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General Water Licence Application
(Application for a new Water Licence)

April 2010

P.O. BOX 119
GJOA HAVEN, NUNAVUT
XOB 1J0
TEL: (867) 360-6338
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NUNAVUT IMALIRIYIN KATIMAYINGI
NUNAVUT WATER BOARD
OFFICE DES EAUX DU NUNAVUT

DOCUMENT MANAGEMENT

Original Document Date: April 2010

DOCUMENT AMENDMENTS

	Description	Date
(1)		
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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

GENERAL WATER LICENCE APPLICATION
(APPLICATION FOR NEW WATER LICENCE)

The applicant is referred to the NWB's Guide 4: *Guide to Completing and Submitting a Water Licence Application for a New Licence* for more information about this application form.

LICENCE NO:
(for NWB use only)

1. APPLICANT (PROPOSED LICENSEE) CONTACT INFORMATION (name, address)

Department of National Defence
North Warning System Office
c/o National Defence Headquarters
101 Colonel By Drive, Ottawa, Ontario K1A 0K2
Attention: Major A. Cameron DAEPM (R&CS) 3-4

Phone: (613) 998-8602
Fax: (613) 998-9261
e-mail: Cameron.AD@forces.gc.ca

2. APPLICANT REPRESENTATIVE CONTACT INFORMATION if different from Block 1 (name, address)

Nasittuq Corporation
Suite 100, 170 Laurier Avenue West
Ottawa, Ontario, K1P 5V5
Attention: Mr. Jacques Plante,
President, Nasittuq Corporation and
Project Director, North Warning System Project

Phone: (613) 234-9033 ext.898
Fax: (613) 234-2671
e-mail: jacques.plante@nasittuq.com

3. NAME OF PROJECT (including the name of the project location)

Bulk Fuel Tank Cleaning and Inspection 2011, PIN-1BG, Croker River, NU.

4. LOCATION OF UNDERTAKING

PIN-1BG is located at Croker River, Nunavut. It is located on the highest point in the area, 67m above sea level and is about 4.5 km inland from the Amundsen Gulf of the Beaufort Sea. The closest community is Paulatuk, approximately 190 km to the west. The host LSS (Logistics Support Site) is located in Inuvik, 600 km SW of the site.

Project Extents – Not available

NW: Latitude: (° ' " N) Longitude: (° ' " W)
NE: Latitude: (° ' " N) Longitude: (° ' " W)
SE: Latitude: (° ' " N) Longitude: (° ' " W)
SW: Latitude: (° ' " N) Longitude: (° ' " W)

Camp Location(s)

Latitude: (69 ° 17 ' 38 " N) Longitude: (119 ° 10' 40 " W) - Beach
Latitude: (69 ° 15 ' 31.5 " N) Longitude: (119 ° 13' 13.8 " W) - Summit

5. **MAP** - Attach a topographical map, indicating the main components of the undertaking.

NTS Map Sheet No.: 087c06 Map Name: Tinney Point Map Scale: 1:50,000

See Annex A – NTS Map 1:50,000.

6. **NATURE OF INTEREST IN THE LAND** - Check any of the following that are applicable to the proposed undertaking (at least one box under the 'Surface' header must be checked).

Sub-surface

☐ Mineral Lease from Nunavut Tunngavik Incorporated (NTI)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Mineral Lease from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

Surface

☐ Crown Land Use Authorization from Indian and Northern Affairs Canada (INAC)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Inuit Owned Land (IOL) Authorization from Kitikmeot Inuit Association (KIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Kivalliq Inuit Association (KivIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ IOL Authorization from Qikiqtani Inuit Association (QIA)
Date (expected date) of issuance: _____ Date of expiry: _____

☐ Commissioner's Land Use Authorization
Date (expected date) of issuance: _____ Date of expiry: _____

☒ Other: Department of National Defence owned land
Date (expected date) of issuance: N/A Date of expiry: N/A

Name of entity(s) holding authorizations:
_____

7. NUNAVUT PLANNING COMMISSION (NPC) DETERMINATION

Indicate the land use planning area in which the project is located.

☐ North Baffin	☐ Keewatin
☐ South Baffin	☐ Sanikiluaq
☐ Akunniq	☒ West Kitikmeot

Is a land use plan conformity determination required?

☐ Yes ☒ No

If Yes, indicate date issued and attach copy _____
If No, provide written confirmation from NPC confirming that a land use plan conformity review is not required.

See Annex B - NPC Confirmation (12 May 2011 e-mail from Brian Aglukark, NPC).

8. NUNAVUT IMPACT REVIEW BOARD (NIRB) DETERMINATION

Is an Article 12 Part 4 screening determination required?

☐ Yes ☐ No

If Yes, indicate date issued and attach copy _____
If No, provide written confirmation from NIRB confirming that a screening determination is not required.

N/A. Exempt from NIRB screening under the Nunavut Land Claims Agreement section 12.3.2 and Schedule 12-1, Item 1.

9. DESCRIPTION OF UNDERTAKING – List and attach plans and drawings or project proposal.

PIN-1BG is a Short Range Radar site (SRR) of the North Warning System, a series of military radar sites across the Arctic. PIN-1BG is an unmanned site, but it is visited by the staff from Logistic Support Site – Inuvik (LSS-I) on scheduled quarterly preventive and corrective maintenance trips and on an as needed basis.

See Annex C- Site Plan and Photos.

The purpose of this project is to clean and inspect the fuel storage tanks at the beach and summit locations of PIN-1BG. This is being done as a due diligence practice, to preserve the life of the tanks, and to complete tank inspections in accordance with an environmental standard. The project will have a positive environmental impact.

There are three tanks with 50,000 L capacity and one tank with 4,500 L capacity at the summit, and two tanks with 50,000 L capacity at the beach. The tanks will be cleaned and inspected by a group of approximately 8 to 10 people on site for approximately 11 to 14 days living in a temporary camp set up for this project at the summit and then at the beach. There is a spill kit located at the site summit and, in addition, the contractor will also have absorbent materials in sufficient quantity on hand during all fuel operations. Waste sludge will be placed in UN spec. drums and will be retrograded outside of Nunavut for disposal.

Work of this project includes:

1. Supply and mobilize labour, equipment, and material to perform the cleaning, inspections, modifications, and repair of tanks.
2. Protect all piping, tanks, and accessories against physical damage
3. Drain piping as required. Return drained fuel to the tank.
4. Inspect pipes, valves, and accessories for damage, record the observations, and submit a report to the Engineer.
5. The fuel tanks are to be cleaned and inspected according to the API 653 (Aboveground storage tank inspection).
6. Following cleaning and inspection of the tanks, fuel must be filtered prior to the final refilling of the tanks.

10. OPTIONS – Provide a brief explanation of the alternative methods or locations that were considered to carry out the project.

There are no alternative methods or locations. The Bulk Fuel Tank Cleaning and Inspection project is done as a due diligence practice, to preserve the life of the tanks, and to complete tank inspections in accordance with an environmental standard. The project will have a positive environmental impact. Sites are selected on an annual basis. They are selected based on a combination of the required inspection intervals as set out by previous API inspection reports (5 year interval), previous year's schedule changes, initial baseline inspection requirements, and proximity to each other for airlift and crew efficiencies.

11. CLASSIFICATION OF PRIMARY UNDERTAKING - Indicate the primary classification of undertaking by checking one of the following boxes.

- ☐ Industrial
- ☐ Agricultural
- ☐ Mining and Milling (includes exploration/drilling/exploration camps)
- ☐ Conservation
- ☒ Municipal (includes camps/lodges)
- ☐ Recreational
- ☐ Power
- ☐ Miscellaneous (describe below):

_____

See Schedule II of *Northwest Territories Waters Regulations* for Description of Undertakings.

Information in accordance with applicable Supplemental Information Guidelines (SIG) must be submitted with a New Water Licence Application. Indicate which SIG(s) are applicable to your application.

- ☐ Hydrostatic Testing
- ☐ Tannery
- ☐ Tourist / Remote Camp
- ☐ Landfarm & On-Site Storage of Hydrocarbon Contaminated Soil
- ☐ Onshore Oil and Gas Exploration Drilling
- ☐ Mineral Exploration / Remote Camp
- ☐ Advanced Exploration
- ☐ Mine Development
- ☒ Municipal
- ☐ General Water Works
- ☐ Power

12. WATER USE - Check the appropriate box(s) to indicate the type(s) of water use(s) being applied for.

- ☐ To obtain water for camp/ municipal purposes
- ☐ To obtain water for industrial purposes
- ☐ To divert a watercourse
- ☐ To cross a watercourse
- ☐ To modify the bed or bank of a watercourse
- ☐ To alter the flow of, or store water
- ☐ Flood control
- ☐ Other: _____

N/A. Water will be brought in to the site. No water will be drawn from a water body at the site.

13. **QUANTITY AND QUALITY OF WATER INVOLVED -** For each type of water use indicated in Block 12, provide the source of water, the quality of the water source and available capacity, the estimated quantity to be used in cubic meters per day, method of extraction, as well as the quantities and qualities of water to be returned to source.

N/A. See Block 12.

Name of water source(s) (show location(s) on map):
_____

Describe the quality of the water source(s) and the available capacity: _____
_____
_____

Provide the overall estimated quantity of water to be used: _____ m^3/day

Provide the estimated quantity(s) of water to be used from each source:
_____

Indicate the estimated quantities to be used for each purpose (camp, drilling, etc.)
_____

Describe the method of extraction(s): _____

Estimated quantity(s) of water returned to source(s) _____ m^3/day

Describe the quality of water(s) returned to source(s): _____
_____
_____

14. **WASTE** – Check the appropriate box(s) to indicate the types of waste(s) generated and deposited.

Note: Hazardous and solid waste will be removed from the site.

- [X] Sewage
- [ ] Solid Waste
- [ ] Hazardous
- [ ] Bulky Items/Scrap Metal
- [ ] Animal Waste
- [ ] Other (describe): _____
- [ ] Waste oil
- [X] Greywater
- [ ] Sludges
- [ ] Contaminated soil and/or water

15. QUANTITY AND QUALITY OF WASTE INVOLVED – For each type of waste indicated in Block 14, describe its composition, quantity in cubic meters/day, method of treatment and method of disposal.

Type of Waste	Composition	Quantity Generated	Treatment Method	Disposal Method
Sewage	Human waste	0.02 m^3/day	Cover with lime	Bury
Grey water	Dishwashing water and portable shower water	0.04 m^3/day	None	Dispose on land

16. OTHER AUTHORIZATIONS – In addition to the sub-surface and surface land use authorizations provided in Block 6, indicate any other authorizations required in relation to the proposed undertaking. For each provide the following:

N/A.

Authorization: _____

Administering Agency: _____

Project Activity: _____

Date (expected date) of issuance: _____ Date of expiry: _____

17. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES - Describe direct, indirect, and cumulative impacts related to water and waste.

This project has some potential environmental impacts that have been addressed.

1. Disposing of sewage (black water) on land or in the water could negatively impact surrounding water quality (fish habitat and drinking water).

   Mitigation

   Sewage (black water) will be buried in a depression, a minimum 31 m from the ordinary high water mark of any water body, such that quality, quantity or flow of the water is not impaired. The black water will also be covered with lime, or other products as directed by the Nunavut Water Board, and then with native material. The land will be restored to the pre-existing natural contours of the land.

2. Tank cleaning will generate rinseate and sludge. Gaskets and fittings from repair work following the tank inspections will be rinsed with water. Improper handling of these materials may results in soil contamination.

   Mitigation

   Rinseate and tank sludge will be placed in UN spec. for drums for future retrograde. A spill response plan is in place and will be activated in the event of a spill. Spill response materials and equipment are available and accessible at the project location.

3. Fuel transfer from tank to tank and fuel drained from existing pipelines during inspection and cleaning of fuel tanks may result in a spill and contamination of local soil.

   Mitigation

   A spill response plan is in place and will be activated in the event of a spill. Spill response materials and equipment are available and accessible at the project location.

4. Non-hazardous materials generated throughout the project such as waste steel piping, fittings, and gaskets may litter the terrain if not disposed of properly.

   Mitigation

   Nonhazardous waste materials will be removed from the site.

5. Use of equipment such as compressors and ventilators may generate noise and dust which may disturb local wildlife or impair their habitat.

   Mitigation

   None required. Work is confined to the camp. Therefore, noise and dust will be localized.

6. Hazardous materials such as sludge, generated throughout the duration of the project, may pose a health risk to personnel if handled improperly.

Mitigation

Personnel will be outfitted with the appropriate personal protection equipment. A spill response plan is in place and will be activated in the event of a spill. Spill response materials and equipment will be available and accessible at project location.

18. WATER RIGHTS OF EXISTING AND OTHER USERS OF WATER

Provide the names, addresses and nature of use for any known persons or properties that may be adversely affected by the proposed undertaking, including those that hold licences for water use in precedent to the application, domestic users, in-stream users, authorized waste depositors, owners of property, occupiers of property, and/or holders of outfitting concessions, registered trapline holders, and holders of other rights of a similar nature.

N/A.

Advise the Board if compensation has been paid and/or agreement(s) for compensation have been reached with any existing or other users.

N/A.

19. INUIT WATER RIGHTS

Advise the Board of any substantial affect of the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL), and advise the Board if negotiations have commenced or an agreement to pay compensation for any loss or damage has been reached with one or more Designated Inuit Organization (DIO).

N/A.

20. CONSULTATION – Provide a summary of any consultation meetings including when the meetings were held, where and with whom. Include a list of concerns expressed and measures to address concerns.

No meetings were held.

21. SECURITY INFORMATION

Provide an estimate of the total financial security for final reclamation equal to the total outstanding reclamation liability for land and water combined sufficient to cover the highest liability over the life of the undertaking. Estimates of reclamation costs must be based on the cost of having the necessary reclamation work done by a third party contractor if the operator defaults. The estimate must also include contingency factors appropriate to the particular work to be undertaken.

