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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

File No.: 3BM-KIM0911

January 19, 2009

Mr. Akeego Ikkidluak
Acting Senior Administrative Officer
Hamlet of Kimmirut
Box 120
Kimmirut, NU X0A 0N0
E-mail: saokim@qiniq.com

RE: NWB Licence No. 3BM-KIM0911

Dear Mr. Ikkidluak:

Please find attached Licence No. 3BM-KIM0911 issued to the Hamlet of Kimmirut 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* (NWNSTRA). 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. An application for amendment will be required for the construction of the proposed new solid waste disposal facility. 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 from interested persons on issues identified. This information is attached for your consideration.

Sincerely,

A handwritten signature in dark ink, appearing to read 'T. Kabloona', with a long horizontal flourish extending to the right.

Thomas Kabloona
Nunavut Water Board, Chair

TK/tla/kt

Enclosure: Licence No. 3BM-KIM0911
Comments from EC, GN-DoE and INAC

cc: Qikiqtani Distribution List



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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI
OFFICE DES EAUX DU NUNAVUT

DECISION

LICENCE NUMBER: 3BM-KIM0911

This is the decision of the Nunavut Water Board (NWB) with respect to an application for a Licence renewal received August 20, 2007 and application for amendment received February 15, 2008, made by:

HAMLET OF KIMMIRUT

to allow for the use of water and disposal of waste for the Hamlet of Kimmirut, located within the Qikiqtani region of Nunavut. With respect to this application, the NWB gave notice to the public that the Hamlet had filed an application for a water licence renewal.

DECISION

After having been satisfied that the application was exempt from the requirement for screening by the Nunavut Impact Review Board in accordance with S. 12.3.2 of the *Nunavut Land Claims Agreement* (NLCA), the NWB decided that the application could proceed through the regulatory process. After reviewing the full submission of the Applicant and written comments expressed by interested parties, 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 *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA), decided to waive the requirement to hold a public hearing and determined that:

Licence Number 3BM-KIM0911 be issued subject to the terms and conditions contained therein. (Motion #: 2008-10-L03)

SIGNED this 9th day of January, 2009 at Gjoa Haven, NU.

Thomas Kabloona
Nunavut Water Board, Chair

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I. BACKGROUND

The Hamlet of Kimmirut is a small community with a population of approximately 546. The Hamlet is located on the southern tip of Baffin Island in Nunavut, at 62°50'06''N and 69°52'04''W within the Qikiqtani region of Nunavut.

The Hamlet of Kimmirut currently discharges its sewage to a ditch which drains directly to the ocean. In 2001 a new sewage lagoon was constructed 1.5 km from the community to improve the treatment of sewage. However, due to the unsafe condition of the access road to the lagoon, the lagoon has never been used.

An assessment of the existing facility as designed, determined that the existing lagoon would not have sufficient capacity to meet the over winter storage requirements of the Hamlet. Thus much of the over winter sewage would accumulate in the form of an ice pack in the gulch downstream of the sewage lagoon. The sewage in the ice pack would then be released in an uncontrolled manner and without treatment during the spring melt.

Further investigations were carried out on the existing facility to determine what works were required in order to meet the requirements of the Hamlet. Based on these investigations, a sewage treatment facility has been proposed utilizing the existing lagoon as the primary cell and the construction of a second lagoon at the bottom of the gulch to provide additional retention followed by wetlands. Rehabilitation of the existing access road is a requirement to allow use of the old lagoon and upgraded facility once completed.

The project has been designed for a twenty (20) year lifetime and a yearly sewage generation rate of approximately 33,195 cubic meters projected for the year 2028. Construction was to begin during the summer of 2008.

II. PROCEDURAL HISTORY

The NWB issued a municipal water licence to the Hamlet of Kimmirut on September 1, 2002, to allow for the use of water and disposal of waste under Licence NWB3KIM0207. The municipal water licence expired on August 31, 2007. The Hamlet of Kimmirut, in conjunction with the Government of Nunavut Department of Community and Government Services (CGS), submitted an application for water licence renewal to the NWB on August 20, 2007. Following a preliminary review of the application, the NWB noted the following documents/reports had not been received:

- Operations and Maintenance Plan of the sewage and solid waste facilities – required by September 1, 2003 and not received;
- Quality Assurance/ Quality Control Plan – required November 1, 2002 and not received.

On September 6, 2007, the NWB notified the Applicant that the above documents would be required prior to the issuance of a renewed licence.

On November 23, 2007, the NWB publicly posted notice of this application, in accordance with Section 55.1 of the Act and Article 13 of the *Nunavut Land Claims Agreement* (NLCA). This assessment process included the referral of the application to a variety of Federal, Territorial and local organizations for their review and comment. Information contained in the submission for review included:

- Application cover letter dated August 20, 2007;
- Letter dated November 30, 2006 from Municipality of Kimmirut to NWB regarding work of GN-CGS on Hamlet's behalf;
- NWB Licence renewal application; and
- Technical Summary Report in English and Inuktitut

The scope of the renewal application included water use, and ongoing disposal of sewage and solid waste. No public concern was expressed during this review. Therefore, the NWB waived the requirement to hold a public hearing and proceeded with the application process.

The NWB received comments on the application from interested parties including Environment Canada (EC) and the Government of Nunavut Department of Environment (GN-DOE) on or prior to January 11, 2008. The review identified a number of issues with the Application and the file in general that needed to be addressed including: (1) Compliance with the existing water licence; (2) Effluent discharge predictions and criteria; and (3) The need for an amendment application.

