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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: **1BR-ROB0813**

August 8, 2008

Natalie Plato, Director Contaminated Sites Program
Indian and Northern Affairs Canada
P.O. Box 2200
Iqaluit, NU
X0Z 0H0
platon@inac-ainc.gc.ca

**RE: NWB Licence No. 1BR-ROB0813**

Dear Ms. Plato:

Please find attached Licence No. **1BR-ROB0813** issued to Indian and Northern Affairs Canada (INAC), Contaminated Sites Program, 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. A summary of submissions required under various conditions of the Licence is also enclosed with this letter.

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 thirty (30) 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 from interested persons on issues identified. This information is attached for your consideration.

Sincerely,

Thomas Kabloona
A/Chief Executive Officer

TK/tla/kt

Enclosure: Licence No. **1BR-ROB0813**
Comments NIRB, KIA, GN, INAC and EC
Summary of Required Submissions

cc: Kitikmeot Distribution List

## Table of Required Submissions

| No | Document | Due Date | Reference to Licence | Board Approval Required |
|---|---|---|---|---|
| 1 | Final Design and Construction Drawings for remediation of mine openings | October 7, 2008 | Part E Item 3 | Yes |
| 2 | Final Design and Construction Drawings for remediation of Tailings Pond | October 7, 2008 | Part E Item 3 | Yes |
| 3 | Final Design and Construction Drawings for remediation of the existing Landfill | October 7, 2008 | Part E Item 3 | Yes |
| 4 | Final Design and Construction Drawings for the construction of the Solid Waste Disposal Facility | October 7, 2008 | Part E Item 3 | Yes |
| 5 | Tailings Freezeback Report | October 7, 2008 | Part E Item 12 | Yes |
| 6 | Tailings Dewatering Plan | October 7, 2008 | Part E Item 13 | Yes |
| 7 | Quarry Management Plan | Thirty (30) days prior to quarrying | Part E Item 11 | Yes |
| 8 | Solid Waste Disposal Facility Management Plan | October 7, 2008 | Part D Item 10 | Yes |
| 9 | Operations and Maintenance Plan for Sewage Disposal Facility | September 7, 2008 | Part D Item 1 | Yes |
| 10 | Spill Contingency Plan | September 7, 2008 | Part I Item 1 | Yes |
| 11 | Monitoring Plan | September 7, 2008 | Part K Item 1 | Yes |
| 12 | Quality Assurance/ Quality Control Plan | October 7, 2008 | Part K Item 13 | Analyst approval |
| 13 | Abandonment and Restoration Plan | November 6, 2008 | Part J Item 1 | Yes |
| 14 | As-Built drawings of the Mine Opening remediation, Solid Waste Disposal Facility, and the existing Landfill remediation | within ninety (90) days following the completion of remediation | Part E Item 15 | No |
| 15 | Close-Out Report | within ninety (90) days following the completion of remediation | Part J Item 2 | No |

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# DECISION

## LICENCE NUMBER: 1BR-ROB0813

This is the decision of the Nunavut Water Board (NWB) with respect to an application for a new a Water Licence dated November 30, 2006 made by:

**INDIAN AND NORTHERN AFFAIRS CANADA**
**CONTAMINATED SITES PROGRAM**

to allow for the use of water, disposal of waste and watercourse crossings during remediation activities at the former Robert's Bay and Ida Bay Mine sites located within the Kitikmeot Region, Nunavut generally located at the geographical coordinates as follows:

Latitude: 68°10'45" N Longitude: 106° 33' 29" W

Reclamation activities as stated by the Applicant in the Remediation Plan include:

- mobilization of equipment, material and personnel to site;
- enhancement of site access routes;
- camp set-up and operation;
- building and structure demolition;
- debris consolidation and disposal
- construction of a solid waste disposal facility;
- burying of non-hazardous infrastructure and mine site waste onsite;
- draining and remediation of the tailings pond;
- removal of waste rock from above the high tide level and use of waste rock for cover, erosion control, and backfill;
- capping of tailings;
- remediation of existing mine site landfill;
- hazardous material removal, handling and transport off site;
- removal of contaminated soils from site;
- remediation of mine openings
- quarrying of gravel and overburden materials
- temporary storage on site for hazardous materials, equipment and fuels;
- site grading;
- demobilization of equipment, materials/wastes and personnel; and
- site monitoring.

**DECISION**

After having been satisfied that the application was for a location within an area in which there is no valid Land Use Plan and having undergone a Screening by the Nunavut Impact Review Board (NIRB) in accordance with Article 12 Part 4 of the *Nunavut Land Claims Agreement* (NLCA)[1], 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*,

[1] Screening Decision for Indian and Northern Affairs Robert's Bay and Ida Bay Site Remediation Project Proposal, Nunavut Impact Review Board, March 20, 2007

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:

**Licence Number 1BR-ROB0813 be issued subject to the terms and conditions contained therein. (Motion #: 2008-05-L15, dated August 4, 2008)**

SIGNED this 8th day of August, 2008 at Gjoa Haven, NU.

_____

Thomas Kabloona
A/Chief Executive Officer

TK/kt

# I. INTRODUCTION

The Government of Canada has implemented the Federal Contaminated Sites Action Plan (FCSAP) to clean up federally owned contaminated sites which pose a risk to human health and/or the environment. The Department of Indian Affairs and Northern Development (DIAND) received funding approval for the investigation and remediation of the abandoned Roberts Bay Silver Mine and Ida Bay Silver Deposit in Nunavut.

The Roberts Bay Mine is located on crown land approximately 115 km southwest of the Hamlet of Cambridge Bay. The Ida Bay Silver Deposit is located approximately 7 km north of the Roberts Bay Silver Mine, along the shore of Melville Sound. Access to the sites is by rotary wing aircraft, fixed wing aircraft equipped with floats or by barge.

The Roberts Mining Company first staked the area in 1964 and the silver deposit was discovered in 1965. The following year gold and silver deposits were staked at Ida Bay. Exploration continued in the area from 1967 until 1972 by the Hope Bay Mining Company (later called Hope Bay Mines Limited). Mining was initiated in 1973 via declines constructed at both Ida Bay and Roberts Bay. In 1974 Hope Bay Mines entered a joint venture with Van silver Explorations and Recko Explorations and the Roberts Bay Mine was upgraded and a small mill was constructed. Operations ceased in 1975. Exploration continued in 1980's and 1990's and in 1997 the Roberts Mining Lease was surrendered. The area was re-staked as the ORO5 claim in 1998.

