



Pursuant to the *Mackenzie Valley Resource Management Act* and Regulations, the Wek'èezhii Land and Water Board, hereinafter referred to as the Board, hereby grants to:

**Tłı̄chq̄ Community Government of Behchokò**

**(Licensee)**

of

**Box 68, Behchokò, NT, X0E 0Y0**

**(Mailing Address)**

Hereinafter called the Licensee, the right to alter, divert or otherwise use water subject to the restrictions and conditions contained in the *Waters Act* and Regulations made there under and subject to and in accordance with the conditions specified in this Licence.

Licence Number: W2014L3-0002 (previously MV2003L3-0010)

Licence Type: A

Water Management Area: NORTHWEST TERRITORIES 01

Location: BEHCHOKÒ, NT

Purpose: WATER USE AND WASTE DISPOSAL

Description: FOR MUNICIPAL PURPOSES

Quantity of water not to be exceeded: SEE PART C, ITEM 4

Effective Date of Licence: NOVEMBER 26, 2014

Term of Licence: 15 YEARS

Expiry Date of Licence: NOVEMBER 25, 2029

This Licence issued and recorded at Yellowknife, NT, includes and is subject to the annexed conditions.

**Wek'èezhii Land and Water Board:**

**Witness – Ms. Sarah Elsasser**

**Acting Chair – Mr. Joseph Mackenzie**

APPROVED BY:

  
**Minister of Environment and Natural Resources**

## Table of Contents

Part A: Scope and Definitions

Part B: General Conditions

Part C: Conditions Applying to Water use

Part D: Conditions Applying to Waste Disposal

Part E: Conditions Applying to Construction

Part F: Conditions Applying to Modifications

Part G: Conditions Applying to Contingency Plans

Part H: Conditions Applying to Operation and Maintenance

Part I: Conditions Applying to Closure and Reclamation

Schedule 1: Annual Report

Schedule 2: Characterization of Water Treatment Plant Sludge

Schedule 3: Sewage Treatment System Studies

Schedule 4: Closure and Reclamation Plans

Annex: Surveillance Network Program





## Part A: Scope and Definitions

### 1. Scope

- a) This Licence entitles the Community Government of Behchokò to use water and dispose of Waste for municipal undertakings at Behchokò, Northwest Territories.
- b) This Licence is issued subject to the conditions contained herein with respect to the use 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 deposit of such Waste may enter any Waters. Whenever new Regulations are made or existing Regulations are amended under the *Waters 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 automatically amended to conform with such Regulations.
- c) Compliance with the terms and conditions of this Licence does not excuse the Licensee from its obligation to comply with the requirements of any applicable Federal, Territorial, Tłıchq, or Municipal laws.



## 2. Definitions

"**Act**" means the *Waters Act*.

"**Analyst**" means an Analyst designated by the Minister under subsection 65(1) of the Act.

"**Bagged Toilet Waste Disposal Facilities**" comprises the area and associated structures designed to contain bagged Toilet Wastes (honey bags) as described in Drawing Number, 40284-01 titled "Rae, Proposed Lagoon Improvements" Reid Crowther and Partners Limited, dated February 12, 1979.

"**Board**" means the Wek'eezhii Land and Water Board established under section 57.1 of the *Mackenzie Valley Resource Management Act*.

"**Coarse-Grained Soil**" means soil having a median grain size of  $>75 \mu\text{m}$  as defined by the American Society for Testing and Materials D422-63 (2007) "Standard Test Methods for Particle-Size Analysis of Soils", or subsequent edition.

"**Edzo Sludge Cell**" comprises the location and record contours of the sludge containment cell constructed in general conformance to Visa Engineering's specifications and Drawing C-1, Site Plan, "Existing Berm Section and Dewatering Cell Section, Edzo Sludge Dewatering Cell," dated November 31, 2000.

"**Fine-Grained Soil**" means soil having a median grain size of  $<75 \mu\text{m}$  as defined by the American Society for Testing and Materials D422-63 (2007) "Standard Test Methods for Particle-Size Analysis of Soils", or subsequent edition.

