



January 15, 2015

Phyllis Beaulieu  
Manager of Licensing  
Nunavut Water Board  
P.O. Box 119  
Gjoa Haven, NU X0B 1J0

**RE: 1BR-GLA0815 Water Use Licence Renewal**

Dear Phyllis:

Defence Construction Canada is submitting the following water use licence renewal for the continuation of the landfill monitoring program at CAM-2, Gladman Point DEW Line site. The application is being submitted on behalf of the Department of National Defence.

In addition to the application form, a remote camp questionnaire, an Executive Summary in English and Inuktitut, a detailed landfill monitoring program, updated site drawings, site map, NIRB Decision, and Spill Contingency Plan are being provided.

We trust the information provided is sufficient for you to process the application. Please feel free to contact the undersigned if you have any questions or comments.

Sincerely,



Tamara Van Dyck BSc  
Coordinator, Environmental Services  
Defence Construction Canada  
613-995-9741  
[Tamara.VanDyck@dcc-cdc.gc.ca](mailto:Tamara.VanDyck@dcc-cdc.gc.ca)

Encl. Renewal Application Form, Remote Camp Questionnaire, Executive Summary in English and Inuktitut, Detailed Landfill Monitoring Program, Site Drawings, Site Map, NIRB Decision, Spill Contingency Plan



## Application for Water Licence Renewal

Document Date: April 2013

Application Submission Date:

**01/19/2015**  
Month/Day/Year

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## DOCUMENT MANAGEMENT

Original Document Date: April 2010

### DOCUMENT AMENDMENTS

	Description	Date
(1)	Updated for public distribution as separate document from NWB Guide 7	June 2010
(2)	Updated NWB logos and reformatted table to allow rows to break across page	May 2011
(3)	New NWB logo and request for background information	April 2013
(4)		
(5)		
(6)		
(7)		
(8)		
(9)		
(10)		



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## APPLICATION FOR WATER LICENCE RENEWAL

Your application may be classified as a **renewal** only if all operations remain the same as previously licensed and only the term of the licence requires change. If your application contemplates:

- a change to the volume of water authorized for use;
- a new activity related to water use or waste disposal;
- a new component related to water use or waste disposal;
- a change in predicted environmental impacts(s); and/or
- a change to any term or condition of the original licence

your application is **NOT** classified as a renewal but rather an amendment and will require submission of an Application for Water Licence Amendment. Licensees applying for combined renewal / amendment are also referred to the Application for Water Licence Amendment.

The applicant is referred to the NWB's Guide 7: *Licensee Requirements Following the Issuance of a Water Licence* for more information about this application form.

Where possible, provide background information regarding the original licence application or attach previously submitted information.

**EXISTING LICENCE NO: 1BR-GLA0815**

**1. LICENSEE CONTACT INFORMATION**

Is the licensee the same as that referred to on the existing licence?

☒ Yes    ☐ No

If No, a licence assignment must be completed and approved by the NWB. **A renewal will only be issued in the name of the current licensee in the absence of assignment of the licence.**

If the licensee is the same, but the name of the licensee has changed, attach a certificate of name change.

Name: **Tamara Van Dyck**  
**Coordinator, Environmental Services**  
**Defence Construction Canada**  
Address: **180 Kent St., 14<sup>th</sup> Floor**  
**Ottawa, ON**  
**K1P 0B6**  
Phone: **613-995-9741**  
Fax: **613-996-9847**  
e-mail: **Tamara.VanDyck@dcc-cdc.gc.ca**

**2. LICENSEE REPRESENTATIVE CONTACT INFORMATION – If different from Block 1.**

Name:  
Address:  
Phone:  
Fax:  
e-mail:  
(Attach authorization letter.)

**3. NAME OF PROJECT**

Is the name of the project the same as that considered in the existing water licence?

☒ Yes    ☐ No

Indicate the name of the project including the name of the location: **DEW Line Clean-Up Project, CAM-2 – Gladman Point**

#### 4. LOCATION OF UNDERTAKING

Is the location of the undertaking the same as that considered in the existing water licence?

☒ Yes    ☐ No

##### Project Extents

NW:	Latitude: ( <b>68</b> ° <b>40</b> ' " N)	Longitude: ( <b>97</b> ° <b>49</b> ' " W)
NE:	Latitude: (   °   ' " N)	Longitude: (   °   ' " W)
SE:	Latitude: (   °   ' " N)	Longitude: (   °   ' " W)
SW:	Latitude: (   °   ' " N)	Longitude: (   °   ' " W)

##### Camp Location(s)

Latitude: (   °   ' " N)                      Longitude: (   °   ' " W)

#### 5. MAP

Are the locations of the main components of the undertaking the same as those considered in the existing licence?

☒ Yes    ☐ No

Attach a topographical map, indicating the main components of the undertaking.

NTS Map Sheet No.: **57B**      Map Name: \_\_\_\_\_      Map Scale: **1:50,000**

## 6. NATURE OF INTEREST IN THE LAND

Is the nature of the interest in the land the same as that considered in the existing water licence?

☒ Yes    ☐ No

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 \_\_\_\_\_

Date (expected date) of issuance: \_\_\_\_\_ Date of expiry: \_\_\_\_\_

Is the name of the entity(s) holding authorizations the same as that considered in the existing water licence?

☒ Yes    ☐ No

If No, a licence assignment must be completed and approved by the NWB.

Name of entity(s) holding authorizations:

\_\_\_\_\_

## 7. NUNAVUT PLANNING COMMISSION (NPC) DETERMINATION

Is the undertaking located in the same land use planning area as that considered in the existing licence?

☒ Yes ☐ No

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

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

Was a land use plan conformity determination required from NPC prior to the issuance of the existing water licence?

☐ Yes ☒ No

If Yes, indicate date issued and attach copy. \_\_\_\_\_

Does the proposed renewal change the original NPC conformity determination or the need to obtain one?

☐ Yes ☒ No

If Yes, indicate date issued (or expected) and attach a copy. \_\_\_\_\_  
If No, provide written confirmation from NPC confirming that a land use plan conformity review is not required.

## 8. NUNAVUT IMPACT REVIEW BOARD (NIRB) DETERMINATION

Was a screening determination required from NIRB prior to the issuance of the existing water licence?

☒ Yes ☐ No

If Yes, indicate date issued and attach copy. **03DN003**

Does the proposed renewal change the original NIRB screening determination or the need to obtain one?

☐ Yes ☒ No

If Yes, indicate date issued (or expected) and attach a copy. \_\_\_\_\_  
If No, provide written confirmation from NIRB confirming that a screening determination is not required.

## 9. DESCRIPTION OF UNDERTAKING

Is the description of the undertaking the same as that considered in the existing water licence?

☒ Yes ☐ No

List and attach plans and drawings or project proposal.

**Description of Landfill Monitoring Program**  
**DND/NTI Cooperation Agreement**  
**CAM-2, Gladman Point Drawings**  
**Camp Questionnaire**  
**NIRB Decision**  
**CAM-2, Gladman Point Map Drawing**  
**Spill Contingency Plan**



## 10. OPTIONS

Are the alternative methods and locations that were considered to carry out the project the same as those considered in the existing water licence?

☐ Yes    ☒ No

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

## 11. CLASSIFICATION OF PRIMARY UNDERTAKING

Is the primary undertaking the same as that considered in the existing water licence?

☒ Yes    ☐ No

Indicate the primary classification of undertaking by checking one of the following boxes.

- |   |   |
|---|---|
| <input type="checkbox"/> Industrial   | <input type="checkbox"/> Agricultural                               |
| <input type="checkbox"/> Mining and Milling (includes exploration/drilling/exploration camps) |   |
| <input type="checkbox"/> Conservation   |   |
| <input type="checkbox"/> Municipal (includes camps/lodges)                                    | <input type="checkbox"/> Recreational                               |
| <input type="checkbox"/> Power  | <input checked="" type="checkbox"/> Miscellaneous (describe below): |

**Landfill monitoring, including the collection of soil and groundwater samples.**

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

## 12. WATER USE

Is the type(s) of water use(s) the same as that considered in the existing water licence?

☒ Yes    ☐ No

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

- |   |   |
|---|---|
| <input type="checkbox"/> To obtain water for camp/ municipal purposes           |   |
| <input type="checkbox"/> To obtain water for industrial purposes                | <input type="checkbox"/> To divert a watercourse                    |
| <input type="checkbox"/> To cross a watercourse                                 | <input type="checkbox"/> To modify the bed or bank of a watercourse |
| <input type="checkbox"/> To alter the flow of, or store water                   | <input type="checkbox"/> Flood control                              |
| <input checked="" type="checkbox"/> Other: <b>To obtain groundwater samples</b> |   |

### 13. QUANTITY OF WATER INVOLVED

Is the source of water the same as that considered in the existing licence?

☒ Yes ☐ No

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

Is the quality of the water source and its available capacity the same as that considered in the existing licence?

☒ Yes ☐ No

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

\_\_\_\_\_

Is the overall estimated quantity of water to be used the same as that considered in the existing licence?

☒ Yes ☐ No

Provide the overall estimated quantity of water to be used: **less than 1 m<sup>3</sup>/day**

Are the quantity(s) of water to be used from each source the same as those considered in the existing licence?

☒ Yes ☐ No

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

\_\_\_\_\_

Are the quantity(s) of water to be used for each purpose the same as those considered in the existing licence?

☒ Yes ☐ No

Provide the estimated quantities to be used for each purpose (camp, drilling, etc.): \_\_\_\_\_

\_\_\_\_\_

Are the method(s) of extraction the same as those considered in the existing licence?

☒ Yes ☐ No

Describe the method(s) of extraction: **Monitoring well sample extraction**

Are the quantity(s) of water returned to source(s) the same as those considered in the existing licence?

☒ Yes ☐ No

Estimated quantity(s) of water returned to source(s): **0 m<sup>3</sup>/day**

Are the quality(s) of water(s) returned to source(s) the same as those considered in the existing licence?

☒ Yes ☐ No

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

\_\_\_\_\_

—

**14. WASTE**

Are the type(s) of waste(s) to be generated and/ or deposited the same as those considered in the existing licence?

☐ Yes ☐ No

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

- |  |   |
|--|---|
| <input type="checkbox"/> Sewage                  | <input type="checkbox"/> Waste oil                      |
| <input type="checkbox"/> Solid Waste             | <input type="checkbox"/> Greywater                      |
| <input type="checkbox"/> Hazardous               | <input type="checkbox"/> Sludges                        |
| <input type="checkbox"/> Bulky Items/Scrap Metal | <input type="checkbox"/> Contaminated soil and/or water |
| <input type="checkbox"/> Animal Waste            |   |

**X Other (describe): The camp requirements are fairly minimal as the program can be completed in approximately 4-5 days. The only waste expected is sewage, which will be deposited into a pit toilet and buried onsite. There are no other wastes expected from the landfill monitoring program.**

# 15. QUANTITY AND QUALITY OF WASTE INVOLVED

Are the quantity(s) of the types of wastes involved the same as those considered in the existing licence?

☒ Yes ☐ No

Are the composition(s) of the types of wastes involved the same as those considered in the existing licence?

☒ Yes ☐ No

Are the method(s) of treatment for the types of waste involved the same as those considered in the existing licence?

☒ Yes ☐ No

Are the method(s) of disposal for the types of waste involved the same as those considered in the existing licence?

☒ Yes ☐ No

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

# 16. OTHER AUTHORIZATIONS

In addition to the sub-surface and surface land use authorizations provided in Block 6, are the same authorizations required as considered in the existing licence?

☒ Yes ☐ No

For each provide the following:

Authorization: N/A

Administering Agency: \_\_\_\_\_

Project Activity: \_\_\_\_\_

Date (expected date) of issuance: \_\_\_\_\_ Date of expiry: \_\_\_\_\_

**17. PREDICTED ENVIRONMENTAL IMPACTS OF UNDERTAKING AND PROPOSED MITIGATION MEASURES**

Are predicted environmental impacts of the undertaking and proposed mitigation measures the same as those considered in the existing water licence?

☒ Yes ☐ No

Describe direct, indirect, and cumulative impacts related to water and waste.

**18. WATER RIGHTS OF EXISTING AND OTHER WATER USERS**

Are the effects of the undertaking on any known persons or property including those that hold licences for water use in precedence 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, the same as those considered in the existing water licence?

☒ Yes ☐ No

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.

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

**19. INUIT WATER RIGHTS**

Are the effects of the undertaking on the quality, quantity or flow of waters flowing through Inuit Owned Land (IOL) the same as those considered in the existing water licence?

☒ Yes ☐ No

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).

**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. **The DEW Line Clean Up Project included an extensive amount of consultation meetings (occurring in the 1990's); these consultations resulted in the Clean Up Protocol implemented in this project. The Long Term Monitoring portion of this project is the comprehensive measures to address any of the concerns expressed.**

## 21. SECURITY INFORMATION

Is the financial security assessment the same as that considered in the existing water licence?

☒ Yes ☐ No

Is the estimate of the total financial security for final reclamation the same as that considered in the existing water licence?

☒ Yes ☐ No

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.

## 22. FINANCIAL INFORMATION

Is the statement of financial security the same as that considered in the existing water licence?

☒ Yes ☐ No

Provide an updated statement of financial security. **N/A**

If the applicant is a business entity please answer the questions below:

Is the list of the officers of the company the same as those considered in the existing water licence?

☐ Yes ☐ No

Provide a list of the officers of the company.

**N/A**

Is the Certificate of Incorporation or evidence of registration of the company name the same?

☒ Yes ☐ No

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 updated studies, reports, research etc.

**A full environmental clean up of the site was completed in 2005. No further studies have been completed.**

Provide a compliance assessment and status report including a response to any inspector's reports. The licensee must contact the NWB for licence specific direction in completing the assessment and report. **N/A**

If in non-compliance, a licence may not be issued until compliance is achieved. If in non-compliance, attach plans/reports for consideration. Application will not be processed if significant issues of non-compliance exist. **N/A**

## 24. PROPOSED TIME SCHEDULE

Is the time schedule for all phases of development (construction, operations, closure and post closure) the same as that considered in the existing licence?

☒ Yes    ☐ No

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

Construction

Proposed Start Date: \_\_\_\_\_ Proposed Completion Date: \_\_\_\_\_  
(month/year) (month/year)

Operation

Proposed Start Date: \_\_\_\_\_ Proposed Completion Date: \_\_\_\_\_  
(month/year) (month/year)

Closure

Proposed Start Date: \_\_\_\_\_ Proposed Completion Date: \_\_\_\_\_  
(month/year) (month/year)

Post - Closure

Proposed Start Date: \_\_\_\_\_ Proposed Completion Date: \_\_\_\_\_  
(month/year) (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**

On what date does the existing licence expire? October 30, 2015

Indicate the proposed term of the renewal (maximum of 25 years): 25 years

Requested date of renewal issuance: 10/2015 Requested Expiry Date: 10/2040  
(month/year) (month/year)

(The requested date of renewal 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**

Is the annual report template expected to be the same as that considered in the existing licence?

☒ Yes ☐ No

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.



## 27. CHECKLIST

The following must be included with the application for renewal for the water licensing process to begin.

Completed Application for Water Licence Renewal form.

☒ Yes ☐ No If no, date expected \_\_\_\_\_

Updated plans, including designs and reports (see Block 23).

☒ Yes ☐ No If no, date expected \_\_\_\_\_

Updated security assessment (see Block 21).

☐ Yes ☒ No If no, date expected **N/A**

Updated financial statement (see Block 22).

☐ Yes ☒ No If no, date expected **N/A**

Compliance Assessment / Status Report (see Block 23).

☐ Yes ☒ No If no, date expected **N/A**

English Summary of Renewal Application.

☒ Yes ☐ No If no, date expected \_\_\_\_\_

Inuktitut and/or Inuinnaqtun Summary of Renewal Application.

☒ Yes ☐ No If no, date expected \_\_\_\_\_

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

☐ Yes ☒ No If no, date expected **N/A**

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.

☐ Yes ☒ No If no, date expected **N/A**

## 28. SIGNATURE

I, **Tamara Van Dyck** (print name)

certify that the application requires no changes to water use or waste disposal as previously authorized and that the information given on this form is, to the best of my knowledge, correct and complete.



Signature

Date

**Jan. 19, 2015**



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## EXPLORATION/ REMOTE CAMP SUPPLEMENTARY QUESTIONNAIRE

**Applicant:** Department of National Defence **Licence No:**

(For NWB Use Only)

### ADMINISTRATIVE INFORMATION

1. **Environment Manager: Tamara Van Dyck, Defence Construction Canada Tel: 613-995-9741 \_\_\_\_\_ Fax: 613-996-9847 E-mail: Tamara.VanDyck@dcc-cdc.gc.ca**
2. Project Manager: Laura D'Costa Tel: 613-943-7852 Fax: 613-996-9848 E-mail: Laura.dcosta@forces.gc.ca
3. Does the applicant hold the necessary property rights? **Yes, the land is DND Reserve**
4. Is the applicant an 'operator' for another company (i.e., the holder of the property rights)? If so, please provide letter of authorization. **N/A**
5. Duration of the Project  
☐ One year or less Start and completion dates: **N/A**  
☒ Multi Year:

If Multi-Year indicate proposed schedule of on site activities

Start: **August 15** Completion: **August 30**

### CAMP CLASSIFICATION

6. Type of Camp  
☐ Mobile (self-propelled)  
☐ Temporary  
☐ Seasonally Occupied: \_\_\_\_\_  
☐ Permanent  
☐ Other: **N/A**
7. What is the design, maximum and expected average population of the camp?  
**The camp at CAM2 will be able to accommodate 5-8 people.**
8. Provide history of the site if it has been used in the past.

**CAM2 is a former DEW Line site that was closed in the early 1990's, with full remediation completed in 2005.**

## CAMP LOCATION

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

**The camp will likely be located on the Airstrip apron.**

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.

**The camp location was selected based on access and availability of a flat gravel pad.**

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

<input checked="" type="checkbox"/>	Crown Lands	Permit Number (s)/Expiry Date: <b>not required</b>
<input type="checkbox"/>	Commissioners Lands	Permit Number (s)/Expiry Date: _____
<input type="checkbox"/>	Inuit Owned Lands	Permit Number (s)/Expiry Date: _____

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

**The closest community is Gjoa Haven, approximately 75 km west of the site.**

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

**Notification of the proposed work is part of the terms of reference that the contractor must comply with, and it is therefore the contractors' responsibility to notify the communities.**

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?

**The monitoring program will have minimal to no impacts.**

## PURPOSE OF THE CAMP

15. ☐ Mining (includes exploration drilling)  
☐ Tourism (hunting, fishing, wildlife observation, adventure/expedition, etc.)  
(Omit questions # 16 to 21)  
☒ Other **Landfill Monitoring Program**

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)
- ☒ Other: **collection of surface soil and groundwater samples and monitoring of ground temperatures**

17. Type of deposit (exploration focus):

- ☐ Lead Zinc
- ☐ Diamond
- ☐ Gold
- ☐ Uranium
- ☐ Other: \_\_\_\_\_

## DRILLING INFORMATION

18. Drilling Activities

- ☐ Land Based drilling
- ☐ Drilling on ice

**N/A**

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.

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

**See attached Spill Contingency Plan. The spill kit will be located at the camp.**

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

**At most, there will be 1 x 200 litre barrel of unleaded gasoline onsite to refueling an ATV.**

## **WATER SUPPLY AND TREATMENT**

26. Describe the location of water sources.

**Bottled water will be brought to site for drinking water purposes. Additional water may be extracted from the water supply lakes and filtered for use.**

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

- ☐ Domestic Use: **<1m<sup>3</sup>/day** Water Source: **Hamlet water supply**  
☐ 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:

**Water will be extracted using buckets or bottles if required. It is not anticipated that an intake with a fish screen will be required.**

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

**Bottled drinking water will be brought to site. If additional water is required, it will be extracted from the summer water supply lake, filtered, and treated with iodine.**

30. Will drinking water be treated? How?  
**See comment above.**

31. Will water be stored on site?  
**No- only bottled water.**

## WASTE TREATMENT AND DISPOSAL

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

☒ Camp Sewage (blackwater)

\_\_\_\_\_ **sewage will be disposed of in a pit toilet and buried.**\_\_\_\_\_

☒ Camp Greywater

\_\_\_\_\_ **Any greywater generated will be disposed of in a pit and buried.**\_\_\_\_\_

☒ Solid Waste

\_\_\_\_\_ **Any solid wastes generated from the camp will be removed from site.**\_\_\_\_\_

☐ Bulky Items/Scrap Metal

\_\_\_\_\_  
☐ Waste Oil/Hazardous Waste

\_\_\_\_\_  
☒ Empty Barrels/Fuel Drums

\_\_\_\_\_ **Will be removed from site at the end of each monitoring event.**\_\_\_\_

☐ Other: N/A

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?

N/A

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?

**This is part of the monitoring program outlined in the supporting documents.**

## 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

## ABANDONMENT AND RESTORATION

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

**Abandonment and restoration activities have already been completed at this site and the landfill monitoring program is used to monitor the status of the site, post clean up. All equipment used for the program will be removed each year upon completion.**

## BASELINE DATA

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

- ☐ 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: \_\_\_\_\_

N/A

## 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:

- ✓ 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*

## CAM-2, Gladman Point Post-Construction Monitoring Program

### INTRODUCTION

The following summary is being provided for the post-construction landfill monitoring program as described in the DND-NTI Environmental Cooperation Agreement for the former CAM-2, Gladman Point DEW Line site. There are five landfill areas at the CAM-2 site that are included in this landfill monitoring program:

- Non-Hazardous Waste Landfill
- Tier II Soil Disposal Facility
- Station Landfill
- West Landfill – North
- West Landfill – South

### BACKGROUND

The Department of National Defence (DND), in cooperation with Nunavut Tunngavik Incorporated (NTI), developed a landfill monitoring plan to address post closure monitoring requirements for the landfills at the DEW Line Sites. Defence Construction Canada (DCC) is managing the cleanup and monitoring programs on behalf of DND.

The objective of the landfill monitoring program is to collect sufficient information to assess the performance of the landfills from a geotechnical and environmental perspective. The landfill monitoring plan specifies the requirements for visual inspection, and chemical and thermal monitoring of landfills at the DEW Line sites under DND's jurisdiction.

### PROGRAM COMPONENTS

The post-construction landfill monitoring program consists of four main components to measure the performance of the landfills, depending on the remediation plan for each landfill. These components are visual, soil, groundwater and thermal monitoring. Details on each of the monitoring components are provided below.

**Visual Monitoring:** The physical integrity of the landfill is inspected and reported using hand-drawn sketches. Documented observations include:

- Evidence of settlement, ponding, frost action, erosion, and lateral movement.
- Sloughing of berms/covering layers, thermal contraction cracks, etc.

Photographic records are to be provided to document the general condition of the landfill and to substantiate all recorded observations.

**Soil and Groundwater Monitoring:** The soil and groundwater monitoring program consists of baseline/background assessment and contaminant evaluation. Background conditions represent soil and water quality from an area not impacted by the landfill. Background (naturally occurring) values are obtained from samples collected from areas that were not directly influenced by activities at the DEW Line site, but are indicative of the prevailing geochemistry. These samples are taken hydraulically upgradient and at some distance from the landfill.



Soil and groundwater samples (where required) are collected prior to construction/closure of a landfill, to represent background as well as baseline conditions. The results of subsequent landfill monitoring events are compared to these baseline and background values to evaluate any potential changes in environmental conditions. Samples are to be analyzed for the following constituents:

- PCBs (polychlorinated biphenyls – Total Aroclor analysis);
- Total Petroleum Hydrocarbons (TPH); and
- Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury.

In general, at least one monitoring well was installed upgradient and two to three wells were installed downgradient of the landfill during the construction phase. Review of analytical data from water samples collected from wells up and down gradient allows evaluation of potential impacts associated with the landfill. Soil samples are collected from the toe of the landfill, generally from the same locations as the monitoring wells. Contamination in soil samples at the toe of the landfill reflects chronic input from water that may have infiltrated the landfill, and is an important factor of contaminated leachate. Prior to collection of samples from a monitoring well, the well is purged and allowed to reach equilibrium. Physical measurements are collected prior to and after purging and are referenced to the top of the monitoring well pipe.

**Thermal Monitoring:** Geothermal analyses were carried out as part of the design to predict the length of time required for permafrost aggradation through landfills requiring leachate containment, including the Tier II Soil Disposal Facility. These analyses also provided information on the long and short term thermal regime in the ground, and the depth of the active layer in the cover material.

A thermal monitoring system provides measurement of sub-surface ground temperatures, which allows comparison to and verification of the predicted ground temperatures. The thermal monitoring system consists of installation of thermistor strings, with thermistor beads at selected intervals to provide ground temperature profiles at various locations within the landfill. The thermistor strings are attached to automated data-loggers that allow for remote data collection. In general, a minimum of three thermistors are installed at each landfill where permafrost aggradation through the landfill contents is an integral part of the design.

## **FREQUENCY**

The landfill monitoring program consists of three phases, as described in detail below.

**Phase I:** Phase I involves monitoring of conditions to confirm that equilibrium is achieved. The frequency of monitoring events during Phase I monitoring is dependent on the closure or remediation design at specific landfills. The landfills will be monitored on an annual basis for the first five years in Phase I monitoring. The five-year term was selected on the basis that ground-temperature thermal regimes at these specific landfills will require three to five years to reach equilibrium.

An evaluation of all Phase I data will be carried out at the end of five years to confirm that thermal and chemical equilibrium is achieved, and that no stability issues had been identified. The landfill

monitoring events are carried out by independent contractors, who successfully win the competitive tender.

**Phase II:** Phase II monitoring is the verification of equilibrium conditions established in Phase I. The monitoring frequency in Phase II is downgraded from Phase I and will be carried out according to the following schedule, year 7, year 10, year 15 and year 25. Year 25 marks the end of Phase II monitoring.

**Phase III:** Phase III involves the monitoring for long-term issues such as liner integrity, permafrost stability, and significant storm events. At the end of the Phase II program, 25 years after construction, a re-evaluation of the landfill monitoring program will be carried out prior to initiating any Phase III program. The scope of the Phase III monitoring program is not included here, but is anticipated to be based on a 10 year monitoring interval.

## **REVIEW AND EVALUATION PROCESS**

An Environmental Working Group (EWG) was established to provide a technical report and to support the DLCU Steering Committee. This working group is comprised of qualified engineering and environmental scientists with expertise in environmental remediation and clean up in northern climates. The EWG has four designated representatives, two from each of the Owner (DND) and the Inuit (through the NTI), respectively.

During the monitoring program, the EWG reviews the results of the monitoring program in accordance with the methodology as described previously. The results of the review and any recommendations regarding changes to the monitoring plan and/or remediation requirements are reported to the DND/NTI Steering Committee.

The requirement for further monitoring after 25 years is evaluated. Monitoring may be terminated if the performance of the landfill was satisfactory over the period of monitoring from an environmental, geotechnical and thermal perspective, as appropriate. The assessment of satisfactory performance is carried out jointly by the NTI and DND.

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**Defence Construction Canada  
Landfill Monitoring Program  
Water Use License Application  
CAM-2, Gladman Point DEW Line Site**



Aerial photo of former CAM-2, Gladman Point DEW Line Site

Prepared by:  
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Project Number: 0171-137-01-08

February 2008

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Revision	Date	Issue/Revision Description
A	February 15, 2008	Issued for Submission



## Signature Page

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# 1.0 Introduction

The following information is being provided for the post-construction landfill monitoring program as described in the DND-NTI Environmental Cooperation Agreement for the former CAM-2, Gladman Point DEW Line site (see Appendix A). Information on both the development and review process for the program, as well as the specific components of the program are included.

## 1.1 Background

The CAM-2, Gladman Point DEW Line site is located on the south side of King William Island, at 68°40' N and 97°49'W. The site is located approximately 75 m west of Gjoa Haven and 300 km east of Cambridge Bay. CAM-2 was converted to a Short Range Radar site (SRR) in the early 1990's.

There are five landfill areas at the CAM-2 site that are included in this landfill monitoring program:

- Non-Hazardous Waste Landfill
- Tier II Soil Disposal Facility
- Station Landfill
- West Landfill – North
- West Landfill - South

## 1.2 Objective

The objective of the landfill monitoring program is to collect sufficient information to assess the performance of the landfills from a geotechnical and environmental perspective. The landfill monitoring plan specifies the requirements for visual inspection, and chemical and thermal monitoring of landfills at the DEW Line sites under DND's jurisdiction.

## 2.0 Program Components

The post-construction landfill monitoring program consists of four main components to measure the performance of the landfills, depending on the remediation plan for each landfill. These components are visual, soil, groundwater and thermal monitoring. Details on each of the monitoring components are provided below.

### 2.1 Visual Monitoring

The physical integrity of the landfill is inspected and reported using hand-drawn sketches. The documented observations include:

- settlement
- erosion
- frost action
- animal burrows
- vegetation re-establishment on surface
- staining
- vegetation stress
- seepage points or ponded water
- debris exposure

### 2.2 Soil and Groundwater Monitoring

The soil and groundwater program consists of baseline/background assessment and contaminant evaluation. Background conditions represent soil and water quality from an area not impacted by the landfill. Background (naturally occurring) values are obtained from samples collected from areas that were not directly influenced by activities at the DEW Line site, but are indicative of the prevailing geochemistry. These samples are taken hydraulically upgradient and at some distance from the landfill.

Soil and groundwater samples (where required) are collected prior to construction/closure of a landfill, to represent background as well as baseline conditions. The results of subsequent landfill monitoring events are compared to these baseline and background values to evaluate any potential changes in environmental conditions.

In general, at least one monitoring well is installed upgradient and two to three wells are installed downgradient of the landfill during the construction phase. Using water elevation data from a minimum of three wells allows assessment of the hydraulic gradient and flow velocities. Review of analytical data from water samples collected from wells up and downgradient allows evaluation of potential impacts associated with the landfill. Soil samples are collected from the toe of the landfill, generally from the same locations as the monitoring wells. Contamination in soil samples at the toe of the landfill reflects chronic input from water that may have infiltrated the landfill, and is an important factor of contaminated leachate.

### 2.2.1 Soil Sampling

The soil monitoring program has the following requirements:

- Soil samples are to be collected from 0 to 15 cm depth and at 40 to 50 cm depth, at the locations as indicated on the Drawings. If the specified sampling depth cannot be achieved, a sample shall be collected at or near the zone of refusal.
- When collecting soil samples at monitoring well locations, the soil samples are to be collected within a 2 - 4 metre radius of the monitoring well. Samples are not to be collected immediately adjacent to the well.
- Soil samples are to be collected with contaminant free utensils and stored in contaminant free containers that are appropriate for subsequent analytical use. Sampling utensils are to be thoroughly cleaned between each sampling episode and rinsed with distilled water. Alternatively, single use sampling utensils may be used.
- Soil samples are to be analyzed for the following constituents:
  - PCBs (polychlorinated biphenyls – Total Aroclor analysis);
  - Total Petroleum Hydrocarbons (TPH), as represented as the total of F1 (nC<sub>6</sub> to C<sub>10</sub>), F2 (nC<sub>10</sub> to nC<sub>16</sub>) and F3 (nC<sub>16</sub> to C<sub>34</sub>) as defined by CCME Tier I Method – Rev. 5 Analysis of Petroleum Hydrocarbons in Soil; and
  - Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc, and mercury.