Where applicable, the financial security assessment should be prepared in a manner consistent with the principals respecting mine site reclamation and implementation found in the *Mine Site Reclamation Policy for Nunavut,* Indian and Northern Affairs Canada, 2002.

N/A.

22. FINANCIAL INFORMATION

Provide a statement of financial responsibility.

If the applicant is a business entity, provide a list of the officers of the company.

If the applicant is a business entity attach a copy of the Certificate of Incorporation or evidence of registration of the company name.

N/A

23. STUDIES UNDERTAKEN TO DATE - List and attach copies of studies, reports, research, etc.

None, the operation of the radar site will continue as usual.

24. PROPOSED TIME SCHEDULE – Indicate the proposed start and completion dates for each applicable phase of development (construction, operation, closure, and post closure).

Construction
Proposed Start Date: _____ (month/year) Proposed Completion Date: _____ (month/year)

Operation
Proposed Start Date: ____July, 2011____ (month/year) Proposed Completion Date: _____August, 2011____ (month/year)

Closure
Proposed Start Date: _____ (month/year) Proposed Completion Date: _____ (month/year)

Post - Closure
Proposed Start Date: _____ (month/year) Proposed Completion Date: _____ (month/year)

For each applicable phase of development indicate which season(s) activities occur.

Construction
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season

Operation
☐ Winter ☐ Spring ☒ Summer ☐ Fall ☐ All season

Closure
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season

Post - Closure
☐ Winter ☐ Spring ☐ Summer ☐ Fall ☐ All season

25. PROPOSED TERM OF LICENCE

Number of years (maximum of 25 years): _____ years

Requested Date of Issuance: June 2011 (month/year) Requested Expiry Date: October 2011 (month/year)

(The requested date of issuance must be at least three (3) months from the date of application for a type B water licence and at least one (1) year from the date of application for a type A water licence, to allow for processing of the water licence application. These timeframes are approximate and do not account for the time to complete any pre-licensing land use planning or development impact requirements, time for the applicant to prepare and submit a water licence application in accordance with any project specific guidelines issued by the NWB, or the time for the applicant to respond to requests for additional information. See the NWB's *Guide 5: Processing Water Licence Applications* for more information)

26. ANNUAL REPORTING – If not using the NWB's *Standardized Form for Annual Reporting*, provide details regarding the content of annual reports and a proposed outline or template of the annual report.

N/A.

27. **CHECKLIST –** The following must be included with the application for the water licensing process to begin.

Written confirmation from the NPC confirming that NPC's requirements regarding land use plan conformity have been addressed.
N/A. See Block 7.

☐ Yes ☐ No If no, date expected _____

Written confirmation from the NIRB confirming that NIRB's requirements regarding development impact assessment have been addressed.
N/A. See Block 8.

☐ Yes ☐ No If no, date expected _____

Completed General Water Licence Application form.

☒ Yes ☐ No If no, date expected _____

Information addressing Supplemental Information Guideline (SIG) , where applicable (see Block 11)
N/A.
☐ Yes ☐ No If no, date expected _____

English Summary of Application.

☒ Yes ☐ No If no, date expected _____

Inuktitut and/or Inuinnaqtun Summary of Application.

☐ Yes ☒ No If no, date expected 1 June 2011

Application Fee of $30.00 CDN (Payee Receiver General for Canada).

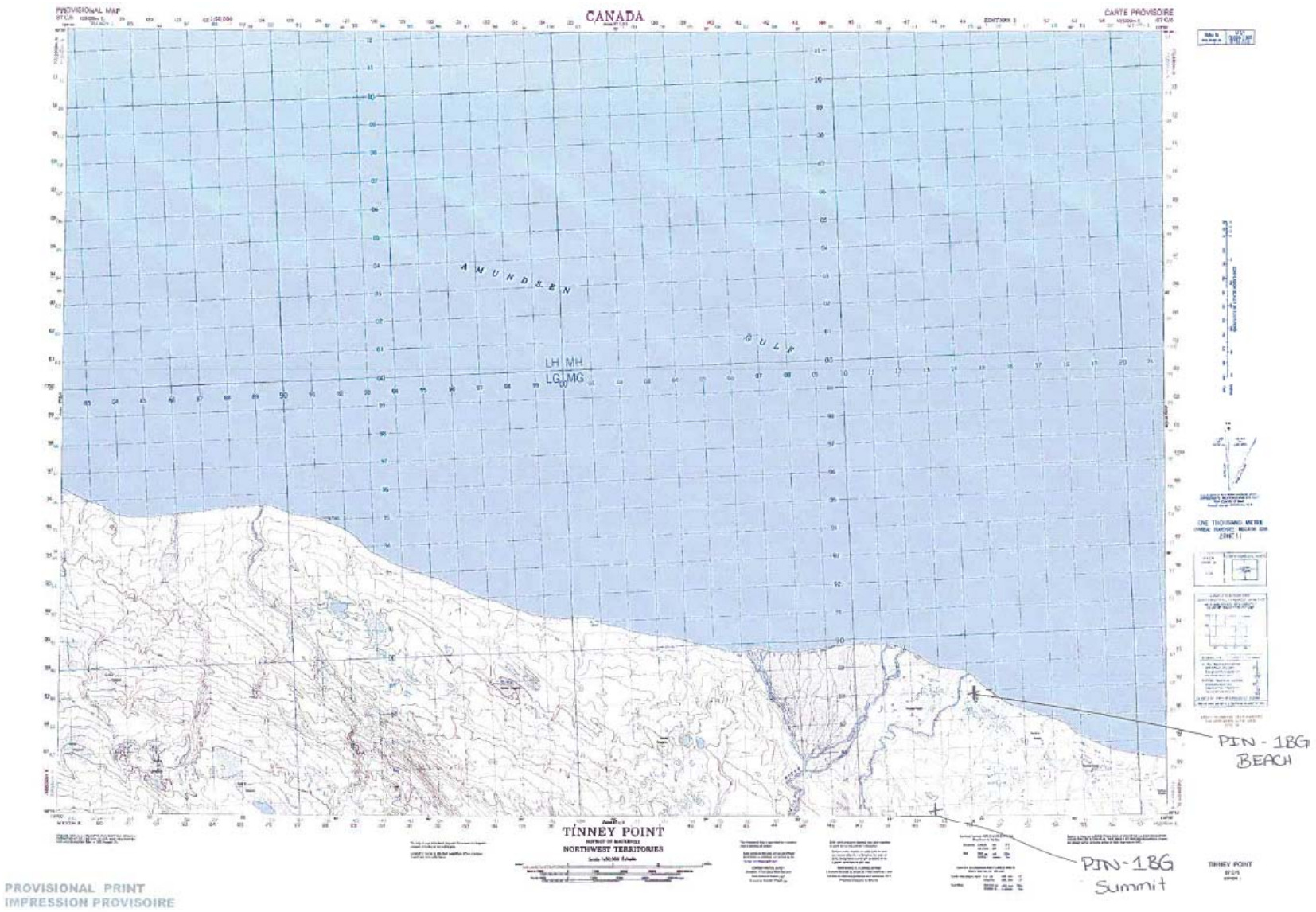
☒ Yes ☐ No If no, date expected _____

Water Use Fee Deposit of $30.00 CDN (Payee Receiver General for Canada). The actual water use fee will be calculated by the NWB based upon the amount of water authorized for use in accordance with the Regulations at the time of issuance of the licence.
N/A. No water will be drawn from a water body at the site.
☐ Yes ☐ No If no, date expected _____

28. **SIGNATURE**

JACQUES PLANTE	PRESIDENT		23/05/11
Name (Print)	**Title (Print)**	**Signature**	**Date**

Annex A – NTS Map 1:50,000


CANADA
PROVISIONAL MAP
CARTE PROVISOIRE
AMUNDSEN
GULF
LH MH
LG MG
PIN - 1BG
BEACH
PIN-1BG
Summit
TINNEY POINT
NORTHWEST TERRITORIES
PROVISIONAL PRINT
IMPRESSION PROVISOIRE

Annex B – NPC Confirmation

Murphy, Maria

From: Brian Aglukark <aglukark@nunavut.ca>
Sent: Thursday, May 12, 2011 4:56 PM
To: Murphy, Maria; Richard Dwyer; Ida Porter
Subject: RE: NPC determination for Croker River and Edinburgh Island

Good afternoon Maria;

Email confirming that the proposal as listed above, falls outside both land use planning boundaries, therefore not conformity determination is required.

Any questions, concerns, please do not hesitate.

Brian Aglukark, NPC
Arviat

From: Murphy, Maria [mailto:Maria.Murphy@nasittuq.com]
Sent: Thursday, May 12, 2011 3:23 PM
To: Brian Aglukark
Subject: NPC determination for Croker River and Edinburgh Island

Good Day,

Could you please tell me whether or not the following locations require a land use conformity determination?

They are both located in the West Kitikmeot region and are West of Cambridge Bay, NU.

Croker River – Latitude - 69 degrees 17' 38" N, Longitude - 119 degrees 10' 40" W

Edinburgh Island – Latitude – 68 degrees 28' 37" N, Longitude – 110 degrees 52' 03" W

Thank you,

Maria Murphy
Environmental Specialist Trainee
Nasittuq Corporation
170 Laurier Avenue West Suite 100 | Ottawa, ON
(613) 787-9669
E-mail: maria.murphy@nasittuq.com
Please consider the environment before printing this email.

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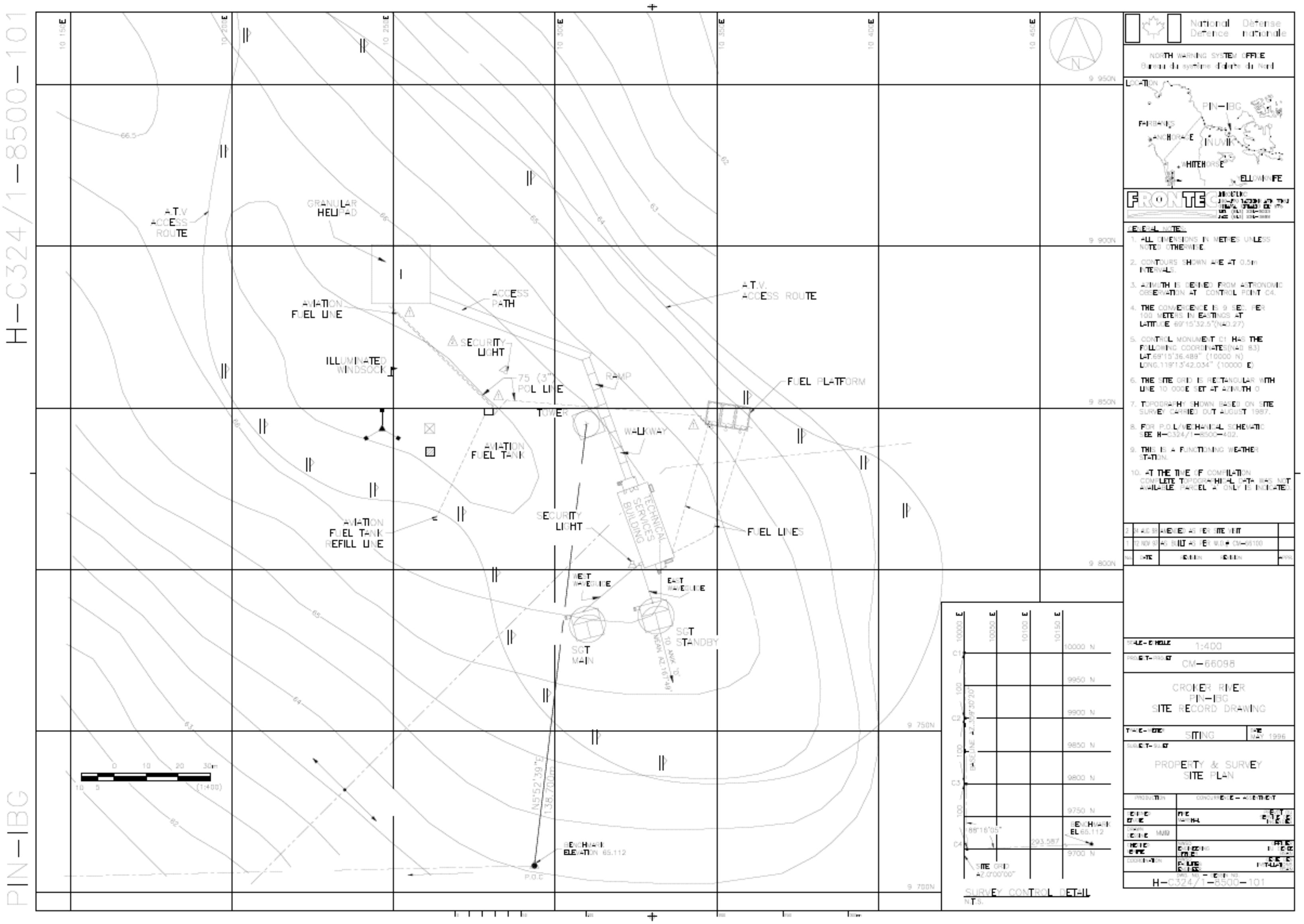
Annex C – Site Plan and Photos


H—C324/1—8500—101
PIN—IBG
National Defence
Défense nationale
NORTH WARNING SYSTEM OFFICE
LOCATION
WHITEHORSE
YELLOWKNIFE
FRONTEC
GENERAL NOTES:
1. ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE.
2. CONTOURS SHOWN ARE AT 0.5m INTERVALS.
3. AZIMUTH IS DERIVED FROM ASTRONOMIC OBSERVATION AT CONTROL POINT C4.
4. THE CONVERGENCE IS 9 SEC. PER 100 METERS IN EASTINGS AT LATITUDE 69°15'32.5"(NAD.27)
5. CONTROL MONUMENT C1 HAS THE FOLLOWING COORDINATES(NAD 83) LAT.69°15'36.489" (10000 N) LONG.119°13'42.034" (10000 E)
6. THE SITE GRID IS RECTANGULAR WITH LINE 10 000E SET AT AZIMUTH 0
7. TOPOGRAPHY SHOWN BASED ON SITE SURVEY CARRIED OUT AUGUST 1987.
8. FOR P.O.L/MECHANICAL SCHEMATIC SEE H—C324/1—8500—402.
9. THIS IS A FUNCTIONING WEATHER STATION.
10. AT THE TIME OF COMPILATION COMPLETE TOPOGRAPHICAL DATA WAS NOT AVAILABLE. PARCEL 'A' ONLY IS INDICATED.
AMENDED AS PER SITE VISIT
AS BUILT AS PER W.O.# CM—66100
1:400
CM—66098
CROKER RIVER
PIN—IBG
SITE RECORD DRAWING
SITING
MAY 1996
PROPERTY & SURVEY
SITE PLAN
A.T.V ACCESS ROUTE
GRANULAR HELIPAD
AVIATION FUEL LINE
ACCESS PATH
A.T.V. ACCESS ROUTE
SECURITY LIGHT
ILLUMINATED WINDSOCK
75 (3") POL LINE
RAMP
FUEL PLATFORM
TOWER
WALKWAY
AVIATION FUEL TANK
SECURITY LIGHT
TECHNICAL SERVICES BUILDING
FUEL LINES
AVIATION FUEL TANK REFILL LINE
WEST WAVEGUIDE
EAST WAVEGUIDE
SGT STANDBY
SGT MAIN
BENCHMARK ELEVATION 65.112
P.O.C
SURVEY CONTROL DETAIL
N.T.S.

