Indian and Northern Affairs Canada | Affaires indiennes et du Nord Canada

Nunavut Regional Office
Operations Directorate
P.O. Box 100
Iqaluit, NU X0A 0H0

File # 9545-2-2.2BE.KAZA
CIDMS #345652

July 28/09

Via Email

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Iqaluit, NU X0A 0H0

Dear Sirs,

Subject **Water License #2BE-KAZ0609, Aurora Energy Resources Inc., Baker Lake Basin Project, Kivalliq Region, Acknowledgement of Operation Shutdown**

Please be advised that on behalf of Indian and Northern Affairs Canada, I have completed a review of the above referenced Nunavut Water Board acknowledgement.

A Technical Review Memorandum (attached) is provided for your consideration.

Should you have any questions regarding this submission, feel free to contact me at 867-975-4555 or David.Abernethy@inac-ainc.gc.ca.

Regards,
David W. Abernethy, Water Resources Regional Coordinator

Encl.

Cc. Kevin Buck, Manager of Water Resources
Bernie MacIsaac, Director or Operations
David Hohnstein, Nunavut Water Board Director of Technical Services

Canada

Technical Review Memorandum

Date: July 28/09

To: Richard Dwyer, Nunavut Water Board
Steve Ash, Aurora Energy Resources Inc.
Peter Kusugak, Indian and Northern Affairs Canada

Cc: Kevin Buck, Indian and Northern Affairs Canada
Bernie MacIsaac, Indian and Northern Affairs Canada
David Hohnstein, Nunavut Water Board

From: David Abernethy, Indian and Northern Affairs Canada

Re: Water License #2BE-KAZ0609 – Aurora Energy Resources Inc. – Baker Lake Basin Project – Acknowledgement Notification of Operations Shutdown

A. Description

On July 22/09 the Nunavut Water Board (NWB or Board) acknowledged Aurora Energy Resources Inc. (Aurora) July 20/09 email notification of operations shutdown for their Baker Lake Basin Project. The NWB circulated this notification to INAC stating that they require confirmation from a Water Resources Officer (INAC) that all abandonment and restoration license terms and conditions have been met before any consideration can be made to close Aurora's water license.

Aurora's July 20/09 email to the NWB and other interested parties (i.e., the Nunavut Planning Commission, the Nunavut Impact Review Board, the Kivalliq Inuit Association, and INAC), states,

> "We have re-evaluated our 2009 programs and decided not to explore on the Baker Lake Basin Property. We are interested in the property and may be back in the future.
>
> The land use inspectors were advised on July 15 that we will be demobilizing the drill rig, associated equipment and fuel from our exploration sites.
>
> Please note that the final abandonment and restoration of the exploration activities will be completed before Land Use Permit # N2006J0017 expires on August 10, 2010."

The project's license is set to expire on Sept. 15/09. The NWB notes that as per Clause 46 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, "the expiry or cancellation of a license does not relieve the holder from any obligations imposed by the license." The NWB also notes that addendums to the Uranium Exploration and Spill Contingency Plans to make them specific to

Aurora are required as per the May 21/09 license assignment from Pacific Ridge Exploration Inc. (Pacific Ridge) to Aurora.
The following documentation was reviewed,

- NWB. *Acknowledgement Notification of Operation Shutdown 2BE-KAZ0609 Baker Basin Project*. July 22/09;
- Steve Ash, Aurora Energy Resources Inc. *Re: Aurora Baker Lake Exploration Update*. July 20/09;
- INAC. *2BE-KAZ0609, Submission of 2008 Annual Report, Technical Review Memorandum*. Jun. 5/09;
- NWB. *Assignment of License 2BE-KAZ0609 Type 'B'*. May 21/09;
- NWB. *Submission of the 2008 Annual Report for the Baker Basin Property; License No. 2BE-KAZ0609*. May 8/09;
- INAC. *2BE-KAZ0609 Application for Assignment, Technical Review Memorandum*. Apr. 9/09;
- Aurora. *2008 Annual Report*. Mar. 31/09;
- Aurora. *Water License Transfer from Pacific Ridge Exploration Ltd. to Aurora Energy Resources Inc.* Mar. 13/09;
- INAC. *2BE-KAZ0609, Submission of 2007 Annual Report, Technical Review Memorandum*. Dec. 3/08;
- NWB. *License 2BE-KAZ0609 Type "B"; Amendment No. 2*. June 4/08;
- NWB. *Amendment 1 to 2BE-KAZ0609 Type "B."* Mar. 20/07;
- Pacific Ridge. *Uranium Exploration Plan*. Nov. 2/06;
- NWB. *Water License 2BE-KAZ0609*. July 20/06;
- Pacific Ridge, *Abandonment and Restoration Plan – Bake Lake Property*. March 2006; and,
- Pacific Ridge, *Spill Contingency Plan – Bake Lake Property*. March 2006.

