Environment Canada Environnement Canada

INTERIM ABANDONMENT & RESTORATION PLAN

- Eureka High Arctic Weather Station –

In support of the
Nunavut Water Board License
No. 3BC-EUR1116

Prepared by Environment Canada
Assets, Contracting and Environmental Management Directorate (ACEMD)

March 2011

Canada

CONTROL PAGE

On receipt of revisions and/or amendments, the Assets, Contracting and Environmental Management Directorate (ACEMD) shall complete this control page to ensure that the Interim Abandonment & Restoration Plan is always current and consistently reflects the operations and activities taking place on site.

Revision Number	Date Inserted	Description	Signature
1	Dec. 2010	Modified closure planning timelines and included temporary closure SOPs	
2	March 2011	Update to include new 2011Water Licence and addendum as required by licence 3BC-EUR1116 Condition I Section 2	

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ACRONYMS AND SYMBOLS

ACEMB	Assets, Contracting and Environmental Management Directorate
CCME	Canadian Council of Ministers of the Environment
EA	Environmental Assessment
EC	Environment Canada
NRC	National Research Council Canada
ODS	Oxygen Depleting Substances
PCB	Polychlorinated Biphenyls
PHC	Petroleum Hydrocarbons
POL	Petroleum, Oil, Liquids
PWGSC	Public Works Government Services Canada
SOP	Standard Operating Procedure

PART I: INTRODUCTION:

BACKGROUND:

All facilities must eventually cease their activities, either temporarily or permanently. When such operations cease, the owner and operator must close the facility in a way that ensures it will not pose a future threat to human health and the environment. Therefore, an Abandonment and Restoration Plan is used to achieve "clean closure."

PURPOSE:

The purpose of this interim Abandonment and Restoration Plan (the Plan) is to provide:

- Conceptual detail on the reclamation of the components of the Eureka site which will not be closed until near the end of its useful life; and
- Operational detail for components which are to be progressively reclaimed now or in the near future.

APPROACH TO PLAN:

The approach taken to develop this Plan is underpinned by the Environment Canada's (EC) commitment to the following global objectives:

- Physical Stability: remaining items will be constructed or modified at closure to be physically stable such that they do not erode, subside or move from their intended location.

- Chemically Stability: remaining items will be chemically stable; the remaining chemical constituents should not endanger public, wildlife or environmental health and safety.

- Future Use and Aesthetics: the site will be compatible with the surrounding lands once abandonment activities have been completed.

The specific actions of the Plan to remediate each of the facility components are, in turn, based on more detailed objectives formulated to achieve the above global intentions. The Plan is an evolutionary document and thus reclamation activities will be more fully described as new information is made available from progressive restoration activities (and associated studies), associated environmental assessments and monitoring results of the aforementioned restoration activities.

The following considerations were considered in the development, evolution and implementation of Eureka's Abandonment and Restoration Plan:

- Respect all historical agreements and obligations in a fair manner;
- Ensure consistency with federal guidelines for the management of contaminated sites;
- Apply simple, practical remedial solutions wherever possible, with flexibility as necessary to adjust to site-specific conditions when they become evident;
- Take into account the warming of the Arctic; and
- Directions from the Nunavut Water Board and inspection reports provided by the Department of Indian and Northern Affairs.

PART II: SITE DESCRIPTION

The Eureka High Arctic Weather Station (HAWS) is located on the north side of Slidre Fjord, at the northwestern tip of Fosheim Peninsula, Ellesmere Island, Nunavut at site coordinates 79°59'41"N and 85°48'48"W.

The total area of the occupied Site is approximately 2.23 ha.

BIOPHYSICAL ENVIRONMENT

PHYSIOGRAPHIC DESCRIPTION:

It is located in the Eureka Hills Eco-region, within the Northern Arctic Ecozone and the topography of the area is rolling and ridged, reaching altitudes of no more than 1000 m above sea level.

Soils in the Site area are primarily a sand/gravel fill underlain by silty, sandy clays.

Permafrost is present with an active layer ranging between 0.6 and 1.2 m in thickness.

CLIMATE

The climate is cold and dry; mean annual temperatures range from -30°C in winter to 0.5°C in summer. Annual precipitation ranges between 50 to 150 mm.

FAUNA

Fauna include must, oxen, Arctic wolves, Arctic foxes, Arctic hares, and lemmings. In addition, summer nesting geese, ducks, owls, loons, ravens, gulls and many other smaller birds nest, raise their young and return south in August.

CURRENT ENVIRONMENTAL CONDITIONS

A Study conducted in 2006 (NRC) provided a list of sites with the highest contamination levels and/or sites which had 100% of their respective samples test above CCME guideline criteria. These sites were:

- North Airstrip Apron
- Sewage Lagoon
- Barrel Dump

A 2007 Environmental Site Assessment (EA) identified the following at Eureka:

- 16 areas of potential environmental concern
- Potentially contaminated environmental media identified at
    - Fuel tank farm (old and new)
    - Powerhouse
    - DND warehouse fuel tank vicinity
    - Bulky debris landfill east of airstrip

A 2009 Environmental Site Assessment (Phase III) identified the following at Eureka:

- 16 initial areas of potential environmental concern have been reduced to 6 Environmental Areas of Concern (AEC) which require further work and/or investigation including:
    - AEC A-7 Ex-Situ Biotreatment Cell
    - AEC B-1 Fuel Tank Farm
    - AEC B-2 In-Situ Landfarm
    - AEC D-1 Powerhouse
    - AEC E-1 Hydrogen Building

CURRENT PERMITS, LICENCES HELD

- Nunavut Water Board Licence No. 3BC-EUR0611 (See Appendix)

PART III: THE PLAN

The Plan consists of the following elements:

1. specific abandonment and restoration objectives and actions to be taken to achieve those objectives for each of the facility components for both temporary and permanent closure;
2. details of measures to be employed for progressive restoration;
3. monitoring program to be employed in recording the success of on-going restoration activities;
4. description of the final landscape and how aesthetic concerns will be factored into the restoration process; and
5. post-closure treatment potentially required for drainage water that is not acceptable for discharge.

TEMPORARY CLOSURE

In the context of Eureka, temporary closure refers to the shutting down operations for a period of time with the intention of resuming operations in the future. The period of shutdown could be for a week or longer and would be a function of political, economic, environmental or social.

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

The political (sovereignty) and environmental (climate) roles played by Eureka make it unlikely that Eureka will ever be abandoned. Notwithstanding, the basic abandonment and restoration objective would be to ensure that the various components of the Eureka site do not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- All legislated requirements (eg. Provisions of water licence) will be complied; and
- Warning signs continue to be posted where appropriate.

TEMPORARY CLOSURE PLAN - EUREKA		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
• Operations & Barracks Buildings • Maintenance garage • Warehouses • Shops & other buildings • Pumphouse • Electrical, plumbing & carpentry facilities • Powerhouse	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Implement the Standard Operating Procedures (SOP) for temporary closure of building • See Appendix A for Building Temporary Closure SOP
• Water reservoir • Water diversion area	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Implement the Standard Operating Procedure (SOP) for Temporary Closure of the water reservoir in order to ensure that water diversion area is closed before any temporary closure of the site. • See Appendix A for Lagoon and Earthen Manure Storage Structure Temporary Closure SOP
• Contaminated (oil, fuel, chemicals) sites	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Identify all open conduits in and around the contaminated sites • Implement the Standard Operating Procedure (SOP) for contaminated sites and ensure that any open conduits (monitoring wells, open pits, etc.) are closed and secure. • See Appendix A for Contaminated Sites Temporary Closure SOP
• Infrastructure (eg. airstrip, electrical power supply	• To ensure that this component of the Eureka	• Implement the Standard Operating Procedures (SOP) for temporary closure of infrastructure

TEMPORARY CLOSURE PLAN - EUREKA		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
systems, culverts, barge landings, and associated infrastructure)	site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• See Appendix A for Infrastructure Temporary Closure SOP
• Hazardous materials (eg. POL Fluids, PCB containing material, ODS containing equipment, batteries, asbestos; compressed gas cylinders; lead-based paint)	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Determine temporary storage requirements of all hazardous materials • Implement Temporary Storage Plan for hazardous materials • See Appendix A Temporary Storage Plan for Hazardous Materials
• Sewage lagoon	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Identify all influent channels into sewage lagoon • Implement Sewage Lagoon Temporary Closure Standard Operating Procedure (SOP) and ensure that all influent channels are closed during temporary closure periods • See Appendix A for Lagoon and Earthen Manure Storage Structure Temporary Closure SOP
• Incinerator	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans	• Determine temporary storage requirements for incinerator • Implement SOP for temporary shut-down and storage of incinerator • See Appendix A for Incinerator Temporary Closure SOP

TEMPORARY CLOSURE PLAN - EUREKA		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
	during temporary closure periods.	
• Solid Waste Landfill Sites	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Identify all open conduits in and around the contaminated sites • Implement the Standard Operating Procedure (SOP) for temporary closure of the solid waste landfill sites and to ensure that any open conduits (monitoring wells, open pits, etc.) are closed and secure • See Appendix A for Solid Waste Landfill Site Temporary Closure SOP
• Barrels	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• Apply general health and safety principles to ensure barrels do not pose a threat

PERMANENT CLOSURE AND RECLAMATION

The following Permanent Closure and Reclamation Plan outlines specific abandonment and restoration objectives and actions to be taken to achieve those objectives for each of the facility components for permanent closure. Actions currently being undertaken to remediate some site components (progressive restoration) are indicated by dates contained within brackets.