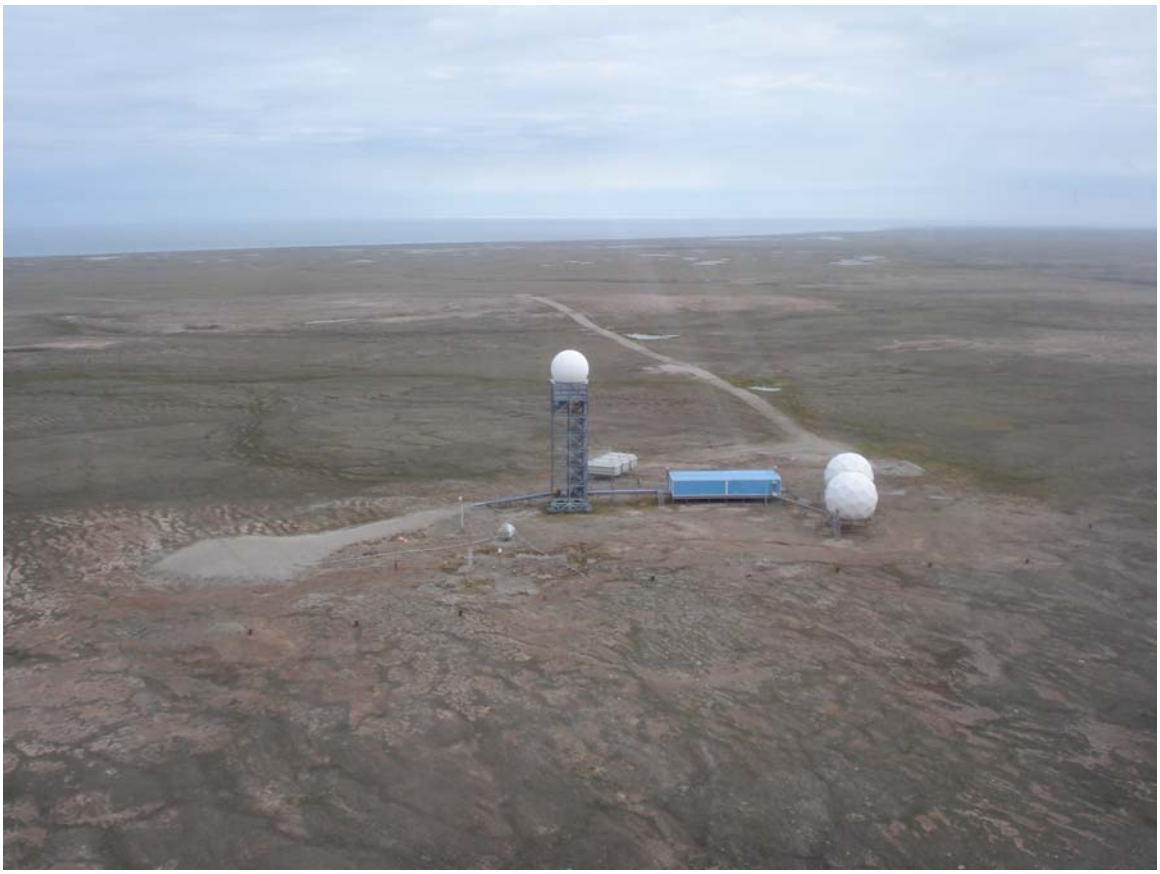


Figure 1: PIN-1BG Summit

Figure 2: PIN-1BG Beach

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GJOA HAVEN, NU X0B 1J0
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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

EXPLORATION/ REMOTE CAMP SUPPLEMENTARY QUESTIONNAIRE

Applicant: Department of National Defence **Licence No:** _____
(For NWB Use Only)

ADMINISTRATIVE INFORMATION

1. Environment Manager : Kim Kalen
   Tel : 613-998-8482, Fax : 613-998-9261
   E-Mail : kim.kalen@forces.gc.ca

2. Project Manager: Tomasz Rudowicz,
   Tel : 613-787-3858, Fax : 613-234-2671,
   E-mail : tomasz.rudowicz@nasittuq.com

3. Does the applicant hold the necessary property rights? Yes

4. Is the applicant an 'operator' for another company (i.e., the holder of the property rights)? If so, please provide letter of authorization.
   See attached letter of authorization dated 16 May 2011 from Kim Kalen.

5. Duration of the Project

   x One year or less Start and completion dates: July 2011 to August 2011
   ☐ Multi Year:

   If Multi-Year indicate proposed schedule of on site activities
   Start: _____ Completion:_____

CAMP CLASSIFICATION

6. Type of Camp

   ☐ Mobile (self-propelled)
   X Temporary
   ☐ Seasonally Occupied: _____
   ☐ Permanent
   ☐ Other:

7. What is the design, maximum and expected average population of the camp?

   There will be approximately 7 tents at the camp. The camp will be located at the summit for approximately one week and at the beach for one week with an average population of 8 to 10 people.

8. Provide history of the site if it has been used in the past.

The site is PIN-1BG, an unmanned Short Range Radar site (SRR) that is part of the North Warning System (NWS), a series of military radar sites across the Arctic. The site has existed for approximately 20 years.

CAMP LOCATION

9. Please describe proposed camp location in relation to biogeographical and geomorphological features, and water bodies.

See Annex B, Figure 1 PIN-1BG Summit. The summit camp will be located in the are of the blue building on land which has no or extremely little vegetation. As shown in the picture, local water bodies are ponds and located away from the summit where the project will occur.

See Annex B, Figure 2 PIN-DA Beach. The beach camp will be located close to the beach tanks. Croker River is to the West and the Amundsen Golf is immediately to the North. Any other local water bodies are ponds and vegetation is sparse.

PIN-1BG is located in Croker River, Nunavut. It is located on the highest point in the area, 67km above sea level and is about 4.5 km inland from the Amundsen Gulf of the Beaufort Sea. The host LSS (Logistics Support Site) is located in Inuvik, 600 km SW of the site.

10. How was the location of the camp selected? Was the site previously used? Was assistance from the Regional Inuit Association Land Manager sought? Include maps and/or aerial photographs.

Camp sites were selected to be within radar site boundaries (DND property)

11. Is the camp or any aspect of the project located on:

X	Crown Lands	Permit Number (s)/Expiry Date: N/A
☐	Commissioners Lands	Permit Number (s)/Expiry Date: _____
☐	Inuit Owned Lands	Permit Number (s)/Expiry Date: _____

12. Closest Communities (direction and distance in km):

The closest community is Paulatuk, NU, which is approximately 190 km to the west.

13. Has the proponent notified and consulted the nearby communities and potentially interested parties about the proposed work?

No, the radar site will operate as normal.

14. Will the project have impacts on traditional water use areas used by the nearby communities? Will the project have impacts on local fish and wildlife habitats?

No, the project will not impact traditional water use or fish and wildlife habitats.

PURPOSE OF THE CAMP

15.
- ☐ Mining (includes exploration drilling)
- ☐ Tourism (hunting, fishing, wildlife observation, adventure/expedition, etc.) (Omit questions # 16 to 21)
- X Other: Fuel tank cleaning and inspection at DND North Warning System radar site.

16. Activities (check all applicable)

- ☐ Preliminary site visit
- ☐ Prospecting
- ☐ Geological mapping
- ☐ Geophysical survey
- ☐ Diamond drilling
- ☐ Reverse circulation drilling
- ☐ Evaluation Drilling/Bulk Sampling (also complete separate questionnaire)
- X Other: Fuel tank cleaning and inspection.

17. Type of deposit (exploration focus): N/A

- ☐ Lead Zinc
- ☐ Diamond
- ☐ Gold
- ☐ Uranium
- ☐ Other: _____

DRILLING INFORMATION

18. Drilling Activities N/A

- ☐ Land Based drilling
- ☐ Drilling on ice

19. Describe what will be done with drill cuttings? N/A

20. Describe what will be done with drill water? N/A

21. List the brand names and constituents of the drill additives to be used? Includes MSDS sheets and provide confirmation that the additives are non-toxic and biodegradable. N/A

22. Will any core testing be done on site? Describe. N/A

SPILL CONTINGENCY PLANNING

23. The proponent is required to have a site specific Spill Contingency Plan prepared and submitted with the application This Plan should be prepared in accordance with the *NWT Environmental Protection Act, Spill Contingency Planning and Reporting Regulations, July 22, 1998* and *A Guide to the Spill Contingency Planning and Reporting Regulations, June 2002.* Please include for review.

    See Annex C – Spill Contingency Plan

24. How many spill kits will be on site and where will they be located?

    One spill kit is permanently located at site summit. The Contractor will also have a spill kit of their own.

25. Please describe the types, quantities, and method of storage of fuel and chemicals on site, and provide MSDS sheets.

    Jet A-1 is stored on site; it is stored in aboveground double-walled storage tanks. There are two tanks with
    50,000L capacity at the beach and four tanks at the summit, one with 4,500 L capacity and three with 50,000 L capacity.

WATER SUPPLY AND TREATMENT

26. Describe the location of water sources.

    N/A. No water will be drawn from water bodies on site.

27. Estimated water use (in cubic metres/day):

    x Domestic Use: 0.04 m^3/day Water source: Will be flown in

    ☐ Drilling: _____ Water source:_____
    ☐ Other: _____ Water source:_____

28. Describe water intake for camp operations? Is the water intake equipped with a mesh screen to prevent entrapment of fish? (see *DFO 1995, Freshwater Intake End-of-Pipe Fish Screen Guideline*) Describe:

    N/A

29. Will drinking water quality be monitored? What parameters will be analyzed and at what frequency?

No.

30. Will drinking water be treated? How?

Commercially bottled water.

31. Will water be stored on site?
Yes, in drums and bottles.

WASTE TREATMENT AND DISPOSAL

32. Describe the characteristics, quantities, treatment and disposal methods for:

X Camp Sewage (blackwater):

0.02 m^3/day, sewage will be buried and covered with lime at a location that is at least 31m away from any water body.

X Camp Greywater:
0.04 m^3/day , will be disposed of on land.

X Solid Waste
non hazardous waste, this waste will not be disposed of on site, it will be flown out.

☐ Bulky Items/Scrap Metal

X Waste Oil/Hazardous Waste

Tank sludge, tank cleaning water. This will be put in UN spec. drums and retrograded out of Nunavut.

☐ Empty Barrels/Fuel Drums

☐ Other:

33. Please describe incineration system if used on site. What types of wastes will be incinerated?

N/A

34. Where and how will non-combustible waste be disposed of? If in a municipality in Nunavut, has authorization been granted?

Non combustible, non hazardous waste will be removed from the site and disposed outside of Nunavut. Hazardous waste will be retro graded south.

35. Describe location (relative to water bodies and camp facilities) dimensions and volume, and freeboard for all sumps (if applicable).

N/A

36. Will leachate monitoring be done? What parameters will be sampled and analyzed, and at what frequency? N/A

OPERATION AND MAINTENANCE

37. Have the water supply and waste treatment and disposal methods been used and proven in cold climate? What known O&M problems may occur? What contingency plans are in place?

N/A. Water will be brought in. Sewage treatment with lime has been incorporated into current NWB water licenses.

ABANDONMENT AND RESTORATION

38. Provide a detailed description of progressive and final abandonment and restoration activities at the site.

Camp will be removed and radar site will continue operation as usual.

BASELINE DATA

39. Has or will any baseline information be collected as part of this project? Provide bibliography.

No.