B. Results of Review

1. The May 21/09 license assignment states that Aurora must submit addendums to their Uranium Exploration Plan (Part F, Item #1) and Spill Contingency Plan (Part G, Item #1) that make them specific to their company within sixty (60) days. It appears that Aurora has not fulfilled this NWB requirement. Due to Aurora's decision to discontinue their project, it would now be redundant to submit these addendums.

2. Closure and decommissioning conditions are listed in Part H of the license. According to their 2008 Annual Report, staff were accommodated in Baker Lake and progressive reclamation measures were applied to the drill

exploration program. Furthermore, as indicated in their July 20/09 email to the NWB and other interested parties, Aurora will demobilize and remove drill rigs, associated equipment, and fuel caches from the project area.

3. Although not required by their license, Aurora has an Abandonment and Restoration Plan (A&R Plan) that was submitted by Pacific Ridge to the Board in March 2006.

4. Page 7 of the March 2006 A&R Plan makes reference to the submission of final closure reports to INAC, the NWB, and the Kivalliq Inuit Association. These reports are to include photographic documentation of site conditions. No record of any submission(s) can be found on the NWB's online public registry.

5. According to the A&R Plan, contaminated soil will be treated as per the Spill Contingency Plan. Having reviewed the project's March 2006 Spill Contingency Plan it is noted that apart from "contacting Federal and Territorial regulatory agencies to identify appropriate disposal methods before disposing of contaminated material" no other contaminated soil clean-up procedures have been provided to the Board.

C. Comments / Recommendations

The following comments / recommendations are provided for consideration,

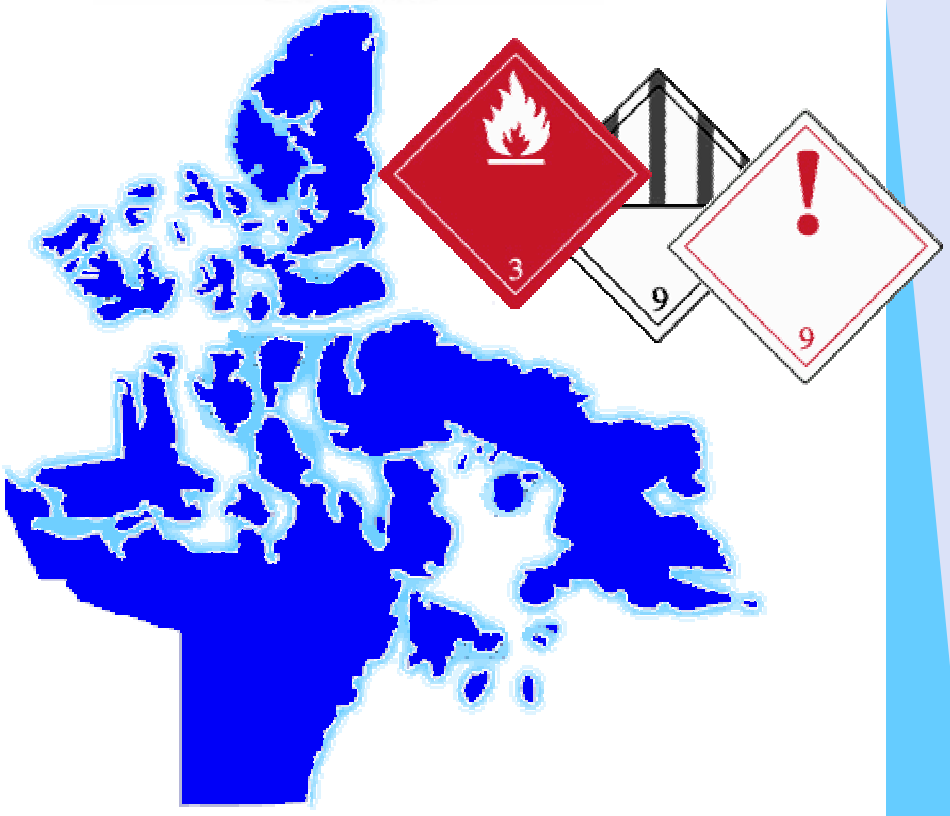
1. INAC is requesting Aurora to submit a final closure and decommissioning report to the INAC Water Resources Officer and the Board for review and approval. This report must address all procedures identified in the March 2006 A&R Plan and demonstrate that the terms and conditions included in Part H of the license have been met.