PERMANENT CLOSURE AND RECLAMATION PLAN		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
• Operations & Barracks Buildings • Maintenance garage • Warehouses • Shops & other buildings • Pumphouse • Electrical, plumbing & carpentry facilities • Powerhouse	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To return area to its original state	• Federal Heritage Building Review of following Eureka buildings (2009) o Older Operations Complex (1963) o Old Garage (1963) o Hydrogen Building (1963) o Transient Barracks (1947) o Plumbing Building (1947) o Bunkhouse (1947) o Carpentry Shop (1947) o Greenhouse (1947) o Electrical Storage Building 9 (1947) o CWS Storage Building 19 (1947) o Eureka International (Strip Shack) (1947) • Conduct inventory of contents and building construction materials (2009) • Consult with stakeholders to determine their storage requirements (2009) • Decide which buildings can be declared surplus (2010) • Retain the services of a qualified engineer to produce a Demolition Waste Disposal Plan (2011) • Conduct an Environmental Assessment (2012) • Obtain any necessary approvals [eg. new landfill site(s)] (2013)

PERMANENT CLOSURE AND RECLAMATION PLAN		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
		• Develop tender documents for the decommissioning of the buildings (2013) • Determine successful candidate to implement Demolition Waste Disposal Plan (2013) • Begin implementation of Demolition Waste Disposal Plan (2014) • Conduct site grading
• Water reservoir • Water diversion area	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To return area to its original state	• Prepare decommissioning plan • Conduct an Environmental Assessment • Conduct site grading
• Contaminated (oil, fuel, chemicals) sites	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To restore in such a fashion as to facilitate the natural use by wildlife	• Site Assessment; listing and geographical extent of contamination based on EA Phase I and Geophysical Study; completed • Reconnaissance Testing Program; performed on all sites identified in EA Phase I Study to confirm nature and extent of contamination and any leachate issues; (2009) • Risk-Based Analysis to determine which specific contaminated sites should be subjected to detailed and systematic testing; (2009) • Detailed Testing Program on specific sites identified in the Risk-Based Analysis to accurately determine nature, extent and rate of movement of contamination; (2010) • Risk-Based Analysis to prioritize sites for remediation; (2010) • Development of a Remediation Plan; (2011)

PERMANENT CLOSURE AND RECLAMATION PLAN		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
		• Conduct and Environmental Assessment, (2011) • Request for federal funding; 2011 • Begin implementation of Remediation Plan; (2012) • Post Remediation Monitoring (location and frequency based on recommendations flowing from detailed testing program and risk-based analysis)
• Infrastructure (eg. airstrip, electrical power supply systems, culverts, barge landings, sewage lagoon piping, water supply piping and associated infrastructure)	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To recycle and reuse • To restore natural drainage patterns where surface infrastructure has been removed • To restore in such a fashion as to facilitate the natural use by wildlife	• Conduct inventory of materials • Consult with stakeholders to determine their storage requirements • Decide which infrastructure can be declared surplus • Retain the services of a qualified engineer to produce a Demolition Waste Disposal Plan • Conduct an Environmental Assessment • Obtain any necessary approvals [eg. new landfill site(s)] • Develop tender documents for the decommissioning of the infrastructure • Determine successful candidate to implement Demolition Waste Disposal Plan • Begin implementation of Demolition Waste Disposal Plan • Conduct site grading
• Hazardous materials (eg. POL Fluids, PCB containing material, ODS containing equipment, batteries, asbestos; compressed gas cylinders; lead-based	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans	• Conduct inventory of contents materials • Consult with stakeholders to determine their storage requirements • Decide which materials can be declared surplus • Determine waste disposal approach • Obtain any necessary approvals [eg. new landfill site(s)] • Develop tender documents for landfilling/hauling of hazardous waste

PERMANENT CLOSURE AND RECLAMATION PLAN		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
paint)	during temporary closure periods. • To recycle and reuse	• Determine successful candidate to implement hazardous waste cleanup • Begin implementation
• Sewage lagoon	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To return area to its original state by grading it to match local topography and to facilitate re-vegetation where appropriate	• Conduct options analysis for sewage treatment & disposal at Eureka (2009) • EC decision on preferred option (2009) • If, on the basis of the preceding preferred option, it is decided to: o close the existing lagoon; or o remove the existing sludge, the services of a qualified engineer will be obtained to determine whether the lagoon is/is not highly contaminated and to recommend a remediation option(s) which may include the following: o the lagoon may be backfilled and shaped to blend in with existing contours provided that measures are applied for leachate control; o the sludge may be de-watered (eg. evaporation allowed to take place) and the dried residue removed and disposed of on-site in an engineered land fill; or o the de-watered sludge may be containerized and land filled to preclude contact with the Arctic ecosystem. • Award consultant contract to provide information for drafting the design build performance documents for new sewage treatment system (eg. water/wastewater mass balance report) (2011) • Draft and complete design build performance documents, including sludge treatment plan (2011) • Develop tender documents for the Design-Build contract (2011)

PERMANENT CLOSURE AND RECLAMATION PLAN		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
		• Close Design-Build contract (2011) • Conduct Environmental Assessment (2011) • Award Design-Build Contract (2012) • Sewage Treatment System constructed at Eureka (2012-2013) • Remediate existing lagoon (2013-2014) • Post monitoring [location of monitoring sites and frequency of monitoring will be based on engineers recommendations (above)]
• Incinerator	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To recycle and reuse	• Removed from the site and re-used
• Solid Waste Landfill Sites	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods. • To return area to its original state	• Site Assessment; listing and geographical extent of contamination based on EA Phase I and Geophysical Study; completed • Reconnaissance Testing Program; performed on all sites identified in EA Phase I Study to confirm nature and extent of contamination and any leachate issues; (2009) • Risk-Based Analysis to determine which specific contaminated sites should be subjected to detailed and systematic testing; (2009) • Detailed Testing Program on specific sites identified in the Risk-Based Analysis to accurately determine nature, extent and rate of movement of contamination; (2010) • Risk-Based Analysis to prioritize sites for remediation; (2010) • Development of a Holistic Remedial Action Plan (RAP); (2011)

PERMANENT CLOSURE AND RECLAMATION PLAN		
Site Component	**Specific Abandonment and Restoration Objective**	**Actions to be taken to achieve Objective**
		• Request for federal funding; 2011 • Implement RAP (free product first, purchase and mobilize any needed equipment – 2 year plan); 2012 • Implement RAP (free product, mobilize any other equipment, begin construction); 2013 • Remediation during summer seasons (2014-2019) • Post Remediation Monitoring (location and frequency based on recommendations flowing from detailed testing program and risk-based analysis);2020
• Barrels	• To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.	• empty barrels will be crushed and disposed in an on-site engineered landfill • filled or partially filled barrels will be inspected and tested if necessary and disposed of appropriately (off-site or incineration). The empty barrels will be rinsed, crushed and disposed on-site in an engineered landfill. The spent rinse liquid will be treated with absorbent material and disposed as hazardous material • buried empty barrels will be inspected to determine if any of the barrels contain material. If the barrels are found to be empty, the area will be stabilized through compaction to crush any corroded barrels. A cover of borrow material will be placed over the area and compacted.

MONITORING OF ON-GOING RESTORATION ACTIVITIES

A monitoring program will be carried out to record the progress of progressive restoration activities. Monitoring activities may include visual inspection to determine if:

- water is ponding on the landfill cover
- the landfill cover is eroding
- frost action is occurring
- the permafrost is developing within the landfill consistent with the design

Monitoring of the contaminated sites will follow a pre-established program and will occur at regular intervals following closure of the site. Contaminated areas that have been excavated will be confirmed clean by field screening methods and samples taken for laboratory confirmation. Once it has been demonstrated that the site is physically and chemically stable, the frequency of monitoring will be reduced. Physical stability will be established as a minimum through visual inspection and may include instrumentation for thermal monitoring. Chemical stability will be confirmed through the collection of suitable samples from around the site.

The details of the pre-established monitoring program (the location of monitoring stations and frequency and duration of monitoring) will be a function of the recommendations of the engineer and will be outlined in subsequent revisions to this document following Detailed Testing Program and the Risk-Based Analyses of the sites (eg. proximity to sensitive receptors) in question.

FINAL LANDSCAPE: SITE GRADING & AESTHETICS

Disturbed areas will be graded and shaped to blend in with the natural contours and to eliminate potential hazards for wildlife, humans accessing the site in the future.

To facilitate physical stability improve the aesthetics of sites subjected to progressive restoration, EC will begin re-vegetation efforts, where appropriate, immediately following such restoration. Consideration will be given to:

- Seeding areas with native seed mixes
- Applying stockpiled soil or growth medium to a depth sufficient to maintain root growth and nutrient requirements
- Incorporation of organic materials based upon local soil assessment
- Establishing temporary or permanent windbreaks
- Transplanting vegetation will be lost to progressive restoration activities
- Placing gravel on sites to discourage vegetation growth where desired.

TREATMENT OF UNACCEPTABLE DISCHARGE FOLLOWING PROGRESSIVE RESTORATION/CLOSURE

In the event that drainage water from any reclaimed facility is not acceptable for discharge, EC would retain the services of a qualified engineer to recommend measures, based on a risk-based analysis, to ensure that human and environmental safety were not jeopardized.

REFERENCES

1. Mine Site Reclamation Guidelines for the Northwest Territories, Indian and Northern Affairs Canada, Yellowknife, NWT, January 2006
2. Abandoned Military Site Remediation Protocol, Indian and Northern Affairs Canada, March 2005
3. Phase I Environmental Site Assessment Eureka High Arctic Weather Station, Eureka, Nunavut, Public Works and Government Services Canada, February 2007
4. Eureka High Arctic Weather Station Geophysical Investigation, Eureka, NU, EBA Engineering Consultants, Edmonton, AB, May 2008
5. Contaminated Sites Remediation Framework, Environment Canada

APPENDIX A: EUREKA WATER LICENCE

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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYIT
OFFICE DES EAUX DU NUNAVUT

File No.: 3BC-EUR1116

June 08, 2011

Mr. Carl Carroll
Property Management Division
Environment Canada
335 River Road
Ottawa ON K1V 1C7

Email: carl.carroll@ec.gc.ca

RE: NWB Licence No. 3BC-EUR1116

Mr. Carroll:

Please find attached Licence No. 3BC-EUR1116 issued to Environment Canada by the Nunavut Water Board (NWB) pursuant to its authority under Article 13 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in Right of Canada.* The terms and conditions of the attached Licence related to water use and waste disposal are an integral part of this approval.

If the Licensee contemplates the renewal of this Licence, it is the responsibility of the Licensee to apply to the NWB for its renewal. The past performance of the Licensee, new documentation and information, and issues raised during a public hearing, if the NWB is required to hold one, will be used to determine the terms and conditions of the Licence renewal. Note that if the Licence expires before the NWB issues a new one, then water use and waste disposal must cease, or the Licensee will be in contravention of the *Nunavut Land Claims Agreement* (NLCA) and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA). However, the expiry or cancellation of a licence does not relieve the holder from any obligations imposed by the licence. The NWB recommends that an application for the renewal of this Licence be filed at least three months prior to the Licence expiry date.

If the Licensee contemplates or requires an amendment to this licence, the NWB may decide, in the public interest, to hold a public hearing. The Licensee should submit applications for amendment as soon as possible to give the NWB sufficient time to go through the amendment process. The process and timing may vary depending on the scope of the amendment, however a minimum of sixty (60) days is required from time of acceptance by the NWB. It is the responsibility of the Licensee to ensure that all application materials have been received and acknowledged by the Manager of Licensing.

The NWB strongly recommends that the Licensee consult the comments received by interested persons

on issues identified. This information is attached for your consideration[1].

Sincerely,

Thomas Kabloona
Nunavut Water Board Chair

TK/kk/ip

Enclosure: Licence No. **3BC-EUR1116**
Comments – INAC, GN-CLEY

cc: Distribution – Qikiqtani

[1] Indian and Northern Affairs Canada (INAC), March 04, 2011; and Government of Nunavut – Department of Culture, Language, Elders and Youth (GN-CLEY), February 23, 2011.