- ☐ Physical Environment (Landscape and Terrain, Air, Water, etc.)
- ☐ Biological Environment (Vegetation, Wildlife, Birds, Fish and Other Aquatic Organisms, etc.)
- ☐ Socio-Economic Environment (Archaeology, Land and Resources Use,
- ☐ Demographics, Social and Culture Patterns, etc.)
- ☐ Other: _____

REGULATORY INFORMATION

40. At a minimum, you should ensure you have a copy of and consult the documents below for compliance with existing regulatory requirements:

We will have a copy of the documents

- ✓ ARTICLE 13 – *NCLA -Nunavut Land Claims Agreement*
- ✓ NWNSRTA – *The Nunavut Waters and Nunavut Surface Rights Tribunal Act, 2002*
- ✓ *Northwest Territories Waters Regulations, 1993*
- ✓ NWB - Water Licensing in Nunavut - Interim Procedures and Information Guide for Applicants
- ✓ NWB - Interim Rules of Practice and Procedure for Public Hearings
- ✓ RWED – *Environmental Protection Act, R-068-93- Spill Contingency Planning and Reporting Regulations, 1993*
- ✓ RWED A Guide to the Spill Contingency Planning and Reporting Regulations, 2002
- ✓ NWTWB - Guidelines for Contingency Planning
- ✓ *Canadian Environmental Protection Act, 1999 (CEPA)*
- ✓ *Fisheries Act, RS 1985* - s.34, 35, 36 and 37
- ✓ DFO - Freshwater Intake End of Pipe Fish Screen Guideline
- ✓ NWTWB - Guidelines for the Discharge of Treated Municipal Wastewater in the NWT
- ✓ Canadian Council for Ministers of the Environment (CCME); Canadian Drinking Water Quality Guidelines, 1987
- ✓ Public Health Act - Camp Sanitation Regulations
- ✓ Public Health Act - Water Supply Regulations
- ✓ *Territorial Lands Act* and *Territorial Land Use Regulations*; Updated 2000

Annex A – Authorization Letter

16 May 2011

Nunavut Water Board
P.O. BOX 119
Gjoa Haven, NU
X0B 1J0
Canada

Attention: Phyllis Beaulieu, Manager of Licensing

Subject: Authorization of Nasittuq Corporation to submit Nunavut Water Board license applications for PIN-1BG Croker River and PIN-DA Edinburgh Island on behalf of the Department of National Defence (DND)

This letter authorizes Nasittuq Corporation to act on behalf of DND (the "applicant") to submit Nunavut Water Board license applications for DND North Warning System (NWS) Sites PIN-1BG, Croker River and PIN-DA, Edinburgh Island.

Respectfully,

Kim Edward Kalen
Environmental Officer – North warning System
(613) 998-8482
Kim.kalen@forces.gc.ca

Annex B – Photos

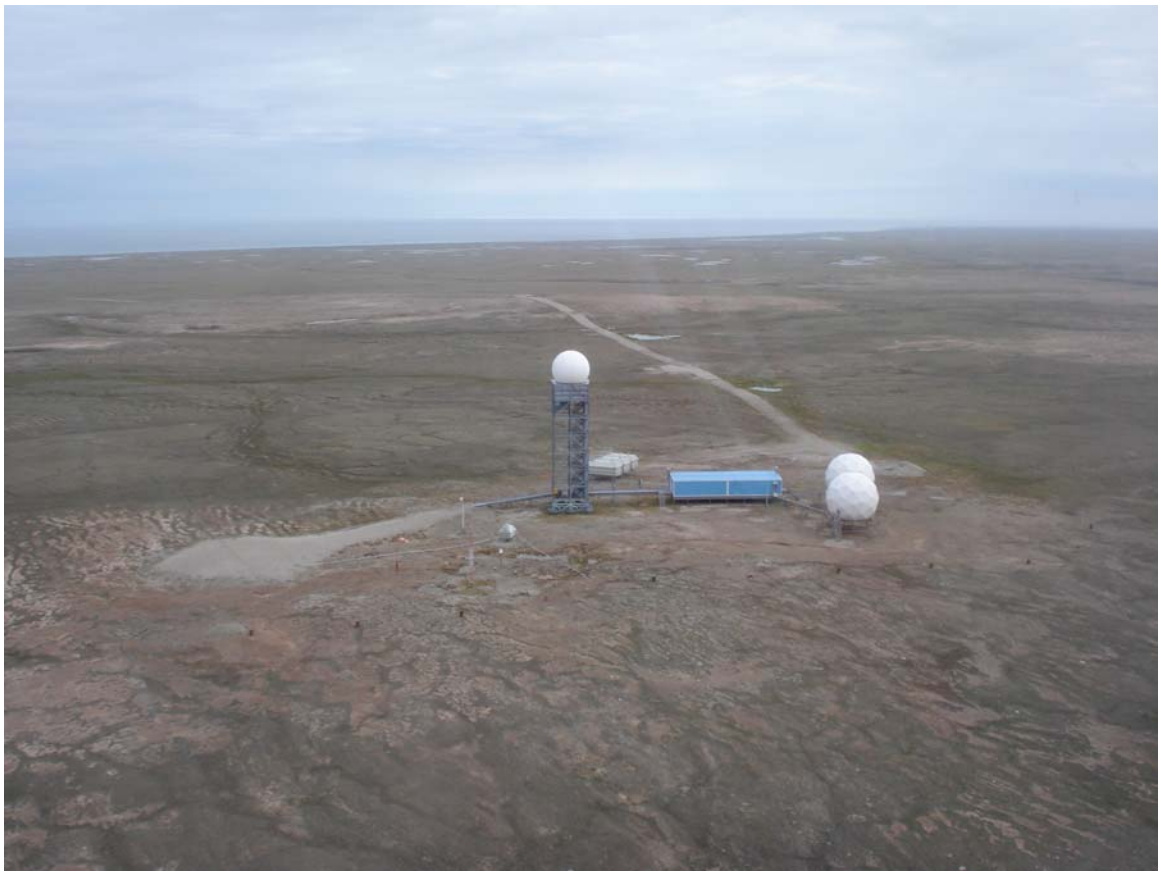

Figure 1: PIN-1BG Summit

Figure 2: PIN-1BG Beach

Annex C – Spill Contingency Plan

Title: **SPILL CONTINGENCY PLAN FOR PIN-1BG (Croker River, Nunavut)**

Applicant: **North Warning System Office, Department of National Defence**

Location: **PIN-1BG North Warning System Site, Croker River, Kitikmeot Region, Nunavut**

Prepared for: **Nunavut Water Board**

Date: **24 May 2011**

Submitted by: **Nasittuq Corporation**

Executive Summary

The Spill Contingency Plan for PIN-1BG (Croker River, Nunavut) applies to all activities and facilities at the North Warning System (NWS) radar site. Jet A-1 fuel is used at PIN-1BG for the operation of the power generation system and furnace and for aircraft refueling. Because of the large volume on site and its many uses, Jet A-1 fuel poses the greatest risk for potential spills. PIN-1BG also has a limited number of hazardous materials (Hazmat) in a flammables cabinet, lead acid batteries, and drums of oil.

The North Warning System Office is responsible for ensuring adequate fuel spill detection and response capabilities are in place and monitored for all NWS operations. Nasittuq Corporation is the operations and maintenance (O&M) contractor and is responsible for: maintaining an up-to-date spill plan, practising spill prevention, maintaining operational competence through staff training, identifying the requirements of sub-contractors in O&M activities, and responding appropriately to spills.

Management of spill risk incorporates three aspects: spill prevention, spill detection, and spill response. Spill prevention for Hazmat includes secure storage areas, labeling, packaging, and training. Spill prevention for fuel includes site condition surveys, preventive maintenance inspections, training of Bulk Fuel Technicians, and safeguards for the fuel systems at unattended sites. Spill detection methods are visual and odour detection, fuel tank dipping, and remote monitoring. Spill response includes spill reporting, dispatching an Emergency Response Team, stopping the leak/flow, containing the spill, cleaning up the spill, properly disposing of the clean-up materials, site remediation, and a final spill report and post-spill review.

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LIST OF ACRONYMS AND ABBREVIATIONS

CMO	Contractor Management Office
DND	Department of National Defence
EMT	Electronics Maintenance Technician
EPM	NWS Environmental Protection Manual
EPP	Environmental Protection Plan
ERT	Emergency Response Team
FMT	Facilities Maintenance Technician
Hazmat	Hazardous Materials
LHCN	Long-Haul Communication Network
LOGS	Logistics Department
LRR	Long Range Radar
LSS	Logistics Support Site
NWS	North Warning System
NWSCC	North Warning System Control Centre
NWSSC	North Warning System Support Centre
NWSO	North Warning System Office
NWT	Northwest Territories
MSDS	Material Safety Data Sheet
O&M	Operation and Maintenance
PCBs	Polychlorinated biphenyls
PGS	Power Generating System
PMI	Preventive Maintenance Inspection
POL	Petroleum, oil and lubricants
PRO	Procedure
SCADA	Supervisory Control and Data Acquisition
SOW	NWS O&M Contract Statement of Work
TDG	Transportation of Dangerous Goods
WHMIS	Workplace Hazardous Materials Information System

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 the North Warning System (NWS) radar site PIN-1BG 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 the NWS radar site PIN-1BG (Croker River). Note that PIN-1BG is an unattended site with occasional site visits from personnel from the Logistics Support Site – Inuvik (LSS-I) in Inuvik, NWT. Since PIN-1BG is in the zone managed by the LSS-I Manager, this plan refers to the LSS-I Manager where required.

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

4.0 GENERAL

4.1 Spill Definition

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);
h) halocarbons (e.g. FM-200); and/or
i) other contaminants.

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-I Manager, who in turn can seek guidance from the Environmental Services Supervisor. Reporting procedures for Halocarbon release are in the EPP 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 Environmental Services.

Most Hazmat items are stored and used in small quantities, e.g. consumer-sized packages/containers such as an aerosol can or paint can. 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 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, Arctic Grade, aviation turbine fuel, kerosene type. This fuel type is 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 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

PIN-1BG has bulk fuel tanks at the beach and summit. The beach has two tanks of 50,000 L capacity each and associated piping. The summit has four tanks with associated piping: three with 50,000 L capacity and one with 4,500 L capacity. The beach and summit are not connected by piping.

All fuel tanks are aboveground, double walled “self-dyked” tanks (i.e. with integral secondary containment).

Oils and lubricants used in the operation of power generating systems (PGS) are stored inside the sole building on-site. Waste POL products are stored in dedicated areas prior to disposal by retrograde outside of Nunavut.

4.5 Fuel and Use

Bulk fuel re-supply of PIN-1BG takes place annually during the summer. Fuel from the beach tanks is transferred by helicopter to the summit tanks. Fuel is delivered to the beach tanks by sealift (barges). Contractors and sub-contractors engaged in fuel re-supply 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 PIN-1BG include: (a) operation of the power generating system, (b) aircraft re-fuelling, and (c) operation of the furnace.

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 for PIN-1BG (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.

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, Department of National Defence

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 Contractors and Sub-Contractors

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

a) Provision of a POL Spill Response Plan[1] 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

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

In the event that a spill occurs during fuel re-supply 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 included in this Plan.

5.4 Division of Responsibility During Re-Supply

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

a) If a fuel spill occurs between the sealift pipeline beach head and the 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 Spill Contingency Plan for PIN-1BG (this document) is implemented. The LSS-I Manager becomes the Spill Control Officer; and 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 barge or aircraft are contacted to stop the pumps and close the isolation valves, as applicable.

e) In all instances, the NWSCC must be informed even if the spill has occurred within the contractor's area of responsibility in order to inform the LSS-I Manager, 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.

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

6.0 PROCEDURE

Nasittuq's management of spill risk incorporates three aspects: (1) spill prevention, (2) spill detection, and (3) spill response. Spill prevention and detection are discussed briefly below, but this document focuses on spill response.

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:

a) Establishment of secure storage areas for Hazmat;
b) Labelling of Hazmat in accordance with Workplace Hazardous Material Information System (WHMIS) legislation;
c) Transportation of Hazmat in accordance with the Transportation of Dangerous Goods (TDG) Regulations; and
d) Training of personnel in correct handling, use, and storage of hazardous materials. Part of this training is in WHMIS which includes how to read Material Safety Data Sheets (MSDSs).

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 Bulk Fuel Technicians in standard operating procedures (e.g. fuel transfers, fuel re-supply); 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 limited due to technological limitations; however, additional appropriate technologies for use in the Arctic environment are currently being tested.

6.3 Spill Response

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

6.3.1 Spill Reporting

Spill reporting will be in accordance with PRO-4.9-37. All outdoor spills (fuel, glycol, etc.) that occur or are discovered outdoors, regardless of the volume, are to be reported. All spills that occur indoors must also be reported.

The responsibilities of the different levels of reporting hierarchies are outlined below. (Telephone numbers for key individuals are provided in Appendix 1. Emergency Contacts List.) *Subparagraphs. 6.3.1.1, 6.3.1.2, 6.3.1.2.1 6.3.1.3, 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

Identify the spill (in association with the LSS-I Manager whenever possible).

Make immediate verbal report to NWSCC. 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[2];
- ☐ 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.

Give a sketch map of the spill area, detailing the location and extent of the spill, to the LSS-I Manager.

If the NWSCC operators suspect a spill as a result of SCADA (remote monitoring) inputs, they will advise the LSS-I Manager, the Environmental Services Supervisor, and NWSO via telephone.

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

6.3.1.2 NWSCC

Upon being notified as per subparagraph 6.3.1.1, the NWSCC shift technician must:

☐ a) Ensure the LSS-I Manager is informed as soon as possible;

☐ b) Phone initial contact persons within 30 minutes, i.e. phone one person for each group of the Environmental Incident reporting group (Environmental Services, NWSO, etc.); and

☐ c) Prepare a report using the ***form B2-A – Incident Initial Notification: Environmental Spill*** based on the information provided (see Appendix 2 for a sample copy of Form B2-A). E-mail report, within 3 hours of notification, to the designated addressee groups indicated on the form. The addressee groups include the Environmental Services Supervisor and NWSO, as shown in **Figure 2 – Spill reporting and response procedures.**

6.3.1.2.1 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 notification steps outlined above (subparagraph 6.3.1.2).