All site assessment activities required to develop a plan for the remediation of Roberts Bay and Ida Bay mine site have been completed. The two year implementation of the remediation plan was scheduled to begin in 2007, with mobilization to site during the summer of 2007 and demobilization from site towards the end of the summer 2009. Site remediation activities will include:

- mobilization of equipment, material and personnel to site;
- enhancement of site access routes;
- camp set-up and operation;
- building and structure demolition;
- debris consolidation and disposal
- construction of a solid waste disposal facility;
- burying of non-hazardous infrastructure and mine site waste onsite;
- draining and remediation of the tailings pond;
- removal of waste rock from above the high tide level and use of waste rock for cover, erosion control, and backfill;
- capping of tailings;
- remediation of existing mine site landfill;
- hazardous material removal, handling and transport off site;
- removal of contaminated soils from site;
- remediation of mine openings
- quarrying of gravel and overburden materials
- temporary storage on site for hazardous materials, equipment and fuels;
- site grading;

- demobilization of equipment, materials/wastes and personnel; and
- site monitoring.

The site remediation activities will be followed by a long term post-remediation monitoring was scheduled to start in 2009.

## II. PRODECURAL HISTORY

An Application was filed by Indian and Northern Affairs Canada (INAC) Contaminated Sites Program on October 12, 2006 for water use and waste disposal activities associated with the proposed remediation of the former Roberts Bay and Ida Mine sites. In addition to the Application documents of November 30, 2006, additional information was submitted on February 2007 and October 2007.

On March 20, 2007, the Nunavut Impact Review Board (NIRB) completed its screening of the Application pursuant to Article 12 of the NLCA.

After the NWB provided notice of the Application to the Kitikmeot Distribution List on April 25, 2007, comments were received from Indian and Northern Affairs Canada (INAC) Water Resources Division, Environment Canada (EC), the Government of Nunavut Department of Environment (GN-DOE), and the Kitikmeot Inuit Association by June 1, 2007.

On June 30, 2008, following review of the October 12, 2006 water licence application and the October 30, 2007 additional information submitted to the Board from the INAC Contaminated Sites Directorate, INAC Water Resources Division submitted additional comments to the Board.

## III. GENERAL CONSIDERATIONS

### 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. While the Applicant has requested a term of three (3) years, the NWB believes that a term of approximately five (5) years is appropriate. The licence term was supported by INAC Water Resources division in its June 30, 2008 comments, and will allow the Licensee to properly carry out the terms and conditions of the licence and will ensure that sufficient time is given to permit the Licensee to develop, submit and implement the plans required under the licence to the satisfaction of the NWB.

### B Remediation

**Remediation Action Plan**
The Applicant submitted the Remediation Plan entitled "*Roberts Bay and Ida Bay Abandoned Mine Sites Remediation Plan*" prepared by AMEC Earth & Environmental, dated January 2007

as part of its Water Licence Application. This Plan outlines the key issues, remediation alternatives and preferred options for the remediation of site components.

INAC in its June 30, 2008 comments recommended that the Contaminated Sites Directorate be required to clearly indicate to the NWB that the recommendations of its consultants are the same as the licence terms and conditions.

The Board, having considered the submission of the Applicant and the comments received from INAC, requires as a condition in Part E Item 1 of the Licence that the Licensee implement the preferred options identified in the Remediation Plan entitled "*Roberts Bay and Ida Bay Abandoned Mine Sites Remediation Plan*" prepared by AMEC Earth & Environmental, dated January 2007.

**Mine Opening Remediation**

There are two (2) mine openings identified at the Roberts Bay mine site. One adit referred to as Adit #1 located to the northeast of the tailings pond and a second adit referred to as Adit #2 located to the east of Adit #1. A vent raise also exists to the north of Adit #2.

There is one (1) adit at the Ida Bay site located approximately 15m from the ocean shoreline and a vent raise located to the west of the adit.

The preferred remediation option for the adits at Roberts Bay is to infill the adits with waste rock where feasible, drill and blast to drop the top of the adit down upon the waste rock, infill the depression with clean waste rock and to reshape the area to blend with the surrounding environment. It is also preferable for an engineered pre-cast concrete cap to be placed over top of the current concrete capped vent raise at Roberts Bay to ensure that the opening is permanently secured in accordance with current mine safety regulations.

The preferred remediation option for the adit and vent raise at Ida Bay is to infill the adit and vent raise with waste rock, blast the roof of the adit to collapse the roof on the rock and then backfill the depression with waste rock.

INAC, in its May 25, 2007 comments, recommended that the Applicant clearly state how it would reclaim mine openings to instill confidence that the precipitation runoff will not enter and collect within the underground mine workings which can result in the subsurface movement of water, permafrost degradation, and contamination of freshwater resources.

The Board, having considered the submission of the Applicant and the comments received from INAC, requires as a condition of Part E Item 3 of the Licence that the Licensee submit to the Board for approval final design and construction drawings for remediation of the mine openings sixty (60) days following the issuance of the Licence.

**Tailings Pond Remediation**

During the last year of operation, some ore at the Roberts Bay mine site was subjected to flotation processing with the concentrate shipped offsite for further processing. Tailings

produced during the process were deposited in a tailings pond approximately forty (40) m in diameter with a waste rock berm.

The preferred remediation option is for any standing water within the tailings pond to be drained by pumping the water into the underground mine adit so that it discharges at least 2 m below the current flooded surface. The water in the tailings pond has been found to have metal concentrations above the freshwater aquatic life guidelines but less than the Metal Mining Effluent Regulation (MMER) limits. Following the preferred remediation option: (1) the existing berms around the tailings pond would be enhanced and re-graded to provide stable long term structures; (2) non-hazardous demolition debris from both the Roberts Bay and Ida Bay sites would be buried within the tailings pond and then capped with clean waste rock; (3) tailings and waste rock fines from other areas around the site would be excavated and placed above the existing tailings; and (4) the entire surface of the tailings pond would be covered with no less than 2 m of waste rock.

