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NUNAVUT WATER BOARD  
NUNAVUT IMALIRIYIN KATIMAYINGI  
OFFICE DES EAUX DU NUNAVUT

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File: **3BC-EUR0611/TR/ B2, D10, I1, G1, H1**

September 13, 2010

Mr. Tim Rauch  
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Environment Canada  
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**Subject: Licence No. 3BC-EUR0611 “Eureka Weather Station” Project; Technical Review of submitted Plans and Manuals**

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Dear Mr. Rauch;

The Nunavut Water Board (“NWB”) has completed a technical review of the following documents, submitted under Licence No. 3BC-EUR0611:

- a. **2008 and 2009 Annual Reports** (received on March 18, 2009 and January 26, 2010, respectively) under Part B, Item 2;
- b. **“Eureka Sludge Disposal Plan”** (March 17, 2009) under Part D, Item 10;;
- c. **“Interim Abandonment and Restoration Plan”** (March 17, 2009) under Part I, Item 1;
- d. **“Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities”**(Revised, March 25, 2010) under Part G, Item 1; and
- e. **“Emergency Plan for Petroleum and Allied Petroleum Products – Eureka High Arctic Weather Station”** (April 27, 2010) under Part H, Item 1,

### **2008 and 2009 Annual Reports**

The 2008 and 2009 Annual Reports were submitted under Part B, Item 2 of Licence No. 3BC-EUR0611 on March 18, 2009 and January 26, 2010 respectively. These two submissions were distributed for general information on April 16, 2009 and February 10, 2010 respectively. No

comments were received from interested persons for either report.

Generally, the requirements of the annual report as presented in Part B, Item 2, have been met with the submissions. The following table summarizes the monitoring results as required for compliance with effluent quality listed under Part D, Item 6:

Parameter	NWB Licence Effluent Limits (MAC <sup>1</sup> )	2007 Results (Average)	2008 Results (Average)	2009 Results (Average)
BOD <sub>5</sub> (mg/l)	100	35, 37 (36)	33, 34 (34)	104, 48 (76)
TSS (mg/l)	120	71, 89 (80)	128, 143 (136)	173, 220 (196)
pH	6-9		8.95, 9.03 (8.99)	9.22, 9.69 (9.46)
Oil and Grease	No visible sheen	Not reported	Not reported	Not reported

Although monitoring for compliance under Part D, Item 6 is being carried out, all monitoring as specified under Part J, Item 11, where monitoring and analyses are required as identified in Table No.1 attached to the Licence, is not being completed. A review of the summary table provided in the annual report, as well as the analytical reports provided by the laboratory carrying out the analyses, did not provide results for the following: Ammonia-N, sulphate, Oil and Grease (Hexane Extractable Material results were provided), Major Cations (calcium, magnesium, potassium and sodium). Future monitoring should include analyses of all parameters included within this table.

In addition, the results presented in the annual reports indicate that the 2008 and 2009 sampling/analyses for the Eureka wastewater lagoon identified a number of parameters exceeding the Guidelines for Effluent Quality and Wastewater Treatment at Federal Establishments (1976) and the Guidelines for the Discharges of Municipal Wastewater in the Northwest Territories (1992). Under the Eureka Weather Station licence, the Northwest Territories guidelines are referenced as the criteria to be used to assess compliance.

As a general summary, in 2008, Total Suspended Solids (TSS), pH, phosphorous, iron, manganese, and total and fecal coliforms exceeded the guideline(s) concentrations. In 2009, TSS, pH, iron, and manganese exceeded the guideline(s) concentrations.

It was also noted that the TSS concentrations have an increasing trend over the past few years. The NWB agrees with EC, that for parameters exceeding recommended levels, the causes of elevated levels should be investigated and identified, with recommendations and actions taken to bring the wastewater lagoon effluent concentrations into compliance.