On February 15, 2008, the GN-CGS submitted an application for the amendment of the expected renewed water licence for the Hamlet of Kimmirut (NWB3KIM0207) suggesting in the cover letter that the NWB combine the two applications. The documents submitted with the amendment application included:

- Application Cover Letter dated February 15, 2008, received February 18, 2008;
- NWB Licence amendment application, received February 28, 2008;
- Facsimile Transmittal and Attachment re: Motion and approval of Preliminary design of Lagoon and Wetland Treatment dated November 1, 2007
- Authorization email from the Hamlet of Kimmirut;
- *Design Brief Rehabilitation and Expansion of Existing Sewage Lagoon for the Hamlet of Kimmirut* prepared for Department of Community Government and Services by Trow Associates Inc., dated January 2008, OTCD00018881A;
- Technical Summary Report in English and Inuktitut, received February 28, 2008;
- Cover Letter dated February 13, 2008 from S. Douglas, Trow Associates to B. Roy, GN-CGS, re: Kimmirut Wetland Planning Study (OTCD00018881A)

- Kimmirut Wetland Planning Study prepared for Trow Associates by Wetland Management Services, dated January 2008, 99559-03;
- Geotechnical Investigation Sewage Lagoon Hamlet of Kimmirut, Nunavut prepared for CGS-Projects, prepared by Trow Associated Inc., dated September 24, 2007, OTGE00018881B;
- Drawing No. 1, entitled Borehole Location Plan-Septic Lagoon Rejuvenation prepared by Trow Associates Inc., project no. OTGE00018881B dated 21/08/07;
- Drawing No. 2 entitled Borehole Location Plan-Proposed Landfill Site prepared by Trow Associates Inc., project no. OTGE00018881B dated 21/08/07;
- Drawing No. 3 entitled Borehole Location Plan-Investigation of Diversion Berm prepared by Trow Associates Inc., project no. OTGE00018881B dated 21/08/07;
- Drawing No. SP-1 entitled Lagoons and Wetlands Site Plan prepared by Trow Associates Inc., project no. OTCD00018881A dated 4/01/2008, signed and stamped by an Engineer;
- Drawing No. L-1 entitled Upper Lagoon prepared by Trow Associates Inc., project no. OTCD00018881A dated 4/01/2008, signed and stamped by an Engineer;
- Drawing No. L-2 entitled Lower Lagoon prepared by Trow Associates Inc., project no. OTCD00018881A dated 4/01/2008, signed and stamped by an Engineer;
- Drawing No. DE-1 entitled Lagoon Dewatering Details prepared by Trow Associates Inc., project no. OTCD00018881A dated 4/01/2008, signed and stamped by an Engineer; and
- Drawing No. T-1 entitled Topographic Map prepared by Trow Associates Inc., project no. OTCD00018881A dated 11/02/2008, signed and stamped by an Engineer.

The scope of the amendment application includes:

- Rehabilitation of the existing access road to the Sewage Disposal Facility;
- Upgrading of the existing Sewage Disposal Facility comprised of a sewage lagoon (upper lagoon);
- Construction of a second sewage lagoon at the bottom of the gulch hydraulically below the existing lagoon (lower lagoon); and
- Effluent release to a Wetland Area that is approximately 15 - 20 ha.

Following a preliminary review of the application, the NWB concluded that the amendment application met the requirements of section 48(1) of the Act and advised the Applicant and distribution list accordingly on March 31, 2008. In addition, having completed its review of the application for licence renewal for the same licence, the NWB determined that, given the timing of the NWB final review of the renewal and the receipt of the amendment application, it would be in the best interest of all parties to combine both applications for maximum clarity and efficiency.

On May 5, 2008, the NWB received comments on the combined application from Indian and Northern Affairs Canada (INAC). Upon consideration of the submissions from EC and GN-DOE in January 2008 as well as the submission from INAC, the NWB identified the following

key issues that were forwarded to the Applicant on June 18, 2008 and that clarification was required prior to the Board considering a decision:

- Response to the NWB's letter of September 6, 2007, concerning the Operations and Maintenance Plan for the sewage and solid waste facilities and status of the QA/QC Plan;
- Status of the access road;
- Status of existing landfill and location of the proposed solid waste disposal facility and issues identified in the document entitled Geotechnical Investigation Sewage Lagoon Hamlet of Kimmirut (Trow Associates Inc., September 24, 2007);
- Hazardous materials storage location;
- Required follow-up to the January 8, 2008 municipal inspection report;
- Confirmation of the location of the sewage treatment facility;
- Design and operation of the sewage treatment facility;
- Quarry source for construction materials; and
- Location of waste disposal facilities in relation to the location of the Hamlet's water supply.

On August 7, 2008, GN-CGS submitted a letter response to the Board's June 18, 2008 request for clarification.

Based upon the results of the detailed assessment of the renewal and amendment application file, including consideration of any potential accidents, malfunctions, or impacts to water that the overall project might have in the area, the Board has approved the application and has issued Licence 3BM-KIM0911.

III. ISSUES

Term of Licence

In accordance with section 45 of the Act, 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 the results of INAC site inspections and the compliance record of the Applicant. In review of the previous water licence NWB3KIM0207 inspection reports, the NWB has noted compliance issues identified by the Inspector in a Municipal Water Use Inspection Report dated December 4, 2002 for an inspection conducted on August 1, 2002 including:

- Storage of hazardous materials and metals; and
- Posting of signs at all surveillance network program stations.