INAC, in its May 25, 2007 comments, recommended that the Applicant provide the NWB with tailings impoundment construction design plans, signed by an engineer registered in Nunavut, along with data to support the likelihood of freezeback permafrost conditions within the tailings. INAC further recommended that the Applicant should provide an operations and maintenance plan for the tailings pond remediation that describes in more detail how water will be transferred to the underground mine adit.

The Board having considered the submission of the Applicant and the comments received from INAC, requires as a condition in Part E Item 3 of the Licence, that the Licensee submit to the Board for approval, final design and construction drawings for the remediation of the Tailings Pond within sixty (60) days of the issuance of the Licence. The Board further requires as conditions in Part E Items 12 and 13 of the Licence that the Licensee submit to the Board for approval a Tailings Freezeback Report and a Tailings Pond Dewatering Plan within sixty (60) days of licence issuance.

**Quarrying and Borrowing**

Six borrow areas were identified at the Roberts Bay Site. Borrow material may be used during remediation activities.

INAC, in its May 25, 2007 comments, expressed concern regarding the acid generating and metal leaching potential of the borrow locations. EC, in its June 1, 2007 comments recommended that if quarrying activities are carried out, an undisturbed buffer zone of at least 100 meters be maintained between any proposed quarry operation and the normal high water mark of any water body

The Board having considered the submission of the Applicant and the comments received from INAC and EC, requires as a condition in Part E Item 11 of the Licence that should the Applicant opt to use borrow material or conduct quarrying activities, the Licensee shall submit to the Board thirty (30) days prior to any quarrying activity, a Quarry Management Plan that addresses the concerns expressed by INAC and EC.

## C Waste Management

### Tailings Pond Discharge Criteria

The water in the tailings pond has been found to have metal concentrations above the freshwater aquatic life guidelines but less than the Metal Mining Effluent Regulation (MMER) limits. An Environmental Site Assessment (ESA) conducted by Rescan determined that there was potential for arsenic to leach from the tailings pond and concluded that additional studies were required to determine whether there would be any future environmental impacts from the tailings impoundment.

EC noted in its June 1, 2007 comments that any discharges from the tailings pond must be protective of the receiving environment and the Applicant should carry out adequate testing to ensure that if tailings water is pumped underground, arsenic levels will not be harmful to the receiving environment. EC further noted in its submission that meeting the requirements of the Fisheries Act is mandatory, irrespective of any other regulatory or permitting system.

As described in section 4.2 of the "*Roberts Bay and Ida Bay Abandoned Mine Sites Remediation Plan*" prepared by AMEC Earth & Environmental, dated January 2007, the Applicant conducted environmental assessments at the site using Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines (EQG) (1999 updated to 2005). In addition, the Applicant retained UMA to conduct a Human Health and Ecological Risk Assessment (HHERA) which determined site specific remedial objectives (SSRO). The Applicant summarized the relevant assessment guidelines in the above mentioned Remediation Plan identifying the SSROs developed by the HHERA and these guidelines were used to assess completion of the remedial plan with respect to impacted soil and water.

The Board, having considered the submission of the Applicant and the comments received from INAC and EC, requires as a condition of Part D Item 4 and Table 1 of Appendix A of the Licence, that any discharge from the tailings pond not exceed the guidelines developed by the Applicant in its Remediation Plan, Appendix B.

### Waste Rock

A variety of waste rock piles remain at the Roberts Bay Mine site, and four main piles of waste rock remain at the Ida Bay mine site. Studies were conducted to characterize the waste rock to determine whether remedial efforts were required, where efforts should be expended and to obtain data to develop the remedial plan. The main conclusions and recommendations of these reports were that waste rock at Ida Bay could be used to backfill mine openings and that waste rock at Roberts Bay could be used to cover and reshape the landfill site, reinforce the tailings pond berm, and backfill mine openings.

EC noted in its June 1, 2007 comments that the site assessments for Roberts Bay indicated the potential for some of the waste rock to be acid generating and recommended that only waste rock that is considered non-acid generating be used in remediation works.

The Board, having considered the submission of the Applicant and the comments received from EC, requires as a condition of Part J Item 2 of the Licence that the Licensee submit a close-out

report containing results of additional ARD and ML sampling and testing on representative waste rock material placed on surface, to confirm that waste rock used during remediation is non-acid generating and non-metal leaching

**Landfill**
The preferred remediation option for non-hazardous demolition waste is the placement of this waste within the tailings pond footprint and covering this landfill with a minimum thickness of 2 m of non-acid generating waste rock. The preferred remediation option for the existing landfill containing domestic waste is to leave the waste in place and simply provide a waste rock cover to isolate the waste.

INAC, in its May 25, 2007 comments, expressed concern regarding the management of runoff at landfill sites critical when encapsulating waste material so as to minimize leachate production.

The Board, having considered the submission of the Applicant and the comments received from INAC, requires as a condition in Part E Item 3 of the Licence that the Licensee submit to the Board for approval, final design and construction drawings for the remediation of the existing Landfill and construction of the non-hazardous Solid Waste Disposal Facility, sixty (60) days following the issuance of the Licence. Furthermore, the Board requires as a condition in Part D Item 10 of the Licence that the Licensee submit to the Board for approval, sixty (60) days following the issuance of the Licence, a Solid Waste Disposal Facility Management Plan that includes detailed plans for the management of surface runoff.

**Incineration**
The preferred remediation option for non-hazardous waste involves obtaining the approvals to incinerate wood at the site to reduce the volume of waste requiring transport. The preferred remediation option for hazardous waste involves the mixing and incineration of petroleum products on site to reduce the volume of hazardous waste requiring transport. Combustible solid non-hazardous waste from the operation of the camp will also be incinerated on site.

EC, in its June 1, 2007 comments, expressed concern regarding the burning of waste products that release contaminants to the air which can eventually be deposited on land and water. EC recommended that burning only be considered after all other alternatives for waste disposal had been explored. EC further recommended that the Applicant review incineration options available and provide justification for the selected device to the regulatory authority. Finally EC recommended that should burning be the only alternative available, that the use of appropriate waste incineration technology should be combined with a comprehensive waste management strategy.