### 2.2.2 Groundwater Sampling

The groundwater monitoring program has the following requirements:

- Monitoring wells are to be purged prior to sampling, maintaining a purge rate at 100 mL/min or less.
- Conductivity, pH, and temperature are to be monitored during purging. Groundwater samples are to be collected when values for these parameters have stabilized and at least one well volume has been purged.
- Final conductivity, pH, temperature and turbidity are to be recorded prior to collection of the groundwater sample.
- Sample bottles are to be filled during a single collection event.
- Groundwater samples are to be collected at the well locations as indicated on the Figures.
- The following groundwater analyses are required. It should be noted that where well volumes do not meet minimum requirements for sample volumes, the sampling is prioritized in the following order:
  - Inorganic elements – total concentrations: arsenic, cadmium, chromium, cobalt, copper, lead, nickel, zinc and mercury. Samples are not to be filtered.
  - PCBs (polychlorinated Biphenyls – Total Aroclor analysis).
  - Total Petroleum Hydrocarbons (TPH) Carbon Range C<sub>6</sub> to C<sub>34</sub>.

### 2.3 Thermal Monitoring

Geothermal analysis are carried out as part of the design to predict the length of time required for permafrost aggradation through landfills requiring leachate containment, including the Tier II Soil Disposal Facility. These analyses also provided information on the long and short term thermal regime in the ground, and the depth of the active layer in the cover material.

A thermal monitoring system provides measurement of sub-surface ground temperatures, which allows comparison to and verification of the predicted ground temperatures. The thermal monitoring system

consists of installation of thermistor strings, with thermistor beads at selected intervals to provide ground temperature profiles at various locations within the landfill. The thermistor strings are attached to automated data-loggers that allow for remote data collection. In general, a minimum of three thermistors are installed at each landfill where permafrost aggradation through the landfill contents is an integral part of the design.

The following are the requirements of the thermal monitoring program:

- The data is to be retrieved from the ground temperature data using a personal computer equipped with the appropriate software and the programming file from the specific datalogger. The programming file will be supplied by DND.
- The data is to be translated and view in the field to ensure completeness.
- Manual readings of the thermistor using a digital readout that is compatible with the thermistors or a multimeter and a switch box are to be collected.
- For the first monitoring event completed by the Consultant, the distance of the thermistor cable above ground is to be measured.
- A sketch to indicate the location of each cable is to be prepared.
- The datalogger memory will be reset memory to zero and restart readings. The system will be monitored using the personal computer to verify that thermistors are being measured.

## **2.4 Frequency**

The landfill monitoring program consists of three phases, as described in detail below.

### **2.4.1 Phase I**

Phase I involves monitoring of conditions to confirm that equilibrium is achieved. The frequency of monitoring events during Phase I monitoring is dependent on the closure or remediation design at specific landfills. The East Landfill and the Tier II Disposal Facility will be monitored on an annual basis for the first five years. The five-year term was selected on the basis that ground-temperature thermal regimes at these specific landfills will require three to five years to reach equilibrium. Typically, the remaining landfills are not required to be monitored every year in the first five years; however, because the Tier II Disposal Facility requires yearly monitoring, it is only prudent to complete the monitoring of the other landfills while on site.

An evaluation of all Phase I data will be carried out at the end of five years to confirm that thermal and chemical equilibrium is achieved, and that no stability issues are identified. The Phase I monitoring program may be extended, if required, to provide sufficient data to establish equilibrium conditions.

The first year of the Phase I post-construction monitoring is completed by the Environmental Sciences Group (ESG) of the Royal Military College of Canada, who are part of the DEW Line Clean Up Project Team. Subsequent landfill monitoring events are carried out by independent contractors, who successfully win the competitive tender.

### **2.4.2 Phase II**

Phase II monitoring is the verification of equilibrium conditions established in Phase I. The monitoring frequency in Phase II is downgraded from Phase I and will be carried out according to the following schedule: year 7, 10, 15 and 25. Year 25 marks the end of Phase II monitoring.

### **2.4.3 Phase III**

Phase III involves the monitoring for long-term issues such as liner integrity, permafrost stability and significant storm events. At the end of the Phase II program, 25 years after construction, a re-evaluation of the landfill monitoring program will be carried out prior to initiating any Phase III program. The scope of the Phase III monitoring program is not included here, but is anticipated to be based on a 10 year monitoring interval.

## **2.5 Review and Evaluation Process**

An Environmental Working Group (EWG) was established to provide a technical report and to support the DLCU Steering Committee. This working group is comprised of qualified engineering and environmental scientists with expertise in environmental remediation and clean up in northern climates. The EWG has four designated representatives, two from each of the Owner (DND) and the Inuit (through the NTI), respectively.

During the monitoring program, the EWG reviews the results of the monitoring program in accordance with the methodology as described previously. The results of the review and any recommendations regarding changes to the monitoring plan and/or remediation requirements are reported to the DND/NTI Steering Committee.

The requirement for further monitoring after 25 years is evaluated. Monitoring may be terminated if the performance of the landfill was satisfactory over the period of monitoring from an environmental, geotechnical and thermal perspective, as appropriate. The assessment of satisfactory performance is carried out jointly by the NTI and DND.

## 3.0 Detailed Landfill Monitoring Requirements

The following sections provide a summary and the detailed monitoring requirements for each landfill at CAM-2.

### 3.1 Station Landfill

The Station Landfill is located approximately 100 m northwest of the main station area, 300 m north of the module train, and 400 m off the abandoned airstrip. The total area identified for remediation was 9,700 m<sup>2</sup>. Contaminated soil associated with the sewage outfall area was present approximately 40 m southeast of the toe, however, no evidence of contaminant migration was detected at the landfill.

This landfill was classified as a low potential environmental risk. Remediation included regrading with the placement of a minimum fill thickness of 0.75 m and flattening of existing slopes to a maximum grade of 3H:1V. The long term monitoring plan consists of visual inspection, and the periodic collection of soil samples. The monitoring coordinates for the Station Landfill are in Table 1, the monitoring requirements are provided in Table 2 and the approximate locations for the collection of soil samples are identified in Figure CAM-2.2.

**Table 1 – Coordinates for the Station Landfill**

Landfill Monitoring Station	Coordinates		Elevation (masl)
	North (m)	East (m)	
C2-1 (soil)	7619131.1	548454.2	-
C2-2 (soil)	7619067.7	548507.9	-
C2-3 (soil)	7619005.2	548538.4	-
C2-4 (soil)	7618953.0	548579.4	-
C2-5 (soil)	7619028.1	548364.1	-

**Table 2 – Monitoring Requirements for the Station Landfill**

Location	Sample Type	Frequency	Parameters
Determined on site	Visual	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	N/A
C2-1 to C2-5	Soil	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	PCBs
			F1 (C <sub>6</sub> -C <sub>10</sub> )
			F2 (C <sub>10</sub> -C <sub>16</sub> )
			F3 (C <sub>16</sub> -C <sub>34</sub> )
			Arsenic
			Cadmium
			Chromium
			Cobalt
			Copper
			Lead
			Nickel
			Zinc
			Mercury



### 3.2 West Landfill - North

The West Landfill – North is located 1 km northwest of the module train and consists of seven lobes of buried debris for a total area of 12,900 m<sup>2</sup>. An area of Type A hydrocarbons contamination was detected upgradient of one of the lobes, with some evidence of migration detected downgradient. However, the downgradient contaminant migration was assessed to be due to the contamination located upgradient of the landfill, and not from the landfill itself.

This landfill was evaluated as a low potential environmental risk. The landfill remediation included excavation of the hydrocarbon impacted soil upgradient of the landfill and regrading and placement of 0.75 m of fill. The long-term monitoring plan consists of visual inspection, and the periodic collection of soil samples. The monitoring coordinates for the West Landfill – North are in Table 3, the monitoring requirements are provided in Table 4 and the approximate locations for the collection of soil samples are identified in Figure CAM-2.3.

**Table 3 – Coordinates for the West Landfill - North**

Landfill Monitoring Station	Coordinates		Elevation (masl)
	North (m)	East (m)	
C2-6 (soil)	7619735.6	547766.6	-
C2-7 (soil)	7619707.7	547869.3	-
C2-8 (soil)	7619634.8	547967.4	-
C2-9 (soil)	7619576.3	548026.9	-
C2-10 (soil)	7619604.3	547769.2	-

**Table 4 – Monitoring Requirements for the West Landfill - North**

Location	Sample Type	Frequency	Parameters
Determined on site	Visual	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	N/A
C2-6 to C2-10	Soil	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	PCBs
			F1 (C <sub>6</sub> -C <sub>10</sub> )
			F2 (C <sub>10</sub> -C <sub>16</sub> )
			F3 (C <sub>16</sub> -C <sub>34</sub> )
			Arsenic
			Cadmium
			Chromium
			Cobalt
			Copper
			Lead
			Nickel
			Zinc
			Mercury

### 3.3 West Landfill - South

The West Landfill – South is located adjacent to the SRR facilities, approximately 700 m northwest of the module train. Four separate lobes of debris were identified, for a total area of 10,500 m<sup>2</sup>. No contaminant impacts were detected.

The landfill was determined to present a low potential environmental risk. Remediation included regrading and placement of 0.75 m of fill. The long term monitoring plan consists of visual inspection and the periodic collection of soils samples. The monitoring coordinates for the West Landfill - South are in Table 5, the monitoring requirements are provided in Table 6 and the approximate locations for the collection of soil samples are identified in Figure CAM-2.4.

**Table 5 – Coordinates for the West Landfill - South**

Landfill Monitoring Station	Coordinates		Elevation (masl)
	North (m)	East (m)	
C2-11	7619442.2	548136.6	-
C2-12	7619373.6	548222.0	-
C2-13	7619299.0	548290.7	-
C2-14	7619295.4	548103.0	-

**Table 6 – Monitoring Requirements for the West Landfill - South**

Location	Sample Type	Frequency	Parameters
Determined on site	Visual	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	N/A
C2-11 to C2-14	Soil	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	PCBs
			F1 (C <sub>6</sub> -C <sub>10</sub> )
			F2 (C <sub>10</sub> -C <sub>16</sub> )
			F3 (C <sub>16</sub> -C <sub>34</sub> )
			Arsenic
			Cadmium
			Chromium
			Cobalt
			Copper
			Lead
			Nickel
			Zinc
			Mercury

### 3.4 Tier II Disposal Facility

The Tier II Disposal Facility is located at the northwest corner of the former station area, approximately 50 m south of the existing Station Area Landfill and 100 m east of the abandoned airstrip. The landfill was constructed with the placement of low-permeability, saturated, compacted berms, the installation of a liner system over the berms and along the landfill base, and the placement of a surface liner system over the landfill contents with the placement of overlying sufficient granular fill to promote freezeback of landfill contents. Four groundwater monitoring wells were installed at the landfill perimeter, and four thermistors were installed within the landfill.

The long term monitoring plan consists of visual monitoring, the collection of soil and groundwater samples, and monitoring of subsurface ground temperatures of the landfill. Approximate locations for the collection of soil and groundwater samples, and thermistor installation locations are identified on Figure CAM-2.5. The monitoring coordinates for the Tier II Disposal Facility are in Table 7 and the monitoring requirements are provided in Table 8.

**Table 7 - Tier II Disposal Facility Coordinates**

Landfill Monitoring Station	Coordinates		Elevation (masl)
	North (m)	East (m)	
MW-5 (soil & groundwater)	7618850.6	548510.0	23.8
MW-6 (soil & groundwater)	7618738.8	548514.5	21.8
MW-7 (soil & groundwater)	7618739.8	548459.7	21.5
MW-8 (soil & groundwater)	7618796.7	548414.3	21.4
VT-1 (temperature)	7618809.6	548510.4	-
VT-2 (temperature)	7618800.6	548469.3	-
VT-3 (temperature)	7618787.8	548502.1	-
VT-4 (temperature)	7618772.0	548478.4	-

**Table 8 - Monitoring Requirements at the Tier II Disposal Facility**

Location	Sample Type	Frequency	Parameters
Determined on site	Visual	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	N/A
MW-5 to MW-8	Groundwater	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	Total Arsenic
			Total Cadmium
			Total Chromium
			Total Cobalt
			Total Copper
			Total Lead
			Total Nickel
			Total Zinc
			Total Mercury
			PCBs
			Total Petroleum Hydrocarbons (C <sub>6</sub> -C <sub>32</sub> )
MW-5 to MW-8	Soil	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	PCBs
			F1 (C <sub>6</sub> -C <sub>10</sub> )
			F2 (C <sub>10</sub> -C <sub>16</sub> )
			F3 (C <sub>16</sub> -C <sub>34</sub> )
			Arsenic
			Cadmium
			Chromium
			Cobalt
			Copper
			Lead
			Nickel
			Zinc
VT-1 to VT-4	Thermal	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	Mercury
			Temperature

### 3.5 Non-Hazardous Waste Landfill

The Non-Hazardous Waste Landfill is located 200 m southeast of the station area, north of the airstrip between two access roads running north-south between the airstrip and the main station area. It was constructed for the disposal of non-hazardous wastes and debris generated and collected during site clean up.

The landfill design included the construction of compacted perimeter berms and the placement of a cover of compacted granular fill over the saturated material. Four groundwater monitoring wells were installed at the landfill perimeter.

The long-term monitoring plan consists of visual monitoring and the periodic collection of soil and groundwater samples. Approximately locations for the collection of soil and groundwater samples are identified on Figure CAM-2.6. The monitoring coordinates for the Non-Hazardous Waste Landfill are in Table 9 and the monitoring requirements are provided in Table 10.

**Table 9 - Non-Hazardous Waste Landfill Coordinates**

Landfill Monitoring Station	Coordinates		Elevation (masl)
	North (m)	East (m)	
MW-1 (soil & groundwater)	7618500.0	548694.5	27.3
MW-2 (soil & groundwater)	7618389.5	548755.7	26.1
MW-3 (soil & groundwater)	7618384.4	548719.0	25.5
MW-4 (soil & groundwater)	7618384.4	548674.1	26.0

**Table 10 - Monitoring Requirements at the Non-Hazardous Waste Landfill**

Location	Sample Type	Frequency	Parameters
Determined on site	Visual	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	N/A
MW-1 to MW-4	Groundwater	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	Total Arsenic
			Total Cadmium
			Total Chromium
			Total Cobalt
			Total Copper
			Total Lead
			Total Nickel
			Total Zinc
			Total Mercury
			PCBs
			Total Petroleum Hydrocarbons (C <sub>6</sub> -C <sub>32</sub> )
MW-1 to MW-4	Soil	Once per year in 2006-2010; 2012; 2015; 2020; and 2030	PCBs
			F1 (C <sub>6</sub> -C <sub>10</sub> )
			F2 (C <sub>10</sub> -C <sub>16</sub> )
			F3 (C <sub>16</sub> -C <sub>34</sub> )
			Arsenic
			Cadmium
			Chromium
			Cobalt
			Copper
			Lead
			Nickel
			Zinc
			Mercury

**Appendix A**  
**DND/NTI Cooperation Agreement**

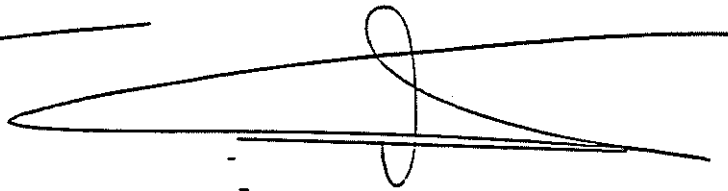
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26 Nov 98*

AGREEMENT  
BETWEEN  
NUNAVUT TUNNGAVIK INCORPORATED  
AND  
HER MAJESTY IN THE RIGHT OF CANADA  
AS REPRESENTED BY  
THE MINISTER OF NATIONAL DEFENCE  
FOR THE CLEAN-UP AND RESTORATION OF  
DISTANT EARLY WARNING SITES  
WITHIN THE NUNAVUT SETTLEMENT AREA

(Environmental Provisions)



Arthur C. Eggleton  
Minister of National Defence



James Eetoolok  
1<sup>st</sup> Vice President  
Nunavut Tunngavik Incorporated

Dated

*1 Sep 98*

Dated

*1 Sep 98*

AGIKATIGEGUTAORYOK

UGUNAGA

NUNAVUT TUNNGAVITKUN TIMIKUTIGIYANIN

UVALO

KOENMIN IHUMAKHUTIVLOGIN KANATAMI

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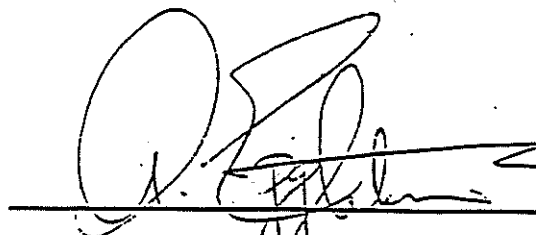
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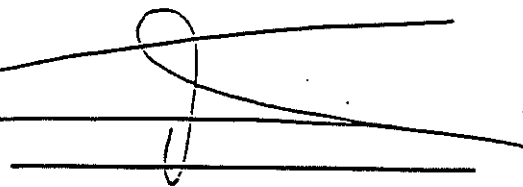
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ARTHUR C. EGGLETON  
MINISTAORYOK AGUYAKTILIKIYINI

KANATAOM GAVAMAENI

UVLOANI \_\_\_\_\_



JAMES EETOOLOOK  
HIVULIK TUKLEATA  
IKHIVAOTALEOM  
NUNAVUT TUNNGAVITKUN  
TIMIKUTIGIYANI  
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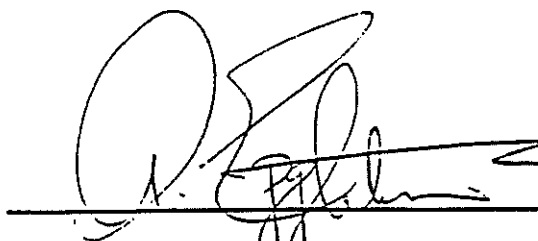
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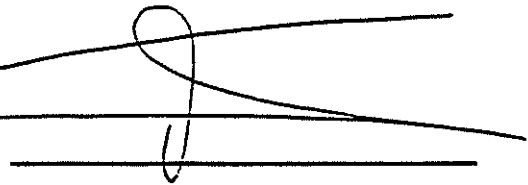
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## **PREAMBLE**

WHEREAS the Government of Canada (Canada) has modernized the air defences of Canada through a joint USA/Canada project referred to as the North American Air Defence Modernization Project (NAADM);

AND WHEREAS NAADM includes the decommissioning of some of the Distant Early Warning (DEW Line) radar sites and the conversion of others to North Warning System (NWS) radar sites;

AND WHEREAS fifteen DEW Line sites are located on Department of National Defence (DND) reserves within the Nunavut Settlement Area (NSA);

AND WHEREAS DND wishes to undertake an environmental clean-up of the DEW Line sites, facilities and associated areas;

AND WHEREAS the Inuit and the Federal Government have an interest in all activities that occur within the NSA, including, but not limited to, protecting the ecosystem integrity and the existing and future well-being of the residents and communities of the NSA and increasing the participation of Inuit and Inuit Firms in business and employment opportunities in the NSA;

AND WHEREAS DND and NTI are voluntarily entering into this Agreement to establish a framework for the decommissioning, remediation and restoration of the DEW Line sites in the NSA;

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

### **1.0 DEFINITIONS**

Debris means hazardous and non-hazardous materials of non-natural origin existing on the surface, or visible and partially embedded within one metre of the surface or within two metres of the surface of any water body at low tide and any structures scheduled for demolition

DEW Line sites means the Distant Early Warning Sites listed in paragraph 3.1 below;

DEW Line Clean-up  
Environmental Provisions

**DCL** means Defence Construction (1951) Limited the designated contracting agent for contracting for the Department of National Defence for the Dew Line Clean-up;

**DND** means the Crown in the right of Canada represented by the Minister of National Defence or his delegate

**Engineered Landfill** means a landfill professionally designed to permanently isolate the contents of the landfill from contact with the environment.

**Hazardous materials or substances** means all materials or substances designated as hazardous under territorial or federal legislation at the time of the clean-up of a particular landfill.

**Inuit** has the same meaning as in the NLCA;

**Inuit Owned Lands** has the same meaning as in the NLCA;

**Landfill** means any area where a concentration of non-hazardous and/or hazardous substances or materials or Debris have been buried;

**Minister of National Defence** means the Minister of National Defence or his designate

**Nunavut Settlement Area** has the same meaning as in the NLCA;

**Rules** means the *Rules and Procedures for the Management of Inuit Owned Lands* adopted by NTI, as amended from time to time,;

**Parties** means NTI and DND;

**Regional Inuit Associations (RIA)** means the Qikiqtani Inuit Association, the Kivalliq Inuit Association and the Kitikmeot Inuit Association;

**Relevant RIA** means the RIA in the region in which a DEW Line site is located;

**Work** means all the materials, equipment, goods, services, labour, matters and things done or furnished or required to be done or furnished to perform any DEW Line site decommissioning, remediation or restoration activity.

## 2.0 OBJECTIVES

- 2.1 The objectives of this Agreement are to establish a broad environmental framework for participation of the Inuit in the clean-up of the DEW Line Sites in the NSA and to achieve cost effective and an environmentally sound DEW Line clean-up as described herein.
- 2.2 DND and NTI will enter into a corollary agreement with respect to economic benefits for the Inuit and Inuit firms including provisions for training (this agreement may or may not involve regional negotiations).

## 3.0 GENERAL

- 3.1 **Scope.** This Agreement relates to the decommissioning, remediation, restoration and related activities of the following DEW Line sites:

PIN 2 - Cape Young  
PIN 3 - Lady Franklin Point  
PIN 4 - Byron Bay  
CAM M - Cambridge Bay  
CAM 1 - Jenny Lind Island  
CAM 2 - Gladman Point  
CAM 3 - Shepherd Bay  
CAM 4 - Pelly Bay  
CAM 5 - Mackar Inlet  
FOX M - Hall Beach  
FOX 2 - Longstaff Bluff  
FOX 3 - Dewar Lakes  
FOX 4 - Cape Hooper\*  
FOX 5 - Broughton Island  
DYE M - Cape Dyer

\* Prior to the signing of this Agreement the clean-up of Cape Hooper (FOX 4) had already begun under a separate set of understandings. Therefore only the post clean-up provisions of this Agreement will apply to this site

- 3.2 **Precedent.** This Agreement is not to be construed as a precedent for any other activities of DND, Canada or any third party. Nothing in this Agreement shall be interpreted or used to define the rights of the Parties, Canada or any third party in relation to any matter under the NLCA or to interpret any Article of the NLCA except for the purpose of this Agreement;
- 3.3 **Urgency.** The Parties mutually agree to recognize the urgency of the matters dealt with in this Agreement and to perform all required actions as expeditiously as possible.
- 3.4 **Nunavut Land Claims Agreement.** The Parties recognize and acknowledge their respective obligations to comply with the NLCA in connection with all Work.
- 3.5 **Inuit Owned Lands.** All use of and access to Inuit Owned lands by DND, Contractors and subcontractors for the purposes of the Work is subject to the NLCA and the Rules, to the extent that the Rules are not inconsistent with the NCLA.
- 3.6 **Clean-up Schedule.** The commencement and completion of the Work will take place in accordance with the attached Appendix A. The Parties will use their best efforts to adhere to Appendix A.
- 4.0 **Steering Committee**
- 4.1 There shall, during the duration of this Agreement, be a Steering Committee to monitor progress, develop recommendations and suggest alternative solutions for achieving the commitments set forth in this Agreement by:
- (a) reviewing progress in achieving the commitments set out in this Agreement;
  - (b) ensuring that any perceived deficiencies with respect to the Work or to commitments under this Agreement discussed and, where agreed, are expeditiously acted upon;
  - (c) considering other items of mutual concern, as appropriate;

- (d) requesting the Environmental Working Group (EWG), established in accordance with section 7 of this Agreement, to undertake additional study and formulate recommendations to the Steering Committee.
- 4.2 The Steering Committee shall consist of four members, two to be named by DND and two to be named by NTI. It shall meet at least twice a year and at the request of any Party at mutually agreed upon times and locations. In order to place an item in the agenda, a Party shall provide that item to the other Party not less than ten working days before each scheduled meeting. The Steering Committee shall operate on the basis of unanimous agreement.
- 4.3 Recommendations agreed to by a majority of the members of the EWG will be incorporated into the site specific plan referred to in section 23 of this Agreement or into the post-clean-up methodology as the case may be. Where either DND or NTI disagree with the EWG recommendations, it will raise the issue at the Steering Committee for discussion in accordance with clause 4.4. If the Environmental Working Group is deadlocked ( ie 2-2) on any issue, including scoring of the risk assessment matrix and landfill remediation, the Steering Committee will discuss the situation and attempt, in good faith, to arrive at a consensus. The Parties pursuant to clause 4.5 may, where appropriate, seek independent advice.
- 4.4 Should unanimous agreement not be reached at the Steering Committee the following approach will be used:
- (a) Prior to Clean-up Commencing - the clean-up will not commence until the issue is resolved to the satisfaction of both Parties.
- (b) Clean-up has commenced - the clean-up will continue in accordance with the site specific clean-up plan. If the issue is not included in the site specific plan then DND will proceed based on the advice provided by its consultants. DND and NTI will continue to attempt to arrive at a consensus.

In either event, both Parties continue to have the option of involving the provisions of section 5 of this Agreement if unanimous agreement cannot be reached. If unanimous agreement is reached at a later date or there is an arbitration decision which differs from the actions taken by DND, the new decision will be implemented.

4.5 The Steering Committee shall, with the agreement of the members, acting reasonably, invite representatives of Government departments, Inuit organizations, non-governmental organizations, Contractors, Subcontractors and others to provide advice or information as required. If requested by the other Party, DND and NTI agree to provide each other with all relevant scientific and technical information, with the exception of:

- advice to Ministers or Inuit Boards of Directors
- negotiating strategies
- commercially confidential third Party information
- personal information

4.6 The Parties each shall be responsible for their respective costs associated with participating in Steering Committee meetings.

## 5.0 ARBITRATION

5.1 If DND and NTI disagree on any question of fact or mixed question of law and fact related to the interpretation, implementation or operation of this Agreement, with the exception of any matter within the jurisdiction of the Arbitration Board under the NLCA, either party may by written demand refer the dispute to arbitration in accordance with the following provisions.

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5.2 An arbitration Panel consisting of a single arbitrator who both Parties agree is qualified to arbitrate the question in dispute will render a decision on the dispute. If DND and NTI cannot agree on a single arbitrator then a decision will be rendered by an Arbitration Panel consisting of three similarly qualified arbitrators, one of whom shall be chosen by NTI, one by DND and the third by the two so chosen, which third arbitrator shall be the chairperson. If within fifteen days of having received a written demand, or such extended time as the parties agree, a party fails to either agree to a single arbitrator or to appoint an arbitrator, or if the two arbitrators appointed by the parties do not agree upon the third arbitrator, then upon written application by either party such third arbitrator shall be appointed by the superior court having jurisdiction in the NSA.

- 5.3 The arbitration proceedings shall be held within thirty days following the appointment of the Arbitration Panel in a location agreed upon by the Parties or, if the Parties are unable to agree, as determined by the arbitration panel. The timing for the panel hearing may be extended by mutual consent of the Parties, not unreasonably being withheld.
- 5.4 The arbitration panel shall have jurisdiction to determine all questions of fact, questions of mixed law and fact and to make an award, including interim relief, payment of interest, and costs. If an arbitration panel makes no decision as to costs, each party shall bear its own costs and an equal share of the other costs of the arbitration, including the remuneration and expenses of the arbitration panel.
- 5.5 The Arbitration Panel shall render a decision, in writing, within thirty days of the completion of the arbitration hearing and state the reasons on which it is based. The decision is final and binding and is not subject to appeal. Pursuant to section 17(3)(b) of the *Federal Court Act*, the Parties agree that the Federal Court Trial Division shall have jurisdiction to review the decision of an arbitration panel on any grounds set out in section 18.1(4) of the *Federal Court Act*.
- 5.6 Where a party to an arbitration fails to comply with any of the terms of the decision of the arbitration panel, any party to the arbitration may file in the office of the Registrar of the superior court having jurisdiction in the NSA, a copy of the decision in the prescribed form, whereupon the decision shall be entered in the same way as a judgement or order of that court, and is enforceable as such.
- 5.7 The territorial *Arbitration Act* shall apply in any arbitration under this Agreement to the extent that it is not inconsistent with this Agreement, unless otherwise agreed by the parties.
- 5.8 The arbitration panel may, on application, allow any to participate in an arbitration as an intervenor, if in the arbitration panel's opinion the interest of that person may be directly affected by the arbitration, and on such terms as the arbitration panel in its discretion may order.
- 5.9 Unless the parties otherwise agree, the proceedings and Board's decision shall be made public.



## 6.0 Environmental Risk Assessment Matrix

- 6.1 All landfills will be scored by the EWG in accordance with the Environmental Risk Assessment Matrix as set out in Appendix B of this Agreement. The construction of this matrix takes into account two conservative assumptions:
- The contents of the landfills are unknown and all potential contaminants (ie substances typically used at DEW Line sites) may be present in the landfill
  - If a contaminant comes into contact with receptors, it could have an adverse impact on those receptors regardless of the exposure duration or concentration
- 6.2 Landfills scoring 105 points or more are classified as potentially high environmental risk (Class A) and will be excavated. Landfills with a score of 100-104 points will be considered on a case by case basis to determine whether they should be excavated or considered as Class B landfills.
- 6.3 Landfills with a score in the range 75 to 99 points are classified as moderate environmental risk (Class B). An engineered leachate containment system will be provided for these landfills to mitigate against potential environmental risks. The landfill engineers under contract to DCL will take into consideration any suggestion of the EWG regarding the design of the leachate containment facility. In specific cases where an engineered leachate containment system cannot be constructed, the EWG will recommend whether complete excavation or partial excavation with a leachate containment system is required.
- 6.4 Landfills with scores of 75 or less are classified as low environmental risk (Class C). The remediation approach for these landfills will be the placement of an engineered cover following collecting, sorting, and appropriate disposal of debris where it may impact on the integrity of the landfill. Hazardous debris will be removed and disposed of in accordance with federal regulations. Generally, the final thickness of cover material will be approximately 0.75 metres, but may vary depending on site specific conditions.
- 6.5 Scores that fall within plus or minus five points of 75 points will be considered on a case by case basis.

