last dip/reconciliation, to determine amount spilled.

- ☐ 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.

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.

If the NWSCC operators suspect a spill as a result of SCADA inputs, they will advise the appropriate LSS Manager, the Environmental Services Supervisor, and NWSO via telephone.

If the spill is discovered at the NWSSC or the SRD, the person discovering the spill must notify the NWSCC who will, in turn, activate PRO-4.9-37.

6.3.1.2 LSS Manager

Upon being notified as per subparagraph. 6.3.1.1, the LSS Manager must proceed with the reporting procedures as follows:

- ☐ a) Immediate verbal report to NWSCC
- ☐ b) Raise Work Order for spill response and clean-up
- ☐ c) E-mail Environment Services (within 12 hours) a follow-up Internal Spill Report using reporting template *Form #C2-A-1* (available on Internet PC 'C' drive at the LSSs).
- ☐ d) Attach (if system capability permits) or FAX a sketch site plan depicting the contaminated location(s) impacted by the spill to Environment Services Supervisor.
- ☐ e) Copy (c) & (d) to NWSCC and NWSSC management

See Appendix 3 for a sample copy of the Internal Spill Report Form C2-A-1.

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. Similarly, spills at the NWSSC or SRD in North Bay are reported to the local community emergency response service (i.e., 911) if assistance is required.

For spills at LSS Goose Bay, the LSS Manager is to contact the 5 Wing Fire Hall, as well as the NWSCC and CMO. Spill reporting and response will be actioned by the Base and will conform to the requirements of the 1 CAD HQ Uniform Spill Reporting Protocol and 5 Wing Emergency Response Plan.