The GN, in its May 1, 2007 comments further recommended the use of a dual chamber, forced air incinerator and that emissions from the incinerator should be demonstrated to comply with Canada Wide Standards for dioxins and furans as well as mercury emissions.

The Board also notes condition #22 in the NIRB screening determination directing the proponent to incinerate all waste daily, and remove the ash from incineration activities and non-

combustible wastes from the project site to an approved facility for disposal. In addition, NIRB's condition 26 directs the proponent to ensure that all hazardous materials, including waste oil, are removed from site.

**Sewage Lagoon**
Two independently operated temporary lagoons will be installed having an individual capacity for forty five (45) days of wastewater storage or one half the duration of the construction season, whichever is less.

INAC, in its May 25, 2007 comments, made recommendations to the Board for the provision of engineered sewage lagoon design plans, an operation and maintenance plan, sampling protocols and abandonment and restoration plans as well as the actual location of the lagoons.

The Board, having considered the submission of the Applicant and the comments received from INAC requires as a condition in Part D Item 1 of the Licence that the Licensee submit to the Board an Operations and Maintenance Manual prepared in accordance with the "*Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories; 1996*".

## D Spill Contingency Plan

The Preliminary Contingency Plan was submitted with the application. However, INAC in both is May 25, 2007 and June 30, 2008 comments recommended that an up-to-date spill contingency plan should be provided to the Board prior to the commencement of project activities and that this plan should reference hazardous material storage locations, hazardous materials management practices, on-site personnel contact information, the Nunavut Spill Form and relevant Material Safety Data Sheets (MSDS). EC, in its June 1, 2007 submission also made a number of comments regarding the handling and storage of fuels and hazardous materials and the GN, in its May 1, 2007 comments recommended that the DOE regulations and guidelines for spill contingency and reporting be followed to ensure the plan is adequately developed.

The Board, having considered the submission of the Applicant and the comments received from INAC, EC and GN requires as a condition in Part I Item 1 of the Licence, that the Licensee submit to the Board thirty (30) days following the issuance of the Licence, a site specific Spill Contingency Plan developed in accordance with the Government of Nunavut *Spill Contingency Planning and Reporting Regulations* and the document entitled "*Contingency Planning and Reporting in Nunavut: a Guide to the New Regulations*".

## E Monitoring Program

The Board notes and accepts INAC's May 25, 2007 comments recommending that a project specific monitoring program be provided.

To measure the performance of reclamation measures and to assess the mitigation of potential impacts to the environment associated with the appurtenant undertaking over the short and long

term, the Board requires under Part K of the Licence, that the Licensee implement a site specific Monitoring Program. To accomplish these objectives, the Board requires, under Part K Item 1, that the Licensee submit a project specific monitoring plan that includes the details recommended by INAC as well as a Quality Assurance/ Quality Control Plan approved by an Analyst under Part K, Item 13.

## F Abandonment and Restoration Plan

To ensure that all facilities are reclaimed in an appropriate manner upon abandonment, the NWB requires all Licensees to prepare and submit an Abandonment and Restoration Plan. The activities proposed under this Licence are for the remediation of the site. The document entitled "*Roberts Bay and Ida Bay Abandoned Mine Sites Remediation Plan*" prepared by AMEC Earth & Environmental, dated January 2007, outlines the key issues, remediation alternatives and preferred options for the remediation of site components.

INAC, in its May 25, 2007 submission to the Board recommended that an Abandonment and Restoration Plan be submitted for the project. Following review of additional information submitted by the Applicant, INAC in its June 30, 2008 comments recommended that the above mentioned plan be considered as the Roberts Bay Remediation and Closure Plan.

The Board accepts INAC's recommendation and as explained in part A of this Decision requires as a condition in Part E Item 1 of the Licence, that the Licensee implement the preferred options identified in the Remediation Plan entitled "*Roberts Bay and Ida Bay Abandoned Mine Sites Remediation Plan*" prepared by AMEC Earth & Environmental, dated January 2007.

In addition to the Remediation Plan, the Board requires under Part J Item 1 an Abandonment and Restoration Plan be submitted within ninety (90) days of Licence issuance. This Plan shall address contractor demobilization and site remediation of the camp and access infrastructure constructed to facilitate the remediation of the mine site.

Other conditions for abandonment and restoration have been included under Part J of this Water Licence.

## LICENCE NO. 1BR-ROB0813

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

**INDIAN AND NORTHERN AFFAIRS CANADA**
**CONTAMINATED SITES PROGRAM**
(Licensee)

of

**P.O. BOX 2200, IQALUIT, NU X0A 0H0**
(Mailing Address)

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

Licence Number **1BR-ROB0813**

Water Management Area **NUNAVUT 07**

Location **ROBERT'S BAY AND IDA BAY MINE SITE REMEDIATION PROJECT**

Purpose **WATER USE AND WASTE DISPOSAL**

Classification of Undertaking **INDUSTRIAL – TYPE "B"**

Quantity of Water Not to Exceed **FIVE (5) CUBIC METRES PER DAY**

Date of Licence **AUGUST 8, 2008**

Expiry Date of Licence **AUGUST 30, 2013**

Dated this 8th day of August, 2008 at Gjoa Haven, NU.

Thomas Kabloona
A/Chief Executive Officer

## 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 Industrial as per Schedule II of the *Regulations* at the Robert's Bay and Ida Bay Mine Site Remediation Project, located approximately 115 km southwest of Cambridge Bay within the Kitikmeot Region, Nunavut, within the general latitude 68°10'45" N and general longitude 106° 33' 29" W

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**

**"Acid Rock Drainage (ARD)"** means the production of acidic leachate, seepage or drainage from tailings, waste rock, borrow material or construction rock that can lead to the release of metals to groundwater or surface water during the life of the Project and beyond closure;

"**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;*

**"Contact Water"** means any water that may be physically or chemically affected by project activities;

**"Discharge"** means the release of any water or waste to the receiving environment;

**"Effluent"** means treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond or following a treatment process;

**"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*;

**"Landfill"** means the existing on site surface landfill containing domestic waste as described in the Applicant's Water Licence Application dated October 12, 2006.