In its internal analysis of Eureka sewage parameters, EC does not include the requirement to meet the specified effluent parameter limits listed under Part D, Item 6. These should also be considered as part of the analysis, as these are not guidelines, but a requirement of the Licence.

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<sup>1</sup> MAC refers to the Maximum Average Concentration at a specific monitoring location. Undefined in the Licence, it is typically considered the average of four consecutive sample results for a specific location (generally daily, weekly or monthly). As monitoring at remote locations, and especially for smaller facilities, rarely extends beyond a few weeks, the effluent limits are applied as an overall average. More recently, issued licences include criteria for single grab samples.

The NWB Acknowledges the effort by EC in working towards meeting the Federal Establishments guidelines and the NWT guidelines and in doing so, is also to address non-compliant issues related to Licence effluent quality limits. It should be noted, that with respect to the 2009 Annual Report and its section on “Next Steps for Elevated Parameters”, this section was not updated to reflect 2010 and was referencing steps for the 2009 season.

In addition to the general reporting requirements, the 2008 Annual Report included, as Appendix I, the Report on the Final Reclamation of the West Airstrip Landfill, December 20, 2008. See review further in this letter.

### **Eureka Sludge Disposal Plan**

A sludge disposal plan is required to be submitted to the Board for approval, ninety (90) days prior to the removal and disposal of any sludge. The NWB received the document entitled “Eureka Sludge Disposal Plan, Eureka High Arctic Weather Station” (“Sludge Plan”) on March 17, 2009, which was subsequently distributed for review and comment, with a submission deadline of April 27, 2009. Comments on the plan were received from Indian and Northern Affairs Canada (INAC) on April 21, 2009, noting that the Sludge Plan referred to an “Options Analysis” for sewage treatment and disposal, which had not been completed at that time (expected in 2009). INAC expressed concern that no sludge disposal should commence until this analysis is complete and more effective options have been provided.

In General, the Sludge Plan indicates that if a decision is made to close the existing lagoon or remove the existing sludge, it would be necessary to determine whether the lagoon is/is not highly contaminated and to recommend remediation option(s), through the assistance of a qualified engineer.

INAC noted that this Plan is subject to any findings provided by Environment Canada’s “options” analysis for sewage treatment and disposal, and further, those findings should be subject to review. INAC comments are available at NWB’s FTP site under the following link:

[ftp://nunavutwaterboard.org/1%20PRUC/3%20MUNICIPAL/3B/3BC%20-%20Camp/3BC-EUR0611%20\(EC%20Eureka\)/3%20TECHNICAL/4%20WASTE%20DISP%20\(D\)/2009/](ftp://nunavutwaterboard.org/1%20PRUC/3%20MUNICIPAL/3B/3BC%20-%20Camp/3BC-EUR0611%20(EC%20Eureka)/3%20TECHNICAL/4%20WASTE%20DISP%20(D)/2009/)

As reported in 2008 and 2009 Annual Reports, many sewage parameter concentrations exceeded the guidelines in the lagoon effluent. NWB concurs with INAC in that, before removing the existing sludge or perusing any other remediation options, the proponent shall undertake investigations and complete its “Options Analysis” to determine the contamination level of the lagoon and its sludges. Further, an approval of the plan as submitted will be withheld and the Licensee is requested to revise the plan and re-submit for approval, taking into consideration the results of the “options analysis” and any additional studies on sludge quality, providing a recommended plan for the disposal of the sewage sludge or closure of the lagoon.

With respect to sewage lagoon operation, in section 2 of the Sludge Disposal Plan: Introduction, refers to a once annual discharge of effluent, usually in July, for the operation of the lagoon. This is inconsistent with past practice and the operational parameters within the O&M manual, which state that decant is carried out twice annually, once in July as the facility is near capacity and once again in the fall to maximize storage capacity for the winter months. Future revisions should include consistent operational guidance for the operators and NWB/INAC Inspection.