"**Freeboard**" means the vertical distance between water line and the lowest elevation of the effective water containment crest on a dam or dyke's upstream slope.

"**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 subsection 65(1) of the Act.

"**Landfarm**" means the area containing contaminated soils located at the Solid Waste Disposal Facilities.

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

"**Maximum Average Concentration**" means the running average of any four consecutive analytical results submitted to the Board in accordance with the sampling and analysis requirements specified in the Surveillance Network Program.

"**Minister**" means a duly appointed member of the Executive Council who is responsible for the Act or the department responsible for administering that Act;

"**Modification**" means an alteration to a physical work that introduces a new structure or eliminates an existing structure and which the alteration does not change the purpose or function of the licensed physical work, but does not include an expansion.



**"Professional Engineer"** means a person who is registered with the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists in accordance with the *Engineering and Geoscience Professions Act*, as a Professional Engineer.

**"Pumpout Sewage"** means all Toilet Wastes and/or Greywater collected by means of a vacuum truck for disposal at an approved facility.

**"Regulations"** are those Regulations promulgated pursuant to section 63 of the Act.

**"Sewage"** means all Toilet Wastes and Greywater.

**"Sewage Disposal Facilities"** comprises the areas and engineered structures designed to contain Sewage and includes the Sewage Disposal Facilities Serving Edzo and the Sewage Disposal Facilities Serving Rae.

**"Sewage Disposal Facilities Serving Edzo"** comprises the area and engineered structures designed to contain Sewage as identified in Drawing Number 4005-SP-70-18, titled "Government of the Northwest Territories, Department of Public Works, Edzo, Northwest Territories, As-Built Sewage Pits Site Plans, Section and Details", and dated August 12, 1979.

**"Sewage Disposal Facilities Serving Rae"** comprises the area and engineered structures designed to contain Sewage as identified in Drawing Number 40, 553-01, titled "Rae Lagoon Outfall Channel and Structure", Reid Crowther and Partners Limited, dated January, 1982.

**"Solid Waste Disposal Facilities"** comprises the area and associated structures designed to contain solid Wastes.

**"Spill Contingency Plan"** means a document, developed in accordance with Indian Affairs and Northern Development Canada's April 2007, or subsequent editions, *Guidelines for Spill Contingency Planning*, that describes the set of procedures to be implemented to minimize the effects of a spill.

**"Surveillance Network Program"** means a monitoring program established to define environmental sampling and analysis requirements, to collect water quality data, and to assess discharge quality, licence compliance, and potential for impacts to the environment.

**"Toilet Wastes"** means all human excreta and associated products, but does not include Greywater.

**"Waste"** means any substance defined as Waste by section 1 of the Act.

**"Waste Disposal Facilities"** means all facilities designated for the disposal of Waste, and includes the Sewage Disposal Facilities, Solid Waste Disposal Facilities, and Bagged Toilet Wastes Disposal Facilities.

**"Water Supply Facilities"** means all the facilities designed to collect, treat, and supply water for municipal purposes and includes the Water Supply Facilities Serving Rae and the Water Supply Facilities Serving Edzo.

**"Water Supplies Facilities Serving Edzo"** comprises the area and associated intake infrastructure as identified in Government of the Northwest Territories, Department of Public Works Plan 72-486, Sheet 2, titled "Edzo Water Supply Line Site Plan", dated February 20, 1973.



**"Water Supply Facilities Serving Rae"** comprises the area and associated intake infrastructure as identified in the Government of the Northwest Territories, Department of Public Works Plan 76-201, Sheet 1, titled "Rae Water Intake Plan Profile", Reid Crowther and Partners Limited, dated September, 1978.