A subsequent inspection was conducted on August 26, 2003 and reported the same day identifying additional compliance issues including:

- Maintenance of a copy of the Licence at the site of operations; and
- Maintenance of the Sewage Disposal Facility.

On September 15, 2003, the Inspector issued direction to the Hamlet of Kimmirut by way of a Deposit of Waste in Contravention of Water Licence 3NWB3KIM0207 letter requiring the Licensee to (1) immediately ensure that any 45 gallon drums of oil, fuel and solvent are consolidated and properly stored and (2) to ensure that no drums of waste oil, fuel or other associated waste products from industrial sources are deposited to the municipal waste facilities.

The most recent inspection conducted on July 13, 2007 and reported on January 8, 2008 provided the following updated concerns:

- Collection and analysis of samples required under the Monitoring Program;
- Submission of the required annual reports;
- Installation of a volumetric measuring device on the water intake system;
- Posting of signs at surveillance network program stations;
- Segregation of bulk metals and hazardous wastes;
- Submission of Sewage and Solid Waste Disposal Facility Operation and Maintenance Plan;
- Presence of the Sewage Disposal Facility;
- Submission of Abandonment and Restoration Plan; and
- Submission of a Quality Assurance/ Quality Control Plan.

In its August 7th, 2008 response to intervener comments, the Hamlet clarified its request for a term of five year(s) for the Licence renewal and amendment. No comments were received from interested parties with respect to the length of term, however, the NWB has decided on a two (2) year term for the Licence based on issues with non-compliance, including non-compliance with administrative and reporting requirements.

The two (2) year Licence term is intended to send a clear message to the Hamlet and regulatory authorities that the Board will not passively encourage the Hamlet's failures to comply with the Licence conditions and associated legal requirements. The Board fully expects the Hamlet to take immediate steps towards full compliance with all Licence requirements for its existing facilities. Upon submission of an application to renew the Licence in approximately twenty one (21) months, the Board expects the Hamlet to be in full compliance with the licence. This shorter licence duration also permits the Board to increase its level of confidence of the Licensee that the facilities are operating as they should. As per Part B, Item 11 of the Licence, the Licensee must submit a Plan for Compliance that clearly demonstrates how the Hamlet will achieve full compliance with the Licence conditions during this time period.

The NWB reminds the Licensee of its responsibility to be in compliance with the conditions of the Licence. If monitoring results demonstrate that effluent does not meet discharge limits, the Licensee is required to take the necessary measures to remedy the situation.

Annual Report

The NWB has imposed on the Licensee, the requirement to produce an Annual Report. These Reports are for the purpose of ensuring that the NWB has an accurate annual update of municipal activities during a calendar year. This information is maintained on the 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/>).

Operational Plans

Under the original licence NWB3KIM0207 Part F Item 1, the Licensee was required to submit a Plan for the Operation and Maintenance (O&M) of the Sewage and Solid Waste Facilities. This Plan was not submitted in accordance with the previous Licence.

INAC, GN-DOE and EC noted in their comments to the NWB that Operations and Maintenance Procedures should be provided. INAC recommended that this Licence renewal and amendment again require the submission of the previously requested Operations and Maintenance Manual and that a revision of this Manual be provided to the Board by the end of the first operating

season of the Enhanced Sewage Disposal Facility with updates included as part of annual reporting. INAC further recommended that this Manual should address hazardous waste management, as well as plans for spill contingency and accidents and malfunctions. In addition, the NWB deems INAC's comments with respect to annual reporting of plans for modifications to stream and water bodies, including water crossings as relevant to Operations and Maintenance planning.

The GN-DOE noted that details related to the treatment and management of sewage sludge should be provided and that a spill contingency plan should be provided for review related to the sewage lagoon and other facilities related to the water licence with reference to the DOE's Spill Contingency Planning and Reporting Regulations and Spill Reporting in Nunavut: A Guide to the New Regulations. EC's submission supported the recommendations made by INAC and GN-DOE, and offered further details with respect to those recommendations.

The Board agrees with all parties on this issue and is again requiring that this Operations and Maintenance Manual be submitted within ninety (90) days of licence issuance for the existing Sewage and Solid Waste Facilities. Following the first operating season of the Enhanced Sewage Disposal Facility the Board is requiring that the O&M Manual be revised and submitted for approval of the Board. This Manual needs to be developed to the satisfaction of the NWB for (1) the operation and maintenance of the sewage and solid waste facilities; (2) hazardous waste management procedures; (3) the management of sludge from the Enhanced Sewage Disposal Facility; (4) the protection of the environment with regard to potential spills through day-to-day operations; (5) planning modifications to streams and water bodies, including water crossings; and (6) include a monitoring program Quality Assurance/Quality Control Plan.

The purpose of the O&M Manual noted above is to assist Hamlet staff in carrying out the procedures relating to the waste disposal facilities. The O&M Manual should demonstrate to the NWB that the Hamlet is capable of operating and maintaining the infrastructure related to water use and waste disposal and to meet the requirements of the Licence. The O&M Manual should be based, at a minimum on the various NWB-approved guidelines available (i.e. *Guidelines for the Preparation of an Operations and Maintenance Manual for Sewage and Solid Waste Disposal Facilities in the Northwest Territories*, Duong and Kent, 1996) and other regulatory guidelines as deemed appropriate.