SPILL RESPONSE FLOW CHART

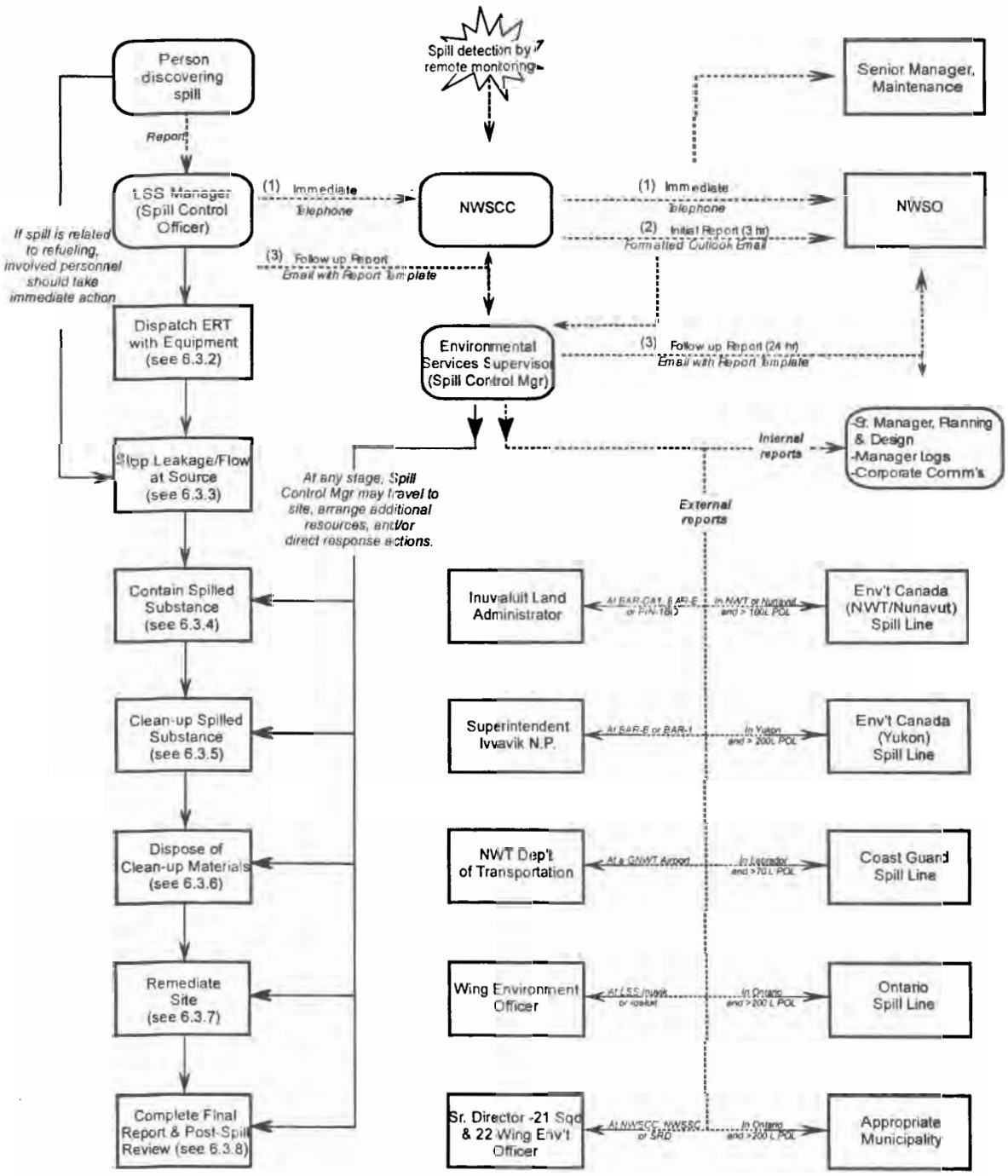

Figure 2. Spill reporting and response procedure; corresponding sections in the text are identified by their section numbers.

6.3.1.3 NWSCC

The Radar/Facilities Group and Long Haul Communication Network (LHCN)/Facilities Group are the points of contact for spill reports. The Radar/Facilities Group is the contact for spills at sites in Zone 3 to 5; the LHCN/Facilities Group the contact for spills in Zones 1 & 2, and North Bay. (CAM-3, in Zone 3, is actually under the LHCN/Facilities Group's jurisdiction, but for simplicity, the report can be made to the Radar/Facilities Group.)

Upon being notified as per subparagraph 6.3.1.2, the NWSCC shift technician must immediately proceed with the following notification steps.

- ☐ a) Telephone notification to NWSO
- ☐ b) Telephone notification to Environment Services Supervisor/designate
- ☐ c) Telephone notification to NWSCC Duty Supervisor
- ☐ d) Telephone notification to SM section.
- ☐ e) Prepare an on-line Initial Incident Report and distribute to addressees in a), b), c), and d) within 3 hours of the verbal notification

6.3.1.3.1 Spills reported by the Canadian Rangers/Third Parties

Upon being notified by the Canadian Rangers or third parties, the NWSCC shift technician must immediately proceed with the following notification steps.

- ☐ a) Telephone notification to NWSO
- ☐ b) Telephone notification to Environment Services Supervisor/designate
- ☐ c) Telephone notification to NWSCC Duty Supervisor
- ☐ d) Telephone notification to SM Section.
- ☐ e) Prepare an on-line Initial Incident Report and distribute to addressees in (a), (b), (c), and (d) within 3 hours of the verbal notification.

Nasittuq will respond to spills reported by the Rangers and third parties on a case by case basis depending on the severity of the spill, its proximity to sensitive ecological components, potential health and safety hazards to people, and property damage.

6.3.1.4 Environment Services Supervisor

Nasittuq's Environment Services Supervisor will assume the position of Spill Control Manager with authority over all spill response activities as shown in Figure 2.

Upon notification of a spill[4], the Environment Services Supervisor will proceed with the following steps.

- ☐ a) Prepare and post Spill Report Form C2-A-2 on "W" drive, based on information provided as per subparagraph. 6.3.1.2 (c)
- ☐ b) Notify spill line, as required
- ☐ c) Notify Senior Manager, Planning and Design, Senior Manager, Maintenance, Manager, Logistics, Senior Manager, Northern Affairs (as appropriate), and Manager, Corporate Communications and Public Affairs (as appropriate).
- ☐ d) Maintain regular/daily contact with NWSO on spill status.
- ☐ e) Notify the Inuvialuit Land Administrator for spills at BAR-DA-1, BAR-E and PIN- 1BD.
- ☐ f) Notify Nunavut Department of Transportation for spills on airport property at both Hall Beach and Cambridge Bay.
- ☐ g) Notify 1 Canadian Air Division for spills at LSS-Inuvik and LSS-Iqaluit (*Nasittuq will provide the initial notification. NWSO will retain any further communications with the Wing*).
- ☐ h) Notify Senior Director – 21 Squadron and 22 Wing Environment Officer for spills at NWSSC and SRD. (*Nasittuq will provide the initial notification. NWSO will conduct any further communications with the Wing and will retain the authority to decide if a Significant Incident Report will be filed*).
- ☐ i) Notify municipality or regional municipality for spills at the NWSSC and SRD.