### **Interim Abandonment and Restoration Plan**

The NWB received the document entitled “Interim Abandonment and Restoration Plan, Eureka High Arctic Weather Station” (“A&R Plan”) on March 17, 2009. The plan was distributed for comments on March 27, 2009. Comments were received from Indian and Northern Affairs Canada (INAC) which included a request for a final abandonment and restoration plan be submitted at least three years prior to final abandonment of the facility. Further review of the Plan by NWB staff has determined that the Plan does not fully meet the requirements of Part I, Item 1. With respect to the section on temporary closure, the plan indicates that the Standard Operating Procedures are to be developed for each of the site components. Part I, Item 1 of the licence states that:

The Licensee shall submit to the Board for approval, within nine (9) months of issuance of this Licence, an Interim Abandonment and Restoration Plan, which shall include but not be limited to the following:

- (b) A description of remediation objectives and measures or actions to be taken to achieve the objectives for each of the facility components.

Also, Item 1 under Part III of the A&R Plan indicates that the plan consists of 5 elements, the first being:

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;

Although studies are scheduled for items identified in the section on permanent closure of facilities, there are no details or timelines provided in the section on temporary closure. As this information is a required minimum of the plan, Board approval has not been granted at this time. Standard operating procedures are to be developed and included in a revised Plan, to be submitted within ninety (90) days of the date of this letter, or, alternatively, the NWB recommends this revision be included with a renewal application, submitted at least ninety (90) days prior to the expiry of the Licence.

As an additional requirement under Part I, the NWB acknowledges receipt of the Final Report on Reclamation of the West Airstrip Landfill (Landfill Report). This report was submitted as Appendix I to the 2008 Annual Report and was distributed for information along with the annual report distribution. No comments were received specific to this report. The report generally meets the requirements of the Licence, however, it was noted that several reports and studies

were referenced within the report. The NWB requests that these reports be included with the Landfill Report as appendices, if possible. Alternatively, detailed executive summaries should be provided to substantiate the claims referred to in the Landfill Report. Part B, Item 10 of the Licence also requires detailed executive summaries be provided in Inuktitut for all reports and studies completed under the Licence.

### **Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities**

The NWB received the “Summary of Operations and Maintenance Procedures for Drinking Water, Sewage, Solid Waste Disposal and Waste Treatment Facilities” (“O&M Manual”), under Part G, Item 1, when it was first submitted November 23, 2007 and distributed for a technical review December 18, 2007. No comments were received during this review period. An internal review was conducted and several points were identified for addition/revision of the plan. Prior to the distribution of correspondence to the Licensee, a revised document was submitted on March 1, 2009 and distributed for information to interested parties on April 23, 2009. No comments were received following distribution. Further to this, an updated/revised procedures manual was again received on February 16, 2010.

NWB has reviewed this latest manual with respect to the previous manual submissions, comments received and internal technical review, and found the manual to be comprehensive with respect to the basic understanding of the processes involved. There were however, several items that were identified in previous versions that have persisted through to the most recent manual received.

At this time the NWB does not find it necessary to distribute the current manual for further review, but has provided the following to be incorporated into a further revision. The Licensee shall therefore, provide to the Board for approval in writing, a revision to the O&M Manual within ninety (90) days of this letter, or as supplemental information with the anticipated renewal application, whichever occurs first. It is to include:

- a. Section 4.1.2 includes a reference to an expanded area of the occupied site. Other documents indicate approx. 2.23 hectares has been disturbed or occupied. The 4744 hectares is thought to be an error and the actual value should be confirmed;
- b. A detailed schedule for the inspection of the water supply, sewage waste and solid waste disposal facilities; The schedule shall discuss the monthly recording of water volumes used at the station, the inspection of all earthen-works, the inspection of all waste disposal facilities.
- c. as there is a chlorination system in place for water treatment, there is no description of the system, the type of chemical used and the procedures in place to prevent, contain and clean-up spills of the chemicals involved. The Emergency plan only addresses spills involving petroleum products, which should also be revised to cover chemical spills, or the appropriate O&M Manual should provide the necessary information to address spills associated with the specific operation.
- d. Monitoring requirements/parameters are to cover, at a minimum, the requirements of the monitoring section of the Licence and Table No.1;