Quarry

The proposed design of the Enhanced Sewage Disposal Facility and access road rehabilitation requires approximately 8,200 cubic meters of granular material which may be exploited from a quarry referred to as Deposit #2. The Applicant is advised that any new quarry development requires screening by the Nunavut Impact Review Board (NIRB) in accordance with Article 12 of the NLCA. The Board cannot authorize water use or waste disposal associated with the proposed development of Deposit #2 or any other new deposit until NIRB has completed its

review of the proposed activity. Further, any new quarry development(s) that receive an approval to proceed from the NIRB will require an amendment to this Licence.

INAC, in its May 5, 2008 submission, recommended that the Licensee provide a quarry design plan to the Board prior to construction that assesses any impacts to freshwater quality that may result from the development and includes mitigation measures. The Board agrees with INAC, however it is not clear to the Board where material for construction of the road access and Enhanced Sewage Lagoon will be obtained.

Therefore, the Board requires as a condition in Part D Item 9 of this Licence, that the Licensee use clean material for construction, operation, and maintenance activities that is obtained from an approved source and which has been demonstrated not to produce Acid Rock Drainage and to be non-Metal Leaching.

In addition, for any approved source of aggregate material within the municipality, the Board requires as a condition in Part D Item 10 that the Licensee submit a quarry management plan to the Board for approval sixty (60) days following licence issuance that (a) confirms that material from the quarry does not produce acid rock drainage and is non-metal leaching; (b) provides an assessment of any potential impacts to freshwater quality; and (c) provides measures to mitigate any potential impacts to freshwater quality.

Water Use

The Hamlet of Kimmirut currently utilizes Fundo Lake as a source of potable water with the quantity used not to exceed 30,000 cubic metres annually. No concerns were raised by the parties in their written submissions as to the amount of water required by the Hamlet, the manner in which it is obtained or in the manner in which this water will be used. The NWB has renewed the terms and conditions associated with water use by the Hamlet accordingly.

Sewage

The Hamlet of Kimmirut currently discharges its untreated wastewater directly to a ditch which discharges into the sea, adjacent to the existing Solid Waste Disposal Facility, approximately 750 metres south of the community. In 2001 a new sewage lagoon was constructed approximately 1.5 km to the west of the community but has never been operated. An assessment of this existing facility determined that it did not have sufficient capacity to meet the over winter storage requirements of the Hamlet. A geotechnical investigation recommended that the existing earth berm which forms the lagoon be upgraded to provide slope stability and to prevent overtopping erosion. An assessment of wetlands potential for treatment determined that the large area below the sewage lagoon and gulch provided potential for meeting treatment requirements. Based on these assessments, construction of a second lagoon at the bottom of the gulch is being proposed to work in series with the existing lagoon prior to the release of sewage for wetland treatment. It

is proposed that in order to meet the requirements of the wetland assessment, sewage not be released to the wetlands until approximately mid June, when the wetlands are active.

As noted by INAC in its comments dated May 5, 2008, the Water Licence Application consists of a report, drawings, and recommendations prepared by the consultant (Trow Associates Inc.(Trow)) retained by the Applicant (Government of Nunavut, Department of Community Government Services (GN-CGS)). However, the Applicant does not specify which recommendations of its consultants would be implemented.

For greater certainty, the NWB has included a condition in Part E Item 1 of the Licence that requires the Licensee to implement the recommended options identified in the Water Licence Application document entitled Design Brief Rehabilitation and Expansion of Existing Sewage Lagoon for the Hamlet of Kimmirut dated January 2008 and prepared by Trow, and to follow the design as provided in the signed and stamped drawings numbered SP-1, L-1, L-2, DE-1, and T-1, dated 04/01/2008, Project No, OTCD00018881A, also prepared by Trow. In the event of a conflict between the conditions of this Licence and the above referenced document, the conditions of this License shall prevail.

INAC, in its comments dated May 5, 2008, also raised an issue regarding the potential effect on wastewater treatment due to changes to the Solid Waste Disposal Facility which may be relocated upstream of the Enhanced Sewage Disposal Facility. On August 7th, 2008, the Applicant clarified that relocation of the Solid Waste Disposal Facility is not being considered under the amendment application.

EC, in its comments dated January 10, 2007 recommended that parameter limits from the previous licence, which in EC's opinion are consistent with the 1992 Guidelines, should be carried forward to the renewal, assuming that the final discharge point is at the lagoon outlet and treatment does not include a wetland. This recommendation was provided prior to the Applicant's submission of the amendment application documents including the document entitled Design Brief Rehabilitation and Expansion of Existing Sewage Lagoon for the Hamlet of Kimmirut dated January 2008 and prepared by Trow which included the applicant's proposal to meet the previous licence parameter limits at the end of the Wetland Area. No further comments were received from EC regarding the applicant's updated proposal, however, the Board continues to agree with EC's comments and is therefore carrying forward effluent quality criteria from the previous licence to Part D Item 2 of the Licence renewal and amendment to be met at the lagoon outlet. To address the appropriate discharge limits to be used, the Hamlet may need to investigate operational parameters, using the system to hold sewage in one cell while a longer decant is carried out from the second cell, taking advantage of the growing season without overwhelming the wetlands vegetation. If the shorter decant is used, then lower, more stringent limits may be appropriate, with some allowance made for the polishing by the wetlands. Adequate monitoring of the site specific wetland treatment is necessary to confirm projected efficiencies and provide sufficient evidence for either less stringent limits to be regulated at the

lagoon discharge or relocating the compliance point from the lagoon discharge to the wetland outlet.