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DECISION

LICENCE NUMBER: 3BC-EUR1116

This is the decision of the Nunavut Water Board (NWB) with respect to an application dated October 21, 2010 for a renewal water licence made by:

ENVIRONMENT CANADA

to allow for the use of water and disposal of waste during operation and maintenance of Environment Canada's Eureka High Arctic Weather Station (HAWS), located on Ellesmere Island within the Qikiqtani Region, Nunavut generally located at the geographical coordinates as follows:

Latitude: 79° 59' 41" N Longitude: 85° 48' 48" W

DECISION

After having received a positive land use plan conformity determination from the Nunavut Planning Commission on January 6, 2011, and following notification of exemption from screening by the Nunavut Impact Review Board on January 11, 2011, the NWB decided that the application could proceed through the regulatory process. In accordance with S.55.1 of the *Nunavut Waters and Nunavut Surface Rights Tribunal Act (NWNSRTA)* and Article 13 of the *NLCA*, public notice of the application was given and interested persons were invited to make representations to the NWB.

After reviewing the submission of the Applicant and considering the representations made by interested persons, the NWB, having given due regard to the facts and circumstances, the merits of the submissions made to it and to the purpose, scope and intent of the *NLCA* and of the *NWNSRTA*, waived the requirement to hold a public hearing, and determined that:

Renewal Licence Number 3BC-EUR1116 be issued subject to the terms and conditions contained therein. (Motion #: 2011-05-L08)

SIGNED this 7th day of June 2011 at Gjoa Haven, NU.

Thomas Kabloona
Nunavut Water Board Chair

TK/kk/ip

LICENCE NO: 3BC-EUR1116

I. INTRODUCTION

The Eureka High Arctic Weather Station (HAWS) was established in 1947. The Eureka HAWS is approximately 1100 km from the true North Pole and is located on the northern shore of Slidre Fiord, at the north-western tip of Fosheim Peninsula, Ellesmere Island, approximately 425 km northwest of the Hamlet of Grise Fiord. The total area of the occupied Site is approximately 2.23 ha. The primary purpose of the Eureka station is to collect weather information in order to produce public weather forecasts. The station also serves as a staging location for other science based activities in the High Arctic, and provides support to the Arctic aviation community.
Facilities at Eureka include operations, shops and other buildings, maintenance garage, warehouses, pump-house, power-house, fuel storage facility, electrical-plumbing-carpentry facilities, water reservoir, incinerator, sewage lagoon and several landfills.

II. PROCEDURAL HISTORY

The previous water licence was issued by Nunavut Water Board (NWB) to Environment Canada on February 6, 2006 to allow for the use of water, disposal of waste and the handling or storage of petroleum products or hazardous materials for the Eureka Weather Station located within the North Baffin Region, Nunavut. The NWB received an application for the renewal water licence from the Environment Canada (EC) on October 21, 2010. The following plans were included with the application:

- Oil Pollution Emergency Plan for Land Spills;
- Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities;
- Interim Abandonment and Restoration Plan;
- Sludge Disposal Plan;
- Quality Assurance & Quality Control Program.

Following an internal completeness review of the application, the NWB noticed that Interim Abandonment and Restoration and Sludge Disposal Plans are the same as presented for the Board approval on March 17, 2009. The technical review of these plans was completed on September 13, 2010 and identified some issues to be addressed. The Licensee was requested to revise the plans and re-submit for approval which wasn't done. Therefore the NWB requested on November 2, 2010 to update those plans. Following receipt of additional information provided by Environment Canada on December 14, 2010 and January 17, 2011, the NWB notified parties on January 18, 2011 and distributed the file for review. Following a thirty (30) day review period followed by an additional fifteen (15) day extension (requested by Indian and Northern Affairs Canada - INAC), and after reviewing all submissions, the renewal Licence 3BC-EUR1116 has been issued.

III. GENERAL CONSIDERATIONS

The following sections outline the issues identified by the NWB and raised by interested parties and provides the background for the terms and conditions imposed within the body of the licence.

A. Term of Licence

In accordance with the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* s. 45, the NWB may issue a licence for a term not exceeding twenty-five years. In determining an appropriate term of a water licence, the Board considers a number of factors including, but not limited to; the results of INAC site inspections and the corresponding compliance record of the Applicant, as well as intervener comments provided during the application review process.

The applicant proposed a 10 year term for the renewal licence. In the past the NWB has issued a 5 year licence for Eureka HAWS. INAC recommended to renew the licence for (5) years, which should be sufficient time for EC to improve the performance of their domestic wastewater treatment capacity. It is recommended that EC keep the NWB and INAC aware of any developments concerning the wastewater treatment lagoon replacement and closure/reclamation. The NWB finds that a five (5) year term is more appropriate in this case. The Licence duration will allow the Licensee to properly carry out the terms and conditions of the Licence and to improve the performance of the wastewater treatment facility.

B. Annual Reporting

The NWB has imposed on the Licensee, the requirement to produce an Annual Report. These Reports, which are standard requirements for NWB licences, are for the purpose of ensuring that the NWB has an accurate annual update of the Licensee's activities related to water use and waste disposal during a calendar year. This information is maintained on the NWB Public Registry and is available to interested parties upon request. A *"Standardized Form for Annual Reporting"* is to be used by the Licensee and is available from the NWB file transfer protocol (FTP) site under the Public Registry link at the NWB Website.

Website Public Registry:
ftp://nunavutwaterboard.org/ADMINISTRATION/Standardized%20Forms/.

This form provides the basis for annual reporting and format, however individual licences with project specific reporting requirements will need to provide information in addition to that of the standard form.

C. Water Use

The Eureka HAWS obtains its water for domestic purposes from nearby Station Creek. The water is pumped from Station Creek into the water reservoir using a submersible pump in order to reduce the transfer of silt from the creek to the reservoir. In the past, a diversion berm was constructed annually to divert water from the creek into the reservoir. This had resulted in unusually high sediment characteristics within the reservoir and the practice was converted to the submersible pumping system. The water is then transferred from the water reservoir to holding tanks within the Eureka complex building and is then chlorinated. The potable water is then further treated by filtration and Reverse Osmosis prior to use for drinking and food preparation.
The volume of water in the impoundment must be sufficient to supply the Eureka HAWS needs throughout the year. It is estimated that the impoundment holds approximately 12,000 m^3 of water. Daily consumption of water for a location such as Eureka HAWS has been estimated to be 290 L per person per day (Smith and Nahir, 2000). The requested volume has not changed and is 10,000 m^3 per annum.

D. Waste Disposal

Sewage

The HAWS facility utilizes a single stage sewage lagoon system for the treatment of wastewater. The wastewater from the Main Complex flows to a holding tank in the pump house. When the tank is full it is pumped to a single-cell sewage lagoon for storage and primary treatment that is subsequently decanted twice a year to Slidre Fiord, at the beginning of July and the end of August. The INAC has indicated that the lagoon is situated within thirty (30) metres of the marine environment and based on the effluent quality monitoring results included in the 2008 and 2009 Annual Reports, this facility is having difficulty meeting licensed effluent quality discharge limits for Biochemical Oxygen Demand, Total Suspended Solids, and pH. In 2009, EC (the Licensee) initiated an "options" analysis for sewage treatment and disposal at Eureka HAWS by Golder Associates (GA). GA recommended the construction of a new 2 cell facultative sewage lagoon as the most viable among the three preferable options. Subsequent to this report, a geotechnical study was initiated by Worley Parsons (WP) in order to further investigate the geotechnical feasibility of constructing a new 2 cell sewage lagoon as an option. EC indicated that this report is in the draft stage and will be forwarded to the NWB when completed (early 2011).

Currently, there is no management of sludge from the wastewater lagoon as all settled solids are left in place within the lagoon. EC's strategy for handling the sludge has not been finalized but a two-cell drying bed is being considered along with the disposal of dried sludge either in place or at an existing site landfill. Prior to removing any sludge, the Licensee shall revise the approved November 2010 Sludge Disposal Plan and submit for approval of the Board as required in Part D, Item 15. The revised Plan shall specify the mitigation measures that will be implemented to prevent any negative impacts to surrounding water sources that can result from the drying or disposal of this material. INAC noted that according to the submitted documents, sludge sampled from the existing lagoon in the summer of 2006 had concentrations of certain parameters exceeding the Canadian Council of Ministers of the Environment "*Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, 1999"*. The Licensee states that EC and the Department of National Defence (DND) are investigating the reasons for these exceedances. The summary of analysis findings shall be submitted for the Board's review.

Sewage Effluent Quality Parameters

In order to protect receiving environment, the NWB has included Effluent quality limits for Total Suspended Solids and Biological Oxygen Demand that are consistent with the "*Guidelines for the discharge of treated municipal wastewater in the Northwest Territories (1992)*". Effluent discharge quality is set based on annual release to a marine fiord environment. Other standard parameters have been included for consistency with other municipal licences.

Eureka HAWS is a Federal facility and as such, the Licensee is encouraged to achieve the recommendations set out in the EC document "*An Approach for Assessing and Managing Wastewater Effluent Quality for Federal Facilities – Final Report, June 1, 2000*" prepared for the Federal Committee on Environmental Management Systems / Wastewater Working Group, Environmental Quality Branch, Environment Canada. The monitoring requirements have been included in the Licence to assist in the characterization and evaluation of the effluent quality.

Solid Waste -Landfills

The "Summary of Operations and Maintenance Procedures for Drinking Water, Sewage , Solid Waste Disposal and Waste Treatment Facilities", dated January, 2011, indicates that the major active landfills are just south of the east end of the landing strip. They are approximately 1.3 km from the Fjord. The referenced landfills are as follows: East Landfill, Ash Landfill, Asbestos Landfill, the former West Landfill, and the Crushed Barrel Landfill. According to this plan, the project's main East Landfill is used to contain non-organic/non-hazardous waste that cannot be incinerated and ash from the

incinerator. INAC noted that it is not clearly articulated which landfill areas will remain in use and which landfills will be reclaimed as part of the present abandonment and restoration plans. This item is to be addressed through the preparation of an Operation and Maintenance Manual, (see item H) complete with a schedule for implementation. The Licensee shall also identify the landfills that are jointly operated with the Department of National Defence (DND) or other organizations. The requirement is set out in Part H, Item 1 of the Licence.

Landfarm

In their comments, INAC raised concerns regarding the projects petroleum hydrocarbon (PH) contaminated soil treatment facility (Landfarm) situated adjacent to the main complex area as referenced in document "Appendix B - MAPS of UNDERTAKING" provided with the Application. INAC recommended that the licence include effluent quality limits for discharge of effluent released from this facility, along with the corresponding monitoring program station(s).
As a Federal facility the Licensee is encouraged to achieve the recommendations set out in the EC document "*Federal Guidelines for Landfarming Petroleum Hydrocarbon Contaminated Soils*" (2005) and in the GN-DOE "*Environmental Guideline for Contaminated Site Remediation"* (2009).