**"Licensee"** means the holder of this Licence;

**"Mine Openings"** means the existing on site adits and vent raises as shown in Figures 4 and 5 of the Applicant's Water Licence Application entitled "*Roberts May Mine Site – Site Plan*" and "*Ida Bay Mine Site – Site Plan*" both dated January 2007 and prepared by AMEC;

**"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;

**"Monitoring Program"** means a program established to collect data on surface water and groundwater quality as well as ground temperature to assess impacts to the environment of an appurtenant undertaking;

**"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 Disposal Facility"** comprises the area and engineered structures designed to contain and treat sewage as described in the Applicants Water Licence Application dated October 12, 2006;

**"Solid Waste"** means non-hazardous waste;

**"Solid Waste Disposal Facility"** means the facility constructed under this Licence for the remediation of non-hazardous waste as described in the Applicant's Water Licence Application dated October 12, 2006.

**"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;

**"Tailings Pond"** means the existing on site facility used to contain tailings as shown in Figure 4 of the Applicant's Water Licence Application entitled "*Roberts May Mine Site – Site Plan*" dated January 2007 and prepared by AMEC.

**"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;

**"Waste Disposal Facility"** means all facilities designated for the disposal of waste, and includes the Sewage Disposal Facility, Solid Waste Disposal Facility, Incinerator and Landfill;

**"Water Supply Facility"** comprises the un-named pond adjacent to the camp and Roberts Lake and associated infrastructure designed to collect and supply water;

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 which shall contain the following information:

   a. The monthly and annual quantities (in cubic meters) of fresh water obtained from all sources;
   b. The monthly and annual quantities (in cubic meters) of Sewage generated;
   c. The monthly and annual quantities (in cubic meters) of material deposited in Waste Disposal Facilities;
   d. A summary of all waste backhauled for disposal at approved facilities under Part D Item 19;
   e. A summary of any construction work, modifications, and major maintenance work (including as-built drawings) carried out on the Water Supply Facilties, Solid Waste Disposal Facilities, and Sewage Disposal Facility, including all associated structures;
   f. Tabular summaries for all data collected during the Monitoring Program;
   g. An analysis of data collected during the Monitoring Program and a brief description of any future studies planned by the Licensee;
   h. A summary of remediation work undertaken during the year and an outline of work anticipated for the following year;
   i. A summary of any studies requested by the Board that relate to waste disposal, water use or reclamation, and a brief description of any future studies planned;
   j. A list of unauthorized discharges and a summary of follow-up actions taken;
   k. Any revisions to the Remediation Plan referred to under Part E Item 1;
   l. Any revisions to the Spill Contingency Plan submitted under Part I Item 1; the Tailings Dewatering Plan submitted under Part E Item 13; the Sewage Operations and Maintenance Plan submitted under Part D Item 1; the Solid Waste Disposal Facility Management Plan submitted under Part D Item 10; or the Quarry Management Plan submitted under Part E Item 11;
   m. A public consultation/ participation report describing consultation with local organizations and the residents of nearby communities;
   n. A brief summary of work done to address concerns or deficiencies listed in the inspection reports and/or compliance reports prepared by the Inspector;
   o. An executive summary in English, Inuktitut, and Inuinnaqtun of all Plans,

Reports, or Studies conducted under this Licence; and

p. 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 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 K, 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. 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.

7. The Licensee shall, within sixty (60) days of issuance of this Licence, post signs in the appropriate areas, identifying the locations of Water Supply Facilities, Solid Waste Disposal Facilities, Sewage Disposal Facilities, and the Monitoring Program stations. All posting shall be in the Official Languages of Nunavut.

8. A copy of this Licence shall be 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:**
Water Resources Officer, INAC
Nunavut District, Nunavut Region
P.O. Box 100
Iqaluit, NU X0A 0H0
Telephone: (867) 975-4295

Fax: (867) 979-6445

**(c) Analyst Contact:**
Taiga Laboratories
Department of Indian and Northern Affairs
4601 – 52 Avenue, P.O. Box 1500
Yellowknife, NT X1A 2R3
Telephone: (867) 669-2781
Fax: (867) 669-2718

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 and Inuinnaqtun.

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

11. This Licence is not assignable except as provided in Section 44 of the *Act*.

## PART C: CONDITIONS APPLYING TO WATER USE

1. The Licensee shall obtain all water for domestic camp use from the un-named pond adjacent to the camp and from Roberts Lake. The volume of water for the purposes of this Licence shall not exceed five (5) cubic meters per day.

2. Streams cannot be used as a water source unless authorized and approved by the Board in writing.

3. 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.

4. 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.

## PART D: CONDITIONS APPLYING TO WASTE DISPOSAL

1. The Licensee shall submit to the Board for approval, thirty (30) days following licence issuance, an Operations and Maintenance Manual prepared in accordance with the "*Guidelines for the Preparation of an Operation and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories; 1996*". This Manual

shall include:

- Details of the Sewage Disposal Facility including design and construction plans signed and stamped by a Professional Engineer registered in Nunavut;
- Sampling protocols;
- Discharge locations; and
- Abandonment and restoration plans.

2. The Licensee shall dispose of all Sewage in the Sewage Disposal Facility.

3. Effluent discharged from the Sewage Disposal Facility at Monitoring Station ROB-4 shall not exceed the following Effluent quality limits:

| Parameter | Maximum Concentration |
|---|---|
| pH | 6 to 9 |
| TSS | 180 mg/L |
| $BOD_5$ | 120 mg/L |
| Faecal Coliforms | 10,000 CFU/dl |
| Oil and Grease | No visible sheen |

4. Effluent discharged from the Tailings Pond at Monitoring Station ROB-5 shall be directed to the flooded underground mine adit at Robert's Bay, at least 2 meters below the flooded surface and shall not exceed the water quality criteria provided in Table 1 of Appendix A.

5. The Licensee shall confirm compliance with Effluent quality limits in Part D Items 3 and 4 prior to Discharge.

6. The Licensee shall provide at least ten (10) days notice to the Inspector prior to any planned Discharges from any facilities. The notice shall include an estimated volume proposed for Discharge and the receiving location.