6.3.1.3 LSS-I Manager

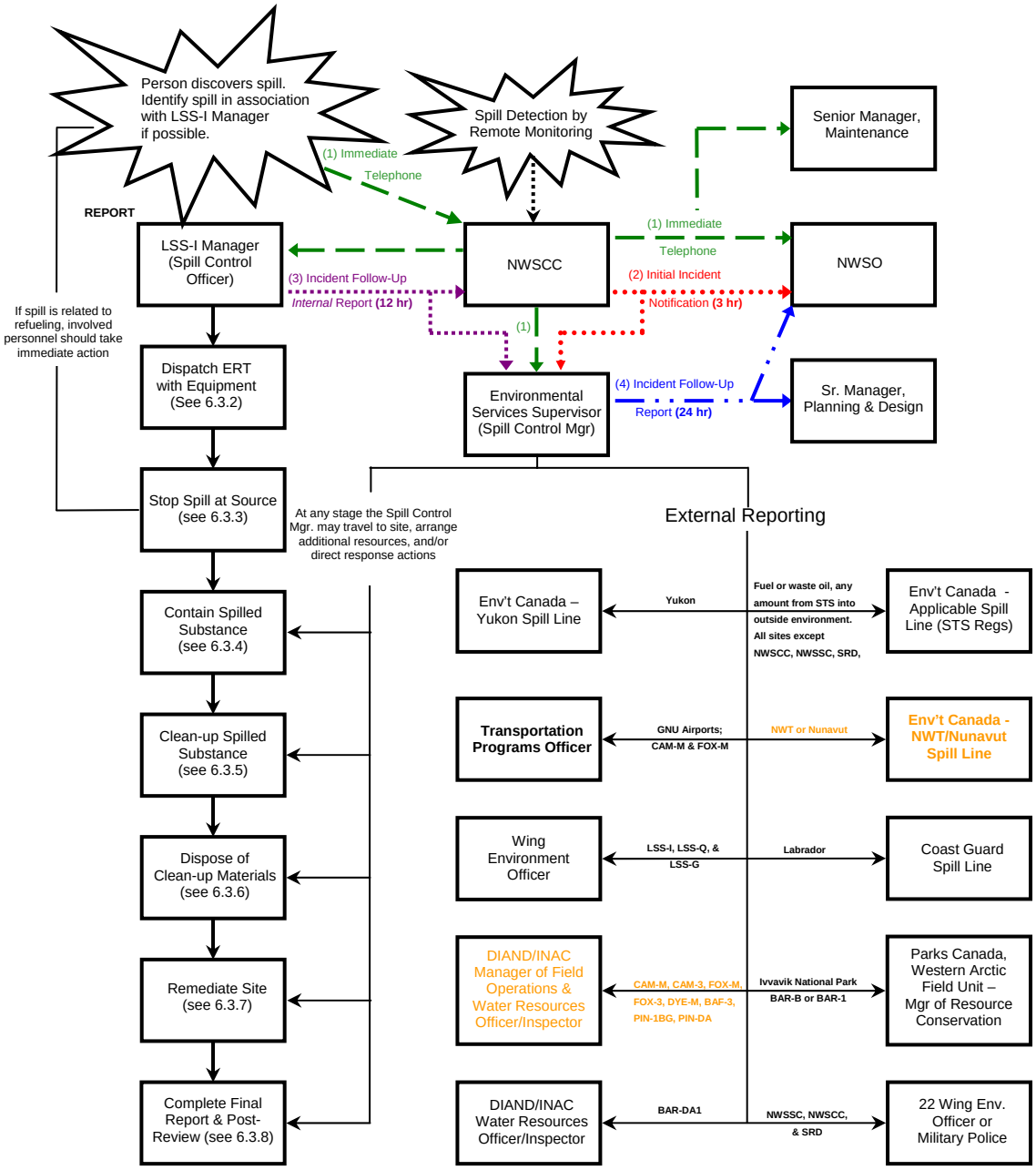
Upon being notified as per subparagraph 6.3.1.1 or 6.3.1.2, the LSS-I Manager must proceed with the reporting procedures as follows:

☐ a) Raise Work Order for spill response and clean-up.

☐ b) Prepare report using form ***C2-A-1 – Incident Follow-Up Internal Report: Environmental Spill*** (see Appendix 3 for a sample copy of Form C2-A-1). E-mail report to designated addressee groups indicated on the form within 12 hours of the telephone notification from NWSCC. The addressee groups include the Environmental Services Supervisor and NWSCC, as shown in **Figure 2 – Spill reporting and response procedures.**

☐ c) Attach or FAX a sketch site plan depicting the contaminated location(s) impacted by the spill to the designated addressee groups outlined above.

Spill Response Flow Chart



Note: The internal reporting pathways are simplified to show the critical flow of information during spill response. See the Spill Contingency Plan (EPP sec. 5.0-XVI) for detailed reporting pathways.

See Appendix 4 for minimum reportable quantities

Figure 2. Spill reporting and response procedures; corresponding sections are referenced by their section numbers.

6.3.1.4 Environmental Services Supervisor

Nasittuq's Environmental 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[3], the Environment Services Supervisor will proceed with the following steps.

☐ a) Prepare a report using the form ***C2-A-2 – Incident Follow-Up Report: Environmental Spill*** based on the information provided by the LSS-I Manager's report (see 6.3.1.3 and See Appendix 5 for a sample copy of Form C2-A-2). E-mail report to addressee groups indicated on the form within 24 hours of notification. These groups include NWSO and Senior Manager of Planning and Design, as shown in **Figure 2 –Spill reporting and response procedures.**

☐ b) Notify Spill Line as required by telephone[4]. Then complete and submit the NT-NU Spill Report (see Appendix 6).

☐ c) Maintain regular/daily contact with NWSO on spill status.

☐ d) Notify DIAND/INAC Manager of Field Operations and the Water Resources Officer/Inspector for spills at PIN-1BG (see Appendix 1).

☐ e) Within 30 days, submit a written report to the Water Resources Officer/Inspector that includes: amount and type of spilled product, GPS coordinates of location of spill, and measures taken to contain and clean up the spill site.

6.3.2 Dispatch of Emergency Response Team

Nasittuq's Environmental Services Supervisor will assume the position of Spill Control Manager. The LSS-I 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-I 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-I Manager throughout the duration of all spill response. The typical responsibilities and composition of an ERT is presented in Figure 3.

[3] Given our broad definition of a 'spill' (i.e., a discharge of <u>any volume</u> of POL or Hazmat, inside or outside of a building), the Environmental Services Supervisor must often exercise judgment 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.

[4] The Spill Lines will subsequently contact government departments and agencies, as well as aboriginal groups and organizations (e.g. Inuvialuit Land Administrator).

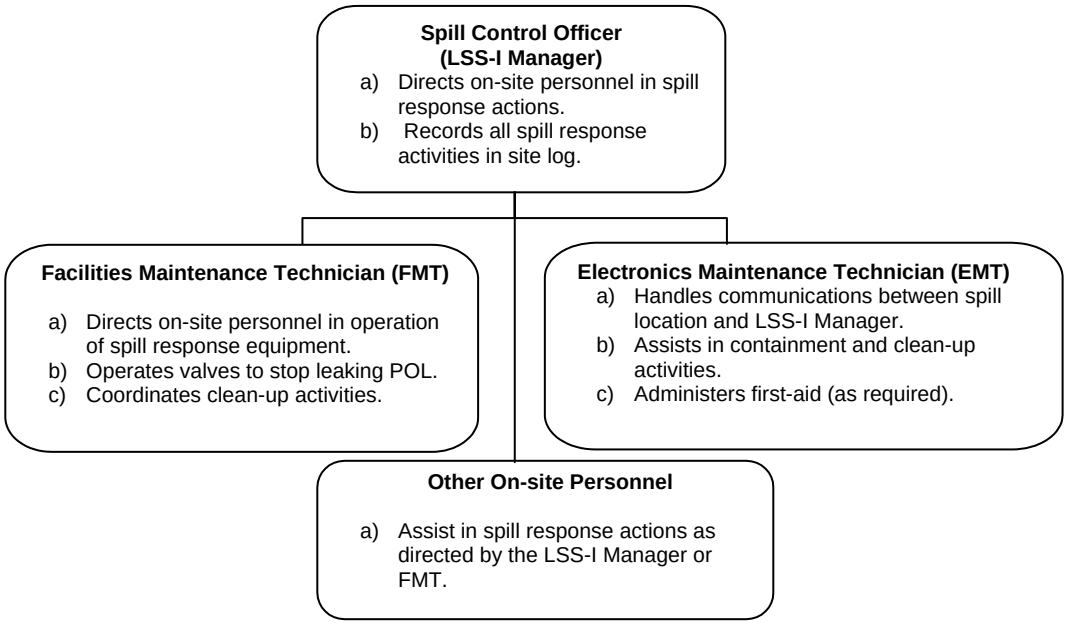


Figure 3. Typical responsibilities and composition of an Emergency Response Team (ERT).

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-I 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 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 use on-site equipment 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, and other equipment, as available, for recovery of the spilled fuel.

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.

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. [5]

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. 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) The waste drums of sorbent material must be marked, labeled and stored as per EPP section 5-XV- Storage and Tracking of Waste Hazmat. They will be retrograded as per EPP section 5-XIX Hazardous Materials Retrograde.

c) Rinse salvage drums with water three times and strain rinse water through hydrophobic sorbent material. The rinseate is to be captured in a drum(s) and handled according to EPP section 5-XV – Storage and Tracking of Waste Hazmat. The Environmental Services Supervisor will decide the appropriate means of disposal on a case-by case basis. 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.

[5] '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.

d) Return salvage drum(s) to spill site for future use. Notify LSS-I Logistics (LOGS) personnel as to the spill response kit items which were used and require replacement. Items will be restocked in accordance with existing supply procedures.

POL/Water Mixture

POL/water mixtures may be dealt with in-place during the clean-up phase, 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 on-site, and can only be used for vehicles.

Quantities of fuel of less than 200 L must also be recovered from the environment.

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 to be captured into drums and handled according to EPP section 5-XV – Storage and Tracking of Waste Hazmat. The Environmental Services Supervisor will decide the appropriate means of disposal on a case-by case basis. 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. Rinse drums with water three times and strain rinse water through hydrophobic sorbent material. The rinseate is to be captured in a drum(s) and handled according to EPP section 5-XV – Storage and Tracking of Waste Hazmat. The Environmental Services Supervisor will decide the appropriate means of disposal on a case-by case basis. Set clean 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-I Logistics (LOGS) personnel as to the spill response kit items which were used and require replacement. Items will be restocked in accordance with existing supply procedures.

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.

e) If the POL/water mixture must be 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 strained water is to be captured into drums and handled according to EPP section 5-XV – Storage and Tracking of Waste Hazmat. The Environmental Services Supervisor will decide the appropriate means of disposal on a case-by case basis. 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 200 L or more of POL are recovered, the fuel is to be filtered.

g) 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.

h) Rinse drums with water three times and strain rinse water through hydrophobic sorbent material. The rinseate is to be captured in a drum(s) and handled according to EPP section 5-XV – Storage and Tracking of Waste Hazmat. The Environmental Services Supervisor will decide the appropriate means of disposal on a case-by case basis. 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.

i) Notify LSS-I Logistics (LOGS) personnel as to the spill response kit items which were used and require replacement. Items will be restocked in accordance with existing supply procedures.

Contaminated Snow

Small volumes of contaminated snow are to be shoveled into an open head 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 open head drums; they may need to be moved without the aid of heavy equipment.

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-I Manager is to advise the Spill Control Manager of disposal actions taken by the ERT, through e-mail or Internal Spill Report updates.

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. greater than 5,000 L) and for any lesser spill (Hazmat or POL) when requested by Nasittuq or NWSO.

6.4 Spill Response - POL Re-Supply Activities

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 re-supply 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 NWSCC must be notified as per section 5.4.

6.5 Spill Reporting Exercises

Environmental Services may conduct annual spill reporting exercises at selected radar sites to identify and mitigate deficiencies. Mock spill scenarios assigned to sites should initiate a response consistent with the correct internal spill reporting process. External reporting to spill lines and/or other contacts is not a component of the spill exercise, and all associated verbal or written communications must clearly announce: 'Exercise. Exercise. Exercise.' The reporting procedure will be tracked by Environmental Services and evaluated according to criteria outlined in the Spill Exercise Report Template in Appendix 7.

6.6 Spill Response Training Program

Spill response training (part of job training course JT-63) is provided to all NWS site personnel and all CMO personnel involved in the O&M of NWS sites.

7.0 FORMS & QUALITY RECORDS

Incident Initial Notification (B2-A): Environmental Spill (ILM # 196553)
Incident Internal Follow-Up Report (C2-A-1): Environmental Spill (ILM # 196554)
Incident Follow-Up Report (C2-A-2): Environmental Spill (ILM # 196555).