Modifications and Construction

The Application's supporting documents indicate that construction of new facilities (2 cell facultative sewage lagoon) will likely take place during this Licence term. The NWB reminds the Licensee that in accordance with Part F, Item 1, the Licensee shall submit to the Board for approval, for Construction drawings at least sixty (60) days prior to commencing the activity, and in accordance with Part F, Item 4, provide as-built plans and drawings of the construction and/or Modifications. These plans and drawings shall be stamped and signed by an Engineer.

F. Spill Contingency Planning

The site-specific Spill Contingency Plan ("Plan") will assist the Licensee in responding to emergencies such that the impacts to water in particular and the environment and public health in general are minimized. The following types of petroleum and allied petroleum products are present at Eureka HAWS:

- Diesel fuel which is used to generate electricity and heat as well as fuel diesel motorized equipment;
- Gasoline to fuel automobiles, pumps and snowmobiles;
- Hydraulic fluids, greases, etc. for equipment and vehicles;
- Aviation Fuel for aircraft;
- Diesel engine oil for equipment and vehicles;
- Hydraulic fluids for equipment and vehicles;
- Glycol for equipment and vehicles; and
- Petroleum and allied petroleum wastes.

Gasoline is brought on shore in 205L drums. The capacity of gasoline tanks located just south of the tank farm is 2,273L. The maximum tank Capacity for Diesel is 693,000L.
The Plan entitled "Emergency Plan for Petroleum and Allied Petroleum Products - Eureka High Arctic Weather Station", revised on April 1, 2010 and submitted April 27, 2010 as a requirement of Part H Item 1 of water license 3BC-EUR0611, shall be revised and submitted to the Board for approval within the ninety (90) days of issuance of this renewal licence as per Part G, Item 2 of the licence.

G. Operation and Maintenance

The NWB received on November 23, 2007, a document titled "Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities" ("Manual"), under Part G, Item 1 of the licence 3BC-EUR0611. Several points were identified by NWB for addition/revision of the plan. A revised document was submitted on March 1, 2009 and further to this, an updated/revised Manual was again received on February 16, 2010. On September 13, 2010, the NWB required the Licensee to submit an updated Manual with the renewal application. An updated Manual, dated January 2011, was submitted as a part of the renewal application. Several items that were identified in previous versions have persisted through to the most recent manual received. The Licensee is required to submit for the Board's approval, a revised Manual that shall include items identified within the NWB's September 13, 2010 review letter. INAC recommended that operations and maintenance procedures for the Landfarm be included within the Manual. INAC noted that the Manual shall demonstrate that the waste management facilities are properly engineered and operated. It was also noted that the November 2010 Sludge Disposal Plan be incorporated into the Manual as well, with mitigation measures that will be implemented to prevent any negative impacts to surrounding water sources that may result from the drying or disposal of the Sludge prior to sludge removal.

H. Abandonment and Restoration Plan

The Licensee was required to submit an Interim Abandonment and Restoration Plan ("Plan") under Part I, Item 1 of licence 3BC-EUR0611. The NWB received the document entitled "Interim Abandonment and Restoration Plan - Eureka High Arctic Weather Station" ("A&R Plan") on March 17, 2009. Some items were identified and the Plan was not approved at that time. The Licensee was requested to submit an updated Plan with the renewal licence application.
The revised "Interim Abandonment and Restoration Plan - Eureka High Arctic Weather Station" Plan, received with the application, dated December, 2010, has been approved by the Board.

INAC identified that there is infrastructure and waste material on site associated with the DND. The Licensee should communicate to the NWB and INAC any agreements in place with the DND or other parties, for reclamation initiatives along with their respective implementation schedules.

I. Monitoring Program

The Monitoring Program is established to collect water quality data to assess the effectiveness of treatment for protection of public health and to assess potential impacts to the environment associated with the water use or waste disposal facilities. Parameters in addition to those that are regulated under Part D have been included in the Monitoring Program in order to assist in the characterization of effluent and the evaluation of treatment and the potential impacts to the receiving environment. The licence also includes effluent discharge monitoring for effluent released from the landfarm.

NUNAVUT WATER BOARD
WATER LICENCE

Pursuant to the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*, the Nunavut Water Board, hereinafter referred to as the Board, hereby grants to

ENVIRONMENT CANADA

(Licensee)

ENVIRONMENT CANADA PROPERTY MANAGEMENT DIVISION
335 RIVER ROAD, OTTAWA, ON K1V 1C7

(Mailing Address)

hereinafter called the Licensee, the right to alter, divert or otherwise use water or dispose of waste for a period subject to restrictions and conditions contained within this Licence:

Licence Number/Type:	**3BC-EUR1116 TYPE "B"**
Water Management Area:	NUNAVUT 04
Location:	EUREKA HIGH ARCTIC WEATHER STATION, QIKIQTANI REGION, NUNAVUT
Classification:	MUNICIPAL UNDERTAKING
Purpose:	DIRECT WATER USE AND DEPOSIT OF WASTE
Quantity of Water use not to Exceed:	TEN THOUSAND (10,000) CUBIC METRES ANNUALLY
Date of Licence Issuance:	JUNE 7, 2011
Expiry of Licence:	JUNE 7, 2016

This Licence, issued and recorded at Gjoa Haven, Nunavut, includes and is subject to the annexed conditions.

Thomas Kabloona,
Nunavut Water Board Chair

PART A: SCOPE, DEFINITIONS AND ENFORCEMENT

1. Scope

This Licence allows for the use of water and the disposal of waste for an undertaking classified as Municipal as per Schedule II of the *Regulations* at the Eureka High Arctic Weather Station (HAWS) Project, located approximately 425km north northwest of Grise Fiord, within the Qikiqtani Region, Nunavut.

a. This Licence is issued subject to the conditions contained herein with respect to the taking of water and the depositing of waste of any type in any waters or in any place under any conditions where such waste or any other waste that results from the deposits of such waste may enter any waters. Whenever new Regulations are made or existing *Regulations* are amended by the Governor in Council under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, or other statutes imposing more stringent conditions relating to the quantity or type of waste that may be so deposited or under which any such waste may be so deposited, this Licence shall be deemed, upon promulgation of such Regulations, to be subject to such requirements; and

b. Compliance with the terms and conditions of this Licence does not absolve the Licensee from responsibility for compliance with the requirements of all applicable Federal, Territorial and Municipal legislation.

2. Definitions

"**Act**" means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

"**Addendum**" means the supplemental text that is added to a full plan or report usually included at the end of the document and is not intended to require a full resubmission of the revised report.

"**Amendment**" means a change to original terms and conditions of this Licence requiring correction, addition or deletion of specific terms and conditions of the Licence; modifications inconsistent with the terms of the set terms and conditions of the Licence;

''**Appurtenant Undertaking**'' means an undertaking in relation to which a use of water or a deposit of waste is permitted by a licence issued by the Board;

"Board" means the Nunavut Water Board established under the *Nunavut Land Claims Agreement* and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act;*

"Fuels Storage Product Transfer Area" means the area around the connection point between a delivery truck, railcar, or vessel and bulk fuel storage with a capacity of 2500 liters or more as described in the water licence application dated October 21, 2011.

"Engineer" means a professional engineer registered to practice in Nunavut in accordance with the Engineering, Geological and Geophysical Act (Nunavut) S.N.W.T. 1998, c.38, s.5;

"Greywater" means all liquid wastes from showers, baths, sinks, kitchens and domestic washing facilities, but does not include toilet wastes;

"Inspector" means an Inspector designated by the Minister under Section 85 (1) of the *Act*;

"Landfarm Facility" means the facility for the petroleum hydrocarbon contaminated soil treatment situated adjacent to the main complex area as referenced in document Appendix B - MAPS of UNDERTAKING, October 21, 2010.

"Licensee" means the holder of this Licence;

"Modification" means an alteration to a physical work that introduces a new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion;

"Nunavut Land Claims Agreement" (NLCA) means the *"Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty the Queen in right of Canada*", including its preamble and schedules, and any amendments to that agreement made pursuant to it;

"Regulations" means the *Northwest Territories Water Regulations sor/93-303 8th June, 1993,* omitting Section 5, Water Use or Waste Deposit without a Licence;

"Sewage" means all toilet wastes and greywater;

"Sewage Treatment Facility" means the single stage sewage lagoon described in the water licence application dated October 21, 2010;

"Solid Waste Disposal Facilities" means comprises the area and associated structures designed to contain solid waste as described in the *Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities,* January 2011.

"Spill Contingency Plan" means a Plan developed to deal with unforeseen petroleum and hazardous materials events that may occur during the operations conducted under the Licence;

"Sump" means an excavation in impermeable soil for the purpose of catching or storing water or waste;

"Toilet Wastes" means all human excreta and associated products, but does not include greywater;

"Waste" means, as defined in S.4 of the *Act*, any substance that, by itself or in combination with other substances found in water, would have the effect of altering the quality of any water to which the substance is added to an extent that is detrimental to its use by people or by any animal, fish or plant, or any water that would have that effect because of the quantity or concentration of the substances contained in it or because it has been treated or changed, by heat or other means;

"Water" means, as defined in S.4 of the Act, except for the purposes of subsection 41(2), inland waters, whether in a liquid or solid state, on or below the surface of land

"Water Supply Facility" means the area and associated intake infrastructure at Station Creek, the reservoir, storage tanks and piping as described in the application submitted October 21, 2011.

3. **Enforcement**

a. Failure to comply with this Licence will be a violation of the *Act*, subjecting the Licensee to the enforcement measures and the penalties provided for in the *Act*;

b. All inspection and enforcement services regarding this Licence will be provided by Inspectors appointed under the *Act*; and

c. For the purpose of enforcing this Licence and with respect to the use of water and deposit or discharge of waste by the Licensee, Inspectors appointed under the *Act*, hold all powers, privileges and protections that are conferred upon them by the *Act* or by other applicable law.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the appurtenant undertaking with the Board no later than March 31st of the year following the calendar year being reported, containing the following information:

a. A summary report of water use and waste disposal activities;
b. A list of unauthorized discharges and a summary of follow-up actions taken;
c. A description of all progressive and or final reclamation work undertaken, including photographic records of site conditions before, during and after completion of operations;
d. A summary of all information requested and results of the Monitoring Program;
e. Map of monitoring program locations, and
f. Any other details on water use or waste disposal requested by the Board by November 1 of the year being reported.

2. The Licensee shall notify the NWB of any proposed changes in operating plans or conditions associated with this project at least thirty (30) days prior to any such change.

3. The Licensee shall install flow meters or other such devices, or implement suitable methods required for the measuring of water volumes as required under Part J, Item 2.

4. The Licensee shall, for all Plans submitted under this Licence, include a proposed timetable for implementation. Plans submitted, cannot be undertaken without subsequent written Board approval and direction. The Board may alter or modify a Plan if necessary to achieve the legislative objectives and will notify the Licensee in writing of acceptance, rejection or alteration of the Plan.

5. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.

6. The Licensee shall review the Plans referred to in this Licence, as required by changes in operation and/or technology, and modify the Plan accordingly. Revisions to the Plans are to be submitted in the form of an Addendum to be included with the Annual Report.

7. Every Plan to be carried out pursuant to the terms and conditions of this Licence shall become a part of this Licence, and any additional terms and conditions imposed upon approval of a Plan by the Board become part of this Licence. All terms and conditions of the Licence should be contemplated in the development of a Plan where appropriate.

8. The Licensee shall ensure a copy of this Licence is maintained at the site of operations at all times. Any communication with respect to this Licence shall be made in writing to the attention of:

(a) Manager of Licensing:
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0
Telephone: (867) 360-6338
Fax: (867) 360-6369
Email: licensing@nunavutwaterboard.org

(b) Inspector Contact:
Manager of Field Operations, INAC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295
Fax: (867) 979-6445

9. The Licensee shall submit one paper copy and one electronic copy of all reports, studies,

and plans to the Board. Reports or studies submitted to the Board by the Licensee shall include a detailed executive summary in Inuktitut.

10. The Licensee shall ensure that any document(s) or correspondence submitted by the Licensee to the Board is received and acknowledged by the Manager of Licensing.

11. This Licence is assignable as provided for in Section 44 of the *Act*.

PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all water for domestic purposes from Station Creek through the Water Supply Facilities, up to a maximum of ten thousand (10,000) cubic metres annually.

2. If the Licensee requires water in sufficient volume that the source water body may be drawn down, the Licensee shall, at least thirty (30) days prior to commencement of use of water, submit to the Board for approval in writing, the following: volume required, hydrological overview of the water body, details of impacts, and proposed mitigation measures.

3. The Licensee shall equip all water intake hoses with a screen of an appropriate mesh size to ensure that fish are not entrained and shall withdraw water at a rate such that fish do not become impinged on the screen.

4. A freeboard of 1.0 metre, or as recommended by a qualified geotechnical Engineer and as approved by the Board, shall be maintained at all dykes and earth-fill structures associated with the Water Supply Facilities.

5. The Licensee shall not remove any material from below the ordinary high water mark of any water body unless authorized.

6. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.

7. Sediment and erosion control measures shall be implemented prior to and maintained during the operation to prevent entry of sediment into water.

PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty one (31) metres from the ordinary high water mark of any water body such that the quality, quantity or flow of water is not impaired, unless otherwise approved by the Board in writing.

2. The Licensee is authorized to dispose of all acceptable food waste, paper waste and untreated wood products in an incinerator.

3. The Licensee shall not open burn plastics, wood treated with preservatives, electric wire, Styrofoam, asbestos or painted wood to prevent the deposition of waste materials of incomplete combustion and/or leachate from contaminated ash residual, from impacting any surrounding waters, unless otherwise approved by the Board in writing.

4. The Licensees shall ensure that all hazardous wastes generated through the course of operation are backhauled and disposed of at an approved waste disposal site or as otherwise approved by the Board.

5. The Licensee shall dispose of and contain all non-combustible solid wastes at the appropriate landfill of the Solid Waste Disposal Facilities or as otherwise approved by the Board.

6. The Licensee shall maintain records of all waste backhauled and records of confirmation of proper disposal of backhauled waste. These records shall be made available to an Inspector upon request.

7. The Licensee shall direct all sewage to the Sewage Treatment Facility or as otherwise approved by the Board.

8. Effluent discharged from the Sewage Treatment Facility at monitoring station EUR-3 shall not exceed the following Effluent quality limits:

Parameter	Maximum Concentration of any Grab Sample
Biochemical Oxygen Demand (BOD)	100 mg/L
Total Suspended Solids (TSS)	120 mg/L
Fecal Coliforms	1×10^6 CFU/100 mL
pH	Between 6 and 9
Oil and grease	No visible sheen

9. Effluent discharge from the Landfarm Facility at monitoring station EUR-4 shall not exceed the following Effluent quality limits:

Parameter	Maximum Concentration of any Grab Sample
Benzene (µg/L)	370
Toluene (µg/L)	2
Ethylbenzene (µg/L)	90
Lead (µg/L)	1
Oil and Grease (mg/L)	15 and no visible sheen
Phenols (µg/L)	20

10. If Effluent does not meet the Effluent quality limits of Part D, Item 10, it shall be considered hazardous waste and disposed off-site at an approved facility.

11. A freeboard of 1.0 metre, or as recommended by a qualified geotechnical Engineer and as approved by the Board, shall be maintained at all dams, dykes and earth-fill structures associated with the Sewage Treatment Facility or Landfarm Facility.

12. The Licensee shall provide at least ten (10) days notification to an Inspector, prior to initiating any Effluent discharge from the Sewage Treatment Facility or Landfarm Facility.

13. The Licensee shall maintain the Sewage Treatment Facility to the satisfaction of the Inspector and operate in such a manner as to prevent structural failure.

14. Should the Licensee require the removal and disposal of sludge from the Sewage Treatment Facility, the Sludge Disposal Plan shall be revised and submitted to the Board for approval, at least ninety (90) days prior to commencing the removal.

PART E: CONDITIONS APPLYING TO INFRASTRUCTURES, ACCESS AND OPERATIONS

1. The Licensee shall not store material on the surface or banks of frozen streams or lakes except what is for immediate use.

2. The Licensee shall not conduct any land based activity within thirty one (31) metres of the ordinary high water mark of any water body, unless otherwise approved by the Board.

3. All activities shall be conducted in such a way as to minimize impacts on surface drainage and the Licensee shall immediately undertake any corrective measures in the event of any impacts on surface drainage.

4. With respect to access road, pad construction or other earthworks, the deposition of debris or sediment into or onto any water body is prohibited. These materials shall be disposed a distance of at least thirty one (31) metres from the ordinary high water mark in such a fashion that they do not enter the water.

PART F: CONDITIONS APPLYING TO MODIFICATIONS AND CONSTRUCTION

1. The Licensee shall submit to the Board for approval, design drawings stamped and signed by a qualified Engineer, ninety (90) days prior to the construction or Modification of any Water Supply Facilities, Sewage Treatment Facility or Solid Waste

Disposal Facilities.

2. The Licensee may, without written consent from the Board, carry out construction and/or Modifications to the Water Supply Facilities, Sewage Treatment Facility or Solid Waste Disposal Facilities provided that such construction and/or Modifications are consistent with the terms of this Licence and the following requirements are met:

   a. the Licensee has notified the Board in writing of such proposed construction and/or Modifications at least sixty (60) days prior to beginning the Modifications;
   b. such construction and/or Modifications do not place the Licensee in contravention of the Licence or the *Act*;
   c. such construction and/or Modifications are consistent with the NIRB Screening Decision
   d. the Board has not, during the sixty (60) days following notification of the proposed construction and/or Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
   e. the Board has not rejected the proposed construction and/or Modifications.

3. Construction and/or Modifications for which all of the conditions referred to in Part F, Item 2 have not been met can be carried out only with written approval from the Board.

4. The Licensee shall provide as-built plans and drawings of the construction and/or Modifications referred to in this Licence within ninety (90) days of completion of the construction and/or Modifications. These plans and drawings shall be stamped by an Engineer.

PART G: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Licensee shall revise and submit to the Board for approval, within ninety (90) days of issuance of the Licence, the Spill Contingency Plan entitled “Emergency Plan for Petroleum and Allied Petroleum Products – Eureka High Arctic Weather Station”, revised April 1, 2010. The Plan shall take into consideration the comments received during the application review process and the NWB letter of September 13, 2010 and shall address the following issues:

   a. Address potential for spills of chemicals used at the site (stored in significant quantity), for example, chemicals used in the chlorination of drinking water;
   b. Measures are to be provided for collection, storage and treatment/removal from site, of materials contaminated with petroleum products or chemicals, including soils;
   c. The contact name and phone number of the overall person in charge at the facility (Eureka Station Program Manager);
   d. The Indian and Northern Affairs Canada Water Resources Inspector’s updated phone number as 867-975-4295;

e. The hard copy of NT/NU Spill form and guide should be available on site in the event that there is no internet access. The spill contingency planning and reporting regulations should be included in the references; and
f. A record of revisions page which identifies the changes.

2. The Licensee shall prevent any chemicals, petroleum products or wastes associated with the project do not enter water. All sumps and fuel caches shall be located at a distance of at least thirty one (31) metres from the ordinary high water mark of any adjacent water body and inspected on a regular basis.

3. The Licensee shall ensure that any equipment maintenance and servicing be conducted only in designated areas and shall implement special procedures (such as the use of drip pans) to manage motor fluids and other waste and contain potential spills.

4. If during the term of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:

a. Employ the Spill Contingency Plan;

b. Report the spill immediately to the 24-Hour Spill Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and

c. For each spill occurrence, submit to the Inspector, no later than thirty (30) days after initially reporting the event, a detailed report that will include the amount and type of spilled product, the GPS location of the spill, and the measures taken to contain and clean up the spill site.

PART H: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Licensee shall revise and submit to the Board for approval, within ninety (90) days of issuance of the Licence, the Operations and Maintenance Manual entitled "Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities", dated January, 2011. The Manual shall take into consideration the comments received during the application review process and the NWB letter of September 13, 2010 and shall contain the following:

a. Petroleum Hydrocarbon contaminated soil treatment facility (Landfarm) Operation and Maintenance Plan;
b. Sewage Sludge Disposal Plan shall be incorporated into the Manual. Mitigation measures shall be specified that will be implemented to prevent any negative impacts to surrounding water sources prior to removing the sludge;
c. Summary of EC and DND analysis findings explaining the parameter concentrations exceedances in the sewage lagoon; and
d. Monitoring Program Quality Assurance/Quality Control Plan (QA/QC Plan). The Plan shall include up to date field sampling methods to all applicable

standards, acceptable to an accredited laboratory as required by Part J, Item 7. The Plan shall include a covering letter from the accredited laboratory confirming acceptance of the Plan for analyses to be performed under this Licence; and

e. A record of revisions page which identifies the changes.

2. A Geotechnical inspection of all engineered facilities related to the management of water and waste shall be carried out upon request of an inspector. The engineer's report shall be submitted to the Board within sixty (60) days of the inspection, including a covering letter from the Licensee outlining an implementation plan addressing each of the Engineer's recommendations.

3. The Licensee shall perform more frequent inspections of the engineered facilities at the request of an Inspector.

PART I: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION OR TEMPORARY CLOSING

1. The Board has approved the Plan entitled "Interim Abandonment and Restoration Plan - Eureka High Arctic Weather Station", dated December, 2010 that was submitted as additional information with the Application.