- e. A discussion on how contaminated soils are stored;
- f. With respect to incinerator ash, the plan indicates that during the winter months the ash is collected and stored in 205L barrels. Then during the summer months, the ash is buried (without the barrels) in a cell of the East Landfill. Non-hazardous confirmatory analyses are required prior to burial of ash on-site. In addition, clarification is requested as to whether the ash is placed loose in the cell of the landfill or if it is pre-bagged to prevent wind dispersion and leaching once in the landfill;
- g. The plan indicates that there is a “state-of-the-art” incinerator installed and in use at the facility. Information on the make/model/capacity of the incinerator should be included with the plan as well as basic operating strategy of the incinerator;
- h. Where/when open burning is carried out (sec.4.6), the plan should include information on condition requirements (ie, weather, including wind, rain) considered prior to the activity and reference to the GN open burning guidelines;
- i. The storage locations/conditions of the Hazardous wastes identified in sec. 4.5.5 are to be provided (including a site map);
- j. Section 3.0 is to include a discussion on the management of sewage sludge accumulated in the lagoon; and
- k. A topographical map of appropriate scale is to be included that illustrates the site components, including water intake, waste disposal locations and all monitoring stations as required by the Licence.

Part G, Item 5 of the Licence requires that a geotechnical inspection of all facilities intended to contain water, fuel or waste be carried out within the first twenty-four months of the current licence. The 2008 annual report indicated, in the response to the Inspection report, that the inspection had been carried out and submitted under a separate cover. An inspection from May 2008, carried out by EBA Engineering Consultants was referenced. This inspection report is not on file with the NWB. The Licensee is requested to submit the report, recommendations and a summary of actions taken along with a proposed schedule of remaining issues to be addressed, within thirty (30) days of this letter date. In addition, the 2009 Annual Report included in the 2009 activities summary, reference to inspections that were carried out upon the fuel tank farm and fuel tanks and that the associated reports were “forthcoming”. The NWB requests that these reports be submitted once they become available, or at the latest, with the 2010 Annual Report.

### **Emergency Plan for Petroleum and Allied Petroleum Products – Eureka High Arctic Weather Station**

NWB received the document entitled “Emergency Plan for Petroleum and Allied Petroleum Products – Eureka High Arctic Weather Station” (“Plan”) on April 26, 2010. A thorough review of the Plan has determined that all of the previous requirements have been acted upon in a satisfactory manner by the Licensee; however, to add to the due diligence component of the Plan, future revisions as required by Part H, Item 3, should include the following information:

- a. Address potential 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 phone number has changed from that listed in the Licence. The contact number should be 867-975-4295; and
- 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.

The Licensee is reminded that the current Licence expires, January 30, 2011. The Licensee is directed to recently approved guidelines for applicants, [Guide 7 - Activities Following the Issuance of a Water Licence](#). Alternatively, this guide is available from the NWB ftp site at the following link:

<ftp://nunavutwaterboard.org/NWB%20GUIDES/>

For access to the NWB ftp site, please include a username of "public" and password of "registry", without the quotations.

For future submission of revised plans with the renewal application, the staff recommends that all plans be made effective for the duration of the licence, subject to annual review and revisions as required by the Licence. Current plans indicate an "expiry" date within the plan, requiring a new plan be submitted for approval of the Board annually, which is not necessary.

Should you have any further questions, please feel free to contact the undersigned at (867) 360-6338 (ext. 30) or [k.kharatyan@nunavutwaterboard.org](mailto:k.kharatyan@nunavutwaterboard.org) , at your earliest convenience.

Yours truly,

*Original signed by:*

Karén Kharatyan  
Technical Advisor

cc: Distribution List – Qikiqtani