APPENDIX 1

Emergency Contacts List

NASITTUQ Emergency Contact List

NWSCC LHCN/Facilities Group (for Zones 1, 2, NWSSC)	(705) 494-6011 ext. 8000
NWSCC Radar/Facilities Group (for Zones 3, 4, 5)	(705) 494-6011 ext. 4000
Barb Thomson, Supervisor, Environmental Services	(613) 831-1844 (H)
Bruce Guy, Manager, Facilities Engineering	(613) 741-6228 (H)
Robert Champagne, Senior Manager Maintenance, NWS Operations	(705) 303-8881 (Cell)
Peter Lundy, Manager, NWSSC	(705) 498-2633 (H)
Kelly Landon, Senior Manager, Logistics and Program Development	(613) 823-9716 (H)
Frank Carroll, Supervisor, Fire & Safety	(613) 592-6923 (H)

NWSO Emergency Contact List

Kim Kalen, Environmental Officer (R&CS 3-4-3)	(613) 998-8482 (W) (613) 728-9562 (H)
Maj. A. Cameron (R&CS 3-4)	(613) 998-8602 (W)

24 Hour Spill Lines

Northwest Territories/Nunavut	(867) 920-8130

1 Canadian Air Division Emergency Contact List

Location	Base	Contact	CSN*
LSS-Inuvik	4 Wing Cold Lake, AB	Wing Env. Officer	690-8430
LSS-Iqaluit	3 Wing Bagotville, QC	Wing Env. Officer	661-8711
LSS-Goose Bay	5 Wing Goose Bay, NL	Wing Env. Officer	555-7811
NWSSC, SRD, and NWSCC	22 Wing North Bay, ON	Wing Env. Officer Commercial tel#: Base Military Police	628-2297 705-494-2011 ext. 2297 705-494-3333

* Canadian Switch Network (i.e. from CMO: 70-2136 + number; from Sites: 88-78 + number)

Other Important Contacts

INAC Nunavut Regional Office, Iqaluit	(867) 975-4500
INAC Manager of Field Operations	(867) 975-4295
INAC Water Resources Officer/Inspector, Kitikmeot Region - Kugluktuk (CAM-M, CAM-3, PIN-1BG, PIN-DA)	(867) 982-4308
INAC Water Resources Officer/Inspector, Qikiqtani Region - Iqaluit (FOX-M, FOX-3, DYE-M, BAF-3)	(867) 975-4289
David Roberts, Transportations Programs Officer (North), Dep't of Economic Development and Transportation, GNU	(867) 899-7340 Email: droberts@gov.nu.ca

APPENDIX 2

Initial Incident Notification (B2-A): Environmental Spill

Document Profile is to have:

a) Title – Initial Incident Report: Environmental
b) Object Date – Date of Incident/Awareness
c) Related Info – Zone, Site (I.E. Zone 1, Bar-2)

Submit to NWSO within 3 hours

To: Incident Reports Enviro-Spill

Subject: ENV / SPILL REPORT - INITIAL NOTIFICATION

Reporting Location: Inuvik
Report Originator:
Report date (dd mmm yyyy):
Report time (Z):
Site Affected:
Location of Spill:
Date (dd mmm yyyy) of incident / awareness:
Time (Z) of incident / awareness:
Reported By (e.g. SCADA or person at site):
Substance spilled:
Leak Status: F4
Action Taken:
SM Section notified:
External Agencies notified:
News media involvement, if known:
Other pertinent information:
NWSCC Tech initials:
This reports ILM #:
Other Incident Reports directly related to this report: ILM #

ENV / SPILL Internal Report (C2-A-1, ILM #196554) to be submitted to CMO within 12 hours

ENV/SPILL Follow-up Report (C2-A-2, ILM #196555) to be submitted by CMO Environmental Services to NWSO within 24 hours

APPENDIX 3

Incident Internal Follow-Up Report (C2-A-1): Environmental Spill

SPILL REPORT – INTERNAL ONLY

(To be submitted within 12 hours)

NOTE: ***** Document Profile is to have:

a) Title – Internal Follow-up Incident Report: Environmental
b) Object Date – Date of Spill
c) Related Info – Zone, Site (I.E. Zone 1, Bar-2)

* Send by e-mail as file attachment to: Environmental Distribution
with a copy to: Incident Reports NB and Site Managers

* Use Mouse or Tab key to move between fields in the form – Mouse or **F4 key** with **up/down arrow keys** for selections.

Report Location: Select	**Report Originator:**
Phone No:	**Initial Report: ILM #** **This Reports ILM #**
Report Date (dd mmm yyyy):	**Report Time (Z):** **z**
Other Incidents directly related to this incident – ILM #	
Site affected:	**Location of Spill:**
Date (dd mmm yyyy) spill occurred:	**Time (Z) spill occurred:** **z**
Date (dd mmm yyyy) spill discovered:	**Time (Z) spill discovered:** **z**
Date (dd mmm yyyy) spill stopped:	**Time (Z) spill stopped:** **z**
Substance:	
Flow Direction: Select	**Estimated Quantity Spilled:**
Cause:	
Status of Spill: Key F4	
Extent & Depth of Contamination:	
Factors affecting spill or recovery [temp, wind, precipitation (snow, freezing rain, rain), surface conditions (snow, ice)]:	
Containment (none, natural, booms, dykes, etc.):	
Action taken or proposed to contain, recover, cleanup or dispose of substance:	
Assistance required (Suggested form):	
Hazards to persons, property or environment (e.g. Fire, potable water, other water, fish, or wildlife):	
Comments and/or recommendations:	
Sketch map provided by FAX: ☐ **Fax Date/time:**	
Date (dd mmm yyyy) spill cleaned up:	**Time (Z) spill cleaned up:** **z**
Work Order No:	

ENV/SPILL Follow-up Report (C2-A-2, ILM #196555) to be submitted by CMO Environmental Services to NWSO within 24 hours

APPENDIX 4

Reporting Criteria for Spill Lines

Federal or Aboriginal Land in Canada

Any spill of fuel or waste oil must be reported to Environment Canada through territorial or provincial spill lines. Spills of greater than 100 L require a written report to Environment Canada.[6]

Nunavut and Northwest Territories

Minimum reportable volumes for Hazmat spills[7]

Item No.	TDGA Class	Description of Contaminant	Minimum Reportable Volume
1	1	Explosives	Any amount
2	2.1	Compressed gas (flammable)	Any amount of gas from containers with a capacity greater than 100 L
3	2.2	Compressed gas (non-corrosive, non-flammable)	Any amount of gas from containers with a capacity greater than 100 L
4	2.3	Compressed gas (toxic)	Any amount
5	2.4	Compressed gas (corrosive)	Any amount
6	3.1, 3.2, 3.3	Flammable liquid	100 L
7	4.1	Flammable solid	25 Kg
8	4.2	Spontaneously combustible solids	25 Kg
9	4.3	Water reactant solids	25 Kg
10	5.1	Oxidizing substances	50 L or 50 Kg
11	5.2	Organic peroxides	1 L or 1 Kg
12	6.1	Poisonous substances	5 L or 5 Kg
13	6.2	Infectious substances	Any amount
14	7	Radioactive	Any amount
15	8	Corrosive substances	5 L or 5 Kg
16	9.1 (in part)	Miscellaneous products or substances, excluding PCB mixtures	50 L or 50 Kg
17	9.2	Environmentally hazardous	1 L or 1 kg
18	9.3	Dangerous wastes	5 L or 5 Kg
19	9.1 (in part)	PCB mixtures of 5 or more parts per million	0.5 L or 0.5 Kg
20	none	Other contaminants	100 L or 100 Kg

Nunavut Water Board

Under Water Licences, any unauthorized discharge of a waste or a foreseeable unauthorized discharge must be reported to the NT-NU Spill line, DIAND / INAC Water Resources Inspector, and DIAND/INAC Manager of Field Operations.

[6] From: *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations*, SOR/2008-197, Section 41, under the Canadian Environmental Protection Act, 1999.

[7] From: Schedule B, *Spill Contingency Planning and Reporting Regulations*, N.W.T. Reg. 068-93, under the Environmental Protection Act.

APPENDIX 5

Incident Follow-Up Report (C2-A-2): Environmental Spill

NASITTUQ

Environmental Emergency / Spill

Report Follow-Up

Document Profile is to have:
a) Title – Follow-up Incident Report: Environmental
b) Object Date – Earliest Date of Occurrence/Discovery
c) Related Info – Zone, Site (I.E. Zone 1, Bar-2)

CMO Environmental Services (ES) to submit report to NWSO within 24 hours or next business day.

E-mail as ILM reference: TO: Incident Reports Enviro-Spill; KALEN.KE@forces.gc.ca
CC: Incident Reports NB and Site Managers

Date and Time		
Date and Time of Occurrence: Zulu	**Date and Time of Discovery:** Zulu	
Spill Stopped Date and Time: Zulu	**Spill Cleaned Date and Time:** Zulu	
Reported By (ES Person):	**Date:**	**Report No:**
Reference initial report ILM#:		

Spill Information			
Material Spilled			
Quantity Spilled:			
Quantity Recovered:			
Location of spill (site and location on site):			
Cause of Spill:			
Status of Spill:			
Environmental Effects:			
Human Health Effects:	**Personal Information Recorded on ILM #:** (From FOR4937-PI, ILM #397470)		
Action Taken to Mitigate Environ/Human Health Effects:			
Weather Conditions:	**Rain** ☐	**Wind** ☐	**Snow/Ice** ☐
	Temperature: °C	**Wind Speed:** km/hr	
	Wind Direction:	**Direction of Drift:**	
Distance from Surface Water:			
Distance from Property Boundary:			

Agencies				
Notified Federal Government:	**Date:**	**Time:** Zulu	**Contact:**	
Notified Provincial Government:	**Date:**	**Time:** Zulu	**Contact:**	
Notification Comments (e.g. Spill Line Report #, Spill Line tel #, co-ordinates of person(s) contacted: name, tel. #, position, gov't dept, city):				

Other	
Work Order #:	**Spill Closure Date:**
Remediation Action Taken:	
Comments:	

APPENDIX 6

NT-NU Spill Report Form and Guide

Northwest Territories | Nunavut | Canada

NT-NU SPILL REPORT

OIL, GASOLINE, CHEMICALS AND OTHER HAZARDOUS MATERIALS

NT-NU 24-HOUR SPILL REPORT LINE
TEL: (867) 920-8130
FAX: (867) 873-6924
EMAIL: spills@gov.nt.ca

REPORT LINE USE ONLY

A	REPORT DATE: MONTH – DAY – YEAR	REPORT TIME	☐ ORIGINAL SPILL REPORT, OR ☐ UPDATE # _____ TO THE ORIGINAL SPILL REPORT	REPORT NUMBER _____-_____
B	OCCURRENCE DATE: MONTH – DAY – YEAR	OCCURRENCE TIME		
C	LAND USE PERMIT NUMBER (IF APPLICABLE)	WATER LICENCE NUMBER (IF APPLICABLE)		
D	GEOGRAPHIC PLACE NAME OR DISTANCE AND DIRECTION FROM NAMED LOCATION	REGION ☐ NWT ☐ NUNAVUT ☐ ADJACENT JURISDICTION OR OCEAN		
E	LATITUDE DEGREES MINUTES SECONDS	LONGITUDE DEGREES MINUTES SECONDS		
F	RESPONSIBLE PARTY OR VESSEL NAME	RESPONSIBLE PARTY ADDRESS OR OFFICE LOCATION		
G	ANY CONTRACTOR INVOLVED	CONTRACTOR ADDRESS OR OFFICE LOCATION		
H	PRODUCT SPILLED	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
	SECOND PRODUCT SPILLED (IF APPLICABLE)	QUANTITY IN LITRES, KILOGRAMS OR CUBIC METRES	U.N. NUMBER	
I	SPILL SOURCE	SPILL CAUSE	AREA OF CONTAMINATION IN SQUARE METRES	
J	FACTORS AFFECTING SPILL OR RECOVERY	DESCRIBE ANY ASSISTANCE REQUIRED	HAZARDS TO PERSONS, PROPERTY OR EQUIPMENT	
K	ADDITIONAL INFORMATION, COMMENTS, ACTIONS PROPOSED OR TAKEN TO CONTAIN, RECOVER OR DISPOSE OF SPILLED PRODUCT AND CONTAMINATED MATERIALS			

L	REPORTED TO SPILL LINE BY	POSITION	EMPLOYER	LOCATION CALLING FROM	TELEPHONE
M	ANY ALTERNATE CONTACT	POSITION	EMPLOYER	ALTERNATE CONTACT LOCATION	ALTERNATE TELEPHONE

REPORT LINE USE ONLY

N	RECEIVED AT SPILL LINE BY	POSITION STATION OPERATOR	EMPLOYER	LOCATION CALLED YELLOWKNIFE, NT	REPORT LINE NUMBER (867) 920-8130

LEAD AGENCY ☐ EC ☐ CCG ☐ GNWT ☐ GN ☐ ILA ☐ INAC ☐ NEB ☐ TC	SIGNIFICANCE ☐ MINOR ☐ MAJOR ☐ UNKNOWN	FILE STATUS ☐ OPEN ☐ CLOSED

AGENCY	CONTACT NAME	CONTACT TIME	REMARKS
LEAD AGENCY			
FIRST SUPPORT AGENCY			
SECOND SUPPORT AGENCY			
THIRD SUPPORT AGENCY			

PAGE 1 OF _____

Instructions for Completing the NT-NU Spill Report Form

This form can be filled out electronically and faxed to the spill line at 867-873-6924. Commencing April 1, 2007, the form can also be e-mailed as an attachment to spills@gov.nt.ca. Until further notice, please verify receipt of e-mail transmissions with a follow-up telephone call. Spills can still be phoned in by calling collect at 867-920-8130.