- 6.6 The scoring of Category C: Receptors of the matrix will take into account local/traditional knowledge in accordance with the procedures set out in Section 8 of this Agreement. The primary focus for the collection of local/traditional knowledge will be on the local community and an Inuit representative who is familiar with the DEW site under assessment.
- 6.7 The scoring of the landfills will take place before the clean-up at that DEW site commences and the site specific clean-up plan is finalized.
- 7.0 **Environmental Working Group**
- 7.1 An Environmental Working Group (EWG) will be established. The EWG will consist of four members, two chosen by each of the Parties. The members will be qualified engineers and/or scientists with expertise in environmental remediation and clean-up in northern climates.
- 7.2 The EWG will, for each of the landfills prior to the clean-up of that site, be responsible for the scoring of the risk assessment matrix, interpreting the results and recommending a remediation solution in accordance with this Agreement. If a majority of the members of the EWG are in agreement with the EWG recommendations then DND will include these recommendations in its site specific plans which are referred to in section 23 of this Agreement. If the EWG is deadlocked then the issue will be referred to the Steering Committee as per section 4.3 of this Agreement.
- 7.3 During the monitoring period, the EWG will also examine the results of the monitoring program in accordance with the methodology set out in section 20 of this Agreement and report to the Steering Committee on the results of their investigation. Should changes to the monitoring plan and/or additional remediation be required, the EWG will make recommendations to the Steering Committee on what action should be taken as per section 4.3 of this Agreement.
- 7.4 The EWG will go on-site during the pre-cleanup delineation phase of the project to assemble information required, including local/traditional knowledge as per section 8 of this Agreement, to score the risk assessment matrix. DND will contribute \$10,000 per site to NTI to defray the cost incurred by its EWG members and a community representative selected by the relevant RIA (NTI Representative). DND will also provide the NTI representative transportation

costs whenever the NTI representatives are travelling to a site or to a community with the DND representatives on a DND charter. DND will also provide meals and accommodation for the NTI representative while at the site.

- 7.5 The EWG will also act as a resource to the Steering Committee and will upon request from the Steering Committee investigate certain matters and produce reports or studies for consideration by the Steering Committee. Both Parties agree to cover the costs of their members of the EWG to undertake such work.
- 8.0 **Local/Traditional Knowledge**
- 8.1 Traditional and local knowledge for use in the scoring of the risk assessment matrix will be collected during the Pre-Cleanup Delineation phase of the DEW Line clean-up project.
- 8.2 An Inuit representative familiar with the DEW site and traditional use of the area around the site will be chosen by the relevant Regional Inuit Association to be on site during the pre-construction delineation phase of a site clean-up. The Inuit representative will work closely with the EWG to identify Inuit use of the area, wildlife patterns, and past events and occurrences that may have impacted on landfills (i.e. dumping, hazardous waste storage, natural occurrences) in order to assist in the scoring of the matrix.
- 8.3 DND and NTI will attempt to establish a community DEW Line Clean-up Committee which would facilitate the flow of local knowledge to the EWG prior to, and during, the site visit.
- 8.4 The EWG will visit the local community (ies) most affected by the DEW site. The EWG will conduct one-on-one interviews with a number of residents and will also meet with the Hamlet Administration Officer and/or the Hamlet Mayor, the local Hunters and Trappers Association, and relevant community organizations to obtain information concerning the traditional use of the area by the community. The Community Land and Resource Committee (CLARC) will be consulted if Inuit Owned Land is affected in any way.
- 8.5 In anticipation of these community consultations, DND, in consultation with NTI will prepare an information package in English and the relevant Inuit language for

use in the community consultations. The package will include maps of the site and the surrounding area along with sample questions (see Appendix D) that would facilitate discussion.

- 8.6 DND will provide NTI with at least six months notice regarding the site visit in a given season. Six weeks notice will be provided regarding the dates for the community visit. DND will attempt to arrange the timing for the community consultation to avoid harvest time when members of the community might be on the land. NTI in conjunction with the EWG will arrange the interviews with the various community associations and individuals.
- 8.7 The EWG will document all information collected during the community consultations. This information will be provided to DND, NTI, the relevant RIA and the host community.
- 8.8 All information collected from the interviews will be considered during the matrix scoring and will be given equal consideration with conventional scientific knowledge collected during the site visits.
- 8.9 Prior to the actual clean-up, DND will conduct a community information session to inform the residents of the scope of the Work and other relevant facts. In the case of CAM 4, there will be a community information session during the summer of 1998 at the option of the RIA. For Fox 5, in addition to this community information session, the EWG will be consulting the community of Broughton Island on FOX-5 as part of its work on scoring landfill evaluation matrices, during the summer of 1998 and DND will provide a limited public information session at that time.
- 9.0 **CEPA Soils**
- 9.1 Soils at concentrations exceeding federal regulations (referred to herein as "CEPA" soils) will be removed from the site and disposed of in a licenced facility in accordance with those federal regulations.
- 10.0 **Tier II Soils**
- 10.1 Tier II soils are defined in Appendix E of this Agreement.

10.2 Tier II soils will be excavated and placed in an engineered, lined, containment facility (Tier II Disposal Facility). After excavation, the area will be backfilled with sufficient clean fill to provide an effective layer over any remaining Tier I soils and to meet the requirement of clause 22 of this Agreement. A schematic of a Tier II Disposal facility is presented in Appendix K. Tier II soils may also be placed in a similarly engineered cell of a larger landfill. The location of the Tier II Disposal Facility will be selected in order to minimize potential environmental impact in a cost-effective manner. In some cases Tier II soils may be transported from one DEW site to another depending on soil volumes and project economics.

10.3 Confirmatory testing will be conducted in accordance with the methodology outlined in section 13 of this Agreement.

#### **11.0 Tier I Soils**

11.1 Tier I Soils are defined in Appendix E of this Agreement.

11.2 Tier I soils will be excavated to a depth of to 30 cm if the soil is located on a flat or gently sloping area such as a gravel pad unless delineation testing indicates a lessor depth of contamination. In such a case, a suitable safety margin will be excavated. Where Tier I soils are located on slopes greater than 3:1 (horizontal:vertical), the contaminated soils will be excavated to a depth of up to 60 cm. After excavation, the area will be backfilled with sufficient clean fill to provide an effective layer over any remaining Tier I soils and to meet the requirement of clause 22 of this Agreement.

11.3 Tier I soils will be placed in a professionally engineered landfill where they may be used as intermediate fill.

11.4 During the pre clean-up delineation phase prior to going to tender for the clean-up, testing to determine the presence or absence of Tier II contaminated soil below the Tier I soils will be conducted.

#### **12.0 Hydrocarbon Soils**

12.1 Hydrocarbon contamination will be based initially on the measurement of Total

will investigate areas of concern identified by NTI and/or its representatives who will be on-site during the delineation work. Risk assessment consideration will be given to soils that act as sources of contaminants to nearby aquatic environments even if the contaminants are below the relevant DCC criteria. The method of delineation will follow the grid as set out in Appendix F of this Agreement.

- 13.2 Confirmatory testing of contaminated areas, other than Tier I soils, will be conducted after contaminated soils have been excavated. Confirmatory testing will be conducted in accordance with the protocol outlined in Appendix F of this Agreement.
- 13.3 Should there be evidence to suggest that some contaminated areas were missed during the pre clean-up delineation work, these areas will be investigated in accordance with the pre clean-up delineation methodology.
- 13.4 During the confirmatory testing phase, NTI may assign a qualified observer to the site.
- 13.5 Appropriate quality assurance measures acceptable to the EWG will be taken to ensure the accuracy of all analytical work in the field or in laboratories.

#### **14.0 Debris**

- 14.1 Debris will be collected and sorted into hazardous and non-hazardous components. Hazardous debris will be disposed of in accordance with Federal regulations. Non-hazardous debris will be buried in a professionally engineered landfill, provided there is a suitable location and sufficient gravel is available. Appendix C contains additional details concerning the destination of collected debris.
- 14.2 All debris which is attributable to the operation of any DEW site and is within two metres of the surface at low tide or within two metres of the surface of an inland water body will be removed by DND.

#### **15.0 Off Site Contamination and Debris**

- 15.1 Where there is reasonable evidence of additional off site contamination or debris

Petroleum Hydrocarbons (TPH) where the TPH value is greater than or equal to 2500 ppm. Should the soils contain Tier I or Tier II contamination, they will be treated in accordance with the relevant sections of this Agreement. These hydrocarbon areas will be identified on site as part of the pre-construction delineation testing.

12.2 Each contaminated area will be evaluated qualitatively by the EWG using the checklist outlined in Appendix J of this Agreement.

12.3 Where remediation is required, one of the following options will be used:

- aerating the hydrocarbon contaminated soil in place to reduce hydrocarbon contaminant concentrations
- use of hydrocarbon contaminated soil as intermediate fill within an engineered landfill
- landfilling in a Tier II Disposal facility
- bioremediation using a landfarming or bio-pile processes
- soil washing
- other equivalent technologies recommended by the EWG

12.4 Based on site specific conditions, the EWG will recommend the most appropriate of the remediation options outlined in clause 12.3 in accordance with section 4.3 of this Agreement. The appropriateness of the options will take into consideration the environmental sensitivity of the area. Factors which will be considered in the selection of the method are:

- type of contaminant (ie fuel or lubricating oil)
- total volume of hydrocarbon contaminated soils on site (mobilization costs, ability to treat the soil)
- concentration of hydrocarbons within the soil (effectiveness of treatment process)
- type of soil

### 13.0 Pre Clean-up Delineation and Confirmatory Soil Testing

13.1 A comprehensive pre clean-up delineation program will be designed to ensure that all contaminated soil and contaminated building material will be identified . DND

which, subject to clause 15.2, is attributable to the operation of a nearby DEW site, DND will undertake testing to determine the extent of the contamination in consultation with NTI and remediate the site in accordance with the relevant sections of this Agreement.

15.2 Should the evidence clearly demonstrate that other individuals or organizations have contributed significantly to the contamination or debris, then NTI and DND will endeavour to obtain the third Party (ies) agreement to contribute its pro-rated share of the investigation and clean-up costs before the investigation and clean-up commences. If the third party does not agree to pay their share of the costs, DND has the option, where practical, to clean up its share of the contamination, or in the alternative, waiting until there is third party agreement regarding payment of the investigation and clean-up costs. The investigation and clean-up will be in accordance with the clean-up protocol outlined in this Agreement.

15.3 NTI will endeavour to identify areas of concern prior to the delineation phase of the clean-up.

#### **16.0 PCBs in Paint**

16.1 PCBs in paint will be treated in accordance with applicable federal regulations. Changes to these regulations will be dealt with in accordance with section 25.1 of this Agreement.

#### **17.0 Materials Containing Lead-based Paints**

17.1 Materials containing lead-based paints will be placed in a professionally engineered landfill. Should regulations or guidelines be issued which direct otherwise, the implementation of this change will be dealt with in accordance section 25.1 of this Agreement.

#### **18.0 Barrels**

18.1 The testing and disposal of POL tank sludge, waste oil, petroleum products, antifreezing agents, solvents and barrels will be handled in accordance with the criteria as set out in Appendix G.



## **19.0 Borrow Material**

- 19.1 DND will attempt to minimize new excavation of borrow materials required for the clean-up activities. Where possible, existing sources of borrow material will be used. All borrow areas will be regraded to match the surrounding topography.

## **20.0 Monitoring Program**

- 20.1 The monitoring program will identify an actual or potential landfill failure. Remedial action will be undertaken if leachate is present at levels greater than the site specific baseline concentrations at the time of the landfill completion. Action taken as result of the monitoring program will ensure the integrity of the landfills and thereby the health of the Inuit is protected on a continuing basis.
- 20.2 Following the completion of the clean-up for a site, DND will commence a monitoring program in accordance with Appendix H of this Agreement.
- 20.3 The monitoring program will have three phases. The objective of each phase are identified in Appendix H.
- 20.4 Monitoring results will be communicated to both Parties in the form of a comprehensive report.

## **21.0 Research Proposals**

- 21.1 NTI, on behalf of communities, may raise at the Steering Committee, items, including the need for hydrographic mapping, which could involve the requirement for research and investigation. These proposals will be discussed and evaluated at the Steering Committee. If the Steering Committee decides that the proposals are consistent with the objective of the clean-up which is to protect the environment from contaminants entering the food chain or involve direct DEW site related impacts which could cause significant economic impact, DND will fund the agreed upon research activities.
- 21.2 Where the proposals are broader in nature and not solely restricted to DND DEW

site activities, DND will support NTI in seeking funding under other Government programs and/or initiatives and may contribute funding to the approved proposals.

- 21.3 Involvement of the Inuit in the research activities including training and technology transfer will be dealt with in an agreement dealing with economic provisions.

## **22.0 Site Restoration**

- 22.1 All sites will be regraded to the extent possible to conform to the natural contours. The regrading will pay particular attention to hydrocarbon stained areas and wherever feasible these areas will be regraded so as to improve the aesthetics of the stained area.

## **23.0 Site Specific Clean-up Plan**

- 23.1 DND will provide NTI with a site specific clean-up plan six months in advance of the clean-up of a particular site. NTI will review the plan to satisfy itself that the plan is in accordance with the requirements as set out in this Agreement. Any items of concern to NTI will be referred to the Steering Committee for resolution in accordance with section 4.3 of the Agreement prior to the issuance of any requests for bids by DCL. DCL, as the representative of the project proponent (DND), will be responsible for preparing all necessary submissions to obtain regulatory approval to proceed with the clean-up activity.

## **24.0 Liability and Indemnification**

- 24.1 DND acknowledges and agrees that it has continuing responsibility and liability for the integrity of all landfills remaining on site. DND agrees that should there be evidence of potential or actual failure of a landfill, it will investigate the situation pursuant to the monitoring provisions of this Agreement.
- 24.2 Should there be evidence of contamination at the DEW Line site which exceeds the protocol as set out in this Agreement at the time of the signing of this Agreement and which cannot be attributed to a third Party then DND will undertake the clean-up.

- 24.3 DND agrees that nothing in this Agreement shall relieve the Crown or its agents either at present or in the future from complying with all applicable federal laws of general application. Changes to territorial law will be referred to the EWG which will make recommendations to the Steering Committee concerning the relevance of these changes to the clean-up.
- 24.4 DND agrees that it will be a condition of any sale or transfer of any of the lands comprising the DEW Line sites that the purchaser must assume DND's obligations under this Agreement with respect to the lands sold or transferred. It will also be a further condition of any such sale or transfer that the purchaser or transferee shall provide security for the performance of the assumed obligation and shall provide and maintain a letter of credit, surety bond, or other security in a form and amount mutually agreeable to the Parties.
- 25.0 Amendments
- 25.1 Should existing federal regulations or guidelines be amended, the EWG will examine the implementation of these changes or amendments taking account the special characteristics of the Arctic environment and make appropriate recommendations to the Steering Committee in accordance with section 4.3 of this Agreement.
- 25.2 The Protocol for confirmatory testing may be reviewed and adjusted on a site by site basis provided that a majority of the EWG are in agreement with the changes. Permanent or major changes will require the prior approval of the Steering Committee.
- 25.3 In the event that either Party wishes to amend the schedule as set out in Appendix A, it will provide the other Party with thirty (30) months written notice. If unforeseen event(s) or a decision by a regulatory body occurs which has a material impact on this schedule, the Parties will review these events and attempt to arrive at a mutually acceptable alternative.
- 25.4 Both Parties agree to review changes in technology and research studies which may have a bearing on this Agreement and discuss the need for changes resulting from these developments. The Steering Committee may task the EWG to investigate a particular technology pursuant to clause 4.1 (d) of this Agreement.

Recommendations of the EWG will be implemented in accordance with section 4.3.

25.5 If either Party wishes to make other changes to this Agreement, it will provide, in writing, six months notice of proposed changes. Any agreed upon amendments will be executed and attached as an appendix to this Agreement.

25.6 DND and NTI agree to consider amendments in an expeditious manner, particularly where the proposed amendments directly affects the conduct of a clean-up in progress or one which is scheduled to commence in the near term.

## 26.0 EWG Reports

26.1 All reports of the EWG will be available to provide additional information and guidance in the implementation of this Agreement. In the event of any conflicts or differences in interpretation of the EWG reports and this Agreement, this Agreement will prevail.

## 27.0 Notices

27.1 Where any Party is obliged or entitled to give any notice, request, approval, demand, consent, direction or other communication (ie Notice) to the other Party, such party shall first communicate the substance thereof personally or by telephone. However, such Notice shall not be sufficiently given until sent in writing to the addressees at the address below. Any Notice may be personally delivered or sent by registered mail or telefacimile and will be effective upon receipt by the addressee.

27.2 Notices to DND will be sent to:

Director General Environment  
National Defence Headquarters  
101 Colonel By Drive  
Ottawa, Ontario  
K1A 0K2

27.3 Notices to NTI will be sent to:

1<sup>st</sup> Vice President  
Nunavut Tunngavik Incorporated  
Box 1041  
Cambridge Bay  
Northwest Territories  
X0E 0C0

28.0 Termination of the Agreement

- 28.1 This Agreement will terminate on the later of December 31<sup>st</sup>, 2008 or when the clean-up work as set out in this Agreement for the sites listed in Appendix A is completed or on such a date agreed to by the Parties in accordance with clause 25.3 of this Agreement.
- 28.2 Notwithstanding clause 28.1 of this Agreement, monitoring and any necessary remediation in accordance with section 20 of this Agreement will continue for twenty five (25) years after the termination of this Agreement.
- 28.3 At the end of twenty five years of monitoring following the termination of this Agreement, DND and NTI will negotiate a new agreement to specify the terms of any further monitoring (if required).

## Annexes to the Agreement

DEW Line Clean-up  
Environmental Provisions

## Appendix A

### Clean-up Schedule

Site*		Start Date	Completion Date
CAM M	Cambridge Bay	1998	1999
FOX 5**	Broughton Island	2001	2003
CAM 4**	Pelly Bay	2001	2003
FOX M/CAM 5	Hall Beach/Maclar Inlet	2002	2006
CAM 3	Shepard Bay	2002	2003
DYE M	Cape Dyer	2003	2006
CAM 2	Gladman Point	2003	2004
FOX 2/FOX 3	Longstaff Bluff/Dewar Lakes	2004	2008
CAM 1	Jenny Lind Island	2004	2005
PIN 4	Byron Bay	2005	2006
PIN 3	Lady Franklin Point	2006	2007
PIN 2	Cape Young	2007	2008

\* Dates for the Baffin Sites are tentative pending resolution of economic and business issues

\*\* The starting dates for CAM 4 and Fox 5 and the subsequent starting dates could be moved up pending the timing of the PCBs in paint decision by Environment Canada

## Appendix B

### Environmental Risk Assessment Matrix

#### Introduction

The matrix has been based on the CCME National Classification System for Contaminated Sites, and adapted to address the particular concerns of the Arctic environment. The matrix is divided into three categories of equal weight: contaminated source, pathways, and receptors. The interaction of these three elements results in environmental risk. Each category is assigned 50 points, which are distributed among several factors. Each of these factors has been made as specific as possible in order to reduce the subjectivity of the matrix to a minimum. In addition, each of the three main categories is assigned a highly subjective "special considerations" factor according to the method described in the CCME Classification System. As it is unlikely that any classification system could address all possible factors, a special considerations factor allows the user to increase or decrease the score "to emphasize important concerns about a site and should be used as an exception rather than as a rule" (CCME 1992, p.6-7).

The purpose of the matrix is to evaluate the environmental risk posed by landfills in their current condition and location. It is not suitable for determining the risk posed by a landfill post-closure, as most of the elements in the matrix would not change by the application of a remedial solution. It should also be recognized that monitoring is an integral part of the closure.

The next sections provide guidance to the EWG on the methodology and items to be considered when scoring the matrix. This section is followed by the actual matrix which is to be used in the scoring.



## *A. Contaminant Source*

Five factors were considered under Contaminant Source to describe specific landfills, as follows:

- A.1 Landfill Extent
- A.2 Estimated Depth of Landfill
- A.3 Presence of Leachate
- A.4 Presence of Surface Contaminated Soil
- A.5 Presence of Surface Debris

### A.1 Landfill Extent

Landfill areas will be based on the results of geotechnical/geophysical site surveys and visual observations. Those landfills with an area greater than 10,000 square metres will score 10 and those smaller landfills will be scored in proportion to their size relative to 10,000 square metres.

### A.2 Estimated Depth

The estimated depth of a landfill is determined by visual inspection of surrounding topographic features. The average depth of the active layer will be used as a qualifier for the description of landfill depth, as this is generally the maximum depth of investigation. The depth of the active layer may range from one to two meters at these sites, depending on material type; therefore an average depth of 1.5 meters was used in the rating. Landfills with estimated depths of greater than 1.5 meters will score 5 and those with estimated depths of less than 1.5 meters will score less.

### A.3 Presence of Leachate

Leachate provides evidence of contamination within landfill. Leachate can be defined as the presence of contaminants in water emanating from the landfill, but concentrations may be so low as to be difficult to detect. The presence of leachate can be better determined by the presence of contaminated soil at the toe of the landfill, indicating

chronic low levels of contaminants leaching from the landfill. All types of contaminants in leachate (PCBs, (Polychlorinated Biphenyls) TPH (Total Petroleum Hydrocarbons) or inorganics) are considered to be of equal concern, as indicators of contamination within the landfill.

In the scoring, leachate is considered to be either present or not; no interpolation of the score is used in this category.

#### A.4 Surface contaminated soil

Within each landfill, there is potentially a source of contamination. The presence of surface contaminated soil, like the presence of leachate, is an indication that the landfill contains contamination. The volume of contaminated soil is not taken into consideration; this provides a conservative approach in that a small amount of contaminated soil can trigger a high score. The presence of Tier II soils will trigger the highest score (15). Based on the hypothesis that each landfill potentially contains contaminants, 5 points are given to this subsection, even if no surface contaminated soils were identified.

#### A.5 Presence of surface debris

At some landfills surface debris is very extensive, while at others there is almost no debris. Scoring needs to be quantitative; therefore the percentage of the surface area of the landfill that is covered with debris is used as the basis for scoring. A landfill that has surface debris covering more than 50% of its surface receives a full score.

## *B. Pathways*

The primary transport mechanisms for contaminants from the DEW Line landfills are considered to be:

- aerial transport of fine particles; and
- water transport, both as surface water run-off or subsurface water flow.

### B.1 Aerial Transport of Contaminants

All contaminants can be transported as particles; windblown debris is not considered in this category, as debris pickup is inherent in any cleanup. Surface contamination or surface expressions of leachate imply the potential for aerial transport. This factor is given a low weight because the quantity of contaminated soil on the surface of a landfill is generally low relative to the quantity of contaminated soil at the site as a whole. In addition, it is anticipated that relative to the effect of water movement, aerial transport contributes less to the transport of contaminants away from a landfill.

### B.2 Water Movement

Water movement includes the movement of surface water and subsurface water within the active layer. "Groundwater" is not addressed as an issue separate from surface water as the movement of water within the active layer is subject to the same driving forces as surface water. The intent of this sub-category is to examine factors that affect migration away from the landfill – slope, runoff, extent and type of cover on the landfill, annual precipitation and distance to surface water. Among these factors, topography, runoff potential and proximity to surface water are given the highest weight.

#### B.2.1 Topography

The degree of the slope on which the landfill is located is one of the major factors contributing to transport of contaminants; the scoring is carried out on a sliding scale. In cases where there are different slopes across the landfill, a weighted average is used.

### B.2.2 Cover Material – Depth

The extent to which potential contaminants are available to transport is also dependent on the depth and type of cover material. The potential for leachate generation and correspondingly, leachate migration, is related to the infiltration of water into the landfill. Cover over the landfill helps mitigate infiltration of water into the landfill contents. As the thickness of the landfill cover increases, the likelihood that potential contaminants will be released from the landfill decreases. If the active layer is contained in the cover material above the debris, then the potential for surface water infiltration into the landfill is small; this circumstance is assigned the lowest score.

### B.2.3 Cover Material – Type

The erosion potential of a landfill is partly based on the type of cover material. Erosion can eventually lead to the exposure of the landfill contents. Some cover materials are more susceptible to erosion than others; well graded gravels are the least susceptible, and silty materials are the most susceptible. In cases where there is no cover, this factor is assigned the highest score. Where the cover materials consist of a combination of soil types, the scoring should reflect the more conservative or higher score.

### B.2.4 Surface Water/Run-Off Potential

This factor aims to describe the destructive potential of water action on the landfill, which could take the form of waves; streams, rivers or lakes; or seasonal drainage. Where there is significant seasonal drainage, the run-off potential is high. "Significant seasonal drainage" is defined as run-off that has the potential to transport large quantities and concentrations of contaminants to surface water courses over a short period of time (CCME 1992, p.23). Significant seasonal drainage also includes consideration of major snow drifting on a landfill.

### B.2.5 Precipitation

The amount of precipitation received, either as rain or snow fall, affects the amount of surface water infiltration or run-off. The majority of the DEW Line sites receive less than 500 mm of precipitation annually, with the exception of Cape Dyer. Typically, the amount of precipitation at any site is relatively low; therefore it is unlikely that any single precipitation event would cause significant runoff. This factor is therefore given a relatively low weight.

### B.2.6 Distance to Downgradient Perennial Surface Water/Seasonal Drainage Channel

The distance to surface water will affect the probability of contaminants reaching the watercourse. This factor can include streams, seasonal or perennial, running directly through the landfill, or streams and lakes downgradient from the landfill, but it is intended to exclude small ponds with no outflow. On very steep slopes this distance should consider the horizontal distance to the water body rather than the vertical drop. The impact of drainage with respect to contaminant exposure is not considered in this category (it is considered under Receptors); this factor determines whether there is a drainage pathway from the landfill.

## *C. Receptors*

This section addresses the potential for impact on receptors, specifically, aquatic and terrestrial habitats, as well as human exposure. Impact on humans is the primary consideration; however, it should be recognized that impact on humans is implicit in the scoring of factors addressing ecosystem impact. The scoring within each category is to be based on recorded data, as well as local knowledge of the land use in the area, and therefore requires local input.

### C.1 Potential Impact on Receiving Freshwater/Marine Habitat

The water body should be selected based on the potential effects on the receiving habitat. In the selection of the receiving water body to be used in the landfill evaluation matrix, consideration must be given to the regional drainage patterns. For example, where the drainage from a landfill is overland (i.e. there is no direct connection between the landfill and the downgradient water body), water bodies beyond 2 kilometers should not be used in the evaluation. This is based on the premise that natural attenuation of any potential contamination will occur with overland flow. Where a direct connection between a landfill and a downgradient water body exists, via a stream or interconnected ponds, the two-kilometre limit should not be used.

#### C.1.1 Proximity to Receiving Freshwater/Marine Habitat

“Receiving habitat” is considered to be the most potentially impacted significant body of water near the toe of the landfill. The water body may support freshwater or marine life and/or may be used by avifauna and/or terrestrial mammals as a water source. It is not necessarily the seasonal drainage course or perennial water body closest to the landfill toe: This section’s objective is to select a habitat which support receptors rather than identify the closest body of water. It is assumed that only habitat downgradient from the landfill is to be considered (given that aerial transport of contaminants to habitat upgradient from the landfill will be addressed by the remediation of contaminated soil).

### C.1.2 Estimated Habitat Usage – Freshwater/Marine

This section is scored based on the frequency of usage within the selected receiving water body: the level of biodiversity and the occurrence of calving/spawning should be considered in scoring. It is recognized that freshwater and/or marine wildlife is potentially more at risk compared with terrestrial wildlife or avifauna, which should only be exposed through water ingestion. Thus, when terrestrial wildlife or avifauna is the primary receptor, the score for this factor should fall into the moderate or low category based on the potential frequency of usage. Otherwise, when the selected water body sustains freshwater and/or marine wildlife, the level of biodiversity should be used to evaluate the score. It should be noted that the most conservative approach - in the selection of the receiving water body - must be used when scores from section C.1.1 and C.1.2 are combined. Finally, "Biologically sensitive" areas such as bird sanctuaries and/or endangered, threatened or vulnerable populations should be considered as "special considerations".

### C.2 Potential Impact on Receiving Terrestrial Habitat

#### C.2.1 Extent of Vegetation

Typically the area in which to consider vegetation would include an area 300 m downgradient from the toe of the landfill. The area within this distance is expected to be most susceptible to uptake of contaminants if they are leaching from the landfill, but a larger or smaller area could be considered if site specific conditions warrant it.

#### C.2.2 Estimated Habitat Usage – Terrestrial/Avifauna

The same criteria as for usage of aquatic habitat are to be applied.

### C.3 Potential Human Exposure Through Land Use

#### C.3.1 Presence/Occupation

This factor addresses strictly dermal exposure and inhalation; consumption of food and water from the area is dealt with in subsequent factors. The risk of dermal exposure or inhalation is much lower when soil is frozen; therefore winter occupation of the site is assigned a low risk. "Summer" in this factor is intended to include the spring, summer and fall periods when the ground is not frozen. Within this factor, the scoring takes into account the likelihood and the duration of contact. In such way, proximity to a community is considered (high likelihood of contact), although proximity to a community does not necessarily trigger a high score if visits are infrequent (low duration of contact).

The likelihood of contact considers proximity to community or to a camp, as well as proximity to "travel routes". The duration of contact considers full time residences (i.e. permanent community for high, summer camp for moderate, winter camp or travel routes as low). Scores may be interpolated between the allocated points, according to the table below.

Table 1-1: Scoring Guide for Section C.3.1

	High Likelihood of Contact	Moderate Likelihood of Contact	Low Likelihood of Contact
High Duration of Contact	8	6	4
Moderate Duration of Contact	6	4	2
Low Duration of Contact	4	2	1

For large DEW Line sites, different parts of the site need to be considered individually, as some areas of the site could be quite far (more than a few kilometres) from the landfill under consideration.



### C.3.2 Proximity to Drinking Water Source

Regardless of whether the source is seasonal or perennial, an established community or a summer camp water source located downgradient of the landfill is to be considered in this factor.

### C.3.3 Food Consumption

Sedentary organisms are more susceptible to local inputs as their exposure is large if they are downgradient from the landfill. These organisms can include bottom-dwellers such as sculpins, mussels, sea urchins etc., as well as terrestrial vegetation, which can be used for medicinal purposes. This kind of contamination "is quite localized when considered on a broad regional scale" (DIAND 1997, pg. 5). Migratory marine animals may have body burdens of contaminants; these are not directly attributable to local contaminant sources, as the vast majority of organochlorines, for instance, arrive in the Arctic via long range transport.

Caribou living in the general area of DEW Line sites do not have elevated levels of contaminants, since they feed over a very wide area. The Canadian Arctic Contaminant Assessment Report (DIAND, 1997) describes these results in more detail.

It is recognized, however, that sources such as DEW Line sites do contribute contaminants to the Arctic ecosystem. For the purpose of scoring the matrix, therefore, a high consumption of animals from the area surrounding the DEW Line sites has the potential to pose a higher risk than a low consumption, **although in general the risk remains low.**

This factor is divided into two sub-sections, and the score is the sum of the score for each of the two sub-sections.

### 1.3 Special Considerations

As indicated in the introduction to the matrix (section 1.1), each of the three main categories includes a "*special considerations*" factor. The proposed value of the special considerations factor is a maximum of ten percent of the overall score for each category. It is intended that no circumstance will allow a user to assign a special considerations score that will cause the score for that category to exceed the maximum allotted. To avoid undue bias, it is also suggested that the user should complete the entire evaluation form and score a site before addressing special considerations in the total score.