7. The Licensee shall discharge Effluent in such a manner as to minimize surface erosion at a distance of at least thirty (30) meters above the ordinary high water mark of any water body, where direct flow into a water body is not possible and no additional impacts are created, or as otherwise approved by the Board in writing.

8. The Licensee shall contain all Greywater in a sump located at a distance of at least thirty (30) metres above the ordinary high water mark of any water body, at a site where direct flow into a water body is not possible and no additional impacts are created, unless otherwise approved by the Board in writing.

9. The Licensee is authorized to dispose of all acceptable food waste, paper waste and untreated wood products in an incinerator and shall remove the ash from incineration activities to an approved facility for disposal.

10. The Licensee shall submit to the Board, within sixty (60) days of licence issuance, a

Solid Waste Disposal Facility Management Plan that includes detailed plans for the disposal of non-hazardous solid waste and plans for the management of surface runoff.

11. The Licensee shall dispose of soils containing substances that exceed the soil quality criteria provided in Table 2 of Appendix A in accordance with the approved Remediation Plan referred to in Part E Item 1.

12. The Licensee shall dispose of sediment containing substances that exceed the sediment quality criteria provided in Table 3 of Appendix A in accordance with the approved Remediation Plan referred to in Part E Item 1.

13. The Licensee shall control and treat any Contact Water, including Contact Water at monitoring stations ROB-10 and ROB-11, containing substances that exceed the water quality criteria provided in Table 1 of Appendix A. Any discharge of Contact Water that meets the water quality criteria in Table 1 of Appendix A shall be discharged in accordance with Part D Item 7.

14. The Licensee shall, for the storage of containers that contain contaminated soil, refer to Part I Item 3.

15. The Licensee shall remove from site, containers used for storage of contaminated materials, on an annual basis.

16. The Licensee shall locate areas designated for waste disposal at a minimum distance of thirty (30) 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.

17. If the Licensee intends to backhaul any waste to a local Nunavut community, the Licensee shall provide to the Board, documented authorization from that community prior to the backhauling of any waste.

18. The Licensee shall manage the storage and disposal of all hazardous materials, including waste oil, in accordance with the *Environmental Protection Act* (EPA), and regulations and the Government of Nunavut's Environmental Guideline for the General Management of Hazardous Waste.

19. 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.

## PART E: CONDITIONS APPLYING TO THE UNDERTAKING

1. The Licensee shall implement the preferred options identified in the Remediation Plan entitled "*Roberts Bay and Ida Bay Abandoned Mine Sites Remediation Plan*" prepared

by AMEC Earth & Environmental, dated January 2007.

2. The Licensee shall review the Remediation Plan referred to in Part E Item 1 as required by changes in operation and/or technology and modify the Plan accordingly. Revisions to the Plan are to be submitted in the form of an Addendum to be included with the Annual Report referred to in Part B Item 1.

3. The Licensee shall submit to the Board for approval, within sixty (60) days of licence issuance, final design and construction drawings signed and stamped by a Professional Engineer registered in Nunavut for the following:
   - Remediation of Mine Openings;
   - Remediation of the Tailings Pond;
   - Remediation of the existing Landfill; and
   - Construction of the Solid Waste Disposal Facility.

4. 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.

5. The Licensee shall not remove any material from below the ordinary high water mark of any water body unless otherwise authorize by the Board in writing.

6. The Licensee shall not deposit, nor permit the deposit of sediment into any waterbody.

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

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

9. The Licensee shall minimize disturbance to terrain, permafrost and drainage during movement of contractor's equipment and personnel around the site during remediation activities.

10. The Licensee shall control all movement of heavy machinery, vehicles and equipment within the hazardous material management area to prevent the dispersion of potentially hazardous dust and materials into the environment.

11. The Licensee shall submit to the Board for approval, thirty (30) days prior to any quarrying activity, a Quarry Management Plan that includes:
    - Selected quarry and borrow site locations and their distance from the normal high water mark of any water body;
    - The topography of selected site(s);
    - Monitoring data to demonstrate that the quarry material is not potentially acid generating or metal leaching; and
    - Monitoring to verify that runoff from the quarry site(s) does not exceed the

Canadian Council of Ministers of the Environment (CCME) Canada Water Quality Guidelines (CWQG) for the protection of aquatic life.

12. The Licensee shall submit to the Board for approval, within sixty (60) days of Licence issuance, a Tailings Freezeback Report including data that demonstrates the likelihood of freezeback permafrost conditions within the tailings.

13. The Licensee shall submit to the Board for approval, within sixty (60) days of Licence issuance, a Tailings Pond Dewatering Plan that includes:
    - A detailed plan, including contingency measures, for the transfer of Tailings Pond Effluent into the Robert's Bay underground mine adit;
    - Triggers that will indicate that treatment of the Tailings Pond Effluent is required; and
    - Treatment measures, if treatment is deemed necessary.

14. The construction of engineered earthworks shall be supervised and field checked by a qualified Engineer. Construction records shall be maintained and available at the request of the Board.

15. The Licensee shall submit to the Board, within ninety (90) days following the completion of remediation, as-built drawings of the Tailings Pond, Mine Openings, Solid Waste Disposal Facility, and the existing Landfill.

## PART F: CONDITIONS APPLYING TO CAMPS AND ACCESS INFRASTRUCTURES

1. The Licensee shall not erect camps or store material on the surface of frozen streams or lakes including immediate banks except what is for immediate use. Camps shall be located on gravel, sand or other durable land such as to minimize impacts on surface drainage.

2. Winter lake and stream crossings, including ice bridges, shall be constructed entirely of water, ice or snow. The Licensee should minimize disturbance by locating ice bridges in an area that requires the minimum approach grading and the shortest crossing route. Stream crossings shall be removed or the ice notched prior to spring break-up.

3. With respect to the access road, pad construction or other earthworks, the direct or indirect deposition of debris or sediment into any water body is prohibited. These materials shall be disposed a distance of at least thirty (30) metres from the ordinary high water mark in such a fashion that they do not enter the water.

## PART G: CONDITIONS APPLYING TO DRILLING OPERATIONS

1. The Licensee is authorized to drill for the purposes of the installation of thermistors and

monitoring wells as required under Part K.

2. The Licensee shall not conduct any land based drilling within thirty (30) metres of the ordinary high water mark of any water body, unless otherwise approved by the Board in writing.