**"Waters"** means any "waters" as defined by section 1 of the Act.



## **Part B: General Conditions**

1. Prior to March 31 of the year following the calendar year reported, the Licensee shall file an Annual Report with the Board. The Annual Report shall contain the information set out in Schedule 1.
2. Meters, devices, or other such methods used for measuring water levels and volumes of water used shall be installed, operated, and maintained by the Licensee to the satisfaction of an Inspector.
3. The Licensee shall comply with the Surveillance Network Program, which is annexed to and forms part of this Licence, and any amendments to the Surveillance Network Program as may be made by the Board.
4. The Licensee shall comply with the Schedules, which are annexed to, and form part of this Licence, and any amendments to the Schedules as may be made by the Board.
5. The Licensee shall operate in accordance with any plans approved pursuant to the conditions of this Licence and with any revisions to such plans, as may be made pursuant to the conditions of this Licence and as approved by the Board. If any plan is not approved by the Board, the Licensee shall revise the plan according to the Board's direction and re-submit it to the Board for approval.
6. The Schedules, the Surveillance Network Program, and any compliance dates specified in this Licence may be amended at the discretion of the Board.
7. Within 60 days of issuance of this Licence, the Licensee shall post the necessary signs to identify the stations of the Surveillance Network Program. All signs shall be located and maintained to the satisfaction of an Inspector.
8. Within 60 days of issuance of this Licence, the Licensee shall post signs in the appropriate areas to inform the public of Water Supply and Waste Disposal Facilities. All signs shall be located and maintained to the satisfaction of an Inspector.
9. The Licensee shall ensure a copy of this Licence is maintained at the Community Government of Behchokò office at all times.



### **Part C: Conditions Applying to Water Use**

1. The Licensee shall obtain all water for Edzo from West Channel using the Water Supply Facilities Serving Edzo, or as otherwise approved by the Board.
2. The Licensee shall obtain all water for Rae from Marian Lake using the Water Supply Facilities Serving Rae, or as otherwise approved by the Board.
3. If authorized in writing by an Inspector, the Licensee may obtain water from an alternate water supply for use on an emergency basis when it is not possible to obtain water from the sources listed in Part C, Item 1 or Item 2.
4. The annual quantity of water used for all purposes shall not exceed 300,000 cubic metres.
5. The water intake hose used on the water pumps shall be equipped with a screen with a mesh size that is satisfactory to an Inspector and sufficient to ensure no entrainment of fish.





#### Part D: Conditions Applying to Waste Disposal

1. The Licensee shall direct all piped and Pump-Out Sewage to the Sewage Disposal Facilities, or as otherwise approved by the Board.
2. All Sewage effluent discharged from the Sewage Disposal Facilities Serving Rae at Surveillance Network Program Station 2014-R3 shall meet the following effluent quality criteria:

Parameter	Maximum Average Concentration
Suspended Solids	120 mg/L
Oil and Grease	5 mg/L
BOD <sub>5</sub>	80 mg/L
Faecal Coliforms	2 x 10 <sup>4</sup> CFU/100 mL

The Waste discharged shall have a pH between 6 and 9, and no visible sheen of oil and grease.

3. All Sewage effluent discharged from the Sewage Disposal Facilities Serving Edzo at Surveillance Network Program Station 2014-E3 shall meet the following effluent quality criteria:

Parameter	Maximum Average Concentration
Suspended Solids	35 mg/L
Oil and Grease	5 mg/L
BOD <sub>5</sub>	30 mg/L
Faecal Coliforms	1 x 10 <sup>3</sup> CFU/100 mL

The Waste discharged shall have a pH between 6 and 9, and no visible sheen of oil and grease.

4. The Licensee shall immediately notify an Inspector of the exceedance of any effluent quality criterion.
5. A Freeboard limit of 1.0 metre, or as recommended by a Professional Engineer and as approved by the Board, shall be maintained at all dykes and earthfill structures associated with the Sewage Disposal Facilities, with the exception of the Edzo Sludge Cell.
6. A Freeboard limit of 0.5 metre, or as recommended by a Professional Engineer and as approved by the Board, shall be maintained at the Edzo Sludge Cell, which forms part of the Sewage Disposal Facilities Serving Edzo.
7. All bagged toilet Wastes (honey bags) shall be disposed of in a manner satisfactory to an Inspector at the Bagged Toilet Waste Disposal Facilities.