2. The Licensee shall submit to the Board for review an addendum to the Plan with the 2011 Annual Report. The addendum shall take into consideration the comments received during the application review process and shall address the following:

   a. Activities related to the Landfarm;
   b. Activities related to the bio-treatment cell;
   c. Plans for the reclamation of the infrastructure and waste material on site associated with the Department of National Defence; and
   d. A record of revisions page which identifies the changes.

3. At least one (1) year prior to final abandonment, the Licensee shall submit to the Board for approval, a final Abandonment and Restoration Plan. The Plan shall include in addition to the content of the Interim Plan, but not be limited to the following:

   a. A description of contaminated soils identified at the site through a completed Phase III Environmental Assessment and the procedures to mitigate the contamination;
   b. A summary of existing data for background levels of metals in the area, and identification of needs for verification of data;
   c. A description of restoration activities outlined in the Interim Abandonment and Restoration Plan:
   d. An implementation schedule for the completion of restoration; and
   e. A detailed monitoring program.

4. The Licensee shall implement the Final Abandonment and Restoration Plan as approved by the Board.

5. The Licensee shall complete all restoration work within the time schedule specified in the Plan, or as subsequently revised and approved by the Board.

6. The Licensee shall carry out progressive reclamation of any components of the project no longer required for the Licensee's operations.

7. Areas that have been contaminated by hydrocarbons from normal fuel transfer procedures shall be reclaimed to meet objectives as outlined in the Government of Nunavut's Environmental Guideline for Site Remediation, January 2002. The use of reclaimed soils for the purpose of back fill or general site grading may be carried out only upon consultation and approval by the Government of Nunavut, Department of Environment and an Inspector.

8. All disturbed areas shall be contoured and stabilized upon completion of work and restored to a pre-disturbed state.

PART J: CONDITIONS APPLYING TO THE MONITORING PROGRAM

1. The Licensee shall maintain Monitoring Program Stations and implement the program as described in the table below and the conditions under this Part.

Monitoring Program Station	Description	Status
EUR-1	Raw water supply prior to treatment	Active Volume
EUR-2	Runoff from the Solid Waste Disposal Facilities	Active
EUR-3	Effluent discharge from Sewage Lagoon to the ocean	Active
	Quantity in cubic metres of Sludge removed from the Sewage Lagoon	New
EUR-4	Effluent Discharge from the Landfarm	New

2. The Licensee shall measure and record in cubic metres, the daily and monthly quantities of water pumped from Station Creek during the annual recharge of the Eureka water reservoir at monitoring Program Station EUR-1.

3. The Licensee shall measure and record in cubic metres the monthly quantities of water utilized for facility operations, for all purposes.

4. The Licensee shall measure and record in cubic metres the daily quantities of effluent pumped from the Sewage Treatment Facility during release to the environment.

5. The Licensee shall analyze samples, prior to the release of Effluent from the Sewage Treatment Facility at EUR-3 for the purpose of demonstrating compliance with the parameters listed under Part D, Item 6.

6. The Licensee shall sample monthly at Monitoring Program Stations EUR-2, EUR-3, EUR-4, during periods of observed flow and annual discharges, to be analyzed for the following parameters:

Biochemical Oxygen Demand – BOD_5	Fecal Coliforms
Total Suspended Solids	pH
Conductivity	Nitrate-Nitrite
Oil and Grease (visual)	Total Phenols
Magnesium	Calcium
Sodium	Potassium
Chloride	Sulphate
Total Hardness	Total Alkalinity
Ammonia Nitrogen	Total Zinc
Total Cadmium	Total Iron
Total Cobalt	Total Manganese
Total Chromium	Total Nickel
Total Copper	Total Lead
Total Aluminium	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)

7. All sampling, sample preservation and analyses shall be conducted in accordance with methods prescribed in the current edition of *Standard Methods for the Examination of Water and Wastewater*, or by such other methods approved by the Board in writing.

8. All analyses shall be performed in a laboratory accredited according to ISO/IEC Standard 17025. The accreditation shall be current and in good standing.

9. The Licensee shall annually review the QA/QC plan submitted under Part J, Item 10 and modify it as necessary. Revised plans shall be submitted to the NWB with an approval letter from an accredited lab that meets standards set in Part J, Item 8 and Part J, Item 9.

10. Modifications to the Monitoring Program may be made only upon written approval from the Board. Requests for changes to the Monitoring Program should be forwarded to the NWB in writing, and should include the justification and appropriate evidence to support the change.

11. The Licensee shall include in the Annual Report required under Part B, Item 1 all data, monitoring results and information required by this Part.

	Standard Operating Procedure	Page: 1 of 4
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Building Temporary Closure	Prepared by Carl Carroll

1. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

2. Scope

To notify all relevant stakeholders of the anticipated temporary building closures as well as to give instruction to site personnel for the proper procedures to be undertaken when it is required to temporarily close buildings at the Eureka Facility. These procedures are to include the external and internal building systems, related to all buildings, which need to be addressed in order to close said buildings and maintain an adequate loss control program until such time as the buildings can be re-opened for resumed operations.

3. Authority

The authority for issuing the Temporary building closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey, or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

4. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

5. Procedures

5.1 *Building Exterior*

- Clear roof and wall vents.
- Check the roof for possible damages and repair as necessary.
- Review building additions or new roof equipment that may increase snow drifting during winter months. Areas where snowdrifts are likely to occur include: intersections of low and high roofs; valleys between two peaked roofs; and intersections of roof and roof-mounted equipment. Excessive snowdrifts increase the weight applied to roof structures and may cause collapse.
- Check roof flashings for leaks.
- Check all roof equipment (exhaust and intake fans/vents, antennas, signs, etc.) mounts are secure against damage during heavy winds.
- Check that all windows are properly closed, sealed, and locked.
- Check all building openings to ensure they are weather-tight so that they will not admit cold air that could cause building systems to freeze or allow entry routes for pests.
- Verify the proper functioning of all exterior lighting
- Check the remaining portions of the exterior of the building, securing anything that could blow around in high winds and cause damage.
- Upon completion of temporary building closure procedures, verify that all buildings are secured and locked.

5.2 Building Interior

5.2.1 General

- Maintain an indoor temperature above 5ºC for currently heated buildings
- Ensure circulation of indoor air is sufficient to maintain adequate temperatures near outer walls
- Remove and safely dispose of unnecessary combustible refuse material
- Remove flammable residues from work areas (ie. Hoods, ducts, ovens, floors, etc.)
- Have all flammable liquids and products properly sealed and stored in appropriate flammable storage cabinets
- Ensure passageways are clear of obstacles and/or debris
- Ensure there is an 18 inch clear space between sprinklers and structural members and storage materials where applicable(pay particular attention in storage areas)
- Ensure that fire doors are unblocked and operating freely
- Remove accumulated dust from overhead piping, machinery etc. where necessary in order to minimize fire hazards

5.2.2 Heating Equipment

- Inspect heating coils, unit heater, air-handling units, and space heaters for proper operation (see EOC Mechanical Preventative Maintenance Packages for details)
- Store combustibles safely away from heating equipment
- Inspect and test safety shutoff valves and cut-off switches on combustion equipment
- Ensure there is an adequate supply of fuel for heating equipment. Fill up above ground storage tanks when/where necessary.
- Inspect heat generation equipment (ie. Generators, stand-by boiler etc.), heat transfer systems, pumps, piping (external Utilidor and internal building), and related safety controls for proper operation (see EOC Mechanical Preventative Maintenance Packages for details)

5.2.3 Mechanical Equipment

- For water cooled equipment, provide adequate heat, locate in heated enclosure, or provide the proper antifreeze solution
- Remove low points and dead ends from piping where possible; other-wise elevate low points and provide drain valves
- Drain all unnecessary pipes and toilets. S-traps and toilet bowl can be filled with plumber's antifreeze to prevent possible freezing.
- Check pressure vessel vents, relief valves, and safety valves to assure that moving parts are protected from water accumulation or freezing of vapour.
- If water is to be shut off to a particular building, shut off the switch to the pump, drain water from all the faucets and from the pump itself, turn off any hot water heater(s) and drain tanks.
- Provide heat tracing and insulation on water-filled instrumentation and control lines, and inspect this equipment.
- Drain and close all exposed water pipes and valves that would be susceptible to freezing.
- Inspect all Water Tanks and supporting equipment for proper operation and absence of leakages. (See PM work package M15100A for specific details)
- Hydraulic power equipment (ie. vehicle lifts etc.) are to be cleaned, drained of oil, and locked out as required

5.2.4 Electrical Equipment

- Ensure lights are clear of combustible materials
- Ensure that all temporary wiring has been removed
- Disconnect and lock-out all unnecessary circuits at main switchboards
- Ensure power is available for emergency systems
- Ensure that unnecessary transformers have been de-energized
- Ensure that dirt and grease have been cleaned from equipment that is necessary to remain operating

5.2.5 Life Safety Equipment

- Inspect and maintain all fire suppression and life safety systems in proper operating order (see Life Safety Systems preventative maintenance packages for details)
- For sprinklered buildings where heat will or cannot be maintained at or above 5ºC;
    - Close all affected sprinkler valves and all fire-pump water valves
    - Drain fire-pump motor jacket(s), sprinklers, domestic water pipes, instrument pipes, boilers, toilet water closets, heaters, and coolers
    - Close domestic water valves and water valve to equipment lines
    - Heat trace (with electric wire) pipes that cannot be drained
    - As soon as sufficient building heat is restored, reactivate fire protection systems
- Check that portable fire extinguishers located in areas subject to freezing are suitable for such locations.
- Drain all fixed eyewash stations and store all portable stations accordingly

5.2.6 Special Equipment

- Verify that proper storage for equipment requiring special protection such as computers, micro-processors, delicate electronics, etc., have been provided
- Verify that all unnecessary mobile equipment for facilities support has been locked and stored appropriately (drain fuel tanks, remove batteries, secure ignition keys, etc.)

5.3 Monitoring

- Implement a regular monitoring program that includes the visual inspection of all exterior and interior building areas for items requiring attention and are to include but not limited to;
    - Ensure the building exits are not impeded and the doors are operating properly
    - The entryways are clear of ice/debris and are safe (no tripping hazards).
    - That the building is secure, no doors open and left unattended
    - That security lights are working - yard and building fixtures
    - That the building hallways are not impeded and that there are no tripping hazards.
    - That there are no obvious building items that pose a hazard i.e. light lenses loose, ceiling tiles loose, broken electrical switches or receptacles, broken glass/windows, etc.
    - Verification of alarm panel and life safety systems to ensure no trouble alarms have been activated

- All findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

Approval

Name, Title of Authority date

Name, Title of Authority date

Name, Title of Authority date

	Standard Operating Procedure	Page: 1 of 3
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Lagoon and Earthen Manure Storage Structures Temporary Closure	Prepared by Carl Carroll

6. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

7. Scope

To notify all relevant stakeholders of the anticipated temporary Lagoon and Earthen Manure Storage Structure closures as well as to give instruction to site personnel for the proper procedures to be undertaken when it is required to temporarily close such structures at the Eureka Facility. These procedures are to include the necessary measures required to be undertaken to temporarily close said structures and maintain an adequate monitoring program until such time as the structures can be re-opened for resumed operations.