The Environmental Working Group (EWG) based the landfill risk evaluation matrix on the CCME model which defines three categories: contaminant source, pathways and receptors. Within those three categories, the EWG tried to address all of the possible factors contributing to risk. Recognizing that even a thorough matrix could never address all possible risk factors, special considerations were included to address specific risk factors, which are not general to all of the DEW Line sites.

As noted in the CCME document, the special considerations factor is not intended to be applied on a regular basis, as it addresses very site-specific risk factors. In fact, if the special consideration factor was being consistently applied in the scoring of landfills, it would indicate that the matrix itself was incomplete. Special considerations should be site-specific characteristics that can be documented.

Three examples of how special considerations could be applied are provided to clarify the use of such a classification:

#### *Example 1. Wildlife on site*

At Byron Bay, the caribou belong to the Peary herd, an endangered species. It may be that "special considerations" points would be assigned to the Receptors category when endangered, threatened and/or vulnerable species (COSEWIC, 1997) are known to visit the DEW Line landfill.

### *Example 2. Drinking water*

The risk associated with landfill impact on a drinking water source is addressed in section C.3.2. In that section, the distance from a landfill to a known drinking water source, permanent or seasonal, is used as an indicator of the risk that the contaminants in the landfill could have an impact on the drinking water source. If a landfill is close to a drinking water source, then section C.3.2 would be assigned the maximum score (8 points). In the case of Pelly Bay, however, where the landfills are far from the drinking water source and therefore receive a relatively low score in section C.3.2, "special considerations" points may be added to address concerns that the landfills are located in the watershed for the community drinking water supply.

### *Example 3. Proximity to a community*

In the landfill risk evaluation matrix, human exposure to a landfill is measured in the following way: people can spend time at the landfill (potential dermal exposure), they can drink water from an area near the landfill (potential ingestion), they could live very close to landfills (potential exposure through aerial transport) or they could eat animals that feed near the landfill (potential ingestion). These three considerations form section C.3 of the risk evaluation matrix. If a landfill is located near a community, there is a greater likelihood that people will spend time at the landfill than there is for landfills far from a community. It is not necessarily the case, however, that landfills near communities receive frequent visits; therefore, instead of creating a special section addressing proximity to a community, the risk of human exposure (section C.3.1) is more accurately evaluated by measuring time spent at a landfill. In these cases, however, "special considerations" points may be added to the Receptors category to address a community's specific concerns.

PROPOSED ENVIRONMENTAL RISK EVALUATION MATRIX FOR LANDFILLS IN THE NUNAVUT REGION			
A.	CONTAMINANT SOURCE		Maximum Score
A.1	LANDFILL EXTENT		10
	>10 000 m <sup>2</sup>	10	
	For areas less than 10 000 = Area of Landfill X 10 / 10 000	2-9	
	Minimum Score	1	
A.2	ESTIMATED DEPTH OF LANDFILL		5
	greater than 1.5 m	5	
	less than 1.5 m	2-4	
A.3	PRESENCE OF LEACHATE		10
	Evidence of Leachate	10	
	No Evidence of Leachate	0	
A.4	PRESENCE OF SURFACE CONTAMINATED SOIL		15
	> DCC Tier II Stains	15	
	> DCC Tier I < DCC Tier II Stains	10	
	Contaminated suspected, no surface contamination noted	5	
A.5	PRESENCE OF SURFACE DEBRIS AT LANDFILL		10
	>50% of surface area	10	
	<50% of surface area, pro-rated	1-9	
	No debris observed	0	
	SPECIAL CONSIDERATIONS		
		+/- 5	
	TOTAL SCORE - CONTAMINANT SOURCE		50

PROPOSED ENVIRONMENTAL RISK EVALUATION MATRIX FOR LANDFILLS IN THE NUHAVUT REGION			
B.	PATHWAY/TRANSPORT MECHANISMS		Maximum Score
B.1	AERIAL TRANSPORT OF CONTAMINANTS		2
	All Landfills Scored as 2 if Surface Soil Contamination (A.4) or leachate (A.3) has been identified		
B.2	WATER MOVEMENT		
B.2.1	TOPOGRAPHY		12
	Steeply Slope (>40 % Grade)	12	
	Sloping (10% to 40% Grade)	4-11	
	Subdued to 10% Slope	2-3	
	Flat (< 3% )	1	
B.2.2	COVER MATERIALS -DEPTH		4
	No to little existing cover	4	
	Greater than 50% exposed/surface debris	3	
	Occasional exposed/surface debris	2	
	Existing cover, minimal debris	1	
	Cover thickness > average active layer thickness	0	
B.2.3	COVER MATERIAL - TYPE		5
	No cover	5	
	Silty/Sandy Material	4	
	Sand/Gravel Material	3	
	Gravel Material	1-2	
B.2.4	SURFACE WATER/RUN-OFF POTENTIAL		12
	Very High - evidence of erosion, continuing run-off, or wave action	12	
	High - evidence of erosion, seasonal, widespread, storm waves	10	
	Moderate - % area affected by erosion	3-9	
	Low - no evidence of erosion, slight slopes	1-2	
B.2.5	PRECIPITATION		5
	> 500 mm annual precipitation	5	
	< 500 mm annual precipitation (pro-rated)	1-4	
B.2.6	DISTANCE TO DOWNGRAIDENT PERENNIAL SURFACE/L SEASONAL DRAINAGE CHANNEL		10
	0 to 100 m	10	
	100 to 300 m	7-9	
	300 to 1 km	2-6	
	greater than 1 km	1	
	SPECIAL CONSIDERATIONS		
		+/- 5	
	TOTAL SCORE - PATHWAYS		50

PROPOSED ENVIRONMENTAL RISK EVALUATION MATRIX FOR LANDFILLS IN THE NUNAVUT REGION				
C.	RECEPTORS			Maximum Score
C.1	POTENTIAL IMPACT ON RECEIVING FRESHWATER/MARINE HABITAT			
C.1.1	PROXIMITY TO RECEIVING FRESHWATER/MARINE HABITAT			
	0 to 100 m	6		6
	100 to 300 m	4-5		
	300 to 1 km	2-3		
	greater than 1 km	1		
C.1.2	ESTIMATED HABITAT USAGE - FRESHWATER/MARINE			
	High: High Biodiversity/ High Occurrence/Calmng or Spawning Area	5-6		6
	Moderate: Moderate Biodiversity, Migratory	3-4		
	Low: Low biodiversity, rare sightings	1-2		
C.2	POTENTIAL IMPACT ON RECEIVING TERRESTRIAL HABITAT			
C.2.1	Extent of Vegetation			
	Extensive vegetation growth, (80 to 100 % ground cover)	6		6
	Moderate vegetation growth (40 to 60% ground cover)	4-5		
	Low vegetation growth (20 to 40% ground cover)	2-3		
	Sparse vegetation (<20% ground cover)	1		
C.2.2	ESTIMATED HABITAT USAGE - TERRESTRIAL/AVIFAUNA			
	High: High Biodiversity/ High Occurrence/Calmng, Denning or Nesting Area	5-6		6
	Moderate: Moderate Biodiversity, Migratory	3-4		
	Low: Low biodiversity, rare sightings	1-2		
C.3	POTENTIAL HUMAN EXPOSURE THROUGH LAND USE			
C.3.1	Presence/Occupation	likelihood of contact		
	Duration of contact	high	moderate	low
	High - Numerous visits, summer camp	6	6	4
	Moderate - occasional summer camp	6	4	2
	Low - Infrequent visits or winter camp	4	2	1
C.3.2	Proximity to Drinking Water Source			
	0 to 100 m	6		8
	100 to 300 m	5-7		
	300 to 1 km	2-4		
	greater than 1 km	1		
C.3.3	Feed Consumption			
	High quantity of sedentary organisms - manne & plant life	6		8
	Moderate quantity of sedentary organisms - manne & plant life	6		
	Low quantity of sedentary organisms - manne & plant life	4		
	No consumption	0		
	High quantity of migratory organisms	2		2
	Moderate quantity of migratory organisms	1		
	Low quantity of migratory organisms	0.5		
	No consumption	0		
	SPECIAL CONSIDERATIONS			
		+/-5		
	TOTAL SCORE - RECEPTORS			50
	TOTAL SCORE			150

**Appendix C**  
**Disposal Requirements For Items**  
**Potentially Found At Dew Line Sites**

Hazardous materials (as defined by federal or territorial legislation) will not be landfilled at the DEW sites.

The following table includes items that could be found at DEW sites and provides the treatment of these items as part of the clean-up.

Item	Disposal
Waste oil	Treat as per the DLCU Barrel Protocol/GNWT criteria
PCB-containing equipment (e.g. transformers/capacitors)	Treat as per federal regulations
Asbestos	Bag and bury according to GNWT regulations
Sewage-liquid	Treat as per wastewater discharge criteria
Sewage-solid	Treat as soil
Lead and PCB based paints	Treat as per federal regulations
Radioactive tubes	Not suitable for landfill
Scrap metal	Bury in engineered landfill on site
Radar components	Bury in engineered landfill on site
Fuel barrels	Treat as per the DLCU Barrel Protocol/GNWT criteria
Lime	Not suitable for landfill
Antifreeze	Treat as per the DLCU Barrel Protocol/GNWT criteria
Wood	Bury in engineered landfill on site
AVGAS (aviation fuel)	Treat as per the DLCU Barrel Protocol/GNWT criteria
Sulfamic acid	Not suitable for landfill.
Cathode-ray tubes and screens	Bury in engineered landfill on site
Filtron tubes	Not suitable for landfill
Oscillators	Bury in engineered landfill on site
Meters	Not suitable for landfill if PCB- or mercury-containing
Copper wire	Bury in engineered landfill on site
Transmission fluid	Treat as per the DLCU Barrel Protocol/GNWT criteria
1,1,1-trichloroethane	Not suitable for landfill
PBX telephone equipment	Bury in engineered landfill on site
Mercury vapour rectifier tubes	Not suitable for landfill
Paint thinners	Treat as per the DLCU Barrel Protocol/GNWT criteria
Batteries	Not suitable for landfill
Chlorinated hydrocarbons	Treat as per the DLCU Barrel Protocol/GNWT criteria
Corrosion inhibitors	Not suitable for landfill
Lye	Not suitable for landfill
Corrosives	Not suitable for landfill



Item	Disposal
Plastic	Bury in engineered landfill on site
Solvent	Treat as per DLCU Barrel Protocol/GNWT criteria
Dynamite	Not suitable for landfill
RF Interference filters	Bury in engineered landfill on site
Generators	Clean and bury in engineered landfill on site
Scopes	Bury in engineered landfill on site
Vehicles	Clean and bury in engineered landfill
Rubber fuel bladders	Clean and bury in engineered landfill on site
Creosote-treated poles	Bag and bury in engineered landfill on site
Compressed gas cylinders	Vent, puncture and bury in engineered landfill on site
Refrigeration equipment	Recover freon and bury in engineered landfill on site
Paper	Bury in engineered landfill on site

## Appendix D

### Sample Questions For Community Consultations

#### *Habitat Considerations*

- Are there fish/birds/clams in the pond/lake/bay immediately down hill of the landfill?
- Are there many different types of fish/birds/clams in the pond/lake/bay? What species have you observed in that water body?
- Does spawning or nesting occur in the pond/lake/bay?
- Do the animals in the pond/lake/bay stay all year round or are they migratory?
- Have you observed any land animals such as caribou, fox or bear at the DEW Line site? How many? Was the wildlife feeding/calving/nesting/burrowing on site or near a landfill?

#### *Exposure Considerations*

- Does the community fish in the pond/lake/bay down hill of the landfill? Where does the community fish?
- Does the community collect clams/sculpins/urchins from the lake/bay?
- Does the community hunt seal, walrus or whales from the bay?
- Does the community pick berries or use the vegetation down gradient of the landfill?
- Does the community hunt at the DEW Line site? What do they hunt?
- How often do the community residents visit the site? Do you camp there seasonally? Where is the camp located?
- Where is drinking water taken from on-site?

#### *Special Considerations*

- Is the community aware of this landfill? Are there any special considerations?

## Appendix E.

### Tier I and Tier II DEW Line Clean-up Criteria

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

\* concentrations exceeding this limits are classified as Tier II Soils except where the concentrations exceed federal regulations (referred to herein as "CEPA" soils)

\*\* concentrations between 200 and 500 ppm are classified as Tier I Soils

\*\*\* concentrations between 1.0 and 5.0 ppm are classified as Tier I Soils

## Appendix F

### Confirmatory Testing Protocol

#### Confirmatory Testing Grid Sizes

Size of area	Grid size	# Perimeter samples analyzed	# Interior grid samples analyzed
<100 m <sup>2</sup>	3x3 m	all	all
>100 m <sup>2</sup> , <2500 m <sup>2</sup>	6x6 m	50%	40%
>2500 m <sup>2</sup>	12x12 m	50%	40%

Where the excavation has an irregular shape, samples from the perimeter of the excavated area are to be collected following the shape of the excavation, rather than the grid if the grid points do not fall on the edge of the excavation.

Samples at the grid intersections will be point samples (as opposed to composite samples from each cell on the grid), to ensure simplicity of sampling and clarity of the result.

## Appendix G

### Barrel Contents Criteria and Disposal

#### Introduction

In order to determine the correct disposal method for barrels and their contents, the contents must first be identified. All barrel contents will be sampled and analyzed. Analytical data obtained for the samples collected from barrels located at the site will be compared to the criteria included in Table 1, below. Barrel contents are identified as organic or aqueous and the concentrations of glycols, alcohols, PCBs, chlorine, cadmium, chromium and lead are determined. Uncontaminated aqueous phases can be disposed of on the land; uncontaminated organic phases can be incinerated; contaminated aqueous material should be scrubbed free of organic material; and contaminated organic material should be disposed of as hazardous material.

Table 1: Barrel Protocol Criteria and Disposal Summary

Phase	% glycols or alcohols	PCB	Cl	Cd	Cr	Pb	Disposal
Organic	-	<2	<1000	<2	<10	<100	Incineration
Organic	-	>2	>1000	>2	>10	>100	Ship south
Aqueous	>2 %	>2	>1000	>2	>10	>100	Ship south
Aqueous	>2 %	<2	<1000	<2	<10	<100	Incineration
Aqueous	<2%						Scrub and discard

#### A. Inspection

1. All barrels are to be inspected to address the following items which shall be recorded and used as a guide prior to opening barrels.

2. Symbols, words, or other marks on the barrel that identify its contents, and/or that its contents are hazardous: e.g. radioactive, explosive, corrosive, toxic, flammable.
3. Symbols, words, or other marks on the barrel that indicate that it contains discarded laboratory chemicals, reagents, or other potentially dangerous materials in small-volume containers.
4. Signs of deterioration or damage such as corrosion, rust, or leaks at seams, rims, and V grooves.
5. Spillage or discoloration on the top and sides of the barrel.
6. Signs that the barrel is under pressure such as bulging and swelling.

#### **B. Sampling**

1. Barrels shall not be transported until it has been determined that they are not under pressure, do not leak, and are sufficiently sound for transport.
2. Barrels to be sampled should be set in an upright position, provided that this does not cause them to leak and that it is physically possible.
3. Barrels should only be opened using heavy equipment, according to accepted procedures and under qualified supervision.
4. Once open, barrels will be sampled by personnel wearing proper personal protective gear. Samples of the contents of all barrels shall be extracted using a drum thief.
5. In instances where there are a large number of barrels with obviously similar contents, these can be grouped together and 30 to 40% of the barrels in the group sampled. Barrels containing less than 50 mm of liquid may be combined with compatible material prior to sampling; samples inferred to contain only water on a visual examination shall be tested prior to this consolidation. Barrel contents, which consist of black oil, shall not be consolidated.
6. All barrels shall be clearly numbered using spray paint or other suitable marker. The number on this label should be the only sample coding provided to the laboratory.
7. The barrel locations and barrel sample descriptions should be recorded.
8. Samples should be kept at ambient temperatures and shipped by guaranteed freight to laboratories where they should be kept cold pending analysis.

#### **C. Testing**

1. Liquid samples shall be inspected and classified as either containing water or organic materials. Samples thought to contain water shall be analyzed to confirm that they are indeed water, and contain less than 2% glycols or alcohols.
2. The contents of barrels containing organic materials, including aqueous samples which contain more than 2% glycols or alcohols, shall be tested for PCBs, total

chlorine, cadmium, chromium and lead, in addition to identification of the major components e.g. fuel oil, lubricating oil.

3. Contents of barrels which contain two or more phases shall have all phases analyzed; the organic phases as described above and the aqueous phase to ascertain whether it contains less than 2% organic substances. In addition, the aqueous phase shall be tested for any components found in the organic phases above the criteria described below.

#### **D. Disposal of Barrel Contents**

1. Barrels containing only rust and sediment shall be treated as empty barrels.
2. Barrel contents comprising water only (less than 2% glycols or alcohols) shall be transferred to an open vessel such as a utility tub or half-barrel and any organic material removed by agitation with a pillow or segment of oil absorbent material. The water may then be discarded on to the ground that is a minimum of 30 meters distance from natural drainage courses. Used oil absorbent material shall be treated as described in below (D.5.).
3. Barrel contents which are composed of water with glycols and/or alcohols or organic phases, and which contain less than 2 ppm PCBs, 1000 ppm chlorine, 2 ppm cadmium, 10 ppm chromium, and 100 ppm lead, may be disposed of by incineration. Alternatively these contents may be disposed of off-site at a licensed disposal facility. The solid residual material resulting from incineration shall be subjected to a leachate extraction test. Material found to be not leachate toxic shall be disposed of as DCC Tier II contaminated soil. Leachate toxic material shall be treated as hazardous waste and disposed of off-site at a licensed disposal facility.
4. Barrel contents, which contain greater than 2 ppm PCBs, 1000 ppm chlorine, 2 ppm cadmium, 10 ppm chromium or 100 ppm lead shall be disposed of off-site at a licensed disposal facility. Contents may be combined with compatible materials for shipping purposes. Flash points may be required to be determined if they cannot be inferred from the product identification.
5. Used oil absorbent material should be treated as hazardous waste and disposed of off-site at a licensed disposal facility. If it is shown to be uncontaminated with PCBs (< 2 ppm), chlorine (< 1000 ppm), cadmium (< 2 ppm), chromium (< 10 ppm) and lead (< 100 ppm), it may be incinerated on-site.

#### **E. Disposal of Barrels**

1. Empty barrels may be crushed or shredded and landfilled on-site as non-hazardous waste after they have been cleaned in an appropriate manner. The barrels shall be

crushed in such a manner so as to reduce their volume by a minimum of 75%.  
Shredded barrels may be disposed of off-site as recycled metals.



## Appendix H

### Post Construction Landfill Monitoring Regime

#### 1.0 Types of Landfills

There are four types of landfills that require monitoring:

- New landfills for non-hazardous materials and Tier I soil;
- Landfills to be closed by the addition of granular fill and regraded;
- Landfills to be closed with leachate containment; and
- Tier II soil disposal facilities.

#### 2.0 Monitoring

New landfills are to be constructed for the disposal of non-hazardous demolition wastes, site debris and Tier I soil. These landfills, constructed according to specifications, are considered to pose low potential environmental risks as the contents and placement of the materials in the landfill are known. The monitoring of these landfills will be limited to a visual inspection program to evaluate the stability of the landfill.

Existing landfills that are to be regraded will be monitored for leachate periodically by the collection of soil and/or water samples from test pits at the toe of the landfill, in addition to visual inspection.

For existing landfills that have been classified as moderate potential environmental risk, and proposed Tier II soil disposal areas, the design in both cases is to incorporate a leachate containment system, consisting of synthetic liners (geocomposite clay liners, and/or geomembrane liners) and promotion of permafrost aggradation through the landfill contents. The monitoring program for these landfills will include thermal monitoring of the ground temperatures in and around the landfill, collection and analysis of soil samples, collection and analysis of water from wells around the landfill, and visual inspection.

### **3.0 Description of Monitoring Components**

#### **3.1 Visual Inspection**

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

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

#### **3.2 Soil and Water Sampling**

Soil and water samples, representing background as well as baseline conditions, will be collected. Results of analyses of samples from landfills will be compared to these baseline and background samples as this is indicative of changing environmental conditions at the site.

In general, one monitoring well will be placed upgradient and three will be placed downgradient. This allows the assessment of hydraulic gradient and evaluation of potential impacts. Soil samples will be collected from the toe of the landfill, and will generally be taken from the same locations as the wells. Soil samples at the toe of the landfill reflect chronic input from water and are a very important indicator of leachate.

Soil and water samples will be tested for:

- PCBs (polychlorinated biphenyls);
- TPH (total petroleum hydrocarbons),; and;
- Inorganic elements: arsenic, cadmium, chromium, cobalt, copper, lead, nickel and zinc.

If the landfill is close to a drinking water source and has the potential to have an impact on it, the water samples will be analyzed for the following parameters in addition to the compounds and elements listed above:

- inorganic elements by ICP scan;

- major ions, hardness, and total dissolved solids,; and;
- pH and conductivity,;

The intent of the additional analyses is to provide added information to evaluate the potential impacts related to the landfill, and not necessarily to provide an assessment of the potability of the water source. In this latter case, the results of the analyses of these drinking water samples will be compared to the most current version of Canadian and/or Territorial standards for drinking water for the parameters analysed, in addition to comparison with background and baseline data.

### 3.3 Thermal Monitoring

As indicated previously, one component of the leachate containment system incorporates aggradation of the permafrost through the landfill contents such that the active layer does not penetrate the waste materials. Geothermal analyses were carried out to predict the length of time for freezeback of the landfill; long-term and short-term thermal regime in the ground; and the depth of the active layer in the cover material. The analyses have shown that it takes several years for the landfill temperatures to equilibrate and stabilize.

A thermal monitoring system provides measurement of sub-surface ground temperatures, which allows comparison to and verification of the predicted ground temperatures. The thermal monitoring system consists of installation of thermistor strings, with "thermistor beads" at select intervals to provide ground temperature profiles at various locations within the landfill. The thermistor strings are attached to automated data-loggers which allow for remote data collection. In general, a minimum of three thermistors will be placed; the actual number will be evaluated on a landfill-specific basis. Thermistor installation will be in accordance with standard engineering practice.

Checklists for the collection of monitoring data are presented in Appendix I.

### 4.0 Monitoring Frequency

Generally, the post-construction monitoring program would have three phases, each with a different objective.

#### **4.1 Phase I: Monitoring of conditions to confirm that equilibrium is achieved.**

During Phase I, sites where leachate containment and/or Tier II soil facilities have been constructed, monitoring will take place on an annual basis, for an estimated period of five years following construction. The five-year term was selected on the basis that ground-temperature thermal regimes at these specific landfills would require three to five years to reach equilibrium.

At other locations, where existing landfills have been regraded and new landfills have been constructed, Phase I monitoring will be carried out on in the first, third and fifth years following construction.

An evaluation of the Phase I data will be carried out at the end of five years to confirm that thermal and chemical equilibrium had been achieved, and that no stability issues have been identified. The Phase I monitoring program may be extended, if required.

#### **4.2 Phase II: Verification of equilibrium conditions established during Phase I.**

The monitoring frequency in Phase II be downgraded from Phase I, and be carried out according to the following schedule: year 7, year 10, year 15 and year 25. Year 25 would mark the end of Phase II monitoring.

#### **4.3 Phase III: Monitoring for long term issues such as liner integrity, permafrost stability, and significant storm events.**

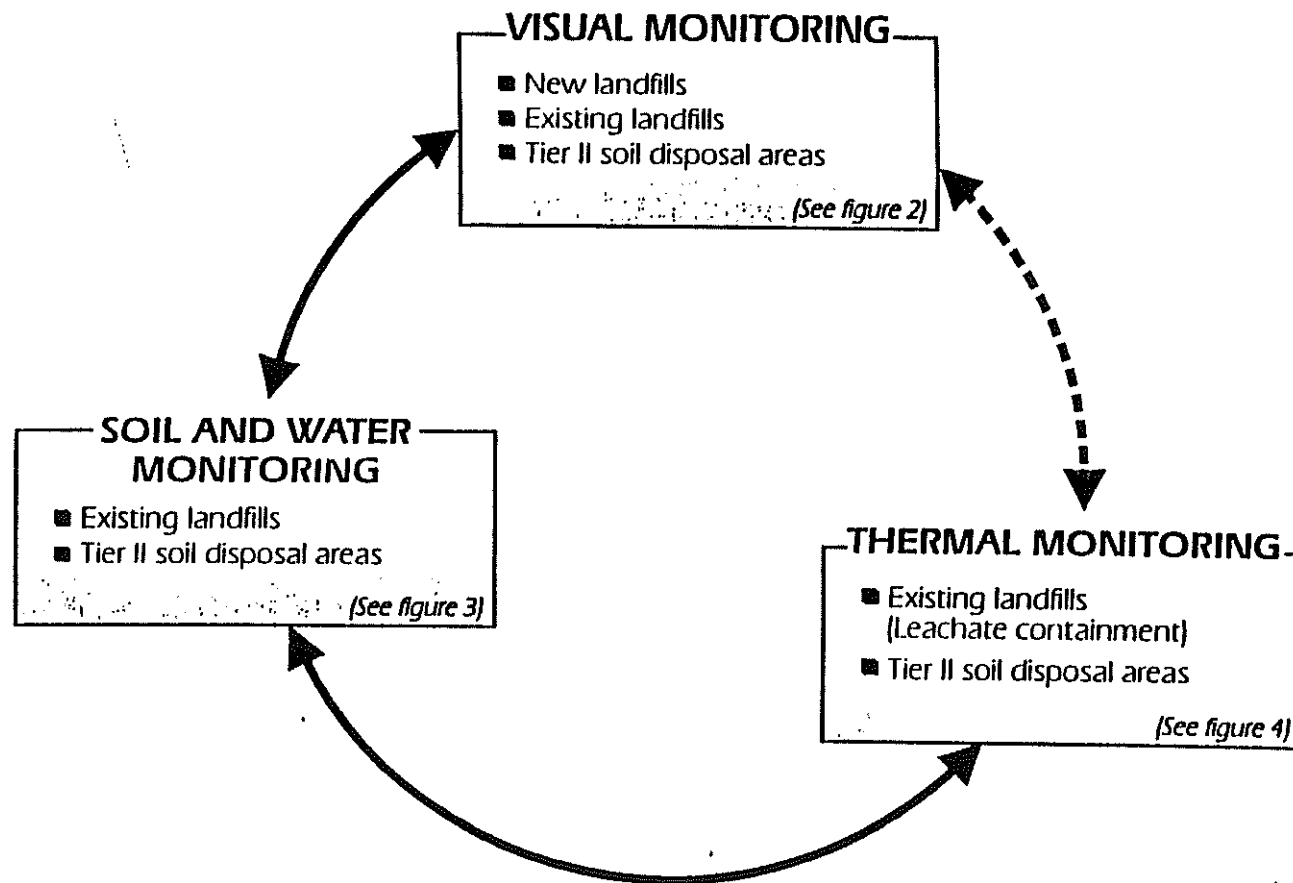
At the end of Phase II, 25 years after implementation of the remedial actions for a given landfill, a major re-evaluation of the monitoring program will be carried out prior to initiating Phase III. It is difficult to predict beyond 25 years how world events and improvements in technology may impact on monitoring requirements. Based on current technology and knowledge, a Phase III program should be implemented at 10 year intervals. The duration of the Phase III program will be estimated at the outset of the program and be subject to re-evaluation as new technologies are developed and new information becomes available.

## 5.0 Interpreting Monitoring Results

Monitoring results (thermal, chemical and visual) have to be interpreted in concert with one another. An increase in chemical concentrations, for instance, from one year to the next does not necessarily trigger action if there are no other signs of landfill instability. Stability problems would have to be established by a geotechnical engineer with northern experience. Action will be taken based on trends in chemical data rather than isolated results.

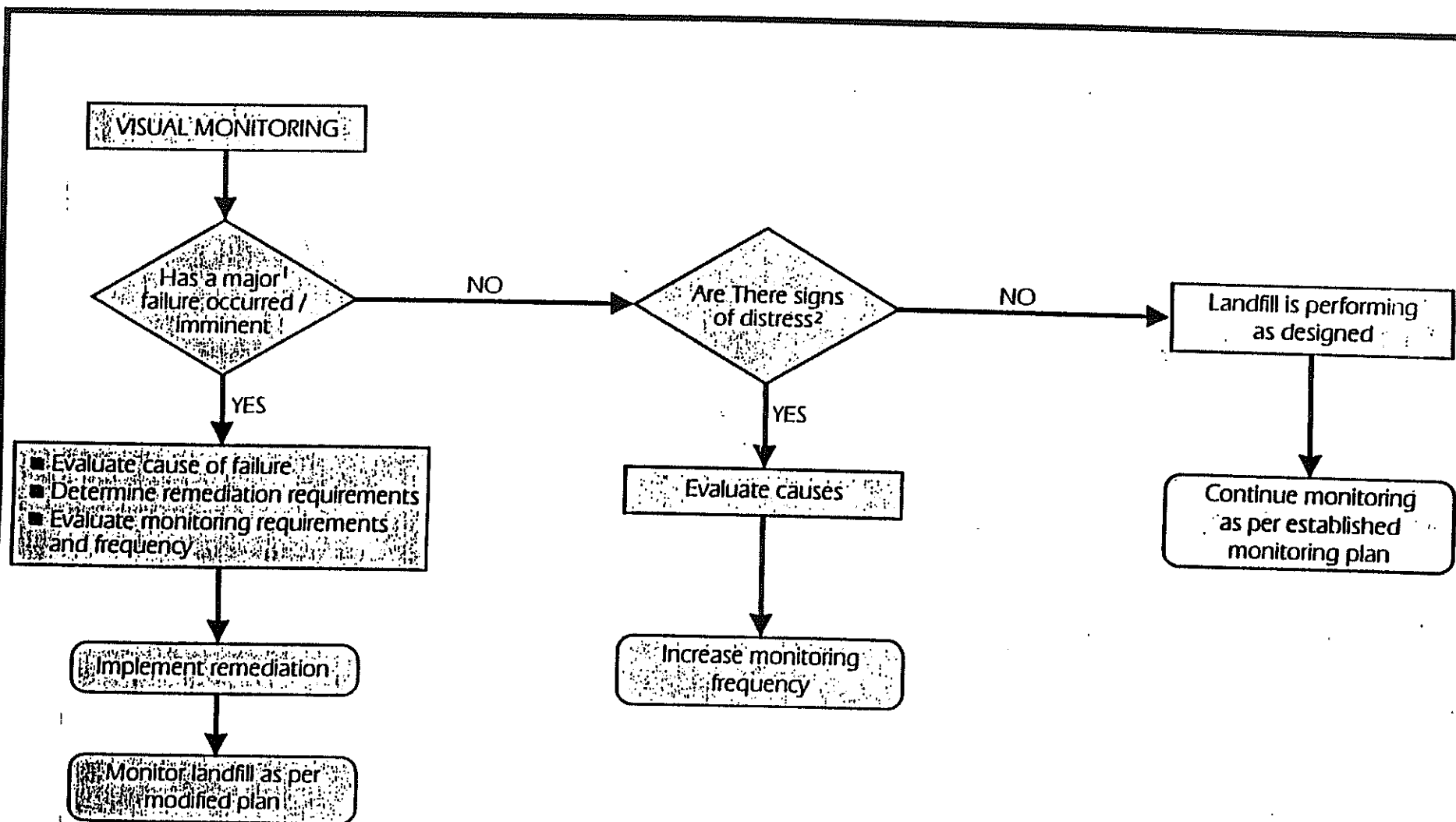
Normally, the first step to be taken when a potential problem is identified is to intensify the monitoring program. If a problem has been confirmed, then remedial action will be undertaken.