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[4] Given our broad definition of a 'spill' (i.e., a discharge of any volume of POL or Hazmat, inside or outside of a building), the Environmental Services Supervisor must often exercise judgement in determining whether a spill is reportable to external (non-NWS) agencies. All agencies give criteria for reporting POL spills, but only some give criteria for other Hazmat spills (those available are provided in Appendix 4). When in doubt, the Environmental Services Supervisor will contact NWSO for direction.

6.3.2 Dispatch of Emergency Response Team

Nasittuq's Environmental Services Supervisor 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. The typical responsibilities and composition of an ERT is presented in Figure 3.

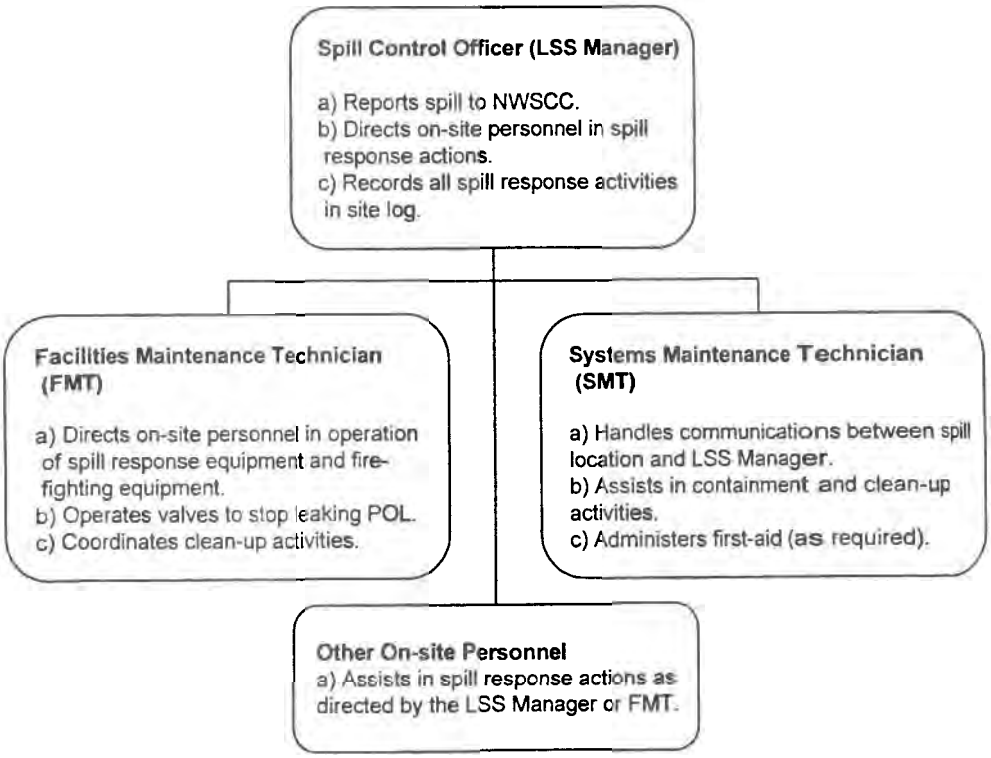

Figure 3. Typical responsibilities and composition of an Emergency Response Team (ERT).

6.3.3 Cessation of Leakage/Flow at Source

If not already completed by the individual discovering and reporting the (fuel) spill, the ERT dispatched by the LSS Manager will take measures to stop further spillage. This would include shutting off pumps, closing isolation valves, applying chemical cold patch to tanks, transferring fuel to another tank, attaching a dresser coupling to the pipe or valve, attaching a blind flange or pipe cap, or other appropriate actions, as determined by the Spill Control Officer.

Since sealift and airlift bulk fuel re-supply operations involve third-party contractors and subcontractors, responsibility for coordinating response, including stopping the flow, containment, clean-up, remediation and reporting, are shared. The division of responsibility is outlined in Section 5.4.