As noted by EC in its January 10th, 2008 submission, the Licensee must also ensure that any effluent discharged from the system's final discharge point is in compliance with Section 36(3) of the Fisheries Act. According to Section 36(3) of the Fisheries Act, the deposition of deleterious substances of any type, under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter such water, is prohibited. The Licensee is advised that compliance with this Licence does not absolve the Licensee from the responsibility to comply with other applicable legislation.

Sewage Sludge

EC, in its January 10th, 2008 submission, recommended that prior to desludging, the Licensee should submit for approval a Sewage Sludge Management Plan that clearly outlines the chemical composition of the sludge and how sludge will be stored, treated and eventually disposed of. The Plan should also include estimates of the quantities of sludge likely produced and the required frequency of extraction. The GN-DOE also commented on January 9th, 2008, that the details related to the treatment and management of sewage sludge should be submitted for review.

The Board agrees with EC and the GN-DOE and requires that the O&M Plan referred to above, include procedures for the management of sludge from the Enhanced Sewage Disposal Facility.

Solid Waste

The Hamlet's Solid Waste Disposal Facility located just west of the location where sewage is currently discharged. According to the Hamlet of Kimmirut Municipal Questionnaire for Water Licence Application Renewal of Water Licence #N514-1441 dated April 15, 2002, the Solid Waste Disposal Facility includes a waste oil storage area and a bulky scrap metal disposal area.

As stated by the Applicant in its response dated August 7th, 2008, no changes or modifications to the landfill are being considered under this renewal and amendment application. However, the Board notes that concerns regarding the management of hazardous materials, including waste oil, have been raised in inspection reports and intervener comments. As such, the Board requires that the O&M Plan referred to above include procedures for the management of hazardous materials. The Licensee is referred to the Government of Northwest Territories Guide to the Used Oil and Waste Fuel Management Regulations for guidance.

Abandonment and Restoration

To ensure that all existing end-of-life facilities are reclaimed in an appropriate manner, the NWB requires Licensees to submit an *Abandonment and Restoration Plan*. This Plan is to be submitted at least six (6) months prior to final closure of any licensed facility or upon the planned construction of new facilities to replace existing ones. The requirements for the Plan are outlined in Part G, Item 1 of this Licence.

Monitoring

Monitoring stations for the raw water supply and runoff from the Solid Waste Disposal Facility have been carried forward into the Licence renewal and amendment from the previous licence NWB3KIM0207.

New monitoring stations at the sewage lagoon discharge and compliance points as well as surface water at the end of the Wetland Area have been added to reflect the changes in the design of the Sewage Disposal Facility as proposed by the Applicant in the document entitled *Design Brief Rehabilitation and Expansion of Existing Sewage Lagoon for the Hamlet of Kimmirut* dated January 2008 and prepared by Trow.

Additional monitoring parameters have also been incorporated into the Licence renewal and amendment for the new monitoring stations to identify potential contaminants of concern.

LICENCE 3BM-KIM0911

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

HAMLET OF KIMMIRUT

(Licensee)

of

BOX 120, KIMMIRUT, NUNAVUT X0A 0N0

(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 **3BM-KIM0911**

Water Management Area **NUNAVUT 05**

Location **KIMMIRUT, QIKIQTANI REGION, NU
(Latitude 62°50'6"N and Longitude 69°52'4"W)**

Purpose **WATER USE AND WASTE DISPOSAL**

Description **MUNICIPAL UNDERTAKINGS**

Quantity of Water Not to Exceed: **30,000 CUBIC METRES ANNUALLY**

Date of Licence **JANUARY 9, 2009**

Expiry Date of Licence **JANUARY 29, 2011**

Dated this 9th of January, 2009 at Gjoa Haven, NU.



Thomas Kabloona
Nunavut Water Board,
Chair

PART A: SCOPE AND DEFINITIONS

1. Scope

- a. This Licence allows for the use of water and the disposal of waste for municipal undertakings at the Hamlet of Kimmirut, Qikiqtani Region, Nunavut (62°50' N; 69°52'W);
- b. 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
- c. 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

In this Licence: **3BM-KIM0911**

“Act” means the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*;

“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;

“Analyst” means an Analyst designated by the Minister under Section 85 (1) of the *Act*;

“Appurtenant undertaking” means an undertaking in relation to which a use of waters or a deposit of waste is permitted by a licence issued by the Board;

“Average Concentration” means the arithmetic mean of the last four consecutive analytical results for composite or grab samples collected from the monitoring stations identified in Part H;

“Board” means the Nunavut Water Board established under the *Nunavut Land Claims*

Agreement;

“Chief Administrative Officer” means the Executive Director of the Nunavut Water Board;

“Effluent” means treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond or a treatment plant;

“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;

“Enhanced Sewage Disposal Facility” comprises the area and engineered upper and lower sewage lagoons, and decant structures designed to contain and treat sewage as described in the Application for Water Licence renewal and amendment filed by the Applicant on February 15, 2008 and illustrated in Drawings SP-1, L-1, L-2, and DE-1 prepared by Trow Associates Inc., project no. OTCD00018881A dated 4/01/2008;