8. The Licensee shall notify an Inspector at least ten days prior to initiating the decant of the Sewage Disposal Facilities Serving Rae.
9. The Licensee shall maintain and operate the Sewage Disposal Facilities in such a manner as to prevent structural failure.
10. By June 30, 2015, and once every two years thereafter, a geotechnical inspection of the Edzo and Rae Sewage Disposal Facilities berms and control structures shall be completed by a Professional Engineer. The Professional Engineer's report shall be submitted to the Board within 60 days of the inspection and shall include a cover letter from the Licensee outlining (a) an implementation plan to respond to any recommendations made by the Professional Engineer and, (b) a summary of any actions taken by the Licensee in the past two years to address recommendations from previous Professional Engineer's Reports.
11. The Licensee shall maintain the Sewage Disposal Facilities to the satisfaction of an Inspector.
12. The Licensee shall dispose of all solid Wastes at the Solid Waste Disposal Facilities in accordance with the approved Solid Waste Management Plan.
13. The Licensee shall submit to the Board, for approval, characterizations of the sludge from the Rae Water Treatment Plant and the Edzo Water Treatment Plant. Each characterization shall contain the information set out in Schedule 2.
14. By December 31, 2016, the Licensee shall submit to the Board, for approval, a study on the efficacy of the Rae Sewage Treatment System. This study shall contain the information set out in Schedule 3a.
15. By December 31, 2016, the Licensee shall submit to the Board, for approval, a study on the efficacy of the Edzo Sewage Treatment System. This study shall contain the information set out in Schedule 3b.
16. Thirty days prior to use of the new Solid Waste Disposal Facility, the Licensee shall submit as-built drawings of the facility to the Board.
17. Prior to its operation, the Licensee shall install and maintain, to the satisfaction of an Inspector, fencing around the perimeter of the new Solid Waste Disposal Facility that is capable of capturing windswept Waste, deterring wildlife, and preventing unauthorized persons from entering the site.
18. The Licensee shall not burn solid or liquid Wastes, with the exception of paper products, paperboard packaging, and untreated wood Waste, which may be burned at the Solid Waste Disposal Facility.



19. Effluent quality criteria for the Landfarm:

- a. All water resulting from Landfarm treatment process shall be sampled and analyzed for the following parameters and shall meet the following criteria prior to discharge:

<b>Parameter</b>	<b>Maximum Grab Sample</b>
Total Suspended Solids	25 mg/L
Chemical Oxygen Demand	50 mg/L
Oil and Grease	No visible sheen
pH	6.5-8.5
Antimony	0.006 mg/L
Arsenic	0.005 mg/L
Barium	1 mg/L
Boron	1.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Selenium	0.001 mg/L
Uranium	0.02 mg/L
Zinc	0.03 mg/L
Benzene	0.005 mg/L
Toluene	0.024 mg/L
Ethylbenzene	0.0024 mg/L
Xylenes	0.3 mg/L
Styrene	0.072 mg/L
F1	2.2 mg/L
F2	1.1 mg/L
Acenaphthene	0.0058 mg/L
Acenaphthylene	0.046 mg/L
Anthracene	0.000012 mg/L
Fluoranthene	0.00004 mg/L
Fluorene	0.003 mg/L
Napthalene	0.0011 mg/L
Phenanthrene	0.0004 mg/L
Pyrene	0.000025 mg/L
Carcinogenic PAHs (as B(a)P TPE)	0.00001 mg/L
Benz[a]anthracene	0.000018 mg/L
Benzo[b+j]fluoranthene	0.00048 mg/L
Benzo[k]fluoranthene	0.00048 mg/L
Benzo[g,h,i]perylene	0.00021 mg/L
Benzo[pyrene]	0.000017 mg/L
Chrysene	0.0014 mg/L
Dibenz[a,h]anthracene	0.00028 mg/L



Indeno[1,2,3-c,d]pyrene	0.00023 mg/L
Phenol	0.004 mg/L
Polychlorinated biphenyls	0.0094 mg/L

---

- b. The Licensee shall provide water-sampling results to an Inspector and the Board prior to any discharge of water from the Landfarm. Discharge shall not commence until authorized by an Inspector.
- c. The Licensee shall direct all discharge from the Landfarm to a location on land that is authorized by an Inspector and is at least 100 metres from the high water mark of any water body. The Licensee shall ensure that discharge does not enter any surface water body.