3. The Licensee shall ensure that all drill waste, including water, chips, muds and salts ($CaCl_2$) in any quantity or concentration, from land-based and on-ice drilling, shall be disposed of in a properly constructed sump or an appropriate natural depression located at a distance of at least thirty (30) metres from the ordinary high water mark of any adjacent water body, where direct flow into a water body is not possible and no additional impacts are created.

4. If artesian flow is encountered, drill holes shall be immediately sealed and permanently capped to prevent induced contamination of groundwater or salinization of surface waters. The Licensee shall report all artesian flow occurrences within the Annual Report, including the location (GPS coordinates) and dates.

5. Where drilling activity has penetrated below the permafrost layer, the NWB requests that the proponent record the depth of permafrost and location of the drill hole to be included within the Annual Report.

## PART H: CONDITIONS APPLYING TO MODIFICATIONS

1. The Licensee may, without written consent from the Board, carry out Modifications to the Water Supply Facilities and Waste Disposal Facilities provided that such 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 Modifications at least sixty (60) days prior to beginning the Modifications;
    b. such Modifications do not place the Licensee in contravention of the Licence or the *Act*;
    c. the Board has not, during the sixty (60) days following notification of the proposed Modifications, informed the Licensee that review of the proposal will require more than sixty (60) days; and
    d. the Board has not rejected the proposed Modifications.

2. Modifications for which all of the conditions referred to in Part H, Item 1 have not been met can be carried out only with written approval from the Board.

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

## PART I: CONDITIONS APPLYING TO SPILL CONTINGENCY PLANNING

1. The Licensee shall submit to the Board for approval, within thirty (30) days of Licence issuance a site specific Spill Contingency Plan developed in accordance with the Government of Nunavut *Spill Contingency Planning and Reporting Regulations* and the document entitled "*Contingency Planning and Reporting in Nunavut: a Guide to the New Regulations*". The Plan shall take into consideration comments and recommendations received from Environment Canada, INAC and the GN-DoE.

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

3. The Licensee shall prevent any chemicals, petroleum products or wastes from entering any water body. All sumps and fuel caches shall be located at a distance of at least thirty (30) metres from the ordinary high water mark of any adjacent water body and inspected on a regular basis. The Licensee shall use secondary containment with an impervious liner; such as self supporting insta-berms, for storage of barreled fuel rather than relying on natural depressions to contain spills.

4. Any equipment maintenance and servicing shall 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.

5. 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 or Environment Canada's 24 hour pager at (867) 920-5131, 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 JI: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION OR TEMPORARY CLOSING

1. The Licensee shall submit to the Board for approval within ninety (90) days of Licence issuance an Abandonment and Restoration Plan to address contractor demobilization and site remediation operations.

2. Within ninety (90) days following the completion of remediation, the Licensee shall submit to the Board, a close-out report containing the results of confirmation sampling to demonstrate that clean-up objectives were met at the completion of remediation activities. This report shall also contain results of additional ARD and ML sampling and testing on representative waste rock material placed on surface to confirm that waste rock used during remediation is non-acid generating and non-metal leaching. The report shall also include a re-evaluation of the need for post closure monitoring.

3. The Licensee shall complete all restoration work prior to the expiry of this Licence.

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

5. The Licensee shall backfill and restore all sumps to the pre-existing natural contours of the land.

6. The Licensee shall remove from the site, infrastructure and site material including all fuel and hazardous material caches, drums, barrels, buildings and contents, docks, water pumps and lines, material and equipment before the expiry of this Licence.

7. All roads and airstrip, if any, shall be re-graded to match natural contour to reduce erosion.

8. All culverts shall be removed and the drainage opened up to match the natural channel. Measures shall be implemented to minimize erosion and sedimentation.

9. In order to promote growth of vegetation and the needed microclimate for seed deposition, all disturbed surfaces shall be prepared by ripping, grading, or scarifying the surface to conform to the natural topography.

10. 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.

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

## **PART K~~J~~: CONDITIONS APPLYING TO THE MONITORING PROGRAM**

1. The Licensee shall submit to the Board for approval, within thirty (30) days of Licence issuance, a project specific monitoring plan that includes:

- GPS coordinates of all sampling points as well as a detailed schematic map identifying all monitoring station sites in relation to infrastructure and topography;
- Specific components of the visual, soil/water and thermal monitoring program;
- Sampling frequency; and
- Physical and chemical parameters for analyses.

2. The Licensee shall maintain Monitoring Program Stations at the following locations:

| Monitoring Station | Description | Parameters | Frequency of Monitoring |
|---|---|---|---|
| ROB-1 | Water supply intake at un-named pond adjacent to the camp | Volume | Daily |
| ROB-2 | Water supply intake at Robert's Lake | Volume | Daily |
| ROB-3 | Sewage pumped to the Sewage Disposal Facility | Volume | Monthly and annually during remediation |
| ROB-4 | Final Point of Discharge from the Sewage Lagoon | Volume and water quality | Once upon commencement of discharge and once prior to completion of discharge during remediation |
| ROB-5 | Discharge from the Tailings Pond | Volume and water quality | During periods of flow |
| ROB-6 | The stream flowing south to Roberts Lake (main watershed) | Water quality | Annually after spring melt |
| ROB-7 | The stream or streams flowing north and west around the bedrock high (northern site drainage) | Water quality | Annually after spring melt |
| ROB-8 | Any streams flowing west to Roberts Bay located below the Tailings Pond, Solid Waste Disposal Facility, and Landfill sites (to detect possible leachate from those facilities) | Water quality | Annually after spring melt |

| | | | |
|---|---|---|---|
| ROB-9 | Roberts Lake (for background and control) | Water Quality | Annually after spring melt |
| ROB-10 | Runoff and leachate from the Solid Waste Disposal Facility / Tailings Pond | Water Quality | Annually after spring melt |
| ROB-11 | Runoff and leachate from the Landfill | Water Quality | Annually after spring melt |
| ROB-12 | Tailings | Temperature | As determined by re-evaluation of need for post closure monitoring |

3. The Licensee shall carry out the monitoring required in Part K, Item 2.

4. The Licensee shall measure and record, in cubic metres, the daily quantities of water utilized for the camp and any other purposes.