“Final Discharge Point” in respect of an effluent means an identifiable discharge point of a facility beyond which the operator of the facility no longer exercises control over the quality of the effluent;

“Freeboard” means the vertical distance between water line and crest on a dam or dyke’s upstream slope;

“Geotechnical Engineer” means a professional engineer registered with the Association of Professional Engineers, Geologist and Geophysicists of Nunavut and whose principal field of specialization with the engineering properties of earth materials in dealing with man-made structures and earthworks that will be built on a site. These can include shallow and deep foundations, retaining walls, dams, and embankments;

“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;

“Licensee” means the holder of this Licence;

“Maximum Average Concentration” means the average concentration of any four consecutively collected samples taken from the identical sampling location and taken during any given timeframe.

“Modification” means an alteration to a physical work that introduces new structure or eliminates an existing structure and does not alter the purpose or function of the work, but does not include an expansion, and changes to the operating system that are consistent with the terms of this Licence and do not require amendment;

“Monitoring Program” means a monitoring program established to collect data on surface water and groundwater quality to assess impacts to the freshwater aquatic 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;

“Sewage” means all toilet wastes and greywater;

“Sewage Disposal Facility” comprises the area and engineered lagoon and decant structures designed to contain sewage, as described in the Application for Water Licence filed by the Applicant on May 17, 2001;

“Solid Waste Disposal Facility” comprises the area and associated structures (landfill site) designed to contain Solid Waste as described in the Application for Water Licence filed by the Applicant on May 17, 2001;

“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 Facilities” means all facilities designated for the disposal of waste, and includes the Sewage Disposal Facility, the Enhanced Sewage Disposal Facility, and the Solid Waste Disposal Facility;

“Water Supply Facilities” comprises the area and associated intake infrastructure at Fundo Lake, as described in the Application for Water Licence filed by the Applicant on May 17, 2001;

“Wetland Area” comprises approximately 15 - 20 hectares of flat land immediately downstream of the lower sewage lagoon, at the bottom of a steep 25% slope, as described in the Application for Water Licence filed by the Applicant on February 15, 2008.

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*;
- 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; and
- d. The Licensee shall, in relation to any application to renew or amend the Licence, have in place a Plan for Compliance approved by the Board in writing, to achieve full compliance with the conditions of this Licence, or a Plan for Compliance must be submitted at the time of Application, in order for the Application to be deemed complete.

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report with the Board not later than March 31st of the year following the calendar year reported which shall contain the following information:
 - a. tabular summaries of all data generated under the “Monitoring Program” and an indication of wastewater treatment levels upstream and downstream of the Wetland Area;
 - b. modifications to the “Monitoring Program” in accordance with Part H Item 11;
 - c. the monthly and annual quantities in cubic metres of fresh water obtained at the Water Supply Facilities;
 - d. the monthly and annual quantities in cubic metres of each and all waste discharged;
 - e. the annual quantity in cubic meters and tones of sludge removed from the Enhanced Sewage Disposal Facility along with the treatment, storage, and

disposal provided as required in Part H Item 6;

- f. the results of sampling and analyses of sewage sludge in accordance with the Operations and Maintenance Manual referred to in Part F Item 2 and as required in Part H Item 5;
 - g. a summary of modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures and facilities;
 - h. a list of unauthorized discharges and summary of follow-up action taken;
 - i. a summary of any abandonment and restoration work completed during the year and an outline of any work anticipated for the next year;
 - j. any updates or revisions for manuals and plans (i.e., *Operations and Maintenance Manual*) as required by changes in operation and/or technology;
 - k. detailed minutes of any public consultation and participation with local organizations and the residents of the community regarding licence amendments;
 - l. a summary of any studies or reports requested by the Board that relate to water use and waste disposal or restoration, and a brief description of any future studies planned; and
 - m. any other details on water use or waste disposal requested by the Board by November 1st of the year being reported.
- 2. The Licensee shall comply with the “Monitoring Program” described in this Licence, and any amendments to the “Monitoring Program” as may be made from time to time, pursuant to the conditions of this Licence.
 - 3. The “Monitoring Program” and compliance dates specified in the Licence may be modified at the discretion of the Board.
 - 4. Meters, devices or other such methods used for measuring the volumes of water used and waste discharged shall be installed, operated and maintained by the Licensee.
 - 5. The Licensee shall, within ninety (90) days after the first visit by the Inspector following issuance of this Licence, post the necessary signs to identify the stations of the “Monitoring Program”. All signage postings shall be in the Official Languages of Nunavut.

6. The Licensee shall post signs in the appropriate areas to inform the public of the location of the Water Supply Facilities and the Waste Disposal Facilities. All signage postings shall be in the Official Languages of Nunavut.
7. The Licensee shall immediately report to the 24-Hour Spill Report Line (867-920-8130) any spills of Waste, which are reported to, or observed by the Licensee, within the municipal boundaries or in the areas of the Water Supply or Waste Disposal Facilities.
8. The Licensee shall ensure a copy of this Licence is maintained at the Municipal Office 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
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.
10. The Licensee shall ensure that all document(s) and correspondence submitted by the Licensee, to the Board, are received and acknowledged by the Manager of Licensing.