A. Report Date/Time	The actual date and time that the spill was reported to the spill line. If the spill is phoned in, the Spill Line will fill this out. **Please do not fill in the Report Number**: the spill line will assign a number after the spill is reported.
B. Occurrence Date/Time	Indicate, to the best of your knowledge, the exact date and time that the spill occurred. Not to be confused with the report date and time (see above).
C. Land Use Permit Number /Water Licence Number	This only needs to be filled in if the activity has been licenced by the Nunavut Water Board and/or if a Land Use Permit has been issued. Applies primarily to mines and mineral exploration sites.
D. Geographic Place Name	In most cases, this will be the name of the city or town in which the spill occurred. For remote locations – outside of human habitations – identify the most prominent geographic feature, such as a lake or mountain and/or the distance and direction from the nearest population center. **You must include the geographic coordinates** (Refer to Section E).
E. Geographic Coordinates	This only needs to be filled out if the spill occurred outside of an established community such as a mine site. Please note that the location should be stated in degrees, minutes and seconds of Latitude and Longitude.
F. Responsible Party Or Vessel Name	This is the person who was in management/control/ownership of the substance at the time that it was spilled. In the case of a spill from a ship/vessel, include the name of the ship/vessel. Please include full address, telephone number and e-mail. Use box K if there is insufficient space. **Please note that, the owner of the spilled substance is ultimately responsible for any spills of that substance, regardless of who may have actually caused the spill.**
G. Contractor involved?	Were there any other parties/contractors involved? An example would be a construction company who is undertaking work on behalf of the owner of the spilled substance and who may have contributed to, or directly caused the spill and/or is responding to the spill.
H. Product Spilled	Identify the product spilled; most commonly, it is gasoline, diesel fuel or sewage. For other substances, avoid trade names. Wherever possible, use the chemical name of the substance and further, identify the product using the four digit UN number (eg: UN1203 for gasoline; UN1202 for diesel fuel; UN1863 for Jet A & B)
I. Spill Source	Identify the source of the spill: truck, ship, home heating fuel tank and, if known, the cause (eg: fuel tank overfill, leaking tank; ship ran aground; traffic accident, vandalism, storm, etc.). Provide an estimate of the extent of the contaminated/impacted area (eg: 10 m^2)
J. Factors Affecting Spill	Any factors which might make it difficult to clean up the spill: rough terrain, bad weather, remote location, lack of equipment. Do you require advice and/or assistance with the cleanup operation? Identify any hazards to persons, property or equipment: for example, a gasoline spill beside a daycare centre would pose a safety hazard to children. Use box K if there is insufficient space.
K. Additional Information	Provide any additional, pertinent details about the spill, such as any peculiar/unique hazards associated with the spilled material. State what action is being taken towards cleaning up the spill; disposal of spilled material; notification of affected parties. If necessary, append additional sheets to the spill report. Number the pages in the same format found in the lower right hand corner of the spill form: eg. "Page 1 of 2", "Page 2 of 2" etc. **Please number the pages to ensure that recipients can be certain that they received all pertinent documents.** If only the spill report form was filled out, number the form as "Page 1 of 1".
L. Reported to Spill Line by	Include your full name, employer, contact number and the location from which you are reporting the spill. Use box K if there is insufficient space.
M. Alternate Contact	Identify any alternate contacts. This information assists regulatory agencies to obtain additional information if they cannot reach the individual who reported the spill.
N. Report Line Use Only	**Leave Blank**. This box is for the **Spill Line's use only**.

APPENDIX 7

Spill Exercise Report Template

200*X* Spill Reporting Exercise

Zone *X* Report

General

Spill reporting exercises were enacted in zone *X* on *Date*. During a spill exercise the respective LSS is required to respond to a mock spill scenario generated by Environmental Services and execute the established internal reporting procedures. In turn, NWSCC and Environmental Services are required to fulfill their respective roles in the spill reporting protocol. The effectiveness of observed spill reporting procedures are evaluated against criteria outlined in the Nasittuq Environmental Protection Plan and Procedure (PRO) 4.9-37. The results section summarizes the values measured during spill reporting exercises.

Spill Scenario: *Insert initial spill scenario*

Report Tracking*

LSS	Date and Date Notified	ES Notification by NWSCC	3-hr Initial Report from NWSCC	12-hr LSS Report Posted	24-hr ES Report Posted
LSS-X	*dd-MMM-yy h:mm am/pm*	*h:mm am/pm contactee*	*dd-MMM-yy h:mm am/pm*	*dd-MMM-yy h:mm am/pm*	*dd-MMM-yy h:mm am/pm*

** all times EST*

APPENDIX 8

Fuel and Chemicals On-Site

Fuel

Jet A1 is the fuel used on-site. Jet A1 fuel tanks and locations are listed below.

PIN-1BG			
LOC ID	**Bulk Fuel Tank Capacity***	**Location**	**Type of fuel**
CROW22A	50,000L	Summit	PGS
CROW22B	50,000L	Summit	PGS
CROW22C	50,000L	Summit	PGS
CROW20A	4,500L	Summit	Aviation
CROW22E	50,000L	Beach	Aviation/PGS
CROW22F	50,000L	Beach	Aviation/PGS
SUMMIT TOTAL	154,500L		
BEACH TOTAL	100,000L		
SITE TOTAL	254,500L		

Bulk fuel re-supply of PIN-1BG takes place annually during the summer. Fuel from the beach tanks is transferred by helicopter to the summit tanks. Fuel is delivered to the beach tanks by sealift (barges). Trained personnel (Bulk Fuel Technicians) check all fuel fuel lines before the transfers begin and monitor the transfers until they are finished. Personnel work in pairs and maintain radio communication. Automatic transfers from summit bulk fuel tanks to the day tank inside the building are done on demand by systems under remote control. All trained personnel complete the course JT-16 POL Handling and Aircraft Refueling.

Chemicals

Items such as aerosols, paint, and cleaning products are stored in a flammables cabinet. There are also lead acid batteries on-site. Drum stock is limited to oil for the PGS. Typically 6 to 10 drums of 15W40 engine oil are on-site.

APPENDIX 9

Spill Kit

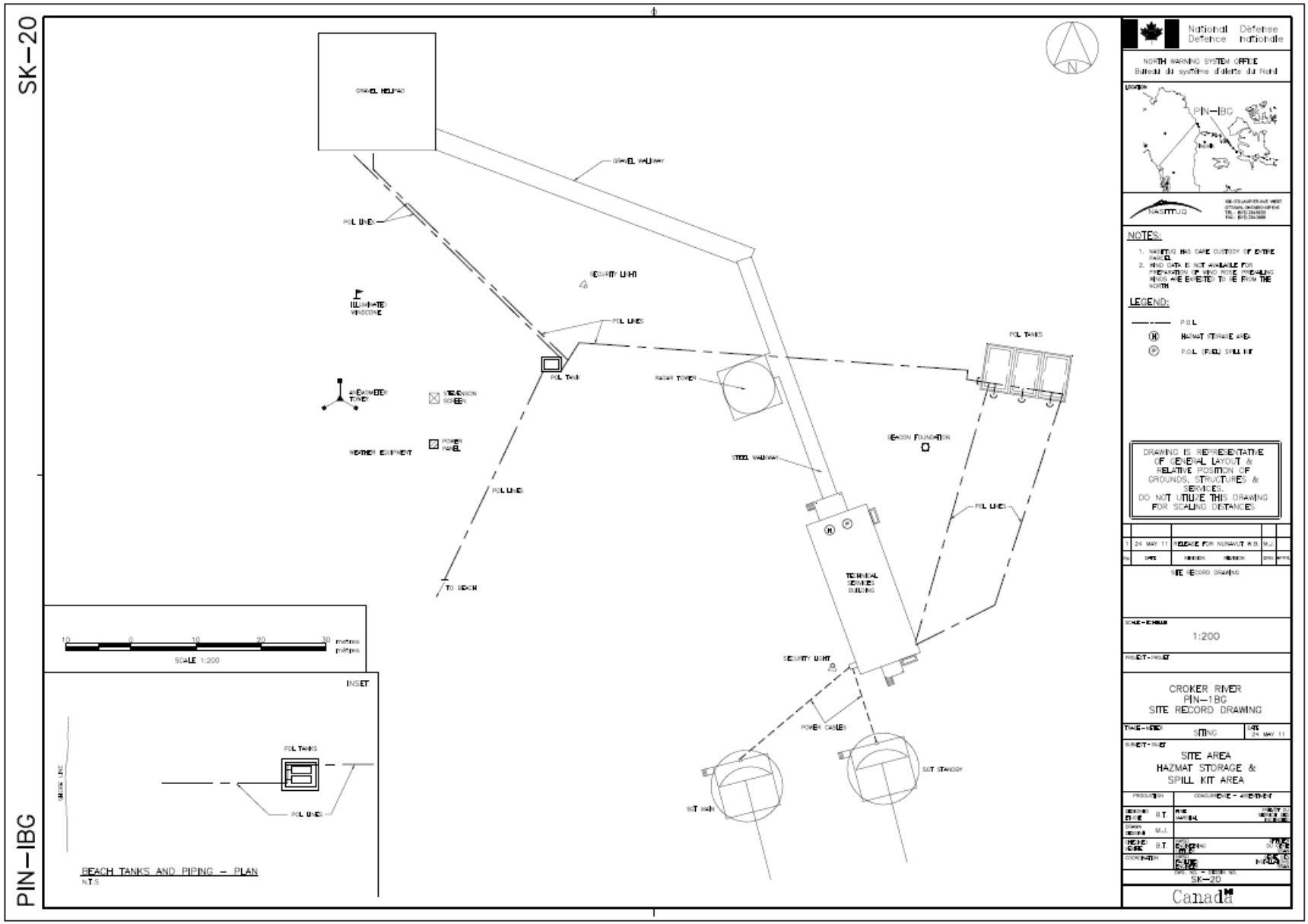
Item Description		Quantity	Item Absorbent Capacity
1.	Absorbent, Material (POL and Water), bags, 25 qt ea, Maximo # 1021477, Item # 48490, can absorb 8 gallons each bag.	12 Bags	436 liters
2.	Absorbent, Sheet (POL): 200 sheets/case: 3/8" x 17" x 19",Maximo # 1021664, Item # OB200, can absorb 9 times its weight. 1 case = 20 lbs = 9.1 kg	1 Case	82 liters
3.	Shovel, Round Mouth	2	
4.	Rubber Gloves, Lined	20 pairs	
5.	Plastic Bags (3mil) 35" W x 50" H, extra strong	1 box x 100 bags	
6.	Polypropylene Rope, 600'/roll	1	
7.	Safety Goggles	2	
8.	85 gal Salvage Drum	2	
		Total Absorption Capacity is	518 liters

This spill kit is for initial spill response. Additional items would be flown in from LSS-I (Inuvik, NWT) and from PIN-M (Cape Parry, NWT) as needed.

APPENDIX 10

Site Map

- SK-20: PIN-1BG SITE MAP - BULK FUEL (POL) TANKS, HAZMAT STORAGE, & SPILL KIT LOCATION


SK–20
PIN–IBG
GRAVEL HELIPAD
GRAVEL RAILWAY
POL LINES
SECURITY LIGHT
ILLUMINATED WINDSOCK
POL TANK
RADAR TOWER
POL TANKS
ANEMOMETER TOWER
RADIATION SCREEN
WEATHER EQUIPMENT
POWER PANEL
BEACON FOUNDATION
STEEL WALKWAY
TO BEACH
TECHNICAL SERVICES BUILDING
SECURITY LIGHT
POWER CABLES
SIT STANDBY
SIT MAIN
10 0 10 20 30 metres
SCALE 1:200
INSET
POL TANKS
POL LINES
BEACH TANKS AND PIPING – PLAN
N.T.S
National Defence
Défense nationale
NORTH WARNING SYSTEM OFFICE
Bureau du système d'alerte du Nord
PIN–IBG
NASITTUQ
NOTES:
1. NASITTUQ HAS CARE CUSTODY OF ENTIRE PANEL
2. WIND DATA IS NOT AVAILABLE FOR PREPARATION OF WIND ROSE PREVAILING WINDS ARE EXPECTED TO BE FROM THE NORTH
LEGEND:
P.O.L
HAZMAT STORAGE AREA
P.O.L (FUEL) SPILL KIT
DRAWING IS REPRESENTATIVE OF GENERAL LAYOUT & RELATIVE POSITION OF GROUNDS, STRUCTURES & SERVICES. DO NOT UTILIZE THIS DRAWING FOR SCALING DISTANCES.
1 24 MAY 11 RELEASE FOR NUNAVUT K.B. M.J.
AS RECORD DRAWING
1:200
CROKER RIVER
PIN–1BG
SITE RECORD DRAWING
SITING
24 MAY 11
SITE AREA
HAZMAT STORAGE &
SPILL KIT AREA
B.T.
M.J.
B.T.
SK–20
Canada

Annex D – Jet A-1 MSDS

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: (see Section 16 for Synonyms) **KEROSENE TYPE AVIATION TURBINE FUEL**
Product Description: Hydrocarbons and Additives
MSDS Number: 8525
Intended Use: Aviation fuel

COMPANY IDENTIFICATION

Supplier: **Imperial Oil Products Division**
240 4th Avenue
Calgary, ALBERTA. T2P 3M9 Canada

24 Hour Environmental / Health Emergency Telephone	519-339-2145
Transportation Emergency Phone Number	519-339-2145
Product Technical Information	1-800-268-3183
Supplier General Contact	1-800-567-3776

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

Reportable Hazardous Substance(s) or Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
2-(2-METHOXYETHOXY)-ETHANOL	111-77-3	0 - 0.15%	Dermal Lethality: LD50 > 2.0 g/kg (Rabbit); Oral Lethality: LD50 7.0 g/kg (Rat)
KEROSENE	8008-20-6	> 99 %	Dermal Lethality: LD50 > 2000 mg/kg (Rabbit); Inhalation Lethality: LC50 > 5.0 mg/l (Rat); Oral Lethality: LD50 > 5000 mg/kg (Rat)

Hazardous Constituent(s) Contained in Complex Substance(s)

Name	CAS#	Concentration*	Acute Toxicity
Naphthalene	91-20-3	0.1 - 1%	Dermal Lethality: LD50 > 20 g/kg (Rabbit); Oral Lethality: LD50 0.49 g/kg (Rat)

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 3 HAZARDS IDENTIFICATION

This material is considered to be hazardous according to regulatory guidelines (see (M)SDS Section 15).