5. The Licensee shall provide the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where sources of water are utilized for all purposes.

6. The Licensee shall determine the GPS co-ordinates (in degrees, minutes and seconds of latitude and longitude) of all locations where wastes associated with camp operations and remediation activities are deposited.

7. The Licensee shall measure and record the monthly and annual quantities of material deposited in Waste Disposal Facilities.

8. The Licensee shall monitor the quality of sewage effluent within the Sewage Disposal Facility prior to discharge to comply with effluent quality criteria provided in Part D Item 3.

9. 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.

10. Additional monitoring requirements may be requested by the Inspector.

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

12. The Licensee shall analyse all monitoring samples at a laboratory certified by the Canadian Association for Environmental Analytical Laboratories (CAEL).

13. The Licensee shall, within thirty (30) days of Licence issuance, submit to the Analyst for approval a Quality Assurance/ Quality Control (QA/QC) Plan, which addresses both field and laboratory requirements. The Plan shall be submitted to the Board upon approval by the Analyst.

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

# APPENDIX A

# REMEDIATION CRITERIA

**Table 1 : Water Quality Criteria**

| Analytical Parameters | Surface Water Freshwater (mg/L) | Surface Water Marine (mg/L) |
|---|---|---|
| Benzene | 0.370 | 0.110 |
| Toluene | 0.002 | 0.215 |
| Ethylbenzene | 0.090 | 0.025 |
| Xylenes | 0.18 | No Guideline (NG) |
| PHC-F1 | No Guideline (NG) | NG |
| PHC-F2 | NG | NG |
| PHC-F3 | NG | NG |
| PHC-F4 | NG | NG |
| Aluminum | 0.005-0.1 | NG |
| Antimony | NG | NG |
| Arsenic | 0.005 | 0.0125 |
| Barium | NG | NG |
| Beryllium | NG | NG |
| Bismuth | NG | NG |
| Cadmium | 0.000017 | 0.00012 |
| Calcium | NG | NG |
| Chromium | 0.0089 | 0.056 |
| Cobalt | NG | NG |
| Copper | 0.002-0.004 | NG |
| Iron | 0.3 | NG |
| Lead | 0.001-0.007 | NG |
| Magnesium | NG | NG |
| Manganese | NG | NG |
| Mercury | 0.000026 | 0.000016 |
| Molybdenum | 0.073 | NG |
| Nickel | 0.025-0.150 | NG |
| Phosphorus | NG | NG |
| Potassium | NG | NG |
| Selenium | 0.001 | NG |
| Silver | 0.0001 | NG |
| Sodium | NG | NG |
| Strontium | NG | NG |
| Thallium | 0.0008 | NG |
| Tin | NG | NG |
| Titanium | NG | NG |
| Vanadium | NG | NG |
| Zinc | 0.03 | NG |

**Table 2 : Soil Quality Criteria**

| Analytical Parameters | Surface Soil (mg/kg) | |
|---|---|---|
| | Fine Grained | Coarse Grained |
| Benzene | 0.0068 | 0.0095 |
| Toluene | 0.08 | 0.37 |
| Ethylbenzene | 0.018 | 0.082 |
| Xylenes | 2.4 | 11 |
| PHC-F1 | 245 (fractional $C_6$-$C1_0$ corrected for BTEX) | 130 |
| PHC-F2 | 700 (fractional $C_{10}$-$C_{16}$) | 150 |
| PHC-F3 | 1135 (fractional $C_{16}$-$C_{34}$) | 400 |
| PHC-F4 | 647 (fractional $C_{34}$-$C_{50+}$) | 2800 |
| Naphthalene | 0.6 | |
| Quinoline | NG | |
| Phenanthrene | 5 | |
| Pyrene | 10 | |
| Benzo(a)antracene | 1 | |
| Benzo(b)fluoranthene | 1 | |
| Benzo(k)fluorantene | 1 | |
| Benzo(a)pyrene | 0.7 | |
| Indeno(1,2,3-cd)pyrene | 1 | |
| Dibenzo(a,h)anthracene | 1 | |
| Antimony | 20 | |
| Arsenic | 105 | |
| Barium | 500 | |
| Beryllium | 4 | |
| Cadmium | 10 | |
| Chromium | 64 | |
| Cobalt | 50 | |
| Copper | 176 | |
| Lead | 140 | |
| Mercury | 6.6 | |
| Molybdenum | 10 | |
| Nickel | 50 | |
| Selenium | 1 | |
| Silver | 39 | |
| Thallium | 1 | |
| Tin | 50 | |
| Uranium | NG | |
| Vanadium | 130 | |
| Zinc | >2000 | |

**Table 3: Sediment Quality Criteria**

| Analytical Parameters | Surface Water Freshwater (mg/L) | Surface Water Marine (mg/L) |
|---|---|---|
| Benzene | No Guideline (NG) | No Guideline (NG) |
| Toluene | NG | NG |
| Ethylbenzene | NG | NG |
| Xylenes | NG | NG |
| PHC-F1 | NG | NG |
| PHC-F2 | NG | NG |
| PHC-F3 | NG | NG |
| PHC-F4 | NG | NG |
| Aluminum | NG | NG |
| Antimony | NG | NG |
| Arsenic | 5.9 | 7.24 |
| Barium | NG | NG |
| Beryllium | NG | NG |
| Bismuth | NG | NG |
| Cadmium | 0.6 | 0.7 |
| Calcium | NG | NG |
| Chromium | 37.3 | 52.3 |
| Cobalt | NG | NG |
| Copper | 35.7 | 18.7 |
| Iron | NG | NG |
| Lead | 35.0 | 30.2 |
| Magnesium | NG | NG |
| Manganese | NG | NG |
| Mercury | 0.17 | 0.13 |
| Molybdenum | NG | NG |
| Nickel | NG | NG |
| Phosphorus | NG | NG |
| Potassium | NG | NG |
| Selenium | NG | NG |
| Silver | NG | NG |
| Sodium | NG | NG |
| Strontium | NG | NG |
| Thallium | NG | NG |
| Tin | NG | NG |
| Titanium | NG | NG |
| Vanadium | NG | NG |
| Zinc | 123 | 124 |