11. The Licensee shall submit to the Board for approval, within ninety (90) days of Licence issuance or upon the filing of any application in relation to the Licence within that time, a Plan for Compliance that clearly demonstrates the measures the Licensee will undertake, including an implementation schedule, to achieve full compliance with the conditions of this Licence, including the issues raised in the Inspector's Reports.
12. 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.
13. The Licensee shall, for all Plans submitted under this Licence, implement the Plan as approved by the Board in writing.
14. 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 condition 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.
15. 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 fresh water from Fundo Lake using the Water Supply Facilities or as otherwise approved by the Board in writing.
2. The annual quantity of water, used for all purposes, shall not exceed thirty thousand (30,000) cubic metres.
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. The Licensee shall not remove any material from below the ordinary high water mark of any water body unless otherwise approved by the Board in writing.
5. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.
6. 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. Prior to commissioning the Enhanced Sewage Disposal Facility, the Licensee shall direct all Sewage to the Sewage Disposal Facility. Following construction of the Enhanced Sewage Disposal Facility, the Licensee shall direct all Sewage to the Enhanced Sewage Disposal Facility, or as otherwise approved by the Board in writing.
2. All Effluent discharged from the Sewage Disposal Facility at Monitoring Program Station KIM-3 and the Enhanced Sewage Disposal Facility at Monitoring Program Stations KIM-6 and KIM-7 shall not exceed the following Effluent quality limits:

Parameter	Maximum Average Concentration
BOD ₅	120 mg/L
Total Suspended Solids	180 mg/L
Faecal Coliforms	1 x 10 ⁶ CFU/100mL
Oil and grease	No visible sheen
pH	between 6 and 9

3. A Freeboard limit of 1.0 meter, or as recommended by a qualified geotechnical Engineer and as approved by the Board in writing, shall be maintained at all dams, dykes, or structures intended to contain, withhold, divert or retain water or wastes.
4. The Licensee shall provide at least ten (10) days notification to an Inspector, prior to initiating any decant of the sewage lagoon.
5. The Sewage Disposal Facility and the Enhanced Sewage Disposal Facility shall be maintained and operated, in such a manner as to prevent structural failure.
6. The Licensee shall dispose of and permanently contain all Solid Wastes at the Solid Waste Disposal Facility or as otherwise approved by the Board in writing.
7. The Licensee shall segregate and store all hazardous materials and/or hazardous waste, including waste oil, within the Solid Waste Disposal Facility in a manner as to prevent the deposit of deleterious substances into any water until such a time as proper disposal arrangements are made.
8. The Licensee shall implement measures to control wind-blown litter at the Solid Waste Disposal Facility.
9. The Licensee shall use clean material for construction, operation, and maintenance activities that is obtained from an approved source and which has been demonstrated not to produce acid rock drainage and to be non-metal leaching.

10. For any approved source of material within the municipality, the Licensee shall submit to the Board for approval sixty (60) following licence issuance, a quarry management plan that includes the following:
 - a. Confirmation that the quarry material does not produce acid rock drainage and is non-metal leaching;
 - b. An assessment of any potential impacts to freshwater quality; and
 - c. Mitigation measures.

PART E: CONDITIONS APPLYING TO MODIFICATION AND CONSTRUCTION

1. The Licensee shall implement the recommended options identified in the Water Licence Application document entitled *Design Brief Rehabilitation and Expansion of Existing Sewage Lagoon for the Hamlet of Kimmirut* dated January 2008, and shall follow the design as provided in the signed and stamped drawings numbered SP-1, L-1, L-2, DE-1, and T-1, dated 04/01/2008 (Trow Associates Inc. Project No. OTCD00018881A). In the event of a conflict between the conditions of this Licence and the above referenced document, the conditions of this License shall prevail.
2. The Licensee shall submit to the Board for approval, design drawings stamped and signed by a qualified engineer registered in Nunavut, 6 months prior to the construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or wastes.
3. The Licensee may, without written approval from the Board, carry out modifications to the Water Supply 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. these 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.
4. Modifications for which all of the conditions referred to in Part E, Item 3, have not been met, may only be carried out upon written approval from the Board. 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.

5. 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.
6. The Licensee shall ensure that sediment and erosion control measures are implemented prior to and maintained during activities carried out under this Part to prevent the release of sediment and minimize erosion.
7. The construction or disturbance of any stream/lake bed or banks of any definable water course are not permitted, unless authorized by the Board in writing.

PART F: CONDITIONS APPLYING TO OPERATION AND MAINTENANCE

1. The Licensee shall submit to the Board for approval, within ninety (90) days following issuance of the Licence, an Operation and Maintenance (O&M) Manual for the Sewage Disposal Facility and Solid Waste Disposal Facility, prepared where appropriate 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*”. The Manual shall take into consideration the comments received during the application review process.
2. The Licensee shall submit to the Board for approval, immediately following the first operating season of the Enhanced Sewage Disposal Facility, a revision to the Operations and Maintenance (O&M) Manual referred to in Part F Item 1, The Manual shall take into consideration the comments received during the application review process and shall contain the following plans:
 - a. *Sewage and Solid Waste Operation and Maintenance Plan;*
 - b. *Hazardous Waste Management Plan;*
 - c. *Sludge Management Procedures;*
 - d. *Spill Contingency Plan;*
 - e. *A plan for the modification of streams and bodies of water within the municipality including crossing; and*
 - f. *Monitoring Program Quality Assurance/Quality Control Plan (QA/QC Plan).*
3. The Licensee shall review the O&M Manual referred to in Part F, Items 1 and 2 as required by changes in operation and/or technology and modify accordingly. Revisions are to be submitted in the form of an Addendum to be included with the Annual Report.
4. An inspection of all engineered facilities related to the management of water and waste shall be carried out annually in July or August by a Geotechnical Engineer. 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.