The flowcharts in Figures 1 to 4 illustrates the decision-making process to be applied to monitoring data. The following section outlines actions to be taken if the monitoring program indicates a deficiency in a landfill.



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**LANDFILL MONITORING PROGRAM**

## SUMMARY FLOW CHART

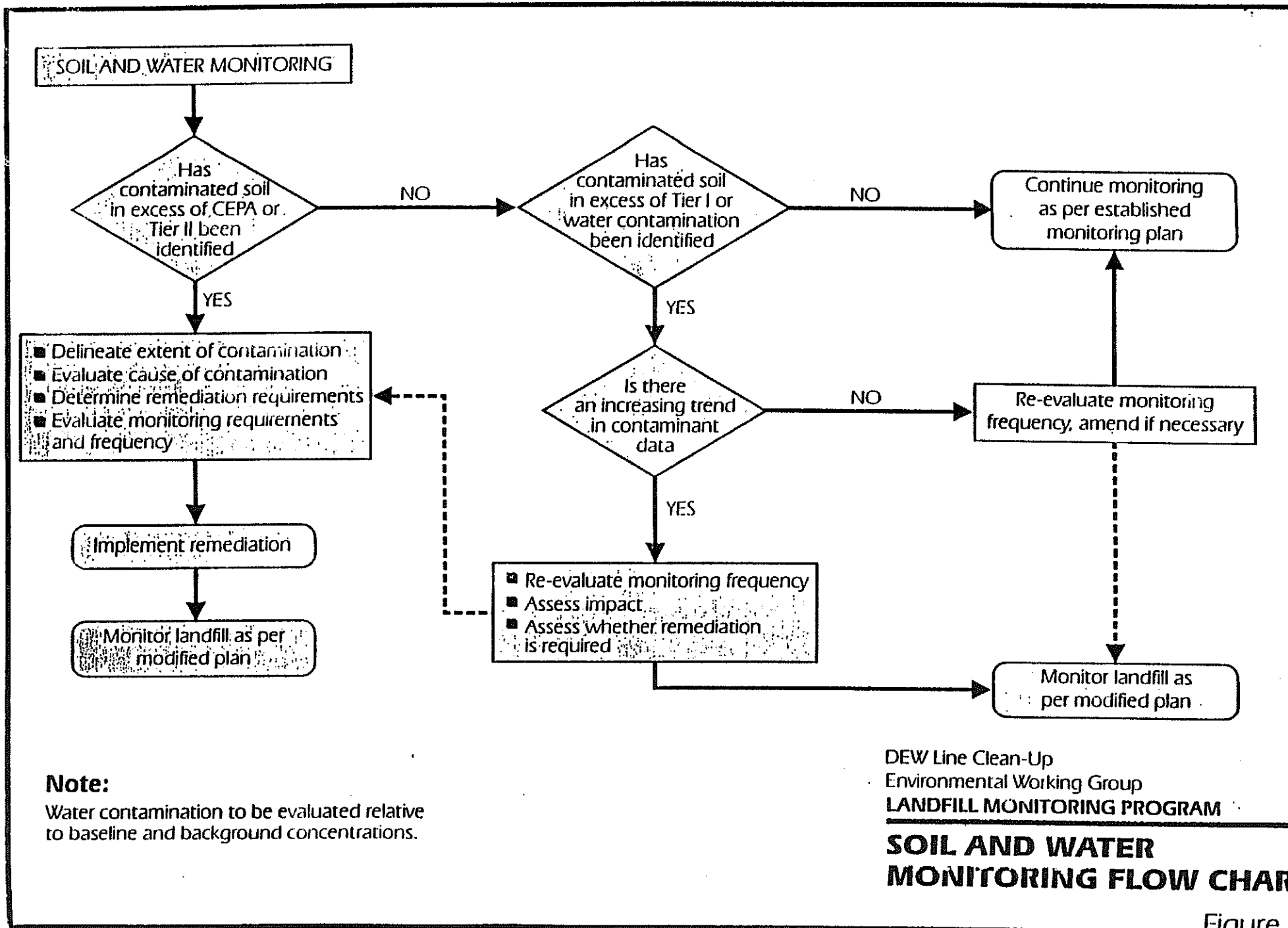


#### Notes:

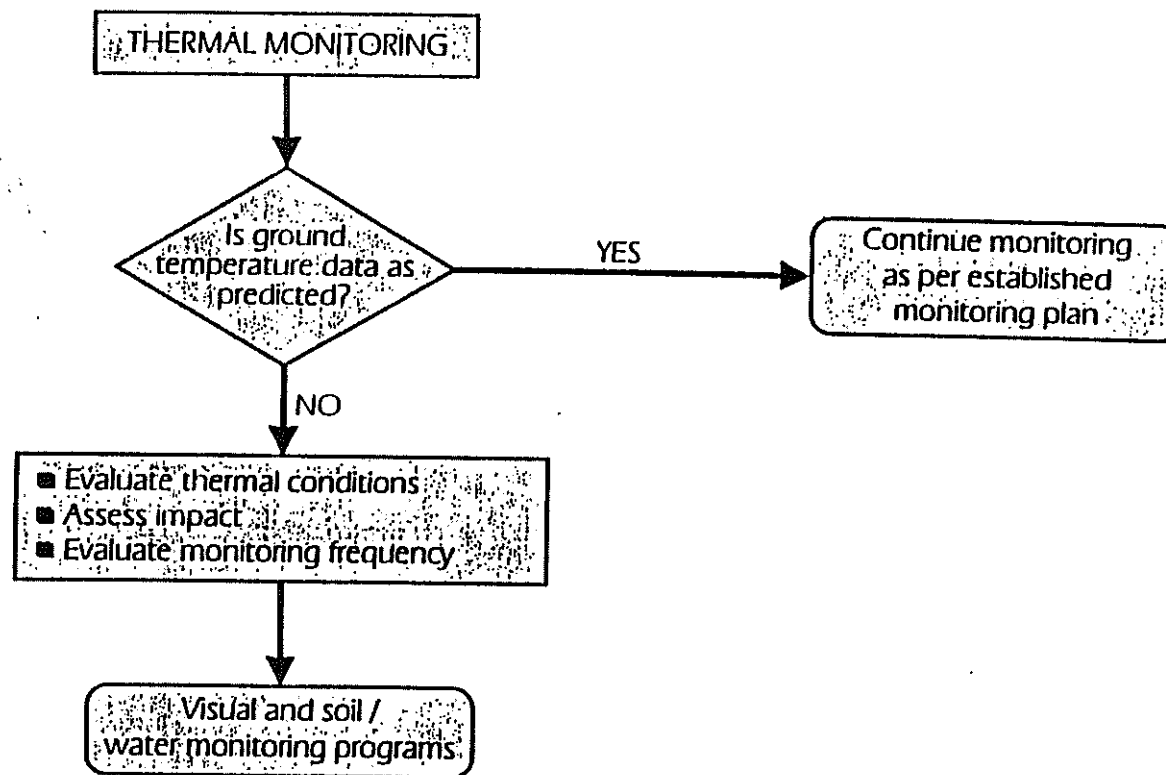
- 1 Major Failure: significant exposed debris (>25% of surface area) due to erosion, settlement, frost action; berm failure (slope stability)
- 2 Signs of Distress: Voids due to settlement, ponding on surface, and/or tension cracks, and/or erosion.

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## VISUAL MONITORING FLOW CHART







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**LANDFILL MONITORING PROGRAM**

## **THERMAL MONITORING FLOW CHART**

## **6.0 Impact of Monitoring Results**

The possible results and the associated potential mitigation requirements for the landfill monitoring components are described in the following subsections. For all instances, the mitigation requirements are dependent on the severity of the deficiency, and will be assessed by a professional geotechnical engineer with northern engineering design and construction experience. In addition, the assessment and implementation of resulting remediation requirements will be carried out in a staged approach to ensure that the proposed solutions address the specific requirements in a logical and cost effective manner.

### **6.1 Visual Inspection**

If the results of the visual inspection program indicate evidence of significant settlement, ponding, or frost jacking, it may be necessary to implement one or more of the following mitigative measures:

- increase the frequency of the visual monitoring program
- place erosion protection material such as riprap, vegetation mats, etc.
- recompact existing debris material and existing granular material
- place additional granular fill
- regrade, as required, to promote positive drainage away from the deficient landfill area.

It should be noted that settlement of the landfill surface may not necessarily result in failure of the landfill. Settlement (typically differential settlement) that results in ponding and infiltration of surface water could lead to erosion and frost jacking problems.

If the visual monitoring program results indicate evidence of sloughing of landfill perimeter berms and thermal contraction cracks, it may be necessary to implement one or more of the following mitigative measures:

- flatten granular berm slopes
- compact existing granular slopes
- place and compact additional granular fill material

## 6.2 Soil and Groundwater Monitoring

The results of the soil and groundwater monitoring program will be compared against baseline data established prior to the initial landfill development or remediation program. Results of the analysis of soil and groundwater samples that show decreasing trends of contamination at the perimeter of landfills typically indicate that the implemented landfill remediation has been effective. Conversely, if the results indicate increasing levels of contamination, then it may be necessary to implement one or all of the following:

- Increase the frequency of the monitoring program.
- Carry out a review and evaluation of the nature and extent of the contamination, including the incorporation of the results of the visual monitoring program. The major objective of this evaluation will be to determine the cause of the contaminant migration problem, and in particular to determine if it is the result of ineffective design, material (e.g. liner) failure, improper compaction, selection and use of inadequate granular material, poor grading, etc. This evaluation may require intrusive investigation into and around the landfill.
- Depending on the results of the above, it may be necessary to remove and replace liner material, reconstruct containment berms, etc.
- Assess the requirement to excavate and dispose of the contaminated soil; this would include the delineation of the vertical and areal extent of the contamination.
- Excavate and dispose of contaminated soil and/or excavate all or part(s) of the landfill, as required.

The requirement for the specific scope and extent of remediation, as outlined above, will also incorporate an risk evaluation of the potential impacts of the contamination based on the principles defined in the Landfill Risk Evaluation Matrix. The need for the risk evaluation is predicated on the understanding that not all affected sites pose the same risk to the environment, and consequently remediation requirements will vary.

## 6.3 Thermal Monitoring

The results of the thermal monitoring program will be compared against the parameters for freezeback that were incorporated into the geothermal design of the landfills. It is important that the overall assessment of these results consider the results of both the visual and soil/groundwater monitoring programs. If the thermal monitoring results indicate ground temperatures that are significantly higher (greater than 2° C) than

predicted during the geothermal analyses carried out as part of the design, then it may be necessary to implement one or more of the following:

- Increase the frequency of the recording and assessment of results from the thermal monitors.
- Establish, based on the results of the soil and groundwater monitoring programs, if groundwater and/or soil contaminant levels beyond the perimeter of the landfill have increased. Incorporate the results of a risk assessment. Assess the impacts, as outlined above, to determine the appropriate remediation requirements.
- If it established that a slower than expected freezeback period has resulted in the migration of contamination beyond the landfill and depending on the results of the above risk assessment, then it may be necessary to implement one or more of the following:
  - determine if the rate of the freezeback progress is continuing, or if freezeback within the landfill has terminated; is at steady-state;
  - excavate and dispose of contaminated soil and/or excavate all or part of the landfill, as required;
  - place additional granular cover material or other insulating material (styrofoam insulation, vegetation) over the landfill to provide an increased insulation barrier over the landfill;
  - reconstruct and/or re-saturate the perimeter berms of the landfill.

## **Appendix I**

### **Landfill Monitoring Checklist**

DEW Line Clean-up  
Environmental Provisions

**DEW LINE CLEANUP  
LANDFILL MONITORING CHECKLIST**

**MONITORING PROGRAM**

LANDFILL TYPE	Visual	Soil and Water	Thermal
New Landfill (Non-Hazardous Wastes)	X		
Landfill requiring Regrading	X	X	
Landfill requiring Leachate Containment	X	X	X
Tier II Soil Disposal Facilities	X	X	X

SITE: \_\_\_\_\_

LANDFILL DESIGNATION: \_\_\_\_\_

LANDFILL TYPE: \_\_\_\_\_

DATE: \_\_\_\_\_

MONITORING EVENT NO.: \_\_\_\_\_

NAME: \_\_\_\_\_

WEATHER CONDITIONS: \_\_\_\_\_

## VISUAL INSPECTION CHECKLIST

Carry out a visual inspection of the landfill surface, berms, toe of berms and identify potential areas of distress as follows:

### 1. Settlement:

- a) Is there differential settlement occurring on the surface?
  - i) low areas or depressions;
  - ii) voids forming
- b) What is the extent of settlement?
  - i) percent of surface area affected;
  - ii) localized areas or continuous;
  - iii) how deep;
- c) Where is the settlement occurring?
  - i) near berms, center of facility, etc.
- d) Explain?
  - i) evidence of significant surface infiltration,
  - ii) water ponding on surface
  - iii) snow drifting

### 32. Erosion

- a) Is there erosion occurring on the surface or berms of the landfill?
  - i) preferred drainage channels;
  - ii) sloughing of material;
- b) What is the extent of erosion?
  - i) percent of surface area affected;
  - ii) localized areas or continuous;
- c) Where is the erosion occurring?
  - i) along the toe, on the surface, through the berms;
- d) Explain?
  - i) evidence of significant surface water run-off;
  - ii) poor material type;

34. Frost Action

- a) Is there frost action/damage to the landfill?
  - i) exposure of debris due to uplift;
  - ii) tension cracking along berms;
  - iii) sorting of granular fill;
- b) What is the extent of frost action?
  - i) percent of surface area affected;
  - ii) localized areas or continuous;
- c) Where is the cracking, frost heaving occurring?
  - i) along the toe, on the surface, through the berms;
- d) Explain?
  - i) poor material gradation;
  - ii) poor compaction;
  - iii) high water content, silt content in cover material;

45. Condition of Other Monitoring Instruments:

56. Provide detailed sketch and photographic record of landfill.

PRELIMINARY STABILITY ASSESSMENT



# SOIL AND GROUNDWATER MONITORING FIELD CHECKLIST

## 1. Soil Samples:

Sample No:	
Field Measurements: VOC	
Soil Description:	
Analyses Requested	

## SOIL AND GROUNDWATER MONITORING FIELD CHECKLIST cont'd

### 2. Water Samples

Sample No: Well No.:	
Field Measurements :	pH Conductivity Temperature
Well Processing	Water level
	Purged well or standing water sampled
	Recovery Rates
Analyses Requested	

Comments:

*Additional surface water samples: where, why, describe areas of stressed vegetation*

## **THERMAL MONITORING CHECKLIST**

Thermistor Number:

Location:

1. Download data
2. Replace battery pack
3. Check condition of connections and instrumentation
4. Save data to hard-drive and disk.
5. Relock cap

DEW Line Clean-up  
Environmental Provisions

## **Appendix J**

### **Hydrocarbon Contamination Checklist**

#### **General**

Date:

Name of Assessor:

Site Name:

Hydrocarbon Spill/Stain Location:

#### **Hydrocarbon Source**

What type of hydrocarbon is present in this stain? Consider the following:

Toxicity (Lubrication Oil, Diesel, Gasoline/Avgas)

Fluidity

Solubility

Volatility

What is the concentration of total petroleum hydrocarbons in parts per million (ppm)? Is it above 2500 ppm?

What is the approximate volume of contaminated soil in cubic metres?

#### **Pathways**

1. Is the contaminated soil in a stable location or on a slope?
2. What is the estimated organic matter in the contaminated soil? (ie. <0.1%, <5%, >5%)

DEW Line Clean-up  
Environmental Provisions

3. What is the estimated grain size of the contaminated soil? Consider the following:

Coarse ( $D_{50} > 75$  micron)

Fine ( $D_{50} < 75$  micron)

4. What is the distance from the contaminated soil to a marine or freshwater environment?
5. What is the annual precipitation of the site?
6. What is the mean summer temperature?

#### Potential Impacts on Receptors

1. What is the distance to the nearest down gradient marine or freshwater habitat?
2. Is this a potential or known drinking water source for terrestrial animals or humans?
3. What is the down gradient habitat usage? Consider the following:
- Grazing, nesting, denning, spawning, calving  
High, medium, or low number of sitings.  
High, medium or low biodiversity.
4. Is this area visited frequently by humans for hunting, fishing, gathering or camping purposes? What is consumed and from where is it obtained?

**Appendix K**  
**Tier II Disposal Facility**

DEW Line Clean-up  
Environmental Provisions

1. GRANULAR FILL THICKNESS DEPENDENT ON SITE SPECIFIC CONDITIONS.
2. GRANULAR FILL GRADATIONS ARE SITE SPECIFIC.

## TIER II DISPOSAL FACILITY

### TYPICAL CROSS SECTION

**AGREEMENT BETWEEN**

**Nunavut Tunngavik Incorporated**

**And**

**Her Majesty In The Right Of Canada,**

**Represented By**

**The Minister Of National Defence**

**With Respect To Economic Benefits For Inuit**

**In The Clean-Up And Restoration Of**

**Distant Early Warning Sites**

**Within The Nunavut Settlement Area**

**(NTI-DND Economic Agreement)**



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## **PREAMBLE**

**WHEREAS** fifteen Distant Early Warning (DEW) Line Sites are located on Department of National Defence (DND) reserves within the Nunavut Settlement Area (NSA);

**AND WHEREAS** DND is undertaking an environmental clean-up of the DEW Line sites, facilities and associated areas;

**AND WHEREAS** the Inuit and the Federal Government have an interest in protecting the ecosystem integrity and the existing and future well-being of the residents and communities of the NSA and increasing the participation of Inuit and Inuit firms in business and employment opportunities in the NSA;

**AND WHEREAS** on September 1, 1998 DND and NTI have entered into an agreement to establish a framework for the remediation and restoration of the DEW Line Sites in the NSA;

**AND WHEREAS** the Parties wish to enter into an agreement addressing the participation of Inuit in the clean-up of DEW Line sites in the Nunavut Settlement Area, in order to achieve a cost-effective and environmentally sound clean up and restoration of DEW Line Sites, which optimises economic benefits and opportunities for Inuit in employment, the provision of goods and services, training and the transfer of technology, in accordance with the *Nunavut Land Claims Agreement* (NLCA), and specifically Article 24 of the NLCA;

**NOW THEREFORE**, in consideration of the premises and mutual covenants contained herein, the Parties agree as follows:

### **1.0 DEFINITIONS**

**Clean-up Contract** means a contract entered into by DND's contracting agent and a Contractor for a Site clean-up;

**Contractor** means the party who has contracted with DND's contracting agent to carry out a Site clean-up;

**Contracting Working Group** means the working group established under Section 4.2 of the Agreement;

**DEW Line Site** means one of the Distant Early Warning Sites listed in Section 3.1 below;

**DIAND DEW Line Sites** means the Distant Early Warning Sites in Nunavut not listed in Sections 3.1 and 3.2;

**DND** means the Crown in right of Canada represented by the Minister of National Defence or his delegate;

**Inuit firm** has the same meaning as in the *Nunavut Land Claims Agreement*;

**Inuit Firm Registry** is the comprehensive list of Inuit firms maintained in accordance with Paragraph 24.7.1 of the *Nunavut Land Claims Agreement*;

**MIEC** means the Minimum Inuit Employment Content set in accordance with Section 5.0 of this Agreement;

**MICC** means the Minimum Inuit Content for Contracting set in accordance with Section 6.0 of this Agreement;

**NLCA** means *Nunavut Land Claims Agreement*;

**NTI** has the same meaning as "Tungavik" under Section 1.1.1 of the NLCA;

**NTI-DND Environmental Agreement** means "The Agreement Between Nunavut Tunngavik Incorporated and the Department of National Defence for the Clean-up and Restoration of DEW Sites Within the Nunavut Settlement Area" dated September 1, 1998;

**Nunavut Settlement Area** has the same meaning as in the NLCA;

**Parties** means Nunavut Tunngavik Incorporated and the Department of National Defence;

**Regional Inuit Association** means the Kivalliq Inuit Association, the Qikiqtani Inuit Association or the Kitikmeot Inuit Association or their successors;

**Representative Occupational Grouping** means a category of personnel required for a Site clean-up classified by occupation or type of work to be performed;

**Registry** has the same meaning as "Inuit Firm Registry";

**RIA** means "Regional Inuit Association";

**Site** means a "DEW Line Site" that is, or is projected to be, remediated and restored, as provided for in the NTI-DND Environmental Agreement;

**Steering Committee** means the Committee established under Section 4.1 of the Agreement;

**Subcontractor** means a party who contracts with a Contractor or Subcontractor to perform any part of the Contractor's obligations on a Site;

**Work** means materials and services furnished or provided to perform a clean-up or restoration of a Site.

## **2.0 OBJECTIVES**

2.1 The objectives of this Agreement are as follows:

- a) to complement the NTI/DND environmental provisions as set out in the NTI-DND Agreement for the Clean-up and Restoration of DEW Sites Within the Nunavut Settlement Area, 1 Sept. 1998;
- b) to further the objectives of Article 24 of the NLCA in relation to the DEW Line Clean-up in the NSA;
- c) to achieve an efficient and cost-effective clean-up and restoration of the DEW Line Sites in the NSA;
- d) to achieve:
  - i) increased participation by Inuit firms in business opportunities generated by the clean-up;
  - ii) improved capacity of Inuit firms to compete for government contracts;
  - iii) increased employment of Inuit up to a representative level;
  - iv) increased access by Inuit to career training, on-the-job training, apprenticeship, and other job-related programs, in order to develop a skilled and professional pool of labour available for work on the DEW Line Clean Up in the NSA; and
  - v) increased opportunities for Inuit to receive training and experience to successfully create, operate and manage businesses in Nunavut;
- e) to establish a mechanism whereby successful Contractors fulfill agreed-upon commitments to levels of Inuit participation.

### 3.0 GENERAL

- 3.1 **Scope.** This Agreement applies to the Site clean-up at the following DEW Line Sites:

PIN 2 - Cape Young  
PIN 3 - Lady Franklin Point  
PIN 4 - Byron Bay  
CAM 1 - Jenny Lind Island  
CAM 2 - Gladman Point  
CAM 3 - Shepherd Bay  
CAM 4 - Pelly Bay (near Kugaaruk)  
CAM 5 - Mackar Inlet  
FOX M - Hall Beach  
FOX 2 - Longstaff Bluff  
FOX 3 - Dewar Lakes  
FOX 5 - Broughton Island (near Qikiqtarjuaq)  
DYE M - Cape Dyer

- 3.2 The Parties acknowledge that prior to the signing of this Agreement, the clean-up of Cape Hooper (FOX 4) and Cambridge Bay (CAM M) had been completed. Note that the process for awarding the contracts for the clean-up of Pelly Bay (CAM 4) and Broughton Island (FOX 5) will have started prior to the timelines contemplated in this Agreement.
- 3.3 **No Precedent.** This Agreement is not to be construed as a precedent for any other activities of DND, Canada or any third party. Nothing in this Agreement shall be interpreted or used to define the rights of the Parties, Canada or any third party in relation to any matter under the NLCA or to interpret any Article of the NLCA except for the purpose of this Agreement.
- 3.4 **Urgency.** The Parties recognize the urgency of the matters dealt with in this Agreement and agree to perform all required actions as expeditiously as possible.
- 3.5 **Nunavut Land Claims Agreement.** The Parties recognize and acknowledge their respective obligations to comply with the NLCA in connection with all Work.
- 3.6 **No Retrospectivity.** This Agreement binds the Parties only with respect to Site clean-ups, including selection of Contractors for Site clean-ups, that have not commenced as of the date of the signing of this Agreement, unless the Parties agree otherwise.

## **4.0 STEERING COMMITTEE AND CONTRACTING WORKING GROUP**

### **4.1 Steering Committee**

4.1.1 The Steering Committee established under Article 4.0 of the NTI-DND Environmental Agreement shall perform the following functions in connection with this Agreement:

- a) establish Minimum Inuit Employment Content, under Section 5.10;
- b) establish Minimum Inuit Content for Contracting, under Section 6.10;
- c) review contract award issues, under Sections 8.3.1, 8.3.3, and 8.3.5 through 8.3.11; and
- d) review Contractor's deviation from MIEC and MICC pursuant to Section 12.2;
- e) consider other items of mutual concern related to the implementation of this Agreement, raised by either Party.

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4.1.2 The Steering Committee may meet either in person or by teleconference.

4.1.3 The Steering Committee shall operate on the basis of consensus.

4.1.4 The Parties each shall be responsible for their respective costs associated with participating in Steering Committee meetings.

4.1.5 The Steering Committee shall establish and make publicly available procedures governing its operations and those of the Contracting Working Group, including, without limitation, conflict of interest, release of information provided to either Party, and procedures for decision-making that ensure fairness and due process to Contractors.

### **4.2 Contracting Working Group**

4.2.1 A Contracting Working Group shall be established, composed of two members appointed by NTI and two members appointed by DND. The working group shall perform the following functions in connection this Agreement:

- a) make a recommendation to the Steering Committee on the Minimum Inuit Employment Content (MIEC), under Section 5.8; and

- b) make a recommendation to the Steering Committee on the Minimum Inuit Content for Contracting (MICC), under Section 6.8.

4.2.2 The Contracting Working Group shall operate on the basis of consensus.

4.2.3 The Parties each shall be responsible for their respective costs associated with participating in Contracting Working Group meetings.

## **5.0 MINIMUM INUIT EMPLOYMENT CONTENT**

5.1 A Minimum Inuit Employment Content (MIEC) shall be set for each Site.

5.2 The MIEC for a Site is the minimum level of Inuit employment that DND shall require the Contractor to achieve for the clean-up of that Site.

5.3 The MIEC shall be expressed as a percentage, and shall be calculated by dividing the total number of Inuit employed, in person-days, by the total number of persons employed, in person days, for the term of the contract of a Site clean-up. The calculation shall include all on-site and off-site personnel employed by Contractors and Subcontractors. Off-site personnel shall include without limitation:

- a) management and support personnel dedicated to the Site clean-up;
- b) project management personnel employed by the Contractor;
- c) technical or drafting personnel; and
- d) expediting, shipping, payroll or accounting personnel.

5.4 The calculation of the MIEC shall not include:

- a) project management staff at DND's contracting agent;
- b) DND employees; and
- c) any consultants contracted by DND or DND's contracting agent for the provision of advice concerning the specifications of the clean-up, contract management or other advice.

5.5 The MIEC shall be within a range of 65-85%.

5.6 Eight months prior to the scheduled commencement of a Site clean-up, DND shall provide NTI with DND's estimates of the types and level of positions that will be required for the conduct of the Site clean-up, in person-days, and broken out by Representative Occupational Grouping. The estimate shall be

provided in the form attached as Annex A.1. Education and skills profiles for Representative Occupational Groupings are listed in Annex B.

- 5.7 Within two months of the receipt of the information described in Section 5.6, NTI, in consultation with the RIAs, shall provide DND with a projection of the level of Inuit employment for the Site clean-up. The projection will be provided in the form attached as Annex A.2 to this Agreement. NTI's projection will be based on an analysis, for each Representative Occupational Grouping, of the number of Inuit qualified for work on the Site clean-up in relation to the employment opportunities using, to the extent possible, relevant available information on Inuit qualifications and employment.
- 5.8 Within one month of receipt by DND of the projection under Section 5.7, the Contracting Working Group shall recommend a MIEC for the Site clean-up. In making the recommendation to the Steering Committee for the MIEC, the Contracting Working Group shall take into account, for each Representative Occupational Grouping, the following factors:
- a) NTI's projection of Inuit employment;
  - b) Inuit employment achieved on other DND DEW Line Site clean-ups to date, compared to the MIEC established for the Sites, and on DIAND DEW Line Sites;
  - c) the results achieved by training and apprenticeship programs for Inuit labour, to date; and
  - d) the projected impact on the availability of Inuit labour of other projects being undertaken in Nunavut.
- 5.9 Where the Contracting Working Group, after a reasonable effort, is unable to reach agreement on the MIEC for a Site clean-up, either Party may refer the MIEC to the Steering Committee for resolution.
- 5.10 The Steering Committee shall meet as soon as practicable following a recommendation under Section 5.8 or a referral under Section 5.9 to decide on a MIEC. In the event that the Steering Committee does not reach agreement on a MIEC within two weeks, either Party may refer the matter to Expedited Arbitration, as provided under Section 14.0.
- 5.11 The MIEC resulting from a decision of the Steering Committee or arbitrator shall be the MIEC required under Section 5.1.
- 5.12 The forms used to provide the information required under Section 5.6 and 5.7 may be modified for a Site clean-up upon the agreement of all members of the Contracting Working Group.



## **6.0 MINIMUM INUIT CONTENT FOR CONTRACTING (MICC)**

- 6.1 A Minimum Inuit Content for Contracting (MICC) shall be set for each Site.
- 6.2 The MICC for a Site is the minimum level of Inuit business participation that DND shall require the Contractor to achieve for the clean-up of that Site.
- 6.3 The Minimum Inuit Content for Contracting (MICC) for a Site clean-up shall be expressed as a percentage, and shall be calculated by dividing the total dollar value of Inuit contracting content by the total dollar value of the Clean-up Contract. The total dollar value of Inuit contracting content shall be calculated by adding the dollar value of all subcontracts for goods or services to be obtained through, or awarded to Inuit firms, including all labour costs. Where the Contractor is an Inuit firm, the total dollar value of Inuit contracting shall also include the Contractor's share of the Clean-up Contract, which is the total dollar value of the contract minus the dollar value of all subcontracts.
- 6.4 The MICC shall be within a range of 60-75%.
- 6.5 Eight months prior to the start of a Site clean-up, DND shall provide NTI with an analysis of categories of contracting opportunities and an estimate of each category's percentage of total value of the Clean-up Contract for the Site clean-up. The analysis shall be in the form provided in Annex A.3.
- 6.6 Within two months of the receipt of the analysis required under Section 6.5, NTI, in consultation with the RIAs, shall provide to DND a list of Inuit firms that have declared themselves able to perform work on a Site clean-up, listed according to the categories of contracting opportunities identified under Section 6.5.
- 6.7 NTI shall request Inuit firms to provide corporate resumes to their RIAs that shall include information on relevant capacity and work experience. NTI shall deal with all information provided to it under this section as strictly confidential. DND shall treat all information provided to it by NTI under this section as commercial confidential information. DND shall not release such information unless prior approval is received from the Inuit firm, or DND is required to release such information under the provisions of the *Access to Information Act* and/or the *Privacy Act*.
- 6.8 The Contracting Working Group shall recommend the MICC for a Site to the Steering Committee within one month of receipt of the list of Inuit firms required under Section 6.6. This recommendation shall take into account the following factors:

- a) Inuit firms' capacities;
  - b) historical data from prior Site clean-ups in Nunavut and the Western Arctic;
  - c) Site-specific characteristics; and
  - d) impact of other projects on the availability of Inuit firms.
- 6.9 In the event that the Contracting Working Group is unable to reach agreement on the MICC, as provided in Section 6.8, either Party may refer the matter to the Steering Committee.
- 6.10 The Steering Committee shall meet as soon as practicable following a recommendation under Section 6.8 or a referral under Section 6.9 to decide the MICC. In the event that the Steering Committee does not reach agreement on the matter within two weeks of a referral, either Party may refer the matter to Expedited Arbitration, as provided under Section 14.0.
- 6.11 The MICC resulting from a decision of the Steering Committee or arbitrator shall be the MICC required under Section 6.1 for a Site.
- 6.12 The form used to provide the information required under Section 6.5 may be modified for a Site clean-up upon the agreement of all members of the Contracting Working Group.