2. INAC recommends that Aurora be required to submit revised Uranium Exploration and Spill Contingency Plans specific to their Baker Lake Basin Project only if, and when, they decide to resume exploration activities. At the present time it is unnecessary for Aurora to submit addendums to these plans as they have decided to shutdown their exploration program.

3. If applicable, contaminated soil should be recovered and remediated in accordance with the Government of Nunavut's *Environmental Guideline for Site Remediation*, dated January 2002 (attached). The industrial remediation guidelines for soil should be applied.

Attached.

ENVIRONMENTAL GUIDELINE FOR Site remediation



Department of Sustainable Development
Environmental Protection Service

Nunavut

GUIDELINE: CONTAMINATED SITE REMEDIATION

AS AMENDED BY:

USE OF GUIDELINE

A guideline is not law and is therefore not enforceable. It does however, assist an inspector to determine what action(s) may be required of him. Paragraph 2.2(c) of the Environmental Protection Act allows the Minister to develop, co-ordinate and administer guidelines. The Act [subsection 5(1)] makes it an offence to discharge a contaminant into the environment, subject to some exceptions [subsection 5(3)]. When a discharge occurs and it is inconsistent with the guidelines, the discharge is considered an unacceptable risk. The inspector may then consider issuing an order or laying an information.

A guideline allows for some leniency in applying the law. A court would probably be inclined to consider the application of a guideline favorably because the public is aware of the standards they are expected to meet.

This Consolidation is not Law.
It is prepared by Environmental Protection Service,
Department of Sustainable Development
Government of the Nunavut

January, 2002

Guideline for Contaminated Site Redemption

January, 2002

GUIDELINE FOR CONTAMINATED SITE REMEDIATION

1 Introduction

The purpose of this guideline is to help you solve a contamination problem on your property by setting standards for site remediation. This guideline will focus on hydrocarbons because they are the most common type of contaminant in Nunavut. However, the principles outlined here can be applied to other types of site contamination. Section 2.2 of the *Environmental Protection Act* gives the Minister of Sustainable Development the authority to develop, co-ordinate and administer these guidelines (see Appendix).

1.1 Definitions

CCME Canadian Council of Ministers of the Environment (CCME) is the major intergovernmental forum in Canada for discussion and joint action on environmental issues of national, international and global concern. The 13 member governments work as partners in developing nationally consistent environmental standards, practices and legislation.

Commissioner's Lands Lands in Nunavut that have been transferred by Order-in-Council to the Government of Nunavut. This includes highways, block land transfers and most lands within municipalities.

Contaminant Any noise, heat, vibration or substance and includes such other substances as the Minister may prescribe that, where discharged into the environment,
(a) endangers the health, safety or welfare of persons,
(b) interferes or is likely to interfere with normal enjoyment of life or property,
(c) endangers the health of animal life, or
(d) causes or is likely to cause damage to plant life or to property.

Contaminated Site Areas of land, water, ground water, or sediments that have levels of contaminants exceeding the remediation criteria. Contaminant sources can include on-site burial of wastes, non-point chemical releases (small, frequent drips and spills), stockpiling and storage of materials, major spills, and releases during fires. Contamination may also be due to illegal dumping of contaminated soil. Contaminated sites may have short or long-term consequences to people or the environment.