5. The Licensee shall perform more frequent inspections of the engineered facilities at the request of an Inspector.
6. If, during the period of this Licence, an unauthorized discharge of waste occurs, or if such a discharge is foreseeable, the Licensee shall:
 - a. employ the appropriate contingency measures as approved under the Operation and Maintenance Manual for the Hamlet of Clyde River
 - b. report the incident immediately via the 24-Hour Spill Reporting Line at (867) 920-8130 and to the Inspector at (867) 975-4295; and
 - c. submit to the Inspector, a detailed report on each occurrence, not later than thirty (30) days after initially reporting the event, that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean-up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and any preventative measures to be implemented.

PART G: CONDITIONS APPLYING TO ABANDONMENT AND RESTORATION

1. The Licensee shall submit to the Board for approval an *Abandonment and Restoration Plan*, at least six (6) months prior to a) abandoning of any facilities and b) the construction of new facilities to replace existing ones. Where applicable, the Plan shall include information on the following:
 - a. solid waste facility;
 - b. water intake facilities;
 - c. the water treatment and waste disposal sites and facilities;
 - d. petroleum and chemical storage areas;
 - e. any site affected by waste spills;
 - f. leachate prevention;
 - g. an implementation schedule;
 - h. maps delineating all disturbed areas, and site facilities;
 - i. consideration of altered drainage patterns;
 - j. type and source of cover materials;
 - k. future area use;
 - l. hazardous wastes; and
 - m. a proposal identifying measures by which restoration costs will be financed by the Licensee upon abandonment.

PART H: 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 Number	Description	Frequency	Status
KIM-1	Raw water supply intake at Fundo Lake	<u>Volume</u> Monthly and Annually	Active (Volume)
KIM-2	Runoff from Solid Waste Disposal Facilities	<u>Water Quality</u> Once at the beginning, middle and near the end of the season when flow is observed	Active (Water Quality)
KIM-3	Effluent discharge from existing Sewage Disposal Facility	<u>Volume</u> Monthly and Annually <u>Water Quality</u> Monthly during months of May to August inclusive	Active (Volume and Water Quality)
KIM-4	Enhanced Sewage Disposal Facility - Upper Lagoon Spillway	<u>Volume</u> Monthly and Annually <u>Water Quality</u> Twice Annually – start of overflow/start of decanting	New (Volume and Water Quality)
KIM-5	Enhanced Sewage Disposal Facility - Upper Lagoon Pump Discharge	<u>Volume</u> Monthly and Annually <u>Water Quality</u> Twice Annually – start of overflow/start of decanting	New (Volume and Water Quality)
KIM-6	Enhanced Sewage Disposal Facility - Lower Lagoon Spillway	<u>Volume</u> Monthly and Annually <u>Water Quality</u> Twice Annually - start and end of decanting	New (Volume and Water Quality)

KIM-7	Enhanced Sewage Disposal Facility - Lower Lagoon Pump Discharge	<u>Volume</u> Monthly and Annually <u>Water Quality</u> Twice Annually – start and end of decanting	New (Volume and Water Quality)
KIM-8	Surface water at end of Wetland Area	<u>Water Quality</u> Monthly during periods of flow from spring to freezeup	New (Water Quality)

2. The Licensee shall confirm the locations and GPS coordinates for all monitoring stations referred to in Part H Item 1 with an Inspector.
3. The Licensee shall collect samples at Monitoring Program Stations KIM-2, KIM-3, KIM-4, KIM-5, KIM-6, KIM-7, and KIM-8 according to the frequency provided in Part H Item 1. Samples shall be analyzed for the following parameters:

Biochemical Oxygen Demand – BOD ₅	Faecal 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 Aluminum	Total Arsenic
Total Mercury	Total Organic Carbon (TOC)
Total Petroleum Hydrocarbons (KIM-2 and KIM-13 only)	

4. The Licensee shall measure and record in cubic meters, the monthly and annual quantities of water pumped from Monitoring Program Station KIM-1 for all purposes and effluent pumped or discharged from Monitoring Program Stations KIM-3, KIM-4, KIM-5, KIM-6, and KIM-7.
5. The Licensee shall sample and analyse sludge in accordance with the approved Operations and Maintenance Manual referred to in Part F Item 2.

6. The Licensee shall measure and record the annual quantities of sludge removed from the Enhanced Sewage Disposal Facility along with the methods of treatment, storage, and disposal provided.
7. Additional monitoring stations, sampling and analysis may be requested by an Inspector.
8. 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 as approved by the Board in writing.
9. All analyses shall be performed by a laboratory certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL), or as otherwise approved by an Analyst.
10. The Licensee shall include all of the data and information required by the Monitoring Program as well as an indication of wastewater treatment levels upstream and downstream of the Wetland Area in the Licensee's Annual Report, as required *per* Part B, Item 1, or as requested by an Inspector.
11. The Licensee shall, within sixty (60) 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 for inclusion with the O&M Manual, required under Part F, Item 2(f).
12. Modifications to the Monitoring Program may be made only upon written approval from the NWB.