## **7.0 CONTRACTOR'S INUIT PARTICIPATION PLAN**

- 7.1 DND shall require all companies that either submit a bid on a Clean-up Contract or enter into negotiations for a Clean-up Contract to provide a preliminary Contractor's Inuit Participation Plan (CIPP) that shall include:
- a) a description of how the company intends to achieve the MIEC, including, where possible and without limitation:
    - i) the number, percentage and types of positions, including training positions, that the company proposes to fill with Inuit, in relation to the total number of positions, and the number and percentage of person-days proposed for these positions in relation to total person-days;
    - ii) the steps the company will take to recruit potential Inuit employees; and
    - iii) any measures the company has taken or proposes to take to increase Inuit employment, including such things as the details of any Inuit recruitment programs, training or apprenticeship programs, and equivalencies for formal qualifications;

- b) where the MIEC is lower than the NTI projection provided to DND under Section 5.7, a description of how the Contractor could achieve the NTI projection for Inuit employment;
  - c) any other measures for optimizing Inuit employment and training; and
  - d) a description of how the company intends to achieve the MICC, including, where possible and without limitation the names, address and particulars of any actual or proposed Subcontractors; and the specifics of any actual or proposed contracting arrangements.
- 7.2 DND shall require all companies that submit a bid on a Clean-up Contract to submit their preliminary Contractor's Inuit Participation Plans in a separate envelope from their tender bid, to DND's contracting agent prior to the closing of bids.
- 7.3 For all bids for contracts for a Site clean-up, DND or its contracting agent shall:
  - a) advise bidders that the envelope containing the CIPP shall be opened first; and
  - b) advise bidders that bids shall be opened only if the CIPP complies fully with the requirements contained in Section 7.1.
- 7.4 Within three (3) months of DND having provided NTI with the estimates required under Section 5.6 above, NTI, through the Regional Inuit Associations, shall ensure that information regarding Inuit who have indicated their interest in employment in Site clean-ups, including information regarding their work experience and qualifications, is provided to DND's contracting agent.
- 7.5 DND's contracting agent shall make the information provided to it under Section 7.4 available to bidders for use by them in the preparation of bids and in finding suitable Inuit labour.
- 7.6 Upon the written request of the Contractor, DND's contracting agent may approve revisions to the CIPP during the course of a Site clean-up, provided that the Contractor demonstrates to DND's contracting agent that the MIEC and MICC for the Site clean-up will still be achieved.
- 7.7 In the event that DND's contracting agent approves a revised CIPP under Section 7.6, it shall provide the Steering Committee with the revised CIPP within five (5) working days of its approval. DND's contracting agent shall not release commercial confidential information to the Steering Committee without written permission from the Contractor.



## **8.0 SELECTION PROCESS FOR CONTRACTOR**

### **8.1 Tender and Contract Documents**

- 8.1.1 In all tender documents issued to companies that submit a bid on a Clean-up Contract or enter into negotiations for a Clean-up Contract, DND's contracting agent shall identify the following as criteria that a Contractor must comply with in a bid:
- a) Minimum Inuit Employment Content (MIEC) established in accordance with Section 5.11;
  - b) Minimum Inuit Content for Contracting (MICC) established in accordance with Section 6.11; and
  - c) Submission of a Contractor's Inuit Participation Plan (CIPP) that fully complies with Section 7.1.
- 8.1.2 DND's contracting agent shall provide a copy of this Agreement in all tender documents issued to companies that submit a bid on a Clean-up Contract or enter into negotiations for a Clean-up Contract, and shall advise such companies in the tender documents that compliance with the provisions of the Agreement by the Contractor and its Subcontractors is mandatory.
- 8.1.3 DND's contracting agent shall include as a term in all Clean-up Contracts that the Contractor will comply with this Agreement and a term that the Contractor will ensure that any Subcontractors will be bound by and comply with the Agreement, where applicable.

### **8.2 Solicitation of Interest**

- 8.2.1 DND's contracting agent shall prepare a Solicitation of Interest (SOI) for a Site clean-up. The SOI shall be in English and Inuktitut and shall request Letters of Interest (LOI) to identify firms that are both interested in and capable of performing as the prime Contractor for clean-up of the Site. The SOI shall be distributed Canada-wide through MERX and by mail or by fax to firms on the Registry.
- 8.2.2 The Solicitation of Interest under subsection 8.2.1 shall have the following characteristics:
- a) The type of opportunity will be a *Letter of Interest (LOI)*;
  - b) The region of delivery will be *Nunavut*;
  - c) The region of opportunity will be *Canada Wide*;

- d) The agreement type is *Comprehensive Land Claim Agreement (CLCA)*.

8.2.3 DND's contracting agent shall include the following in the SOI: .

- a) A description of the background, objectives and nature of the clean-up of DND DEW Line Sites;
- b) A description of the services to be provided by a Contractor for clean-up of the Site and of the specific capabilities required for a Contractor;
- c) A statement that the Site is located in a region where a Comprehensive Land Claim Agreement has been signed;
- d) Instructions for the preparation of a response to the Solicitation of Interest;
- e) A description of the employment and contracting environment in Nunavut, within the context of the NCLA and the requirements of the NTI-DND Economic Agreement ( as per Annex D of this Agreement);
- f) A definition of Minimum Inuit Employment Content (MIEC) and the Minimum Inuit Content for Contracting (MICC) and identification of the range for the MIEC and MICC that must be achieved by the Contractor in the Site clean-up;
- g) All available values for the MICC and MIEC for previous Clean-up Contracts in Nunavut.

8.2.4 DND's contracting agent shall require that firms responding to the Solicitation of Interest adhere to the following process:

- a) Firms shall provide a complete and fully documented LOI in the format prescribed in the SOI.
- b) Firms shall provide in a LOI any information or documentation necessary to demonstrate capability to:
  - i) Provide the services of a Contractor for clean-up of the Site;
  - ii) Manage and finance a contract as Contractor for clean-up of the Site;
  - iii) Obtain liability insurance;
- c) Each firm's LOI shall contain a statement that the firm understands the requirements to meet the levels for MIEC and MICC for the clean-up of the Site provided for under Sections 5.5 and 6.4 of the Agreement, and is capable of meeting those requirements

8.2.5 DND's contracting agent shall assess the Letters of Interest to determine those firms that have demonstrated their capability to be a Contractor for clean-up of a given Site and based on that assessment shall establish a list of qualified Contractors for that Site.

### **8.3 Selection Process for a Site Clean-up**

8.3.1 Where DND's contracting agent determines under Section 8.2.5 that only one firm is capable of performing the contract for the Site clean-up, the following procedure shall be followed:

- (a) DND's contracting agent shall issue an Advance Contract Award Notice (ACAN) indicating its intent to negotiate the contract with the firm;
- b) if no valid challenge to the ACAN is received within the time frame provided for in the Treasury Board of Canada Contracting Policy, DND's contracting agent shall negotiate with the firm for the purpose of arriving at a price for the Site clean-up and shall require the firm to submit a CIPP in accordance with the requirements of Section 7.1 above;
- c) if negotiations have been successfully completed under Subsection b), above, DND shall make a determination as to whether the price is acceptable, and whether the criteria set forth in Subsections 8.1.1 (a) to (c) have been met;
- d) in the event that DND determines under Subsection c) above that the price is acceptable and that the criteria set forth in Subsections 8.1.1 (a) to (c) have been met, DND's contracting agent shall issue a letter of intent to award the contract to the firm;
- e) in the event that DND determines under Subsection c) above that the firm has not fully met the criteria set forth in Subsections 8.1.1 (a) to (c), DND shall refer the matter to the Steering Committee and Sections 8.3.7 through 8.3.10 shall apply; and
- f) in the event that negotiations under Subsection b) above are not successfully completed, or the price is not acceptable to DND, DND's contracting agent may decline to award the contract to the firm.

8.3.2 Where DND's contracting agent determines under Section 8.2.5 that more than one firm is capable of performing the Clean-up Contract, it may invite bids from the list of firms determined in 8.2.5 in accordance with Section 8.3.3. Where there is a valid challenge to the Advance Contract Award Notice issued in accordance with Section 8.3.1, DND's contracting agent may

invite bids from the sole firm considered capable in Section 8.2.5 plus the firms which have put forward a valid challenge to the ACAN, in accordance with Section 8.3.3.

8.3.3 The process for the tender shall follow the Treasury Board of Canada Contracting Policy, along with the following specific procedures, whereby DND's contracting agent shall:

- a) open the envelopes containing the Bidder's CIPP before opening any other part of any bid;
- b) with respect to each bidder's CIPP, make a determination as to whether the CIPP meets the criteria set forth in Subsections 8.1.1 (a) to (c) , and open only those bids that in DND's contracting agent's determination meet those criteria;
- c) if DND's contracting agent determines that none of the bids meets the criteria set forth in Subsections 8.1.1 (a) to (c), refer the matter to the Steering Committee, which shall determine if the work should be retendered with a revised MIEC and/or MICC;
- d) identify the lowest priced of the bids opened under Subsection b) and determine whether the price is acceptable to DND; and
- e) if the bid meets the criteria set forth in Subsections 8.1.1 (a) to (c) and the price is acceptable, issue a letter of intent to award the contract, otherwise the contract shall not be awarded.

8.3.4 DND's contracting agent shall require that, within twenty-eight (28) calendar days of a company receiving a letter of intent pursuant to Sections 8.3.1 or 8.3.3, the company shall provide to DND's contracting agent a final CIPP confirming that it is capable of achieving the MICC and MIEC for the Site, and that this final CIPP shall meet the criteria set forth in Subsections 8.1.1 (a) to (c), and shall include, without limitation:

- a) documentation evidencing the signing of agreements with Inuit Subcontractors, or the intention to enter into subcontracts with Inuit Subcontractors, if applicable; and
- b) a schedule showing a monthly projection of Inuit labour and Subcontractors to be utilized throughout the life of the contract.

8.3.5 DND's contracting agent shall review the final CIPP, including the documentation and schedule provided by the company under Section 8.3.4. In the event that DND's contracting agent determines that the documentation and schedule is adequate to confirm that the bidder can meet the criteria set forth in Subsections 8.1.1 (a) to (c), the contracting agent, acting in good



faith, shall approve the CIPP and may award the Contract to the company. In all other events DND's contracting agent shall either:

- a) withdraw the letter of intent; or
- b) request a review by the Steering Committee.

8.3.6 DND's contracting agent shall provide the Steering Committee with a copy of the approved CIPP within fifteen (15) days of contract award. DND's contracting agent shall not release commercial confidential information to the Steering Committee without written permission from the Contractor.

8.3.7 In the event that DND's contracting agent requests a review of a contract award under Section 8.3.1, 8.3.3 or 8.3.5, the Steering Committee shall meet to determine whether the company has made best efforts to meet the criteria set forth in Subsections 8.1.1 (a) to (c), and, whether fault for any failure to do so cannot reasonably be placed on that company. The determination of best efforts shall take into account, without limitation:

- a) the specific activities of the firm to achieve the elements contained in its preliminary CIPP; and
- b) adherence by the firm with the requirements of Section 9.0.

8.3.8 In the event that the Steering Committee fails, within 3 weeks of a matter being referred to it under Section 8.3.1, 8.3.3 or 8.3.5, to agree on whether the company has made best efforts to meet the criteria set forth in Subsections 8.1.1 (a) to (c), the Steering Committee shall refer the matter for decision under the Expedited Arbitration provisions in Section 14.0.

8.3.9 In the event that the Steering Committee, or arbitrator appointed under Section 14.0, determines that the company failed to make best efforts to meet the criteria set forth in Subsections 8.1.1 (a) to (c) and that fault for the failure can reasonably be placed on the company, DND's contracting agent shall withdraw the letter of intent to award the contract.

8.3.10 In the event that the Steering Committee, or arbitrator appointed under Section 14.0, determines that the company has made best efforts to meet the criteria set forth in Subsections 8.1.1 (a) to (c) and that fault cannot reasonably be placed on the company for its failure, the MICC shall be adjusted at the discretion of the Steering Committee or arbitrator in order to allow for the awarding of the contract.

8.3.11 The specific contracting process to be utilized in issuing contracts for monitoring of Sites will be determined by the Steering Committee prior to the preparation of any future contract documents for monitoring of Sites.



## **9.0 SELECTION PROCESS FOR INUIT SUBCONTRACTORS**

### **9.1 Inuit Firm Registry**

- 9.1.1 NTI shall provide to DND the most current Inuit Firm Registry ("the Registry"). The Registry shall contain a brief description of the equipment, goods or services provided by each Inuit firm, the firm's experience, address and contact name.
- 9.1.2 The Registry shall be included in all contract solicitation documents.

### **9.2 Bid Invitations for Subcontracts**

- 9.2.1 DND's contracting agent shall require Contractors who have a letter of intent or who have been awarded the contract, or any Subcontractors, in subcontracting work on a Site clean-up, to invite Inuit firms listed in the Registry that may be capable of performing the proposed subcontracting work, to bid on the proposed subcontracting work.
- 9.2.2 DND and its contracting agent and Contractors shall be held blameless if Inuit firms that do not appear in the Registry are not solicited under Section 9.2.1.
- 9.2.3 Nothing in Section 9.2.1 shall prevent a Contractor or Subcontractor from seeking bids from firms not listed in the Registry.
- 9.2.4 All contract documents issued by DND's contracting agent shall require Contractors and Subcontractors, in subcontracting work on a Site clean-up, to:
- a) include in bid invitations only employment and skills requirements that are essential to the Site clean-up;
  - b) provide Inuit firms with a minimum of 15 days to respond to a bid invitation, but that in no event shall an Inuit firm have less time to respond than firms not listed in the Registry; and
  - c) enter into a contract with an Inuit firm if that Inuit firm's bid meets the Contractor's or Subcontractor's requirements, including such criteria as technical compliance and price, if the Contractor or Subcontractor enters into a subcontract for the Work.
- 9.2.5 All contract documents issued by DND's contracting agent shall require Contractors and Subcontractors, in subcontracting Work on a Site clean-up, to take the following steps in the event that they reject a bid from an Inuit firm

on grounds that it contains minor variances which cause it to be considered not technically compliant or not competitive:

- a) provide the Inuit firm that submitted the bid with a written statement of the variances and the grounds for rejection;
- b) provide the Inuit firm that submitted the bid the opportunity to revise its bid to address the stated variances and submit another bid within 7 calendar days of the date on which it was notified that the bid was rejected; and
- c) enter into a subcontract with the Inuit firm if the new bid meets the Contractor's or Subcontractor's requirements and is less than or equal to the lowest priced bid from non Inuit firms which meet the Contractor's or Subcontractor's requirements; otherwise the contract may be awarded to a firm not listed in the Registry.

9.2.6 DND's contracting agent shall, where a bid has been rejected under Section 9.2.5, require the Contractor or Subcontractor, upon receiving a request in writing, to provide the Inuit firm within thirty (30) calendar days with written reasons why the bid was rejected. Subject to the approval of the Inuit firm, a copy of the reasons shall also be provided to NTI.

## **10.0 TRAINING**

- 10.1 DND shall provide NTI with \$50,000 per Site to assist in meeting the overall objective of achieving a representative level of Inuit employment on DEW Line Site clean-ups through the training of Inuit for clean-up related jobs, for a total of \$750,000 for all Sites in Nunavut.
- 10.2 DND and NTI agree to work jointly to identify additional funding sources for training activities envisioned in Section 10.1.
- 10.3 Of the \$750,000 DND has agreed to provide under Section 10.1, NTI acknowledges that DND has already provided \$100,000 in connection with the clean-up of the FOX 4 and CAM M Sites. Of the \$650,000 remaining, DND shall make an initial payment of \$75,000 to NTI as soon as practical after the signing of this Agreement to fund the development of a comprehensive training plan, schedule and budget.
- 10.4 The cost of any training positions identified in the plan developed by NTI for on-the-job training at a Site shall be funded from sources other than DND's budget for the Site Clean-up Contract. Cost for such training shall also include administrative costs that may be borne as result of the presence of trainees.

- 10.5 The training plan, which shall be completed within one year after receipt of funding for the plan, shall set out a schedule for further payments to NTI from DND up to the full amount of \$650,000.
- 10.6 Subject to DND's agreement to the schedule which may be based on reasonable budget considerations, DND shall make payments to NTI in accordance with the schedule completed under Section 10.5. NTI shall provide DND with an updated training plan and budget, outlining the proposed use of funds, prior to each payment.
- 10.7 The training plan referred to in Section 10.3 shall incorporate both common and site specific elements. The training plan shall include, without limitation, the following elements:
- a) an analysis of skills and knowledge requirements for all positions;
  - b) learning objectives derived from the skills analysis identified in Subsection (a);
  - c) identification of training resources, including existing and required training programs;
  - d) development of a detailed plan and schedule for design, delivery and evaluation of orientation and training courses necessary to achieve representative levels of Inuit employment; and
  - e) development of milestones and performance indicators that will be considered in setting MIEC and MICC under Sections 5.8 and 6.8.

## **11.0 REPORTING**

- 11.1 DND shall provide to NTI, by December 1 of each year that this Agreement is in effect, a report covering annual and cumulative results by type and level of employment, for each Site clean-up, including:
- a) the total number of person days worked by all employees by Representative Occupational Grouping;
  - b) the total number of person days worked by Inuit, by Representative Occupational Grouping;
  - c) the percentage of total person days worked by Inuit, by Representative Occupational Grouping; and
  - d) a list of all contracts for goods, services and labour awarded to Inuit firms and to non-Inuit firms during the year and the dollar value of each of those contracts.

- 11.2 NTI shall provide DND with a report, by December 1 of each year that this Agreement is in effect, outlining the progress of the training program, the number of Inuit trained as well as the success rate of the program, including:
- a) a list of training programs provided under the NTI training plan;
  - b) the number of hours of training received by Inuit in these programs;
  - b) the percentage of Inuit who successfully completed the training; and
  - c) the number of graduates who were subsequently hired by Contractors and Subcontractors.
- 11.3 DND shall include as a term in all Clean-up Contracts between DND and the Contractor a requirement for the Contractor to submit monthly reports on the Contractor's compliance with the final CIPP or the revised CIPP. DND shall advise NTI within five (5) business days of any deviations below the currently approved CIPP. Either Party may request a meeting of the Steering Committee following such a report. Where DND advises NTI of such a deviation below the CIPP in any two consecutive months, a meeting of the Steering Committee is required to be held pursuant to Section 12.2.

## **12.0 ENFORCEMENT**

- 12.1 Where, during a Site clean-up, deviation from the approved CIPP or from the CIPP as amended pursuant to Section 7.6 indicate that the MIEC or MICC may not be achieved by the Contractor over the remainder of the Site clean-up, DND or its contracting agent shall advise the Steering Committee within ten (10) working days.
- 12.2 The Steering Committee, within one week of receiving notice under Section 12.1, shall convene to make a determination as to whether the Contractor is using its best efforts to comply with the MIEC or MICC. The Contractor shall then be required to demonstrate to the satisfaction of the Steering Committee that it has made best efforts to comply with the MIEC or MICC, and that fault for the failure to comply with the MIEC or MICC cannot reasonably be placed on the Contractor.
- 12.3 Where the Steering Committee does not make the determination required under Section 12.2 within 3 weeks, either Party may refer the matter to arbitration under the Expedited Arbitration provisions in Section 14.0.
- 12.4 Where the Steering Committee in a determination made under Section 12.2, or arbitrator to which a matter is referred under Section 12.3, determines that the Contractor failed to make best efforts to comply with the MIEC or MICC, and that fault can reasonably be placed on the Contractor for this failure, the

Steering Committee shall so advise DND's contracting agent of their determination or of that of the arbitrator. The Steering Committee or arbitrator may make recommendations on remedial measures to be applied, and DND's contracting agent may, after considering any recommendations by the Steering Committee or arbitrator, apply remedial measures at its sole discretion. DND's contracting agent shall report to the Steering Committee as soon as practicable on the results of the remedial measures applied. Remedial measures shall, to the extent possible, be designed to correct the Contractor's failure to achieve the MIEC and/or MIEC, and to provide a disincentive for future failures. DND's contracting agent shall consider the following measures and inform NTI of the actions taken. Measures may include:

- a) requiring the Contractor to undertake additional measures to achieve the MIEC or MIEC;
  - b) providing the Contractor with information about specific Inuit or Inuit firms who are known to be available and qualified for employment by the Contractor, and advising the Contractor that further enforcement steps may be taken if the MIEC or MIEC are not met;
  - c) withholding progress payments;
  - d) issuing a stop work order;
  - e) charging the Contractor for damages related to a stop work order; or
  - f) terminating the contract.
- 12.5 Where the Steering Committee, or arbitrator appointed under Section 14.0 determines that the Contractor made best efforts to achieve the MIEC and MIEC through its currently approved CIPP, and that fault cannot reasonably be placed on the Contractor for failing to meet the MIEC or MIEC, the Steering Committee, or arbitrator, shall adjust the MIEC or MIEC.
- 12.6 Following an adjustment to the MIEC or MIEC under Section 12.5, DND's contracting agent shall thereafter continue to monitor and report on the Contractor's performance as provided for in Section 11.3.

## **13.0 ARBITRATION**

- 13.1 If DND and NTI disagree on any question of fact or mixed question of law and fact related to the interpretation, implementation or operation of this Agreement, with the exception of any matter within the jurisdiction of the Arbitration Board under the NLCA and of any matter related to provisions of this Agreement mentioned in Section 14.1, either Party may by written demand refer the dispute to arbitration in accordance with the following

- 14.6 The arbitration proceedings shall be held within two weeks of the appointment of an arbitrator. The arbitration proceedings shall be in a location agreed upon by the Parties, or if the Parties are unable to agree, as determined by the arbitrator. The timing for the hearing may be extended only by the mutual consent of the Parties, acting reasonably.
- 14.7 The arbitrator shall have all of the powers granted under the Commercial Arbitration Act (Canada) to conduct the arbitration, may compel the attendance of the Parties and any required witnesses and the tendering of any documents or things and dispose of any further matters that arise out of the arbitration decision (if raised by the Parties within five (5) days of the completion of the arbitrator's written decision).
- 14.8 With respect to any such arbitration:
- a) each Party shall bear its own costs and an equal share of the other costs of the arbitration, including remuneration and expenses of the arbitrator;
  - b) the arbitrator shall have jurisdiction to determine all questions of fact, law, and questions of mixed fact and law and make a determination;
  - c) all witnesses called to give evidence at the hearing shall be sworn under oath and shall be subject to such examination as the arbitrator determines to be appropriate, and there shall be a court reporter and a formal record of the hearing.
- 14.9 The arbitrator shall, on application, allow a Contractor or a Subcontractor directly affected by a decision requested of the arbitrator to participate in the expedited arbitration as an intervenor, on such terms as the arbitrator in his or her discretion may order.
- 14.10 The arbitrator shall render a decision in writing and provide such decision to the Steering Committee within one week of the conclusion of the hearing. The decision shall state the reasons on which it is based. The decision is final and binding, and is not subject to appeal.
- 14.11 Where a Party to the arbitration fails to comply with any of the terms of the decision of the arbitrator, any Party to the arbitration may file in the office of the Registrar of the Nunavut Court of Justice, a copy of the decision in the prescribed form, whereupon the decision shall be entered in the same way as a judgment or order of the court, and is enforceable as such.
- 14.12 Unless the Parties otherwise agree, the proceedings and arbitrator's decision shall be made public.



## **15.0 ENTIRE AGREEMENT**

This Agreement and the Annexes hereto shall constitute the entire and sole agreement between the Parties and shall supersede all other communications, negotiations, arrangements and agreements of any nature among them in relation to this Agreement prior to the date of the Agreement.

## **16.0 SEVERABILITY**

If any provision of this Agreement or its application to any person or circumstance shall, to any extent, be invalid and unenforceable, the remainder of this Agreement, or the application of such provisions to persons or circumstances other than those as to which it is held invalid or unenforceable, shall be valid and enforced to the fullest extent permitted by law and be independent of every other provision of this Agreement.

## **17.0 ENUREMENT**

This Agreement shall enure to the benefit of and be binding upon each of the Parties hereto, their respective heirs, legal representatives, successors and permitted assigns.

## **18.0 APPLICABLE LAW**

This Agreement shall be governed by and construed in accordance with the applicable laws of Canada and Nunavut.

## **19.0 TIME IS OF THE ESSENCE**

The Parties acknowledge that time is of the essence of this Agreement.

## **20.0 PARLIAMENTARY APPROPRIATION**

The implementation of the Agreement is subject to there being an appropriation for the contracts for the fiscal year in which any commitment would come in course of payment.

## **21.0 HOUSE OF COMMONS**

No member of the House of Commons shall be admitted to any share or part of this Agreement, or to any benefit arising thereof.

## **22.0 AMENDMENTS**

- 22.1 If either Party wishes to make changes to this Agreement, it shall provide notice of proposed changes in writing to the other Party. Amendments must be agreed upon by both Parties. Any agreed-upon amendments will be executed and attached as an appendix to this Agreement.
- 22.2 DND and NTI agree to consider amendments in an expeditious manner, particularly where the proposed amendments directly affect the conduct of a Site clean-up that is in progress or one which is scheduled to commence in the near term.

## **23.0 NOTICES**

- 23.1 Where any Party is obliged or entitled to give any notice, request, approval, demand, consent, direction or other communication (i.e. Notice) to the other Party, such Party shall first communicate the substance thereof personally or by telephone. However, such Notice shall not be sufficiently given until sent in writing to the addressees at the address below. Any Notice may be personally delivered or sent by registered mail or telefacsimile and will be effective upon receipt by the addressee.

- 23.2 Notices to DND will be sent to:

Director General Environment  
National Defence Headquarters  
101 Colonel By Drive  
Ottawa, Ontario  
K1A 0K2

- 23.3 Notices to NTI will be sent to:

1<sup>st</sup> Vice President  
Nunavut Tunngavik Incorporated  
Box 1041  
Cambridge Bay  
Nunavut  
X0E 0C0

## **24.0 OFFICIAL LANGUAGES**

- 24.1 The official languages of this Agreement shall be English and Inuktitut. In the case of incompatibility between the two texts, the text of the English version shall prevail.

## **25.0 TERMINATION OF THE AGREEMENT**

- 25.1 This Agreement will terminate on the later of December 31<sup>st</sup>, 2008 or when the Clean-Up Work as set out in this Agreement for the Sites listed in Section 3.1 is completed or on such a date agreed to by the Parties in accordance with Section 22.3 of this Agreement.

IN WITNESS HEREOF, the Parties have executed this Agreement.

**Nunavut Tunngavik  
Incorporated**

**Department of National Defence**

\_\_\_\_\_  
Acting President

\_\_\_\_\_  
Minister of National Defence

\_\_\_\_\_

\_\_\_\_\_

this \_\_\_\_\_ day of \_\_\_\_\_ 2001

## **ANNEXES TO THE AGREEMENT**

## ANNEX A: REPORTS

### A.1 Format for DND Work Force Estimate (Section 5.6)

Site:
Region:

Occupational Group	Projected Manpower Requirements							
	Year 1		Year 2		Year 3		Overall	
	Positions	Persondays	Positions	Persondays	Positions	Persondays	Positions	Persondays
Project Manager/General Superintendent (Off-site)								
Site Superintendent								
Site Clerk								
Expediter (Off-Site)								
Surveyor								
Surveyor's Assistant								
Service Truck Driver								
Camp Setup Carpenter/ Electrician/Plumber								
Foreman								
Heavy Equipment Operator								
Heavy Equipment Mechanic								
Truck Driver								
Labourer/Scaleperson/Cutter								
Asbestos Labourer								
Hazardous Material Handler								
Cook/Cook's Helper								
Bear Monitor								
Nurse/First Aid								
Other								
Other								
<b>Total:</b>								

Note: The specific Representative Occupational Groupings included in this form may be changed, under Section 5.12, by mutual consent of the Contracting Working Group to reflect variations among Sites. DND's work force estimate may include additional categories of work not listed, as required.

## A.2 Format for NTI Inuit Labour Projection (Section 5.7)

Site:															
Region:															
Positions Identified	Projected Manpower Requirements (person days)							Projected Inuit Employment (person days)							
	Year 1		Year 2		Year 3		Overall	Year 1		Year 2		Year 3		Overall	
	Pos.	Person Days	Pos.	Person Days	Pos.	Person Days	Person Days	Pos.	Person Days	Pos.	Person Days	Pos.	Person Days	Person Days	
Project Management															
Site Superintendent															
Site Clerk															
Expediter															
Surveyor															
Surveyor's Assistant															
Service Truck Driver															
Camp Setup															
Carpenter/Electrician/Plumber															
Foreman															
Heavy Equipment Operator															
Heavy Equipment Mechanic															
Truck Driver															
Labourer/Scaleperson/Cutter															
Asbestos Labourer															
Hazardous Material Handler															
Cook/Cook's Helper															
Bear Monitor															
Nurse/First Aid															
Other															
Other															
<b>Total Positions</b>															
<b>Projected Inuit Employment</b>									%		%		%	%	

Note: The specific Representative Occupational Groupings included in this form may be changed, under Section 5.12, by mutual consent of the Contracting Working Group to reflect variations among Sites.





### A.3 DND: Analysis of Contracting Opportunities (Section 6.5)

Site: Region:	
Description	% of Total Contract Value
1 Marine Transportation 2 Commercial Airlines 3 Local Aircraft Charter 4 Catering 5 Small Tools 6 Camp Supply 7 Bonds & Insurance 8 Office Supplies 9 Communications Equipment 10 Bear Monitor 11 Geotextile - Supply & Install 12 Geomembrane - Supply & Install 13 Drilling for Instrumentation 14 Instrumentation 15 Public Consultation/Translation 16 Excavate Hazardous/Contaminated Soil 17 Landfarming 18 Gravel - Excavate & Place 19 Excavation 20 Demolition & Debris 21 Landfill Excavation 22 Asbestos Abatement 23 Project Management and Overhead 24 Other	
<b>Total</b>	<b>100%</b>

Note: The specific Contracting Opportunities included in this form may be changed, under Section 6.12, by mutual consent of the Contracting Working Group to reflect variations among Sites. DND's analysis of contracting opportunities may include other contracting opportunities not listed, as required.