Remediation The management of the contaminant at a site so as to prevent, minimize, or mitigate damage to human health, property, or the environment. Remediation is a broader term then clean-up in that remediation options can include physical actions such as removal, destruction, and containment, as well as the use of institutional control such as zoning designations or orders.

T.P.H. Total petroleum hydrocarbons, (includes total purgable and total extractable hydrocarbons).

1.2 Roles and Responsibilities

The Department of Sustainable Development, Environmental Protection Service (EPS), is the main contact concerning remediation of contaminated sites on Commissioner's Land, EPS determines the required level of remediation using the remediation criteria cited in these guidelines. EPS also reviews your remediation plan and monitors the progress of the project. It is your responsibility to remediate the site to acceptable levels. As there may be health or safety concerns to consider, we recommend you also contact the Department of Health, the Office of the Fire Marshal, the municipality and the landowner.

> ***EPS will provide advice on remediation measures, but it is the sole responsibility of the polluter and land owner to provide adequate site remediation.***
> ***(See Environmental Protection Act in Appendix)***

2 Defining The Problem

If you think you have contamination on your property, the first step is to do a thorough site investigation. A thorough investigation may avert unnecessary remediation costs. Depending on the degree and complexity of the contamination, you may require the assistance of a qualified environmental consultant or engineer.

Ask yourself the following questions:

2.1 What is the History of the Site*?*

Thorough historical research will aid in identifying and locating the contaminant(s). It may also aid in assessing responsibility for the contamination. Consider the following:

- Is the site near an existing tank farm, fuel storage area or other contaminant storage site?
- Is it near where a tank farm or fuel storage site previously existed?
- Has there ever been a spill on or near the property?

2.2 What is the Contaminant?

It is essential to identify the contaminant, in order to determine suitable remediation options.

- Common contaminants in Nunavut are diesel fuel, turbo, fuel, gasoline and used oil.
- You should take representative samples with the assistance of an accredited laboratory.

2.3 What is the Degree of Contamination?

Consider the following:

- What is the length, width and depth of the contaminated area?
- What is the soil type?
- Where is the surface and ground water?
- What is the type of permafrost, if any? Is it saturated, unsaturated, continuous or discontinuous permafrost?

2.4 What are the Possible Impacts*?*

Remember that this contaminated site may affect many people and other living organisms. Determine both the pathway of contamination and all possible receptors of contamination.

Consider the following:

- How did the contamination enter the site?
- Did it enter the ground water?
- Will it affect people through either toxic vapors or soil contamination?
- Could there be any effects on vegetation, wildlife or domestic animals?
- How will the contamination affect adjacent sites?
- What will the site be used for in the future?
- Are there any special factors relating to public use of the area?
- Is it commercial, agricultural or residential land? (Section 2.4.1)

2.4.1 Land Use

Identifying the type of land use will help you assess the extent of human and ecological exposure to contaminants in the soil, and is essential for planning practical remediation programs. The specified land uses considered in this guideline are: agricultural, residential/parkland and commercial/industrial.

Agricultural	All uses of land where the activity is primarily related to the productive capability of the land or facility (e.g. greenhouse) and is agricultural in nature, or is related to the feeding and housing of animals such as livestock.
Residential/ Parkland	Residential: all uses of land in which dwelling on a permanent, temporary or seasonal basis is the primary activity. Institutions, hospitals, schools, daycare and playgrounds are also indicated under this land use. Residential/Parkland is often readily accessible to the public. Parkland: all land uses in which the primary activity is recreational in nature and requires the natural or human designed capability of the land to sustain that activity.
Commercial	All uses of land in which the primary activity is related to the buying, selling or trading of merchandise or services.
Industrial	All land uses in which the primary activity is related to the production, manufacture or storage of materials. The public does not usually have uncontrolled access to this type of land. This does not include institutions

(e.g. schools, hospitals, playgrounds).

Always confirm the required level of remediation with EPS. The type of land found adjacent to the contaminated site may affect the remediation criteria levels that you have to follow.

3 Remediation

Once the problem has been defined (section 2), you can decide on the appropriate remediation options. If you have hired a qualified contractor, they may recommend remediation options to you. General remediation categories include:

On-site/Off-site	Will your remediation be on or off-site? Techniques will vary accordingly.
On-site treatment	The soil must meet the remediation criteria (section 4).
Off-site treatment	Merely moving the spill to a landfill facility is not acceptable. After moving the soil to an acceptable location, you must contain the contaminants, and then treat the soil or water to reduce the contamination to an acceptable level (section 4).
Groundwater	Contaminated groundwater may require treatment. A qualified contractor can advise you on the available options.