PHYSICAL/CHEMICAL EFFECTS

Combustible. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Material can accumulate static charges which may cause an incendiary electrical discharge.

HEALTH EFFECTS

Irritating to skin. Danger of serious damage to health by prolonged exposure. May cause harm to the unborn child. If swallowed, may be aspirated and cause lung damage. May be irritating to the eyes, nose, throat, and

lungs. Breathing of high vapour concentrations may cause dizziness, light-headedness, headache, nausea and loss of co-ordination. Continued inhalation may result in unconsciousness. High-pressure injection under skin may cause serious damage.

Target Organs: Reproductive system | Skin |

NFPA Hazard ID:	Health:	2	Flammability:	2	Reactivity: 0
HMIS Hazard ID:	Health:	2	Flammability:	2	Reactivity: 0

Note: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse. If product is injected into or under the skin, or into any part of the body, regardless of the appearance of the wound or its size, the individual should be evaluated immediately by a physician as a surgical emergency. Even though initial symptoms from high pressure injection may be minimal or absent, early surgical treatment within the first few hours may significantly reduce the ultimate extent of injury.

Eye Contact

Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion

Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN

If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE

Hydrocarbon Solvents/Petroleum Hydrocarbons- Skin contact may aggravate an existing dermatitis.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed

spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Combustible. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.

Hazardous Combustion Products: Smoke, Fume, Aldehydes, Sulphur Oxides, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES

Flash Point [Method]: 38C (100F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 5.0
Autoignition Temperature: N/D

SECTION 6 ACCIDENTAL RELEASE MEASURES

Notification Procedures

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT

Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Use clean non-sparking tools to collect absorbed material. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING

Avoid contact with skin. Do not siphon by mouth. Use proper bonding and/or earthing procedures. Do not use as a cleaning solvent or other non-motor fuel uses. For use as a motor fuel only. It is dangerous and/or unlawful to put petrol into unapproved containers. Do not fill container while it is in or on a vehicle. Static electricity may ignite vapour and cause fire. Place container on ground when filling and keep nozzle in contact with container. Do not use electronic devices (including but not limited to cellular phones, computers, calculators, pagers or other electronic devices etc) in or around any fuelling operation or storage area unless the devices are certified intrinsically safe by an approved national testing agency and to the safety standards required by national and/or local laws and regulations. Prevent small spills and leakage to avoid slip hazard. Material can accumulate static charges which may cause an electrical spark (ignition source).

Static Accumulator: This material is a static accumulator.

STORAGE

Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Storage containers should be earthed and bonded. Drums must be earthed and bonded and equipped with self-closing valves, pressure vacuum bungs and flame arresters.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Substance Name	Form	Limit/Standard			Note	Source
KEROSENE	Stable Aerosol.	TWA	5 mg/m3			Supplier
KEROSENE	Vapour.	TWA	200 mg/m3			Supplier
KEROSENE [as total hydrocarbon vapor]	Non-Aerosol	TWA	200 mg/m3		Skin	ACGIH
Naphthalene		STEL	15 ppm		Skin	ACGIH
Naphthalene		TWA	10 ppm		Skin	ACGIH

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Use explosion-proof ventilation equipment to stay below exposure limits.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

No special requirements under ordinary conditions of use and with adequate ventilation.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

Chemical resistant gloves are recommended.

Eye Protection: If contact is likely, safety glasses with side shields are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

Chemical / oil resistant clothing if contact with material is likely.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

See Sections 6, 7, 12, 13.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.

GENERAL INFORMATION

Physical State: Liquid
Colour: Pale yellow
Odour: Petroleum/solvent
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 C): 0.81
Flash Point [Method]: 38C (100F) [ASTM D-93]
Flammable Limits (Approximate volume % in air): LEL: 0.7 UEL: 5.0
Autoignition Temperature: N/D
Boiling Point / Range: < 205C (401F)
Vapour Density (Air = 1): 4 at 101 kPa
VAPOUR PRESSURE: [N/D at 20°C] | < 1 kPa (7.5 mm Hg) at 38C
Evaporation Rate (N-Butyl Acetate = 1): N/D
pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): > 3.5
Solubility in Water: Negligible
Viscosity: [N/D at 40°C] | 8.8 cSt (8.8 mm^2/sec) at -20C
Oxidizing properties: See Sections 3, 15, 16.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: N/A
Pour Point: -40°C (-40°F)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

MATERIALS TO AVOID: Halogens, Strong Acids, Alkalies, Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

Route of Exposure	Conclusion / Remarks
INHALATION	
Toxicity (Rat): LC50 > 5000 mg/m³	Minimally Toxic. Based on test data for structurally similar materials.
Irritation: No end point data.	Elevated temperatures or mechanical action may form vapours, mist, or fumes which may be irritating to the eyes, nose, throat, or lungs. Based on assessment of the components.
Ingestion	
Toxicity (Rat): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Skin	
Toxicity (Rabbit): LD50 > 2000 mg/kg	Minimally Toxic. Based on test data for structurally similar materials.
Irritation (Rabbit): Data available.	Moderately irritating to skin with prolonged exposure. Based on test data for structurally similar materials.
Eye	
Irritation (Rabbit): Data available.	May cause mild, short-lasting discomfort to eyes. Based on test data for structurally similar materials.

CHRONIC/OTHER EFFECTS

For the product itself:

Vapour/aerosol concentrations above recommended exposure levels are irritating to the eyes and respiratory tract, may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness and other central nervous system effects including death. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.
Jet fuel: Some jet fuels have potential in mice to suppress indicators of immune system functionality. The relevance of these effects to humans is uncertain.

Contains:

DIETHYLENE GLYCOL MONOMETHYL ETHER: Oral maternal exposure of animals resulted in teratogenicity. Dermal maternal exposure of animals resulted in slight toxicity to the fetus. KEROSENE: Carcinogenic in animal tests. Lifetime skin painting tests produced tumours, but the mechanism is due to

repeated cycles of skin damage and restorative hyperplasia. This mechanism is considered unlikely in humans where such prolonged skin irritation would not be tolerated. Did not cause mutations in-vitro. Inhalation of vapours did not result in reproductive or developmental effects in laboratory animals. Inhalation of high concentrations in animals resulted in respiratory tract irritation, lung changes and some reduction in lung function. Non-sensitizing in animal tests. NAPHTHALENE: Exposure to high concentrations of naphthalene may cause destruction of red blood cells, anemia, and cataracts. Naphthalene caused cancer in laboratory animal studies, but the relevance of these findings to humans is uncertain.

Additional information is available by request.

CMR Status:

Chemical Name	CAS Number	List Citations
KEROSENE	8008-20-6	4
Naphthalene	91-20-3	3, 4

--REGULATORY LISTS SEARCHED--

1 = IARC 1
2 = IARC 2A
3 = IARC 2B
4 = ACGIH ALL
5 = ACGIH A1
6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Expected to be toxic to aquatic organisms.

MOBILITY

More volatile component -- Highly volatile, will partition rapidly to air. Not expected to partition to sediment and wastewater solids.
High molecular wt. component -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Majority of components -- Expected to be inherently biodegradable

Atmospheric Oxidation:

More volatile component -- Expected to degrade rapidly in air

BIOACCUMULATION POTENTIAL

Majority of components -- Has the potential to bioaccumulate, however metabolism or physical properties may reduce the bioconcentration or limit bioavailability.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Regulatory Disposal Information

Empty Container Warning Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (TDG)

Proper Shipping Name: FUEL, AVIATION, TURBINE ENGINE
Hazard Class & Division: 3
UN Number: 1863
Packing Group: III
Special Provisions: 17

Footnote: In containers of 454 litres or less this material is exempt from TDG regulations.

LAND (DOT)

Proper Shipping Name: FUEL, AVIATION, TURBINE ENGINE
Hazard Class & Division: COMBUSTIBLE LIQUID
ID Number: 1863
Packing Group: III
ERG Number: 128
Label(s): NONE
Transport Document Name: FUEL, AVIATION, TURBINE ENGINE, COMBUSTIBLE LIQUID, UN1863, PG III

Footnote: The flash point of this material is greater than 38°C/100°F. Regulatory classification of this material varies. DOT: Flammable liquid or combustible liquid. OSHA: Combustible liquid. IATA/IMO: Flammable liquid. This material is not regulated under 49 CFR in a container of 450 litre/119 gallon capacity or less when transported solely by land, as long as the material is not a hazardous waste, a marine pollutant, or specifically listed as a hazardous substance.

SEA (IMDG)

Proper Shipping Name: FUEL, AVIATION, TURBINE ENGINE
Hazard Class & Division: 3
EMS Number: F-E, S-E
UN Number: 1863
Packing Group: III
Label(s): 3
Transport Document Name: FUEL, AVIATION, TURBINE ENGINE, 3, UN1863, PG III

AIR (IATA)

Proper Shipping Name: FUEL, AVIATION, TURBINE ENGINE
Hazard Class & Division: 3
UN Number: 1863
Packing Group: III
Label(s) / Mark(s): 3
Transport Document Name: FUEL, AVIATION, TURBINE ENGINE, 3, UN1863, PG III

SECTION 15 REGULATORY INFORMATION

WHMIS Classification: Class B, Division 3: Combustible Liquids Class D, Division 2, Subdivision A: Very Toxic Material Class D, Division 2, Subdivision B: Toxic Material

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations.

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

National Chemical Inventory Listing: AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
Naphthalene	91-20-3	1, 6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2
3 = TSCA 5e
4 = TSCA 6
5 = TSCA 12b
6 = NPRI

SECTION 16 OTHER INFORMATION

N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 04: First Aid Eye - Header was modified.
Section 04: First Aid Ingestion - Header was modified.
Section 06: Notification Procedures - Header was modified.
Section 11: Ingestion Acute Lethality - Header was modified.
Section 08: Hand Protection was modified.
Section 09: Vapour Pressure - Header was modified.
Section 05: Hazardous Combustion Products was modified.
Section 06: Accidental Release- Spill Management- Water was modified.
Section 14: Sea (IMDG) - Header was modified.
Section 14: Label(s) - Header was modified.
Section 15: National Chemical Inventory Listing - Header was modified.

Section 16: Synonyms was modified.
Section 16: Health Hazards - Header was modified.
Section 16: Physical Hazards - Header was modified.
Section 08: Exposure Limits Table was modified.
Section 16: Water Spill was modified.
Section 11: Chronic Tox - Product was modified.
Section 11: Chronic Tox - Component - WHMIS was modified.
Composition: Constituents Table - Header was added.
Composition: CAS Number was added.
Composition: CAS Number was added.
Composition: Concentration - Header was added.
Composition: Concentration - Header was added.
Composition: Primary Ingredient Name was added.
Composition: Primary Ingredient Name was added.
Composition: Substances Table - Header was added.
Composition: No components was added.
Composition: Concentration Footnote was added.
Section 08: OEL Table - Substance Name Column - Header was added.
Section 08: OEL Table - Form Column - Header was added.
Section 08: OEL Table - Limit Column - Header was added.
Section 08: OEL Table - Notation Column - Header was added.
Section 08: OEL Table - Source Column - Header was added.
Section 13: Regulatory Disposal Information - Header was added.
Section 13: Regulatory Disposal Information - Header was deleted.
Composition: Concentration Footnote was deleted.
Composition: Primary Ingredient Name was deleted.
Composition: Primary Ingredient Name was deleted.
Composition: CAS Number was deleted.
Composition: CAS Number was deleted.
Composition: Concentration - Header was deleted.
Composition: Concentration - Header was deleted.
Composition: Constituents Table - Header was deleted.
Composition: Substances Table - Header was deleted.
Composition: No components was deleted.
Section 08: OEL Table - Form Column - Header was deleted.
Section 08: OEL Table - Limit Column - Header was deleted.
Section 08: OEL Table - Notation Column - Header was deleted.
Section 08: OEL Table - Source Column - Header was deleted.
Section 08: OEL Table - Substance Name Column - Header was deleted.

SYNONYMS: ESSO TURBO FUEL A-1, KEROSENE-TYPE AVIATION TURBINE FUEL, JET A, JET A-1, AVIATION TURBINE FUEL, JET A-1 (FSII), CAN/CGSB-3.24 GRADE F34

Precautionary Label Text:
WHMIS Classification: Class B, Division 3: Combustible Liquids Class D, Division 2, Subdivision A: Very Toxic Material Class D, Division 2, Subdivision B: Toxic Material

Health Hazards
Irritating to skin. Danger of serious damage to health by prolonged exposure. May cause harm to the unborn child. If swallowed, may be aspirated and cause lung damage. May cause central nervous system depression.

Target Organs: Reproductive system | Skin |

Physical Hazards
In use, may form flammable/explosive vapour-air mixture. Combustible. Material can accumulate static charges which may cause an incendiary electrical discharge.

PRECAUTIONS
Avoid contact with skin. Do not siphon by mouth. Use proper bonding and/or earthing procedures.

FIRST AID
Eye: Flush thoroughly with water. If irritation occurs, get medical assistance.

Oral: Seek immediate medical attention. Do not induce vomiting.

Skin: Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

FIRE FIGHTING MEDIA
Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

SPILL/LEAK
Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. Report spills as required to appropriate authorities. If the Flash Point exceeds the Ambient Temperature by 10 deg C or more, use containment booms and remove from the surface by skimming or with suitable absorbents when conditions permit. If the Flash Point does not exceed the Ambient Air Temperature by at least 10C, use booms as a barrier to protect shorelines and allow material to evaporate. Seek the advice of a specialist before using dispersants.
Use
Not intended or suitable for use in or around a household or dwelling.

DGN: 5007485 (1012675)

Prepared By: Imperial Oil Limited, IH and Product Safety