8. Authority

The authority for issuing the temporary closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey, or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

9. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

10. Procedures

10.1 *Initial inspections*

- Identify all possible source of runoff that may be directed toward the lagoon.
- Inspect lagoon containment wall conditions and identify possible weak points where seepage could possibly occur
- Identify all possible entry points to lagoons
- Sample and analyze contents of lagoons to use as baseline indicator
- Identify current lagoon levels and amount of freeboard
- Record all findings

5.2 Closure Period

5.2.1 Summer closure period (when lagoons may be discharged and/or refilled)

- Divert possible surface water runoff away from lagoons where necessary.
- Erect and Maintain fences and post warning signs around lagoons and uncovered structures
- Reinforce containment structure walls with the addition of soil and/or compaction with heavy machinery where necessary
- For the Sewage lagoon;
    - perform yearly drainage and testing of effluent according to yearly procedures outlined in the SUMMARY OF OPERATIONS AND MAINTENANCE PROCEDURES FOR DRINKING WATER, SEWAGE, SOLID WASTE DISPOSAL AND WASTE TREATMENT FACILITIES
    - Monitor and maintain the appropriate freeboard levels for the sewage lagoon.
- For the Water Lagoon;
    - Pump water from lagoon in order to fill the domestic water holding tanks to ensure availability of water required upon re-opening of facilities.
    - Refill water lagoon to capacity as per the procedures outlined in the SUMMARY OF OPERATIONS AND MAINTENANCE PROCEDURES FOR DRINKING WATER, SEWAGE, SOLID WASTE DISPOSAL AND WASTE TREATMENT FACILITIES.
    - Monitor and maintain the appropriate freeboard levels for the Water Lagoon
- Repair where necessary, and maintain, all pumping and piping infrastructure related to Lagoons

5.2.2 Other Than Summer Closure Period (no discharge/refill possible)

- Divert possible surface water runoff away from lagoons where necessary.
- Erect and Maintain fences and post warning signs around lagoons and uncovered structures
- Reinforce containment structure walls with the addition of soil and/or compaction with heavy machinery where necessary (if not already frozen)
- Monitor and maintain the appropriate freeboard levels for the Lagoons
- Maintain water source opening at Water Lagoon to ensure access to water upon re-opening of facility
- Repair where necessary, and maintain, all pumping and piping infrastructure related to Lagoons

6. Monitoring

Implement a regular monitoring program that includes the visual inspection of all lagoon areas, surface water runoff areas, and drainage areas that may require attention.
This monitoring program can be included with that of other Temporary Closure SOPs if these closures occur simultaneously.
As a general rule, all findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

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Name, Title of Authority date

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Name, Title of Authority date

	Standard Operating Procedure	Page: 1 of 3
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Contaminated Sites Temporary Closure	Prepared by Carl Carroll

11. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

12. Scope

To notify all relevant stakeholders of the anticipated temporary closure of the contaminated sites area as well as to give instruction to site personnel for the proper procedures to be undertaken when it is required to temporarily close this area at the Eureka Facility.

13. Authority

The authority for issuing the temporary closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

14. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

15. Procedures

15.1 *Initial inspections*

- Identify all possible source of runoff that may be directed toward and/or away from the contaminated site areas.
- Inspect contaminated site areas perimeter fencing and warning signs, where applicable, for needed repairs.
- Identify all possible entry points to the contaminated site areas and cordon off where applicable.
- Identify, sample and analyze any leachate to use as baseline indicator
- Identify current conditions, photograph and record all findings

5.2 Temporary Closure Period

- Divert possible surface water runoff away from contaminated site areas where necessary.
- Erect and Maintain fences and post warning signs around contaminated site areas wherever possible
- Provide weighted cover materials for monitoring pits/wells surrounding contaminated site areas
- Where possible, apply additional layer of soil in order to cap contaminated surface soil in order to protect wildlife from contact exposure

6. Monitoring

- Implement a regular monitoring program that includes the visual inspection of all contaminated site areas and related confinement infrastructure, surface water runoff areas, and drainage ditches that may require attention.
- For extended periods of temporary closure, it may be necessary to resample, analyse, and record groundwater and/or surface water, where applicable, in order to identify any changes in function of the established confinement and control measure for the contaminated site areas.
- As a general rule, all findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

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Name, Title of Authority date

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Name, Title of Authority date

	Standard Operating Procedure	Page: 1 of 4
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Facility Infrastructure Temporary Closure	Prepared by Carl Carroll

16. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

17. Scope

To notify all relevant stakeholders of the anticipated temporary closure at the Eureka Facility and to give instruction to site personnel for the proper procedures to be undertaken for the temporary closure of the related infrastructure until such time as the facility re-opens for operations.

18. Authority

The authority for issuing the temporary closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

19. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

20. Procedures

20.1 *Pre-closure*

- Identify all non-essential infrastructure that requires temporary shutdown due to changes in operating conditions or circumstances
- Maintain all essential infrastructure in order to support remaining on-site staff required during the temporary closure period

5.2 Temporary Closure Period

5.2.1 Essential Roads

- Perform regularly scheduled surface reshaping or repair
- Perform regularly scheduled ditch and culvert cleaning, repair
- Perform regular snow thaw road check and repair when necessary
- Perform storm damage and pollution control structure check and repair
- Perform seasonal check of signs and notices

5.2.2 Non-Essential Roads

- Pre and post thaw season channel crossing and ditch maintenance prior to closure when applicable
- Storm damage and pollution control structure check and repair prior to temporary closure when applicable
- Perform surface reshaping or repair as necessary prior to temporary closure when applicable
- Periodic check of closure controls and signs where applicable prior to and during temporary closure period where applicable

5.2.3 Airstrip

- Perform surface reshaping or repair as necessary prior to closure
- Perform regular snow thaw checks and repair when necessary prior to closure
- Final inspection of runway lighting and correction of deficiencies when/where necessary prior to temporary closure
- De-energize power supply to runway lighting when not in use (other than essential or emergency use in support of on-site personnel during temporary closure period)
- Periodic check of closure controls and signs where applicable prior to and during temporary closure period when/where applicable

5.2.4 Electrical Power Supply

- Maintain essential power supply systems during temporary closure period (generators, essential electrical distribution lines, life safety systems, fuel pumping supply systems, Utilidor and heat transfer systems, etc)
- De-energize non-essential power supply systems and related transformers

5.2.5 Heat Transfer Systems

- Maintain essential heat transfer system (powerhouse) and utilidor supply to essential buildings during temporary closure period

- Shut off supply of heat supply piping to non-essential buildings, when/where applicable, during temporary closure period

5.2.6 Water Supply and Distribution System

- Maintain potable water distribution system in support of on-site staff during temporary closure period
- Maintain waste distribution system in support of on-site staff during temporary closure period

5.2.7 Barge landing area

- Storm damage and pollution control structure check and repair prior to temporary closure when applicable (ensure fuel transfer spill receptacle at shore pipeline connection is covered and secured)
- Perform surface reshaping or repair as necessary prior to temporary closure where applicable
- Periodic check of closure controls and signs where applicable prior to and during temporary closure period where applicable

5.2.8 Fuel Delivery systems

- Shut down fuel delivery systems/piping to non-essential buildings when/where applicable during temporary closure period
- Maintain fuel delivery systems to essential buildings and infrastructure that support on-site staff during temporary closure period
- Perform regularly scheduled inspections/verifications of the fuel tank farm, related fuel delivery piping & systems, and above ground storage tanks as per operations guidelines

6. Monitoring

- Implement a regular monitoring program that includes the visual inspection of the essential and non-essential infrastructure systems for integrity as well as the fuel delivery systems
- Report any spills immediately to the Nunavut Report line at (867) 920-8130
- As a general rule, all findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

Approval

Name, Title of Authority date

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Name, Title of Authority date

	Standard Operating Procedure	Page: 1 of 3
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Temporary Storage Plan for Hazardous Materials	Prepared by Carl Carroll

21. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

22. Scope

To notify all relevant stakeholders of the anticipated temporary closure at the Eureka Facility and to give instruction to site personnel for the proper procedures to be undertaken for the temporary storage of hazardous materials until such time as the facility re-opens for operations.

23. Authority

The authority for issuing the temporary closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey, or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

24. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

25. Procedures

25.1 *Initial inspections*

- Identify all possible sources and current site storage locations of hazardous materials including but not limited to small compounds near the tank farm, surrounding the DND warehouse, garages, and the Hydrogen Building.
- Identify possible locations to safely and centrally locate various types/classifications of hazardous materials for temporary storage
- Identify any requirements necessary to secure access to hazardous materials (lock buildings, storage cabinets, fence off outdoor areas etc.)

5.2 Temporary Closure Period

- When possible, package and ship off site any used and unwanted hazardous materials to appropriate disposal sites in order to reduce on site hazardous material inventory during temporary closure periods
- Ensure that all hazardous materials as sealed and stored in appropriate containers designed for such purposes
- Ensure the storage of hazardous materials according to the following guidelines:
    - Compatibility of wastes is respected (do not store together)
        - Acids & cyanides
        - Flammable/combustibles and oxidizers
        - Strong acids & strong alkalies
        - Acids & water
        - Solvents & corrosives
        - Flammable liquids & ignition sources
    - Segregation – wastes should be segregated based on final disposal options
    - Ventilation – Highly volatile organic hazards can present serious health risk. Waste should be stored outside in sheds which provide free air movement.
    - Climate/Environment – consideration must be given to freezing temperatures and precipitation when storing wastes.
- Erect and Maintain fences, where necessary, and post warning signs around outdoor hazardous material storage areas.
- Provide the appropriate WHMIS documentation at the storage site locations
- Provide the appropriate secondary containment and spill response kits for storage areas
- Ensure appropriate fire prevention measures are in place for the storage areas
- Ensure leak detection programs are in place for storage tanks
- Ensure chemical transport and storage procedures meet compliance standards outlined in the Canada Labour Code, Canadian Environmental Protection Act, National Building Code, National Fire Code of Canada, Transportation of Dangerous Goods Act, and The Government of Nunavut Environmental Protection Act, Territorial and Lands Act, and all other applicable statutes, regulations, standards, guidelines, and local by-laws.

6. Monitoring

- Implement a regular monitoring program that includes the visual inspection of the hazardous material storage areas and storage tank locations
- Report any spills immediately to the Nunavut Report line at (867) 920-8130
- As a general rule, all findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

Approval

Name, Title of Authority date

Name, Title of Authority date

Name, Title of Authority date

	Standard Operating Procedure	Page: 1 of 3
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Solid Waste Landfill Site Temporary Closure	Prepared by Carl Carroll

26. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

27. Scope

To notify all relevant stakeholders of the anticipated temporary closure of the solid waste landfill sites areas as well as to give instruction to site personnel for the proper procedures to be undertaken when it is required to temporarily close this area at the Eureka Facility.