3.1 Remediation Guidelines

Remediation in Nunavut is guideline based. The required degree of remediation is determined by CCME 1991 Interim Criteria, CCME 1997 Recommended Canadian Soil Quality Guidelines and the Environmental Protection Service.

Remediation Guidelines for Soil

	Agricultural	Residential/ Parkland	Commercial	Industrial
Benzene	0.05	0.5	5	5
Toluene	0.1	0.8	0.8	0.8
Ethylbenzene	0.1	1.2	20	20
Xylene	0.1	1	17	20
Total Petroleum Hydrocarbons (TPH)*	-	500**	2500**	2500**
Lead	70	140	260	400
Polychlorinated biphenyl	0.5***	5***	50***	50***

Note: All values are in µg/g or parts per million (ppm). These are the more commonly required parameters. The type of contamination at the site may require analysis for additional CCME parameters.

* Total petroleum hydrocarbons (includes total purgeable and total extractable hydrocarbons).
** The TPH guidelines were developed by the Government of the Northwest Territories (GNWT)
*** CCME 1991 Interim Criteria (note: 1998 PCB Soil Quality Guidelines are currently under development).

The chart below may help you to visualize the amount of contaminant it would take to create a level of 1000 PPM. Remember that 1000 PPM is a much greater level than many of the acceptable remediation criteria levels listed above.

Amount of Soil and Gasoline Creating a Level of 1000 PPM	
Volume of Soil	***Volume of Gasoline***
5g (typical amount used for chemical analysis)/1 tsp.	.005 ml/ 1/1000 tsp.
4.5 litres/1 gallon bucket	7.5 ml /1.5 tsp.
205 litres/45 gallon drum	400 ml /1 3/4 cups
18,5976 kg/410,000lb (or 140 yd^3, enough to fill a living room that is 10 x 19 x 19 ft.)	205 litres/45 gallon drum

3.2 Decision Considerations

The following should be considered when making your final decision:

Guidelines (section 3.1).

Permission You must obtain permission from the local municipality or landlord before using any of their facilities, such as the landfill site or the sewage lagoon.

Time required How long will the remediation take?

Cost Is your remediation plan cost effective?

Aesthetics Does your plan restore the area to an acceptable level of aesthetic quality?

Technology How effective is the technology being considered?