## ANNEX B: EDUCATION AND SKILLS PROFILES

Position	Essential Qualifications
Superintendent/Construction Manager	3-5 years directly related project management experience, and substantial (minimum 10 years) construction supervision experience, normally combined with trade certification in one or more relevant trades and/or relevant post-secondary education
Clerk	Previous clerical experience
Expediter	2-3 years experience as expeditor for a northern construction company, ideally combined with 2-3 years trade experience in an applicable construction trade
Surveyor Technologists	2-3 year college program and trade certification
Surveying Assistants	Some related training and/or experience
Service Truck Driver	On-the-job training Driver's license appropriate to class of vehicle
Foreman	3 years supervising similar construction activities
Electrician	Trade certification
Carpenter	Trade certification or 3-5 years on the job experience
Welder	Trade certification
Plumber	Trade certification
Heavy Equipment Operator	5 week certification program Valid driver's license
Heavy Equipment Mechanic	Trade certification or 5 years experience
Small Equipment Mechanic	Trade certification or 3-5 years experience
Truck Driver	Valid driver's license Approved medical certificate 3-4 weeks training
Labourer	On-the-job training; physically fit for the proposed work
Asbestos Labourer	12 hours classroom instruction 12 hours practical instruction
Asbestos Foreman	18 hour training course (following minimum of 2 years of experience as asbestos labourer)

Position	Essential Qualifications
	Certificate from Occupational Health and Safety
Hazardous Materials Handler	5 years + TDG certification through employer
Cooks	Trade certification or 2 years experience
Cooks Helper	Some related experience
First Aid	Training in appropriate first aid courses
Bear Monitor	Experienced polar bear hunter

**Note:** This list of qualifications is for the use of the Contracting Working Group in establishing the MIEC. This list is not intended for any other use by any third party for any purpose, and DND and NTI are not liable for any use of this list by any third party. Bidders or Contractors are required to establish their own criteria for hiring project staff.

## **ANNEX C: LIST OF ARBITRATORS**

Honourable Roger P. Kerans

Roger F. X. Marentette

Daniel Ish Q.C.

Harvey J. Kirsh

Honourable Lorne O. Clarke

Paul-Emile Chiasson

## **ANNEX D BUSINESS ENVIRONMENT STATEMENT**

The following language shall be included in all Solicitations of Interest prepared and distributed by DND's contracting agent, as described in Section 8.2 of this Agreement:

One of the principal objectives of The Nunavut Land Claims Agreement is to provide Inuit with means of participating in economic opportunities through government contracting. Article 24 of the NLCA ("Government Contracting") provides full details of the Government of Canada's obligations to fulfill this objective. In the case of DEW Line Clean Up for which the Department of National Defence (DND) has responsibility, NTI and the Government of Canada, as represented by DND, have entered into an Agreement (see Annex XX of the SOI).

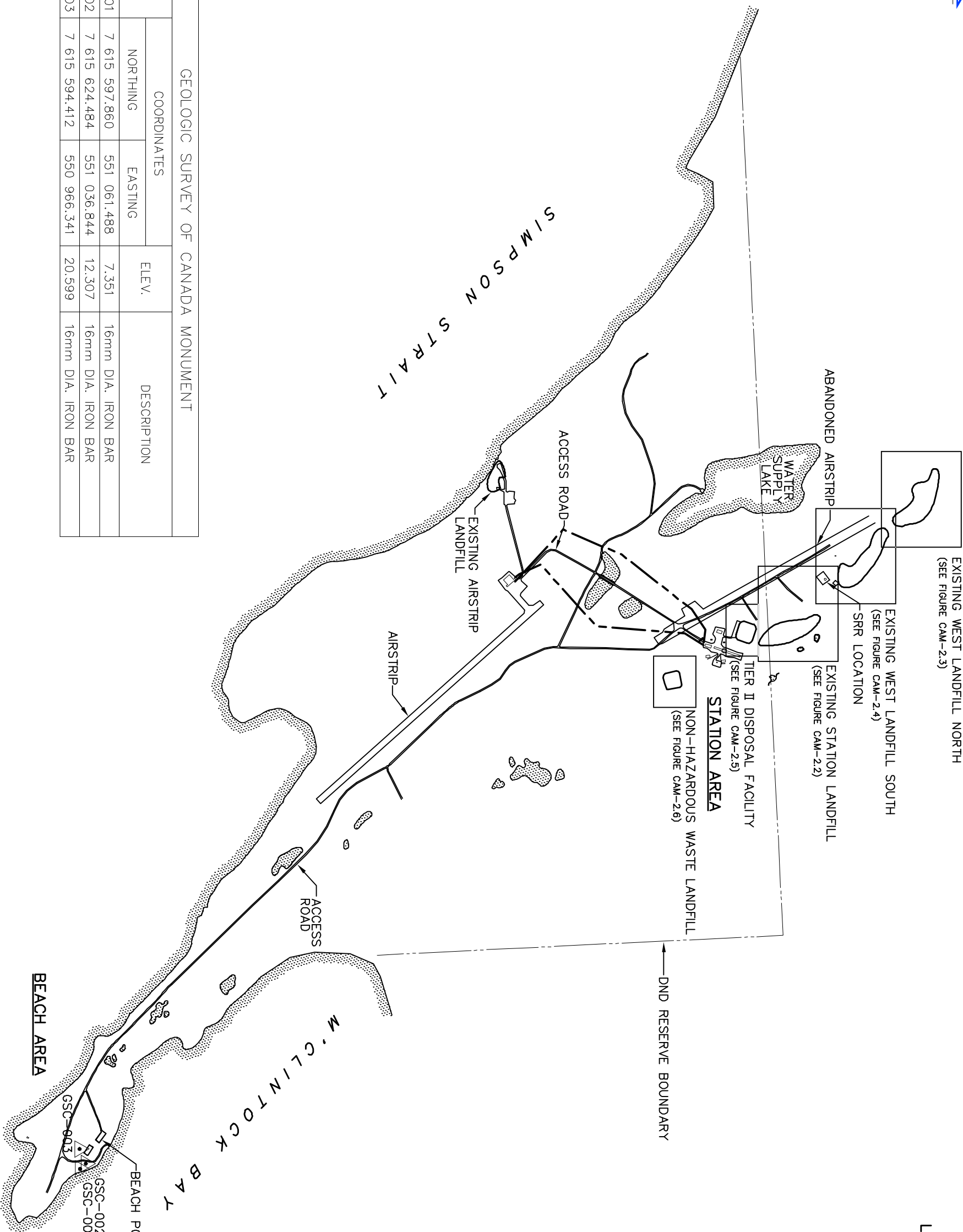
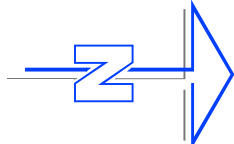
The principal mechanism to which NTI and DND have agreed for provision of economic benefit for Inuit is the use of a Minimum Inuit Employment Content (MIEC) and a Minimum Inuit Content for Contracting (MICC). Companies that are invited to submit tenders for the work following this SOI will be informed of the site specific MIEC and MICC. These levels will be set within the following ranges – MIEC (65-85%); MICC (60-75%). Contractors will be required to achieve the MIEC and MICC in the contract, and DND's contracting agent will monitor levels of MIEC and MICC based on a monthly plan submitted by the Contractor.

In the case of the MIEC the Inuit workforce must be made up of Inuit enrolled under the NLCA. Contractors must understand that they may need to recruit a workforce from a number of communities in Nunavut, and that a significant number of the workers have Inuktitut as their first language. DND's contracting agent will provide bidders with a list of Inuit who have indicated their interest in employment in Site clean-ups, including information regarding their work experience and qualifications. This list will be prepared by NTI approximately six months prior to the commencement of the clean-up of a given Site.

In the case of the MICC, Inuit firms used as Subcontractors must be drawn from the Inuit Firm Registry maintained by NTI.

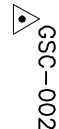
## **Appendix B**

### **Figures**

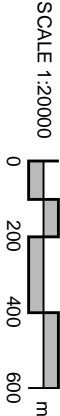


GEOLOGIC SURVEY OF CANADA MONUMENT				
NO.	COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
GSC-001	7 615 597.860	551 061.488	7.351	16mm DIA. IRON BAR
GSC-002	7 615 624.484	551 036.844	12.307	16mm DIA. IRON BAR
GSC-003	7 615 594.412	550 966.341	20.599	16mm DIA. IRON BAR

LEGEND:



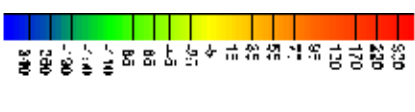
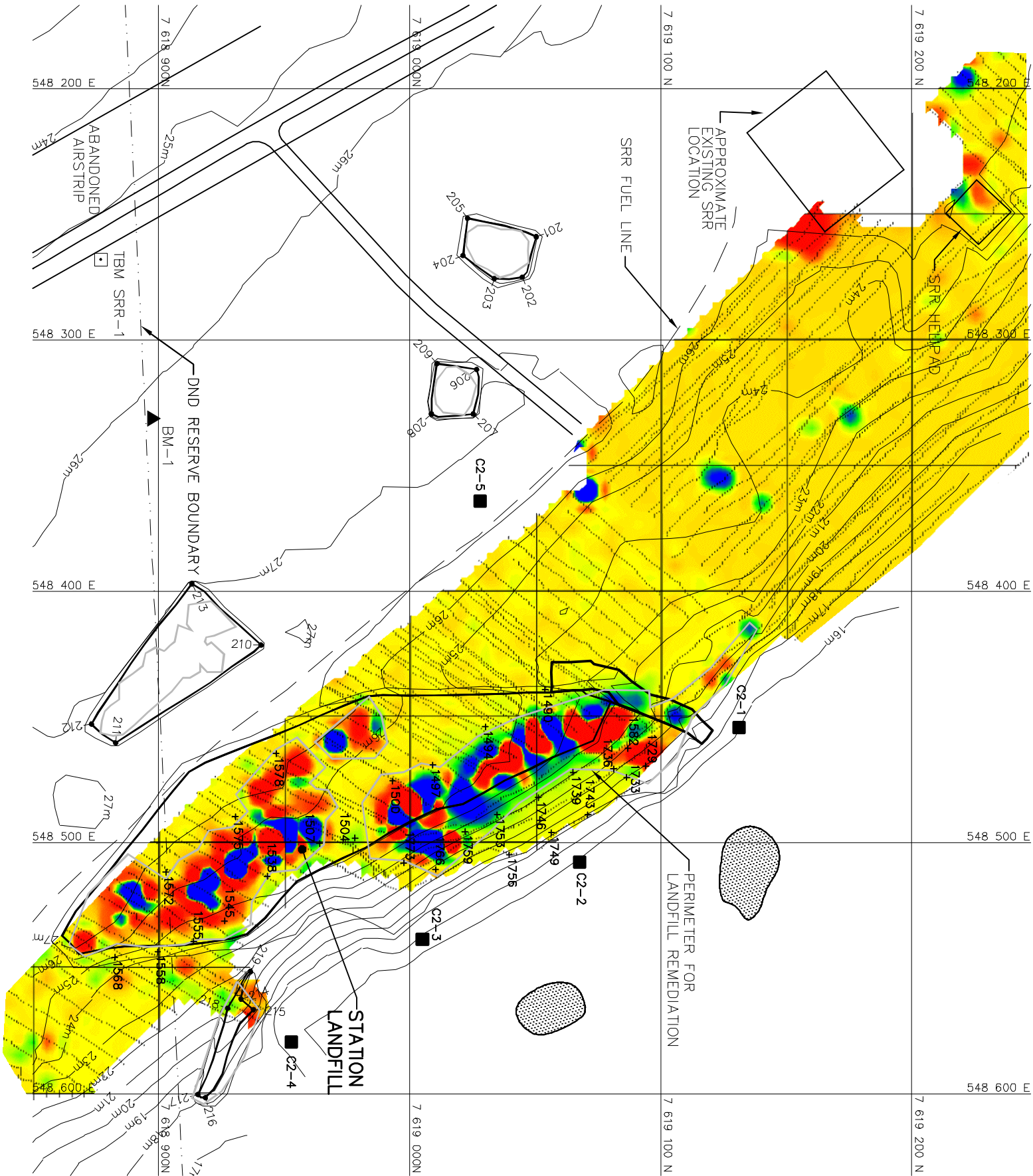
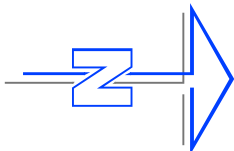
GSC-002  
GEOLOGIC SURVEY OF CANADA  
MONUMENT



RECORD DRAWING  
NOT FOR CONSTRUCTION

DEW LINE CLEAN UP  
LANDFILL MONITORING PLAN  
CAM-2 GLADMAN POINT  
OVERALL SITE PLAN  
FIGURE CAM-2.1





COORDINATE POINTS (AS-BUILT)		
STATION LANDFILL AREA		
REGRAIDING		
NO.	NORTHING	EASTING
201	7 619 050.5	548 258.8
202	7 619 044.9	548 274.9
203	7 619 033.7	548 275.5
204	7 619 021.2	548 266.3
205	7 619 023.1	548 251.5
206	7 619 026.7	548 311.6
207	7 619 025.4	548 329.4
208	7 619 008.7	548 329.3
209	7 619 010.9	548 309.3
210	7 618 940.9	548 421.4
211	7 618 883.0	548 460.3
212	7 618 873.4	548 452.9
213	7 618 913.4	548 397.0
214	7 618 932.9	548 562.3
215	7 618 937.8	548 566.5
216	7 618 918.8	548 601.5
217	7 618 915.8	548 600.3
218	7 618 927.7	548 565.9
219	7 618 936.8	548 551.3

- LEGEND:
- TBM4

TEMPORARY BENCHMARK

BM-1

PERMANENT BENCHMARK

10T-•

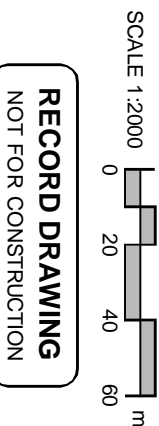
COORDINATE POINT

■

MONITORING SOIL SAMPLE LOCATION

+1749

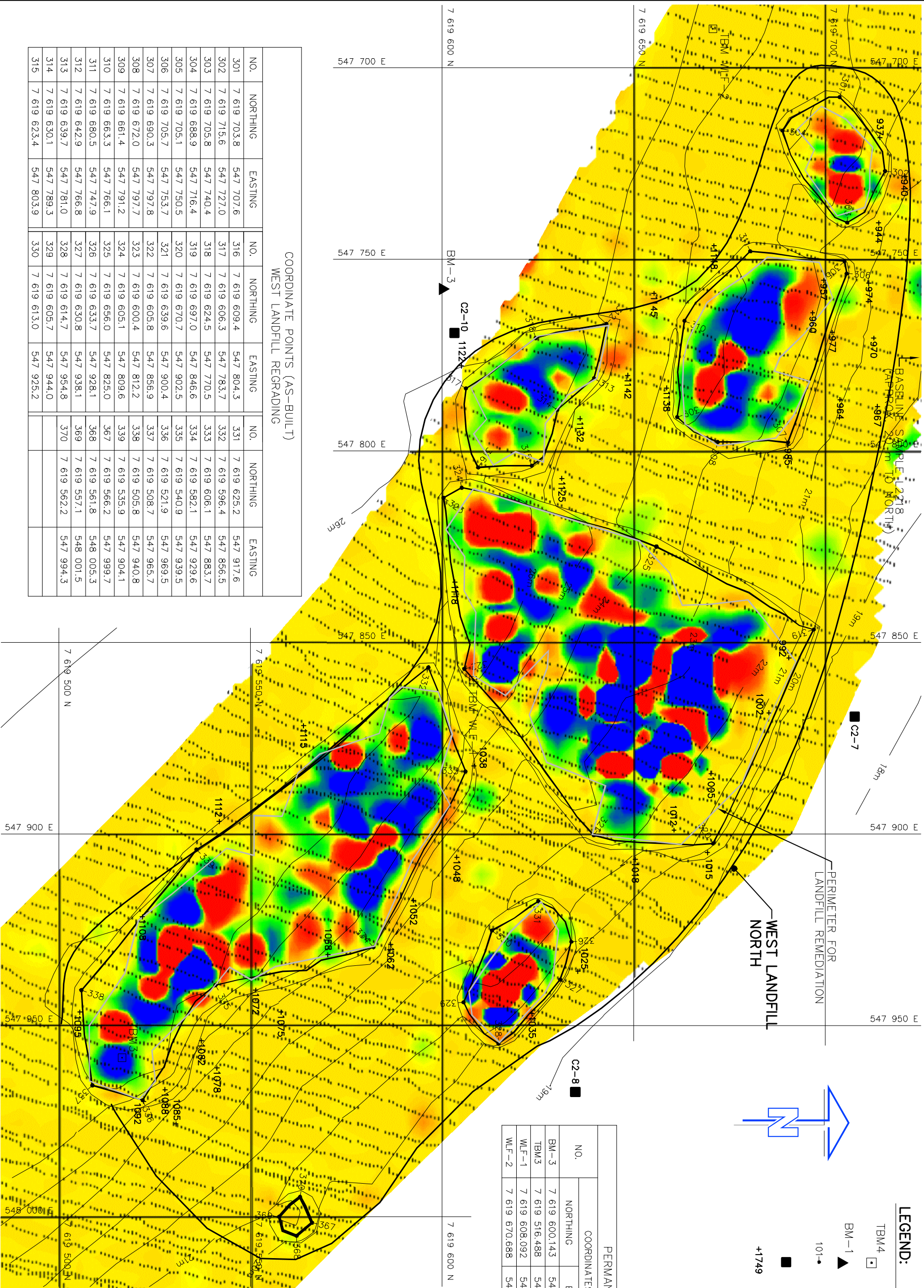
BASELINE SOIL SAMPLE LOCATION



DEW LINE CLEAN UP  
LANDFILL MONITORING PLAN  
CAM-2 GLADMAN POINT  
STATION LANDFILL  
FIGURE CAM-2.2

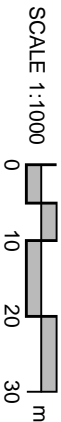
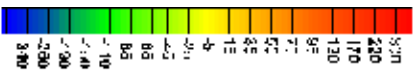
PERMANENT BENCHMARK			
NO.	COORDINATES		DESCRIPTION
	NORTHING	EASTING	
BM-1	7 618 897.363	548 331.191	26.595 25mm DIA. STEEL PIPE
SRR-1	7 618 877.108	548 267.873	24.975 16mm DIA. IRON BAR





COORDINATE POINTS (AS-BUILT) WEST LANDFILL REGRADING									
NO.	NORTHING	EASTING	NO.	NORTHING	EASTING	NO.	NORTHING	EASTING	
301	7 619 703.8	547 707.6	316	7 619 609.4	547 804.3	331	7 619 625.2	547 917.6	
302	7 619 715.6	547 727.0	317	7 619 606.3	547 783.7	332	7 619 596.4	547 856.5	
303	7 619 705.8	547 740.4	318	7 619 624.5	547 770.5	333	7 619 606.1	547 883.7	
304	7 619 688.9	547 716.4	319	7 619 697.0	547 846.6	334	7 619 582.1	547 929.6	
305	7 619 705.1	547 750.5	320	7 619 670.7	547 902.5	335	7 619 540.9	547 939.5	
306	7 619 705.7	547 753.7	321	7 619 639.6	547 900.4	336	7 619 521.9	547 989.5	
307	7 619 690.3	547 797.8	322	7 619 605.8	547 856.9	337	7 619 508.7	547 965.7	
308	7 619 672.0	547 797.7	323	7 619 600.4	547 812.2	338	7 619 505.8	547 940.8	
309	7 619 661.4	547 791.2	324	7 619 605.1	547 809.6	339	7 619 535.9	547 904.1	
310	7 619 663.3	547 766.1	325	7 619 656.0	547 825.0	367	7 619 566.2	547 999.7	
311	7 619 680.5	547 747.9	326	7 619 633.7	547 928.1	368	7 619 561.8	548 005.3	
312	7 619 642.9	547 766.8	327	7 619 630.8	547 938.1	369	7 619 557.1	548 001.5	
313	7 619 639.7	547 781.0	328	7 619 614.7	547 954.8	370	7 619 562.2	547 994.3	
314	7 619 630.1	547 789.3	329	7 619 605.7	547 944.0				
315	7 619 623.4	547 803.9	330	7 619 613.0	547 925.2				

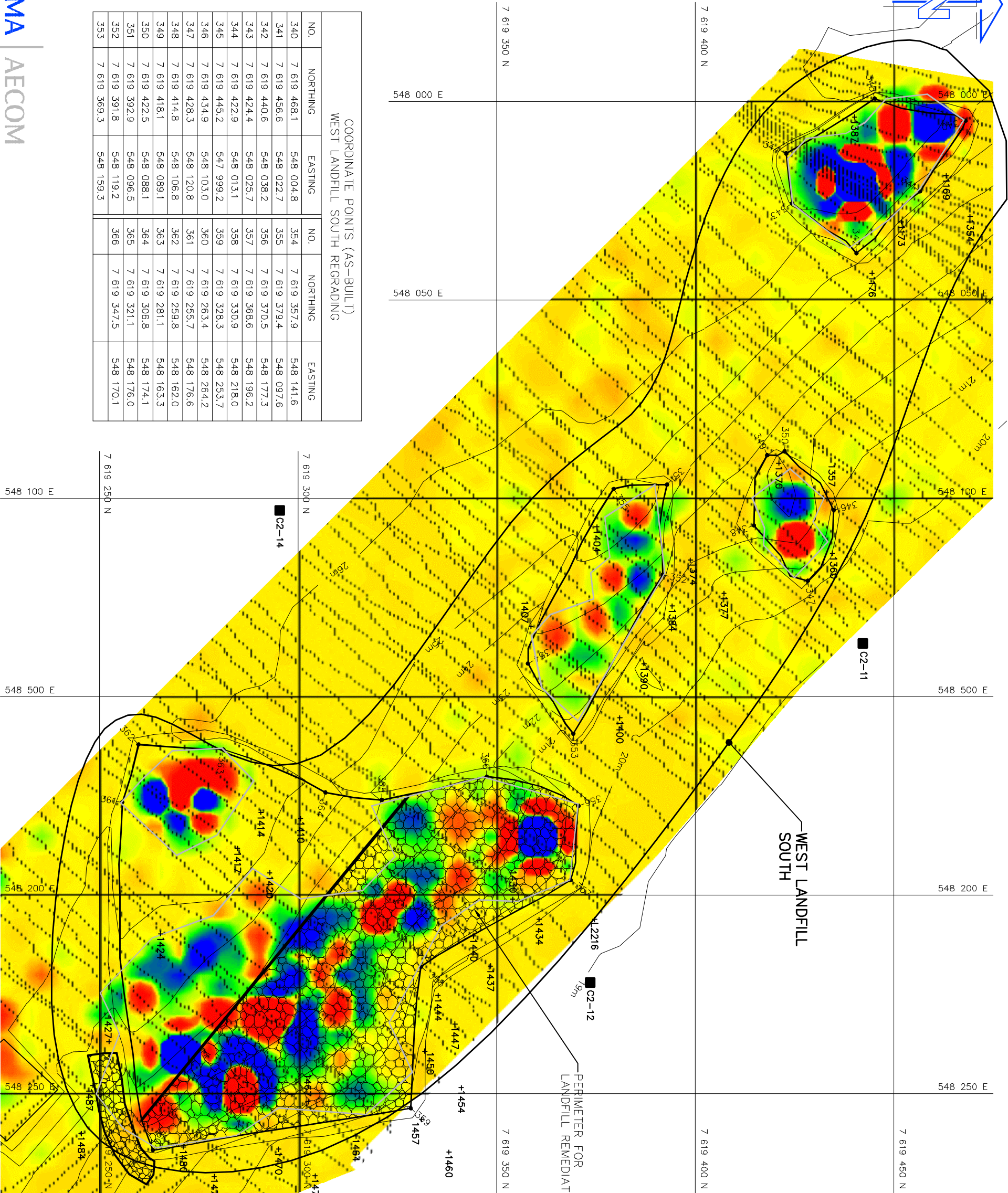
PERMANENT BENCHMARK			
NO.	COORDINATES		DESCRIPTION
	NORTHING	EASTING	
BM-3	7 619 600.143	547 757.734	25.763 25mm DIA. STEEL PIPE
TBM3	7 619 516.488	547 958.417	27.318 CARRIAGE BOLT
WLF-1	7 619 608.092	547 859.834	25.563 16mm DIA. IRON BAR
WLF-2	7 619 670.688	547 689.789	24.878 16mm DIA. IRON BAR



RECORD DRAWING  
NOT FOR CONSTRUCTION

DEW LINE CLEAN UP  
LANDFILL MONITORING PLAN  
CAM-2 GLADMAN POINT  
WEST LANDFILL NORTH  
FIGURE CAM-2.3





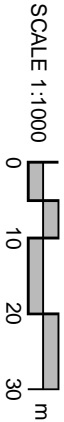
COORDINATE POINTS (AS-BUILT) WEST LANDFILL SOUTH REGARDING				
NO.	NORTHING	EASTING	NO.	EASTING
340	7 619 468.1	548 004.8	354	7 619 357.9
341	7 619 456.6	548 022.7	355	7 619 379.4
342	7 619 440.6	548 038.2	356	7 619 370.5
343	7 619 424.4	548 025.7	357	7 619 368.6
344	7 619 422.9	548 013.1	358	7 619 330.9
345	7 619 445.2	547 999.2	359	7 619 328.3
346	7 619 434.9	548 103.0	360	7 619 263.4
347	7 619 428.3	548 120.8	361	7 619 256.7
348	7 619 414.8	548 106.8	362	7 619 259.8
349	7 619 418.1	548 089.1	363	7 619 281.1
350	7 619 422.5	548 088.1	364	7 619 306.8
351	7 619 392.9	548 096.5	365	7 619 321.1
352	7 619 391.8	548 119.2	366	7 619 347.5
353	7 619 369.3	548 159.3		

LEGEND:

- TBM4
- TEMPORARY BENCHMARK
- BM-1
- PERMANENT BENCHMARK
- 101
- COORDINATE POINT
- MONITORING SOIL SAMPLE LOCATION
- BASELINE SOIL SAMPLE LOCATION

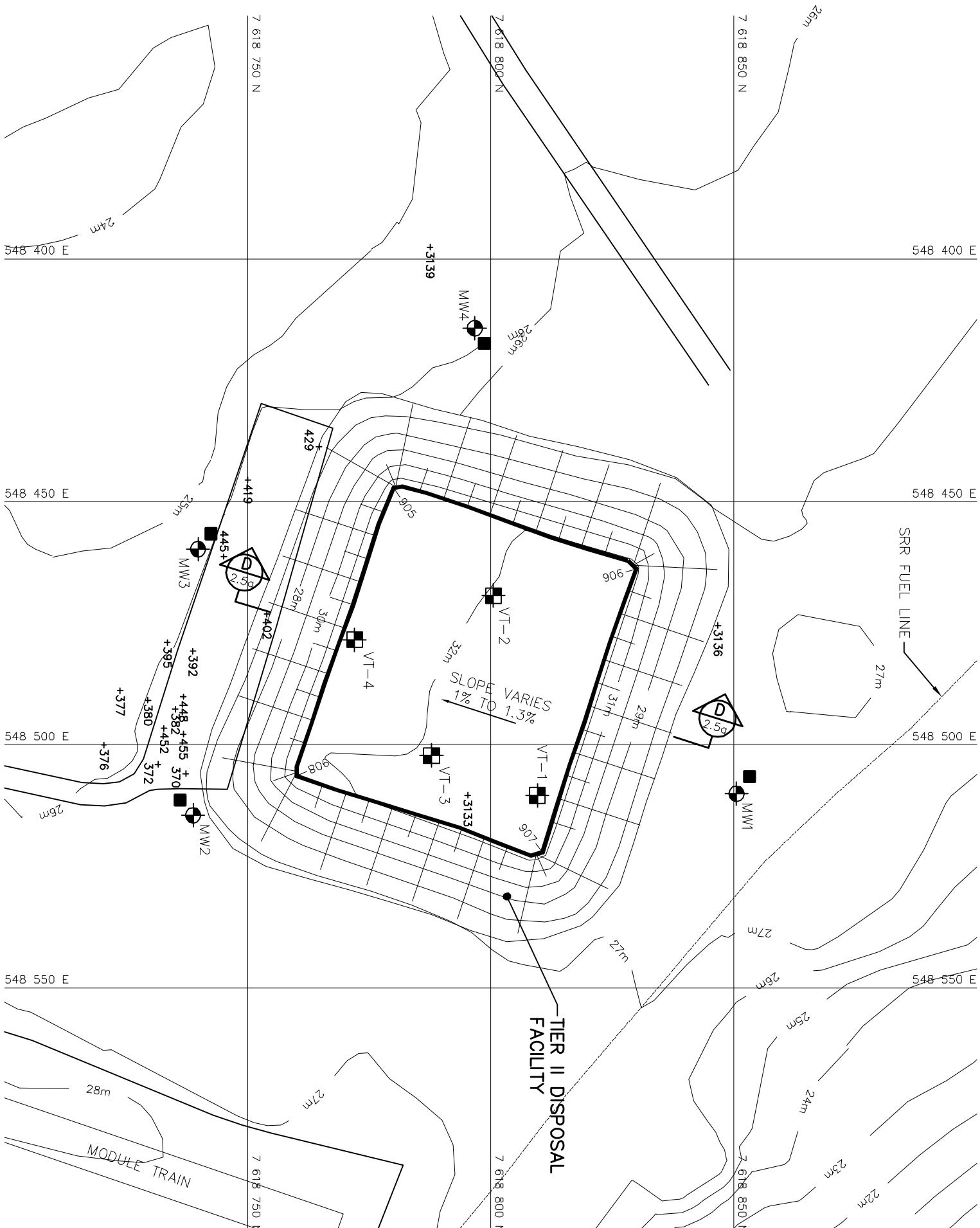
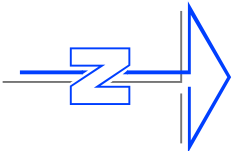


MAGNETIC  
GRADIENT  
(gammas/m)



RECORD DRAWING  
NOT FOR CONSTRUCTION

DEW LINE CLEAN UP  
LANDFILL MONITORING PLAN  
CAM-2 GLADMAN POINT  
WEST LANDFILL SOUTH  
FIGURE CAM-2.4



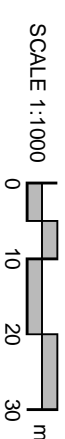
LEGEND:

- |       |                                 |
|-------|---------------------------------|
| 101-● | COORDINATE POINT                |
| ■     | MONITORING SOIL SAMPLE LOCATION |
| ⊙     | MONITORING WELL LOCATION        |
| ⊠     | VERTICAL THERMISTOR LOCATION    |
| +1749 | BASELINE SOIL SAMPLE LOCATION   |

COORDINATE POINTS (AS-BUILT) FINAL LANDFILL SURFACE		
NO.	NORTHING	EASTING
905	7 618 780.0	548 447.2
906	7 618 829.9	548 463.7
907	7 618 810.7	548 522.1
908	7 618 760.1	548 506.3

COORDINATE POINTS (AS-BUILT) VERTICAL THERMISTORS		
NO.	NORTHING	EASTING
VT-1	7 618 809.6	548 510.4
VT-2	7 618 800.6	548 469.3
VT-3	7 618 787.8	548 502.1
VT-4	7 618 772.0	548 478.4

COORDINATE POINTS (AS BUILT)		
MONITORING WELLS		
NO.	NORTHING	EASTING
MW1	7 618 850.6	548 510.0
MW2	7 618 738.8	548 514.5
MW3	7 618 739.8	548 459.7
MW4	7 618 796.7	548 414.3

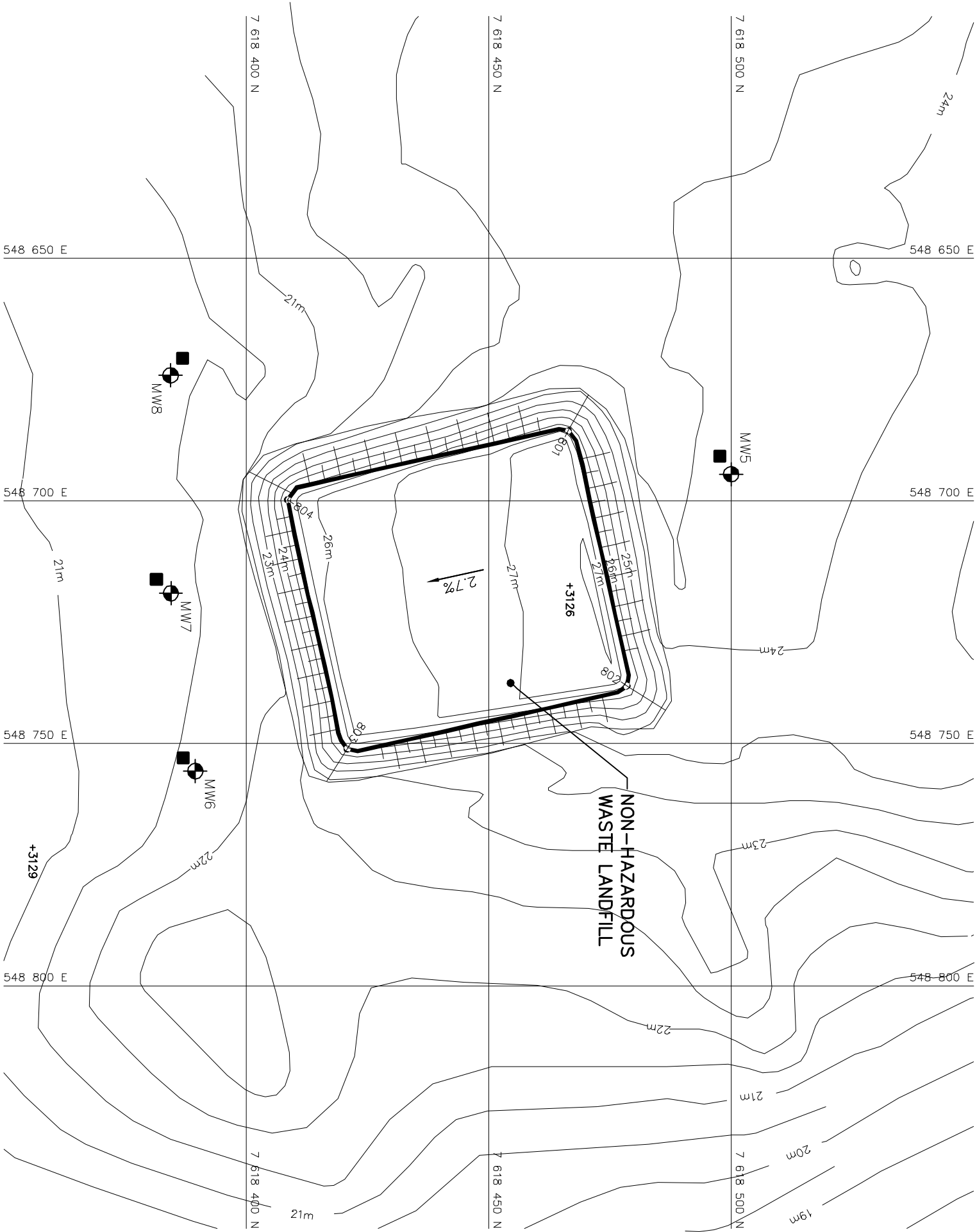
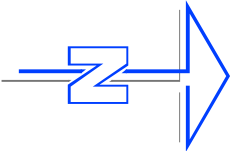


**RECORD DRAWING**  
**NOT FOR CONSTRUCTION**

DEW LINE CLEAN UP  
LANDFILL MONITORING PLAN  
CAM-2 GLADMAN POINT  
TIER II DISPOSAL FACILITY  
FIGURE CAM-2.5





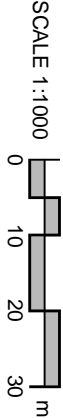


LEGEND:

- 10+ Coordinate Point
- Monitoring Soil Sample Location
- Monitoring Well Location
- +1749 Baseline Soil Sample Location

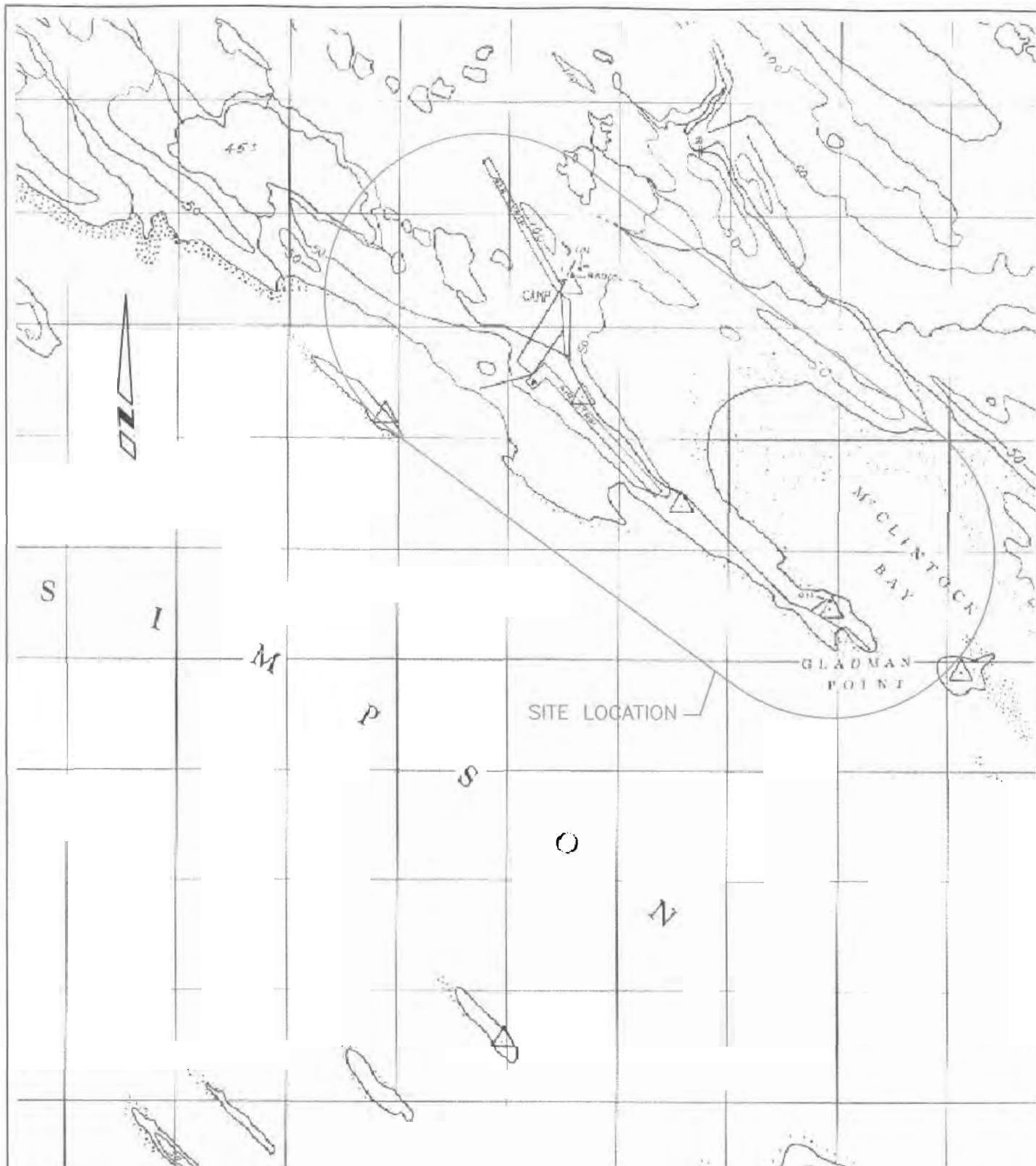
Coordinate Points (As Built) Monitoring Wells			
No.	Northing	Easting	Elev.
MW5	7 618 500.0	548 694.5	23.8
MW6	7 618 389.5	548 755.7	21.8
MW7	7 618 384.4	548 719.0	21.5
MW8	7 618 384.4	548 674.1	21.4

Coordinate Points (As-Built) Non-Hazardous Waste Landfill			
No.	Northing	Easting	Elev.
801	7 618 466.4	548 685.5	26.3
802	7 618 478.5	548 738.2	26.4
803	7 618 420.8	548 751.2	25.0
804	7 618 408.5	548 699.8	25.0



RECORD DRAWING  
NOT FOR CONSTRUCTION

DEW LINE CLEAN UP  
LANDFILL MONITORING PLAN  
CAM-2 GLADMAN POINT  
NON-HAZARDOUS WASTE LANDFILL  
FIGURE CAM-2.6



# LEGEND:



0 02 12 15 FOR REPORT  
REV Y M D ISSUE/REVISION DESCRIPTION CO ES ES  
DRN DES CHK ENG

REFERENCE FROM 1962 MAP, SIMPSON STRAIT 67A/10, EDITION 1  
DEPARTMENT OF MINES AND TECHNICAL SURVEYS



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

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## NUNAVUT TERRITORY

CAM-2  
GLADMAN POINT  
SITE LOCATION PLAN

UMA JOB No.  
0171-120-01-08

ACAD FILE No.  
EW-43

FIGURE No.  
1

ISS/REV  
0

# Spill Contingency Plan

## 1. Contact Information

The Spill Contingency Plan (SCP) was prepared for the CAM-2, Gladman Point landfill monitoring team. The SCP is effective as of June 1, 2015 and will be available as a stand-alone document to all team members and will also be posted on-site in the camp.

The landfill monitoring is being conducted as a follow up to the DEW Line Clean Up Project, as represented by the Department of National Defence and Defence Construction Canada. To request additional information, or additional copies of the SCP, please contact:

**Tamara Van Dyck**  
**Coordinator, Environmental Services**  
**Defence Construction Canada**  
**180 Kent Street, 14th floor, Ottawa ON K1P 0B6**



## **2. Introduction**

The following contingency plan presents the prescribed course of action to be taken in the case of an unanticipated spill event occurring during the landfill monitoring program at the CAM-2 site. The plan will enable the site team to maximize the effectiveness of the environmental protection response and meet all regulatory requirements for reporting to the appropriate authorities.

### **2.1 Scope and Purpose**

The purpose of the plan is to:

- Provide a clear statement of the procedures to be followed in response to a spill;
- Minimize the potential environmental impact of a spill by establishing a pre-determined action plan;
- Protect the health and ensure the safety of the personnel involved in the Spill Response activities;
- Provide a reporting network for spills;
- Ensure site restoration;
- Identify the roles and responsibilities involved in the spill response activities; and
- Identify sufficient personnel, materials and equipment needed to make an adequate response to a spill.

### **2.2 Site Information**

It is estimated that the camp operation will require minimal amounts of gasoline for the all-terrain vehicles, which will be purchased from the community and will not be stored. Each ATV will be equipped with a spill kit, in the event of an equipment leak.

### **2.3 Potential Safety Hazards**

The most significant potential safety hazard related to a fuel spill at the CAM-2 site is the possible soil and water contamination from the spill. The ATV's will not be stopped in areas of ponded water or near streams to avoid this hazard. Although soil contamination is a real potential hazard, the likelihood is small, and potential spill volumes are small.

### **2.4 Environmental Mapping**

The attached drawing shows the site plan.

### **2.5 Resource Inventory**

The following equipment is typically on-site during a landfill monitoring program event: ATV, small spill kits, and shovels.

### **2.6 Training and Exercises**

As the potential spill volume is small (20 L or less), no formal spill response training is typically provided. However, general spill response awareness and use of the spill clean-up materials is provided as part of the Health and Safety training for the site.

## 3. Response Organization

### 3.1 Roles and Responsibilities

The contractor will be responsible for spill response clean up in the event of a spill during the landfill monitoring activities at CAM-2. The responsibilities are described below.

- Ensure the team is aware of the spill kit locations and their use.
- Ensure sufficient materials and equipment are available for adequate response to fuel and hazardous material spills.
- Verbally report all spills to the DCC Project Manager as soon as practical.
- Stop or reduce discharge, if it is safe to do so.
- Make every effort to contain the spill.
- Deploy hand tools and absorbents to the spill site.
- Follow all guidelines and regulations for disposal of spilled materials and contaminated soil as established by appropriate government agencies.
- Document all events/actions.
- Report the spill to the Spill Report Line and follow up with a written spill report. This report shall summarize the initial report information; confirmation of spill volume; actions taken; future remediation/monitoring requirements; and a sketch map and/or photographs of the spill area.

### 3.2 Communications and Contacts

Intra-site communication is via two-way radios, and a satellite phone will be used for all other communications. The following table provides relevant contact numbers.

Resource	Location	Phone No.
24 Hour Spill Line	NWT/Nunavut	867-920-8130
Environment Canada	Environmental 24 hour Emergency	867-920-5131
Environment Canada	Enforcement Officer	867-975-4644
Government of Nunavut – Environmental Protection	Iqaluit	867-975-5907
Aboriginal Affairs and Northern Development Canada – Water Resources Inspector	Nunavut Regional Office	867-975-4550
Aboriginal Affairs and Northern Development – Land Administration Minister	Nunavut Regional Office	867-975-4280
Department of Fisheries and Oceans	Nunavut Regional Office	867-975-8000
Defence Construction Canada (representatives for the Department of National Defence)	Environmental Officer – Tamara Van Dyck	613-995-9741

## **4. Action Plan**

Gasoline could potentially be spilled at the CAM-2 site. The fuel will be stored in the original barrel in the upright position, so the potential spill volumes are relatively small and would only affect the immediate area around the camp, where the fuel will be stored.

### **4.1 Initial Action**

In the event of a spill, protection of human health and safety is paramount. Contamination of personnel involved in a clean-up is a real possibility, as is contamination of the surrounding workplace and environment. The individual discovering a spill shall:

- Warn the people in the immediate vicinity and evacuate if necessary.
- Isolate or remove any ignition sources and take all safety precautions before approaching.
- Attempt to stop the leakage and contain the spill, if safe to do so.
- Deploy equipment and personnel to initiate containment and clean up, report to the DCC Environmental Officer.
- Prepare the Government of the Northwest Territories Spill Report Form.
- Notify all other pertinent parties, including the DND and other government agencies.

### **4.2 ATV Parking Area**

In order to prevent spill or accidents at ATV parking area, the following procedures apply:

- Conduct ATV fuelling in a manner that avoids spillage. Operators are to be in attendance for the duration of the refuelling operation and are to ensure that all storage container outlets are properly sealed after use.
- Smoking is prohibited within 7.5 metres of the fuel storage facility.

## 5. Reporting Procedures

When reporting a spill to the 24 Hour Spill Report Line and completing the Nunavut Spill Report Form, the following information shall be included:

- Date and time of the spill;
- Location of the spill and direction the spill may be moving;
- Name and phone number of a contact person close to the location of the spill;
- Type of contaminant spilled and quantity spilled;
- Cause of the spill;
- Whether the spill is continuing or has stopped;
- Description of the existing containment;
- Action taken to contain, recover, clean up and dispose of spilled material;
- Name, address and phone number of the person reporting the spill; and
- Name of owner or person in charge, management or control of the contaminants at the time of the spill.

The spill report is to be submitted to the Aboriginal Affairs and Northern Development Canada (AANDC) Water Resources Officer no later than 30 days after initially reporting the spill to the spill report line. The contact list is provided in Section 2.2.

## **SCREENING DECISION**

**Date: March 3, 2003**

Hon. Robert Nault  
Minister Responsible for Indian and Northern Affairs  
Ottawa, Ontario

Dear Minister:

**RE: Screening Decision of the Nunavut Impact Review Board (NIRB) on Application:  
NIRB 03DN003      DIAND N2003X0002      NWB NWB5GLA  
DEW Line Clean-up CAM-2, Gladman Point**

**Authority:**

Section 12.4.4 of the Nunavut Land Claim Agreement states:

Upon receipt of a project proposal, NIRB shall screen the proposal and indicate to the Minister in writing that:

- a) the proposal may be processed without a review under Part 5 or 6; NIRB may recommend specific terms and conditions to be attached to any approval, reflecting the primary objectives set out in Section 12.2.5;
- b) the proposal requires review under Part 5 or 6; NIRB shall identify particular issues or concerns which should be considered in such a review;
- c) the proposal is insufficiently developed to permit proper screening, and should be returned to the proponent for clarification; or
- d) the potential adverse impacts of the proposal are so unacceptable that it should be modified or abandoned.

**Primary Objectives:**

The primary objectives of the Nunavut Land Claims Agreement is referenced in the screening section 12.4.4 (a) are set out in section 12.2.5 of the Land Claims Agreement. This section reads:

In carrying out its functions, the primary objectives of NIRB shall be at all times to protect and promote the existing and future well-being of the residents and communities of the Nunavut Settlement Area, and to protect the ecosystemic integrity of the Nunavut Settlement Area. NIRB shall take into account the well being of the residents of Canada outside the Nunavut Settlement Area.

The decision of the Board in this case is 12.4.4 (a) the proposal may be processed without a review under Part 5 or 6; NIRB may recommend specific terms and conditions to be attached to any approval, reflecting the primary objectives set out in Section 12.2.5;

**Reasons for Decision:**

NIRB's decision is based on specific considerations that reflect the primary objectives of the Land Claims Agreement and NIRB's mandate. Our considerations in making this decision included:

- the potential impact of further contamination of the ecosystem from PCB's, heavy metals, petroleum products or other materials entering the marine environment and subsequently into the food chain from failure of the designed storage and containment structures;
- the adequacy of plans for the clean up, storage and removal of contaminated soils, spills and to prevent the further migration of PCB's and petroleum products;
- the adequacy of plans to control runoff and drainage control within and around the facility;
- the potential to contaminate clean areas from wind blown debris or contaminated machinery;
- the potential to impact fish or fish habitat;
- the impact and disturbance to nesting migratory birds and their habitat along coastal areas due to activities;
- the potential to impact on traditional hunting and fishing activities;
- the potential to impact permafrost causing long-term adverse effects such as differential settlement, terrain instability and erosion;
- the potential impact from disturbance to vegetation;
- the potential impacts to the terrain from heavy equipment and vehicles which may cause rutting and erosion;
- potential impact of quarrying activities to the ecosystem;
- the potential impact to the ecosystem from accidental spillage of petroleum products;
- the storage and disposal of fuel, garbage, sewage, and grey water, and the impact of these on the ecosystem.

**Terms and Conditions:**

- That the terms and conditions attached to this screening report will apply

**Storage and Management of Hazardous Materials**

1. The Permittee shall not mix or dilute any hazardous materials with any substance or divide into small or quantities to avoid meeting the definition of hazardous waste.
2. The Permittee shall store hazardous material in their original containers, where possible, or in containers manufactured for the purpose of storing hazardous waste. The containers must be sound, sealable and not damaged or leaking.
3. The Permittee shall maintain a record of the type and amount of waste in storage.
4. The Permittee shall label all containers according to the requirements of the Work Site Hazardous Materials Information System (WHMIS) of the Safety Act or the relevant Transportation Authority, if transportation is planned.
5. The Permittee shall ensure that drainage into and from the site is controlled to prevent spills and leaks from leaving the site and to prevent run off from entering the site.
6. The Permittee shall segregate incompatible wastes by chemical compatibility to ensure safety of the public and workers and facility.

7. The Permittee shall ensure the storage facilities are a secured area with controlled access. Only persons authorized to enter and trained in waste handling procedures should have access to the storage site.
8. The Permittee shall perform regular inspections and provide reports to the authorizing agency.
9. The Permittee shall place containers so that each container can be inspected for signs of leaks and deterioration.
10. The Permittee shall remove any leaking and deteriorated containers and transfer their contents to a sound container.
11. The Permittee shall have emergency response equipment appropriate for the hazardous waste stored on site.
12. The Permittee shall ensure that all hazardous wastes are stored in a proper manner and transported from the site in accordance with the *Transportation of Dangerous Goods Act and Regulations*.
13. The Permittee shall ensure that the storage facility is registered if the site is to be used for long term storage (period of 180 days or more), and quantities to be stored exceed the quantities set out for individual waste classes or if the aggregate quantity for all classes of waste exceed 5000kg/L.
14. If a *Fisheries Act* authorization is required, it must first be obtained from the Department of Fisheries and Oceans (DFO) and screened by the Nunavut Impact Review Board (NIRB) before the commencement of any activity associated with the Airstrip Landfill. If any other Federal or Territorial Authorization is required it must first be screened by NIRB before the issuance of an authorization.

### **Fuel Transport and Storage**

15. The deposition of deleterious substances into water bodies frequented by fish is prohibited under Section 36 of the *Fisheries Act* unless authorized by regulation. The Permittee shall therefore ensure that any deleterious chemicals, fuel or wastes associated with the proposed project do not enter such waters.
16. The Permittee shall ensure that the transportation of fuel shall be done in compliance with the *Transportation of Dangerous Goods Act and Regulations* requirements.
17. The Permittee shall ensure that fuel storage containers are not located within thirty (30) metres of the ordinary high water mark of any body of water unless authorized by the Minister.
18. The Permittee shall ensure that all fuel is kept in double walled containers. All valves on fuel tanks should have receptacles placed beneath them to catch any leaked fuel.
19. The Permittee shall inspect all fuel containers for leaks daily and shall report and repair all leaks immediately.
20. The Permittee shall construct a dyke around each stationary fuel container or group of stationary fuel containers where one container has a capacity exceeding 4000 litres.
21. The volume of the dyked area shall be 10% greater than the capacity of the largest fuel containment placed therein.
22. The dyke and area enclosed by the dyke shall be lined with a type of plastic film liner approved by the Engineer.

23. The Permittee shall ensure that the dyke and area enclosed by the dyke shall be impermeable to petroleum products at all times.
24. The Permittee shall take all reasonable precautions to prevent the possibility of migration of spilled petroleum fuel or chemicals over the ground surface.
25. The Permittee shall have emergency response and spill contingency plans for fuel transfer and storage as well as any other hazardous liquids at the site in place prior to the commencement of the land use activity.
26. The Permittee shall immediately report all spills of petroleum and hazardous chemicals to the Twenty-four (24) hour spill report line (867) 920-8130.
27. The Permittee shall ensure that vehicle and equipment maintenance and servicing shall be conducted only in designated areas and shall implement special procedures to manage fluids, waste and contain potential spills.
28. The Permittee should ensure that all ethylene glycol (antifreeze) is managed in accordance with the *Environmental Protection Act (EPA)* of NWT due to its high potential to attract wildlife.
29. The Permittee shall ensure that any chemicals, fuels or wastes associated with the project do not spread to the surrounding lands or enter into any water body.
30. The Permittee shall ensure that a land use inspector approves the containment of the contaminated soil.

## **Waste Disposal**

31. The Permittee shall not discharge or deposit any refuse substances or other waste materials in any body of water, or on the banks thereof, which will impair the quality of the waters of the natural environment.
32. The Permittee shall ensure that any areas designated for waste disposal shall not be located within thirty (30) metres of the ordinary high water mark of any body of water, unless otherwise authorized.
33. The Permittee shall ensure that all waste management sites are mapped and inventoried.
34. The Permittee shall recover and recycle material wherever practical.
35. The Permittee shall construct, operate, maintain and monitor the containment areas to ensure that there is no seepage of leachate into natural drainage and waterways and subsequently into the marine environment. Any seepage that occurs should be collected and treated as hazardous material.
36. The Permittee shall regrade the landfills to match the contours of the land.
37. The Permittee shall treat and dispose of all lead and PCB contaminated paints as hazardous materials.
38. The Permittee shall keep all garbage in a covered metal container until disposed of in an approved disposal site.
39. The Permittee shall incinerate all combustible and food wastes in a forced air fuel-fired incinerator daily to eliminate potential for wildlife problems created by the attraction of wildlife to garbage.
40. The Permittee shall ensure that all ash and non-combustible non-hazardous wastes are buried in an approved landfill.
41. The Permittee shall deposit all sewage and greywater discharged in a sump ensuring drainage is away from any waterbody.



42. The Permittee shall backfill and recountour all sumps to mach the natural environment prior to the expiry date of the permit.

## **Environmental**

43. The Permittee shall ensure that all hazardous material management areas shall be located a minimum distance of one hundred (100) metres from the nearest water body.
44. The Permittee shall implement procedures to screen CEPA soils to avoid / minimize the spreading of contaminated dust.
45. The Permittee shall control all movement of heavy machinery, vehicles and equipment within the hazardous material management area to prevent the dispersion of potentially hazardous dust and materials into the environment.
46. The Permittee shall clean (decontaminate) all heavy machinery and equipment prior to movement to another area. All fluids (including water) resulting from the cleaning shall be treated as hazardous waste and shall be containerized and disposed of as per the regulations.
47. The Permittee shall not move any equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging.
48. The Permittee shall suspend operation if rutting occurs.
49. The Permittee shall avoid causing soil damage that disturbs natural drainage patterns or expose permafrost. These areas shall be repaired immediately.
50. The Permittee shall insulate the ground surface beneath all structures and facilities, by constructing gravel pads or other approved methods to prevent any vegetation present from being removed and to prevent the degradation of permafrost causing ground settling and/or erosion.
51. The Permittee shall leave a strip of undisturbed vegetation at least thirty (30) metres width between roads, quarry or navigable waterways.
52. The Permittee shall commence and foster revegetation on all parts of the land used. Methods should include scarification and transplanting of native vegetation from other areas.
53. The Permittee shall remove any obstruction to natural drainage caused by any part of this land use operation.

## **Quarry**

54. The Permittee shall not remove any material from below the ordinary high water mark of any stream.
55. The Permittee shall slope the sides of the excavations and embankments except in solid rock to 2:1 (two horizontal, one vertical).
56. The Permittee may only excavate and stockpile in areas designated.

## **Wildlife**

57. The Permittee shall ensure that there is no damage to wildlife habitat in conducting this land use operation.
58. The Permittee shall use the latest bear detection and deterrent techniques to minimize man-bear interactions. The Permittee is strongly urged to contact DSD wildlife officers regarding safety in polar bear country literature and training.

59. The Permittee shall ensure that pilots maintain an altitude of at least 300m above ground or water when passing over areas where birds are concentrated. Raptor nesting areas should be avoided at all times.
60. The Permittee shall ensure that land use activities avoid environmentally sensitive areas (denning, nesting areas) by a minimum of 250metres.
61. The Permittee shall make all efforts to minimize harassment to wildlife including conduction operations in sensitive areas during critical time periods (denning, nesting, staging etc.).

### **Stream Crossings**

62. The harmful alteration, disruption or destruction of fish habitat is prohibited under Section 35 of the *Fisheries Act*. No construction or disturbance of any stream/lake bed or banks of any definable watercourse is permitted unless authorized by DFO.
63. The Permittee shall limit instream activity. Machinery is not permitted to travel up the streambed and fording of the stream be kept to a minimum.
64. The Permittee shall ensure that stream crossings are located to minimize approach grades.
65. The Permittee shall ensure that bank disturbance is to be avoided.
66. The Permittee shall stabilize approaches during construction and upon completion of the project to control run off, erosion and subsequent siltation of the stream. Methods to control erosion may include revegetation of slopes, drainage ditches and sediment traps.
67. The Permittee shall not deposit or permit the deposit of sediment into any waterbody.
68. The Permittee shall ensure that all equipment is well cleaned and free from contaminated materials, oil and grease.
69. The Permittee shall not conduct mechanized clearing within thirty (30) metres of the normal high water mark of a watercourse in order to maintain a vegetative mat for bank stabilization.
70. The Permittee shall ensure that debris from clearing activities will not be dragged or skidded across water courses, and all slash and debris is to be disposed above the high water mark so that it does not enter the water
71. The Permittee shall control siltation from construction activities with geotextile silt barriers. These barriers should be installed to sufficiently isolate the abutment construction and associated fill activities for the stream flow while allowing free flow of the stream main channel. These barriers must also be removed in a manner that does not result in the release of trapped sediments.
72. The Permittee shall ensure that culverts are removed upon abandonment of roadways.

### **Camp**

73. The Permittee shall locate all infrastructure facilities on gravel, or other durable land.
74. The Permittee shall keep the land use area clean and tidy at all times.

## **Archaeological Sites**

75. The Permittee shall follow all terms and conditions for the protection and restoration of archaeological resources as outlined by the Department of Culture, Language, Elders and Youths (CLEY).

## **Monitoring**

76. The Permittee shall include in the monitoring program sampling from the marine ecosystem (sediment, arthropods, etc) to ensure contaminant pathway is not entering marine ecosystem.

77. The Permittee shall maintain all site signs and notices at the PCB storage facility.

## **Recommendations**

1. NIRB would like to encourage the proponent to hire local people and services, to the extent possible
2. NIRB advises all proponents that they should consult with the local residents regarding their activities in the region.
3. Any amendment requests deemed by NIRB to be outside the original scope of the project will be considered a new project.
4. The Permittee shall notify NIRB, DFO, DOE and the NWB of any changes or plans in operating conditions associated with this land use activity.
5. The Permittee shall advise NIRB of the final destination of the contaminated soil and ensure all the proper permits for transportation of the soil are obtained prior to removal.

## **Validity of Land Claims Agreement**

### **Section 2.12.2**

Where there is any inconsistency or conflict between any federal, territorial and local government laws, and the Agreement, the Agreement shall prevail to the extent of the inconsistency or conflict.

Dated \_\_\_\_\_ at Arviat, NU

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Elizabeth Copland, Chairperson