28. Authority

The authority for issuing the temporary closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey, or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

29. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

30. Procedures

30.1 *Initial inspections*

- Identify all possible source of runoff that may be directed toward and/or away from the solid waste landfill site areas.
- Inspect solid waste landfill site areas and perimeter to identify capping requirements
- Identify all monitoring wells/pits for the solid waste landfill areas.
- Identify, sample and analyze leachate, if any, to use as baseline indicator
- Identify current conditions, photograph and record all findings

5.2 Temporary Closure Period

- Divert possible surface water runoff away from solid waste landfill site areas where necessary.
- Erect and Maintain fences and post warning signs around solid waste landfill monitoring wells/pits where applicable
- Provide weighted cover materials for monitoring pits/wells surrounding contaminated site areas
- Where possible, apply additional layer of soil in order to adequately cap solid waste landfill areas in order to protect wildlife from contact exposure and/or windblown debris

6. Monitoring

- Implement a regular monitoring program that includes the visual inspection of the solid waste landfill areas and related confinement infrastructure for monitoring wells/pits, surface water runoff areas, and drainage ditches that may require attention.
- For extended periods of temporary closure, it may be necessary to resample, analyse, and record groundwater and/or surface water, where applicable, in order to identify any changes in function of the established confinement and control measure for the solid waste landfill site areas.
- As a general rule, all findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

Approval

Name, Title of Authority date

Name, Title of Authority date

Name, Title of Authority date

	Standard Operating Procedure	Page: 1 of 3
Environment Canada	Version: 1	Date: Dec. 1, 2010
Location: Eureka	Title: Incinerator Temporary Closure	Prepared by Carl Carroll

31. Purpose

To ensure that this component of the Eureka site does not become a source of contamination or a safety hazard to wildlife and humans during temporary closure periods.

32. Scope

To notify all relevant stakeholders of the anticipated temporary closure at the Eureka Facility and to give instruction to site personnel for the proper procedures to be undertaken for the temporary closure of the incinerator until such time as the facility re-opens for operations.

33. Authority

The authority for issuing the temporary closure will be held by the Station Program Manager (SPM) which is either John MacIver, Rai LeCotey, or Al Gaudet. The intentions of such closure are to be communicated in advance, to all relevant stakeholders including Environment Canada personnel, DND personnel, CANDAC personnel, Nunavut Water Board personnel, Airport Authority personnel, all research organizations occupying Eureka facilities, and all relevant Public Company personnel that use or intend to use the Eureka Facilities.

34. Requirements

Environment Canada will ensure that the following general conditions are met:

- Sufficient staff are on-site to protect the health and safety of humans, wildlife and the environment and the expertise is made available to care for the site and any potential problems that may arise;
- Sufficient and proper equipment and supplies are left on site for any maintenance or reclamation activities that may need to be implemented;
- Access to the site, buildings and other structures will be secured and restricted to authorized personnel only;
- Warning signs continue to be posted where appropriate

35. Procedures

35.1 *Pre-closure*

- Identify and collect all possible sources of organic non-hazardous waste materials that require incineration prior to facility temporary closure.
- Incinerate all remaining wastes
- Allow the incinerator to cool sufficiently (approximately 6-8 hours) and dispose of ash accordingly

5.2 Temporary Closure Period

- Perform Routine incinerator shutdown inspection and maintenance including:
  - Lock out and tag out power to equipment as required
  - Check fuel lines for leaks and check connections
  - Close both fuel line shutoff valves (near tank and near burner)
  - Drain lines, inspect and change filter if necessary
  - Check spark arrestor to ensure no plugging
  - Inspect refractory for large cracks (not expansion cracks)
  - Check combustion air hole for plugging
  - Inspect door gaskets for damages
  - Inspect condition of chimney
- If applicable (pending timing of temporary closure with yearly maintenance crew arrival), have annual service performed by professional Technician as indicated in Westland Environmental Services Inc. Operations and Maintenance manual. (see burner section page 13)
- Disconnect and lock out power to incinerator
- Perform general interior cleaning of building as required
- Secure incinerator and ensure access is available only to authorized personnel for periodical monitoring

6. Monitoring

- Implement a regular monitoring program that includes the visual inspection of the interior and exterior of the incinerator building envelope for integrity as well as the associated above ground fuel storage tank and fuel lines.
- Report any spills immediately to the Nunavut Report line at (867) 920-8130
- As a general rule, all findings and observations noted during these monitoring rounds will be assessed and the appropriate group/individual will be contacted for appropriate action if necessary. Actions taken to address deficiencies are to be noted in a log book. Pages are to be consecutively numbered, and the date shown at the top of the page. Pages are not to be removed, and pages are not to include more than one day's activity.

Approval

Name, Title of Authority date

Name, Title of Authority date

Name, Title of Authority date

Monthly Temporary Closure Inspection Checklist

Property Management Division, District 3, Eureka

Facility: _____

Month: **Inspected by:**

- **READ CHECKLIST BEFORE VISUAL INSPECTION**
- **ALWAYS TAKE PICTURES OF THE DAMAGES OR THE ISSUE**
- **REPAIR AND DOCUMENT IN D3 FACILITY FILE**

	Y or N	Comments
Building Conditions		
Is the interior of the buildings in good order? Verify building hallways are not impeded and that there are no obvious building items that pose a hazard or are in need or repairs (check piping and critical systems in all areas) Ensure alarm panel and life safety systems & security lights are working properly etc.	☐ Yes ☐ No	
Is the exterior of the buildings in good order? Verify building entrance areas are not impeded, exterior doors are operating properly, and that there are no obvious building items that pose a hazard or are in need or repairs. Ensure exterior security lights are working etc.	☐ Yes ☐ No	
Has building been secured upon completion of inspection (door entrances locked, window coverings still in place, etc) ?	☐ Yes ☐ No	
Lagoon Conditions		
Is there any evidence of damage to or seepage from lagoon walls, record freeboard levels? (runoff diverted away from lagoons?)	☐ Yes ☐ No **Freeboard _____**	

Is the area clear of debris, fencing in good condition, is signage in place?	☐ Yes ☐ No	
Contaminated Site Conditions		
Is runoff diverted away from contaminated sites? Is the area secured? (check that area is clear of debris, fencing is in good condition, signage in place)	☐ Yes ☐ No	
Are all monitoring wells and pits covered and secured?	☐ Yes ☐ No	
Are drainage areas and ditches free of runoff and/or leachate? (If leachate present, photograph area, resample and have analyzed, record results)	☐ Yes ☐ No	
Facility Infrastructure Conditions		
Are essential roads, ditches, and signage in satisfactory condition? (clear & grade roads as required, clear ditches)	☐ Yes ☐ No	
Are non-essential roads, ditches, and signage in satisfactory condition? (verify that signage is still in place, note non-essential road deficiencies do be addressed upon re-opening of operations)	☐ Yes ☐ No	
Is the Airstrip and runway lighting in good condition? (clear & grade as required in event runway is temporarily required, turn on runway lighting and check for deficient lights & replace)	☐ Yes ☐ No	
Is the power supply and distribution system in good condition? (Perform inspections of generators, fuel supply, and related distribution systems)	☐ Yes ☐ No	
Is the heat supply and distribution system in good condition? (Inspect generators, heat exchangers, pumps, related piping)	☐ Yes ☐ No	

Is the water supply and distribution system in good condition? (Inspect water lagoon intake, storage tanks, filtration/chlorination/U.V. systems, and related external building and internal building related piping)	☐ Yes ☐ No	
Has weekly and monthly fuel supply and transfer systems been performed?	☐ Yes ☐ No	
Solid Waste Landfill Conditions		
Is runoff diverted away from landfill areas? Is the area secured and well capped? (check that area is clear of debris, fencing is in good condition, signage in place)	☐ Yes ☐ No	
Are all monitoring wells and pits covered and secured?	☐ Yes ☐ No	
Are drainage areas and ditches free of runoff and/or leachate? (If leachate present, photograph area, resample and have analyzed, record results)	☐ Yes ☐ No	
Hazardous Materials Storage Areas		
Are hazardous material storage areas in good conditions? (visual inspection for leaks, unusual odors, damage containers etc)	☐ Yes ☐ No	
Are spill kits, personal protective equipment, and WHMIS documentation easily accessible and fully stocked?	☐ Yes ☐ No	
Incinerator Building		
Is the Incinerator in good condition? (Verify interior for fuel leaks, interior/exterior envelope for integrity, entrances are cleared, exterior fuel supply/piping free of leaks etc.)	☐ Yes ☐ No	

ADDENDUM 1: EUREKA ACTIVITIES RELATED TO THE LAND FARM, BIOTREATMENT CELL, AND DND RELATED WASTE MATERIALS.

1. Activities Related to the Landfarm;

-The sole activity related to the landfarm is the continued yearly tilling of the topsoil. As recommended by the Franz Environmental Phase III Environmental Site Assessment (ESA), the remedial options for this AEC should be re-evaluated to develop a more effective approach as it does not appear that the PHC impacted soils are being remediated to any significant degree. As the Phase III ESA is complete, Environment Canada is now entering the Remediation Phase of the project which will see the development of the Human Health Risk Assessment, Environmental Risk Assessment, and some further sampling downgradient of the landfarm, beginning in summer of 2012. The development of a holistic approach to all PHC contaminated soil and the development of an overall management strategy of contamination is to commence in 2012.

-There have been no other activites related to this landfarm.

2. Activities Related to the Biotreatment Cell APEC -7 & DND Biotreatment Cell APEC-8 ;

-The sole activity related to the Biotreatment Cell APEC A-7 is the continued yearly tilling of the topsoil, as recommended by the Franz Environmental Phase III Environmental Site Assessment, in order to provide aeration in order to assist the degradation of the hydrocarbons within the soil by the microorganisms present. Yearly samples of the Biotreatment Cell Apec A-7 soil for BTEX and PHCs will be taken, beginning in 2013, for the purpose of statistical trend analysis, in order to assess whether there is a significant change in concentrations over time.

-There have been no activities to date related to the Biotreatment Cell Apec A-8. Franz Environmental does not recommend any further investigation of this APEC A-8 as per the Phase III Environmental Site Assessment Report. The stockpiled contaminated soil will be incorporated into a site-wide remedial action plan for managing PHC impacted soils through the holistic approach to all PHC contaminated soil and the development of an overall management strategy of contamination.

3. Plans for the reclamation of the infrastructure and waste material on site associated with DND;

- DND will be requested to provide an inventory and status of all waste material on site for their locations and infrastructures along with any Abandonment and Restoration Plans concerning this inventory. Once attained, the DND Abandonment and Restoration Plan will be incorporated into that of Environment Canada's Plan.