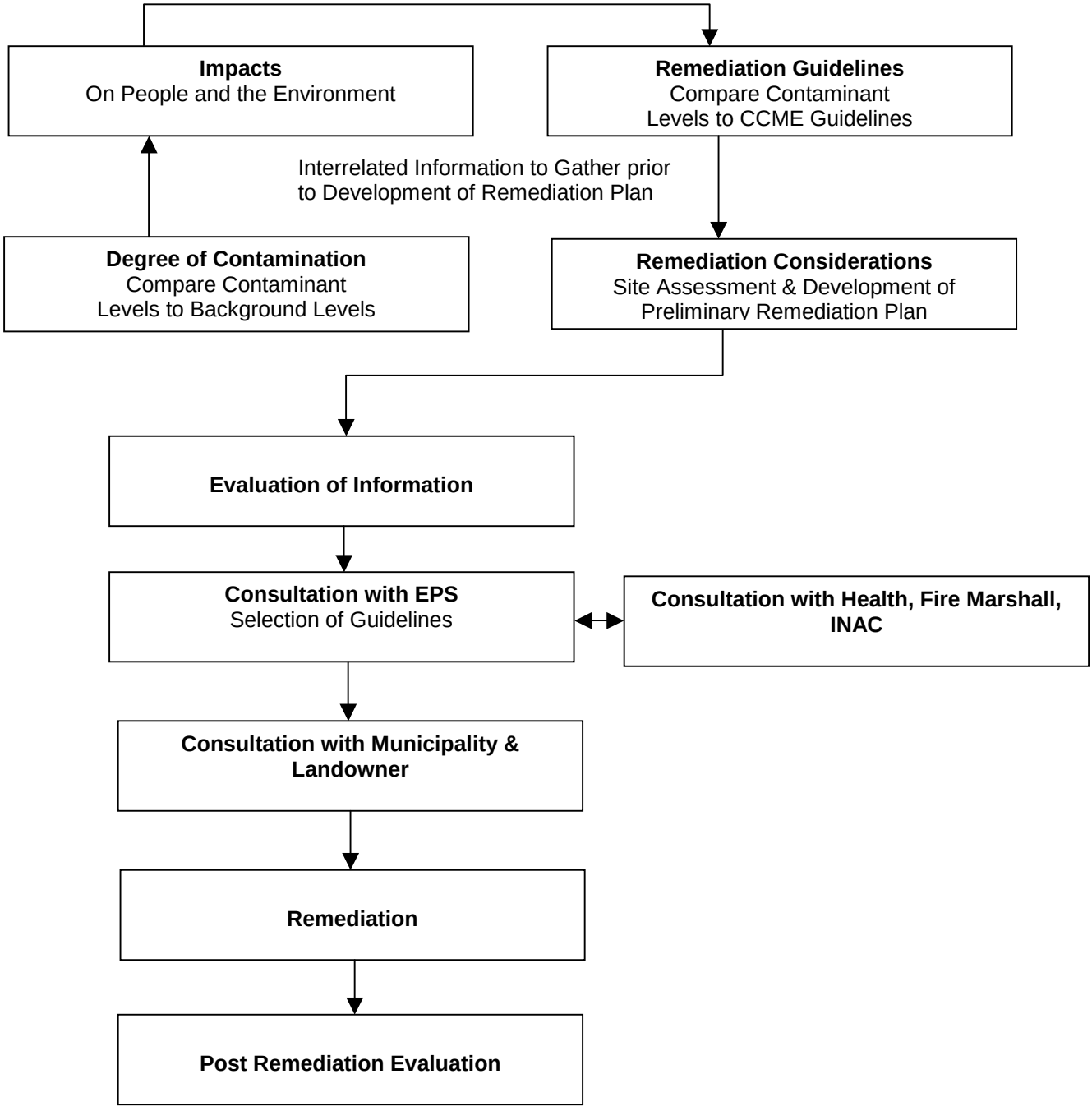


Figure 1: Steps Used in Site Remediation

4 Conclusion

This is a brief introduction to the process of contaminated site remediation.

For more information:

1) Read CCME 1997 Recommended Canadian Soil Quality Guidelines report (see References).

2) Contact the Environmental Protection Service
   Department of Sustainable Development
   P.O. Box 1000, Station 1195
   Iqaluit, Nunavut, X0A 0H0
   Phone: (867) 975-5900; Fax: (867) 975-5990

   Remember that this document is intended to inform you about some of the basic issues involved in contaminated site remediation. Once you have read this document and verified that you have a contaminated site, you must contact the Environmental Protection Service. You should work with EPS before proceeding through the site remediation process.

5 Bibliography

CCME (Canadian Council of Ministers of the Environment). 1991 Interim Canadian Environmental Quality Criteria for Contaminated Sites . The National Contaminated Sites Remediation Program, Report No. CCME EPC-CS34. Winnipeg, Manitoba.

CCME (Canadian Council of Ministers of the Environment). 1997 Recommended Canadian Soil Quality Guidelines. ISBN 1-895-925-92-4. Winnipeg, Manitoba.

APPENDIX
Environmental Protection Act

The following is a subset of the *Environmental Protection Act*. The complete act can be obtained from any office of the Department of Sustainable Development.

1. In this Act,

"Contaminant" means any noise, heat, vibration or substance and includes such other substances as the Minister may prescribe that, where discharged into the environment,

(a) endangers the health, safety or welfare of persons,
(b) interferes or is likely to interfere with normal enjoyment of life or property,
(c) endangers the health of animal life, or
(d) causes or is likely to cause damage to plant life or to property.

"Discharge" includes, but not so as to limit the meaning, any pumping, pouring, throwing, dumping, emitting, burning, spraying, spreading, leaking, spilling, or escaping.