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, and other means as determined by Spill Control Officer.

6.3.4 Spill Containment

The ERT will deploy materials from the on-site spill control kit and utilize such on-site equipment as may be available to contain the spill, possibly including the construction of temporary containment 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 nature of the spill or as directed by NWSO, the Spill Control Manager may travel to the spill site to supervise response activities.

6.3.5 Clean-Up of Spilled Material

Following successful containment of the spill, the ERT will deploy absorbent materials, salvage drums, POL pumps, slip tanks, the 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 recovered fuel as a means of clean-up.

Additional resources 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 cannot be closed until all actions are completed, or the remaining requirements transferred to a separate Work Order.

6.3.6 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 may need to be brought to the spill site from the host LSS or a proximal LRR site.)

Used Sorbent Materials

Sorbent materials found on the sites include 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 pick-up all liquids, or specific. Hydrophobic sorbents adsorb organic liquids such as fuel, but not water. [6]

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 described below, and the wrung-out sorbent dealt with as detailed below.

a) All used sorbent materials, regardless of type, are to be placed in salvage drums with secure lid. The contents of the drum are to be marked 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 site 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 site, transfer used sorbent from salvage drum to the site's burn bin If the site does not have a burn bin, an alternate secure, non-leaking

[6] 'Adsorption' means that the liquid attaches to the surface of the sorbent particles, rather than being absorbed into the molecular structure of the sorbent particles.

container, such as a drum, may be used. For larger volumes, a decommissioned day tank can be cut in half to form two burn troughs. 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, allow to drain/air dry, and remove or block out markings. Add used sorbent material to burn bin.

e) Ignite waste in burn bin. If ignition is difficult, a small amount of accelerant (e.g., 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.

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 placed 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 must be done at least 30 m (100 ft) from any water body.

   ii. Dispose of used sorbent as discussed in the preceding section.

   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, remove or block out markings, and return to stockpile. Rinsing activities are to take place at least 30 m (100 ft) from any water body.

   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.

e) 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.

   i. 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, and 15 m from structures, tanks, or piping.

   ii. 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.

iii. Slowly drain water from separator, straining it through 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 can 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 Used Sorbent Materials, above.

iv. 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 >".

f) 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.

g) 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.

h) 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.

i) 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, remove or block out markings, 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 Used Sorbent Materials, above.

j) 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.

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 the preceding section. 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.

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>.

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, the number of drums involved and their contents. A spill clean-up Work Order cannot be closed until the disposal actions are completed, or the remaining requirements are transferred to a separate waste disposal Work Order.

6.3.7 Site Remediation

Site remediation will be undertaken by trained Nasittuq personnel or by experienced commercial spill response firms, as per NWSO's acceptance.

6.3.8 Final Report and Post-Spill Review

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.

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

a) Document all events from the initial spill report through to site remediation;
b) Analyze 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 for every major spill (e.g., > 5000 L) and for any lesser spill (Hazmat or POL) when requested by Nasittuq or NWSO.

6.4 Spill Response - POL Re-supply Activities

The *Procedure for Hazardous Materials Management* (included in this EPP) describes the bulk POL re-supply process for NWS sites. POL re-supply is conducted by: (a) sealift (e.g. vessel or barge) and (b) airlift (e.g. rotary wing or fixed wing aircraft).

Transport of the bulk POL is performed by contractors and subcontractors who must each possess their own spill contingency plan. The re-supply contractor will be responsible for spill response when the spill originates from the contractor's equipment, i.e., occurs between the vessel and the junction with NWS piping. Response to a spill originating from NWS piping or facilities during resupply will be the responsibility of Nasittuq, and will be reported and responded to as per this Plan.

Even when the contractor is the responding authority, the LSS Manager is to notify the NWSCC and the Environmental Services Supervisor of the spill, as detailed in Section 6.3.1.

6.5 Spill Response Training Program

Spill response training (i.e., job training course JT-63) is provided to all NWS site personnel and all CMO personnel involved in the O&M of NWS sites. Presentation slides of the training program are provided in Annex C.

7.0 FORMS & QUALITY RECORDS

Initial Incident Report B2-A
Internal Spill Report Form C2-A-1
Environmental Emergency / Spill Follow-up Report Form C2-A-2.