"Environment" means the components of the Earth and includes:

(a) air, land and water,
(b) all layers of the atmosphere,
(c) all organic and inorganic matter and living organisms, and
(d) the interacting natural systems that include components referred to in paragraphs (a) to (c).

2.2 The Minister may

(a) establish, operate and maintain stations to monitor the quality of the environment in the Territories;
(b) conduct research studies, conferences and training programs relating to contaminants and to the preservation, protection or enhancement of the environment;
(c) develop, co-ordinate and administer policies, standards, guidelines and codes of practice relating to the preservation, protection or enhancement of the environment.

5. (1) Subject to subsection (3), no person shall discharge or permit the discharge of a contaminant into the environment.

(2) REPEALED, R.S.N.W.T. 1988, c. 117 (Supp.), s. 8

(3) Subsection (1) does not apply where the person who discharged the contaminant or permitted the discharge of the contaminant establishes that:

(a) the discharge is authorized by this Act or the regulations or by an order issued under this Act or the regulations;
(b) the contaminant has been used solely for domestic purposes and was discharged from within a dwelling-house;
(c) the contaminant was discharged from the exhaust system of a vehicle;
(d) the discharge of the contaminant resulted from the burning leaves, foliage, wood, crops or stubble for domestic or agricultural purposes;

(e) the discharge of the contaminant resulted from burring for land clearing or land grading;
(f) the discharge of the contaminant resulted from a fire set by a public official for habitat management of silviculture purposes;
(g) the contaminant was discharged for the purposes of combating a forest fire;
(h) the contaminant is a soil particle or grit discharged in the course of agriculture or horticulture; or
(i) the contaminant is a pesticide classified and labeled as domestic under the *Pest Control Products Regulations* (Canada).

(4) The exceptions set out in subsection (3) do not apply where a person discharges a contaminant that the inspector has reasonable grounds to believe is not usually associated with a discharge from the excepted activity. R.S.N.W.T. 1988, c. 75 (Supp.) S. 5; c. 117 (Supp.), s. 8.

5.1 Where a discharge of a contaminant into the environment in contravention of this Act or the regulations or the provisions of a permit or license issued under the Act or the regulations occurs or a reasonable likelihood of such a discharge exists, every person causing or contributing to the discharge or increasing the likelihood of such a discharge, and the owner or the person in charge, management or control of the contaminant before its discharge or likely discharge, shall immediately:

(a) subject to any regulations, report the discharge or likely discharge to the person or office designated by the regulations;
(b) take all reasonable measures consistent with public safety to stop the discharge, repair any damage caused by the discharge and prevent or eliminate any danger to life, health, property or the environment that results or may be reasonably expected to result from the discharge or likely discharge; and
(c) make a reasonable effort to notify every member of the public who may be adversely affected by the discharge or likely discharge. R.S.N.W.T. 1988, c. 75 (Supp.), s. 5; c. 117 (Supp.), s. 9.

6. (1) Where an inspector believes on reasonable grounds that a discharge of a contaminant in contravention of this Act or the regulations or a provision of a permit or license issued under this Act or the regulations has occured or is occurring, the inspector may issue an order requiring any person causing or contributing to the discharge or the owner or the person in charge, management or control of the contaminant to stop the discharge by the date named in the order.

7. (1) Notwithstanding section 6, where a person discharges or permits the discharge of a contaminant into the environment, an inspector may order that person to repair or remedy an injury or damage to the environment that results from the discharge.

(2) Where a person fails or neglects to repair or remedy any injury or damage to the environment in accordance with an order made under subsection (1) or where immediate remedial measures are required to protect the environment, the Chief Environmental Protection Officer may cause to be carried out the measures that he or she considers necessary to repair or remedy an injury or damage to the environment that results from any discharge.

If you would like to be placed on a mailing list to receive guideline amendments or for public consultation on Environmental Protection Service legislation please fill this out and mail or fax to:

Environmental Protection Service
Department of Sustainable Development
P.O. Box 1000, Station 1195
Iqaluit, Nunavut, X0A 0H0
Fax: (867) 979-5990

Users of this guide are encouraged to report any errors, misspellings, etc. contained within, to EPS at the above address

Mailing List for Environmental Protection Service Information

Name: _____

Title: _____

Address : _____

_____

Phone / Fax Number: _____