20. Soil quality criteria for the Landfarm:

- a. Consistent with the criteria for remediation of industrial land outlined in the GNWT “Guideline for Contaminated Site Remediation”, all treated soils from the Landfarm shall meet the following criteria:

Parameter	Maximum Grab Sample
pH	6-8
Benzene	5.0 mg/kg
Ethylbenzene	20 mg/kg
Toluene	0.8 mg/kg
Xylene	20 mg/kg
Phenol	3.8 mg/kg
Polychlorinated biphenyls	33 mg/kg
Antimony	40 mg/kg
Arsenic (inorganic)	340 mg/kg
Barium	2000 mg/kg
Beryllium	8 mg/kg
Cadmium	22 mg/kg
Total Chromium	87 mg/kg
Hexavalent Chromium (VI)	1.4 mg/kg
Cobalt	300 mg/kg
Copper	91 mg/kg
Cyanide (free)	8 mg/kg
Fluoride (total)	2000 mg/kg
Lead	600 mg/kg
Mercury (inorganic)	50 mg/kg
Molybdenum	40 mg/kg
Nickel	50 mg/kg



Selenium	3.9 mg/kg
Silver	40 mg/kg
Thallium	1 mg/kg
Tin	300 mg/kg
Vanadium	130 mg/kg
Zinc	360 mg/kg

<b>Total Petroleum Hydrocarbons</b>	<b>Fine-Grained Soils</b>	<b>Coarse-Grained Soils</b>
Fraction 1 (C6-C10)	660 mg/kg	310 mg/kg
Fraction 2 (>C10-C16)	1500 mg/kg	760 mg/kg
Fraction 3 (>C16-C34)	2500 mg/kg	1700 mg/kg
Fraction 4 (>C34)	6600 mg/kg	3300 mg/kg

If testing of particle size is not completed by the Licensee to determine if soil is Coarse- or Fine-Grained, soil must be treated to achieve the criteria for Coarse-Grained Soils.

- b. The Licensee shall provide soil-sampling results to an Inspector and the Board prior to any removal of soil from the Landfarm.
  - c. The Licensee shall place treated soil in the Solid Waste Disposal Facilities and cover with the final solid waste facility cap as part of the closure and reclamation of the Solid Waste Disposal Facility, or as otherwise as approved by the Board.
21. The Licensee shall ensure that any unauthorized Wastes associated with the municipal undertaking do not enter any Waters.



## **Part E: Conditions Applying to Construction**

1. Ninety days prior to construction of any dams, dykes or structures intended to contain, withhold, divert or retain water or Wastes, other than as contemplated in the Spill Contingency Plan, the Licensee shall submit to the Board, design drawings stamped by a Professional Engineer.
2. Construction of dams, dykes, or structures identified in Part E, item 1 shall be carried out in accordance with the recommendations of the Professional Engineer responsible for the design, including but not limited to recommendations regarding field supervision and inspection requirements
3. As-built drawings of dams, dykes, or structures identified in Part E, item 1 shall be stamped by a Professional Engineer and submitted to the Board within 90 days of completion of the facility.
4. Any fill materials used in the construction of any facilities must be from an approved source and be clean and free of contaminants.



## **Part F: Conditions Applying to Modifications**

1. 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 conditions of this Licence and the following requirements are met:
  - a) The Licensee has notified the Board and Inspector, in writing, of the proposed Modifications at least 60 days prior to beginning the Modifications;
  - b) the Modifications do not place the Licensee in contravention of either the Licence or the Act;
  - c) The Board has not, during the 60 days following the notification of the proposed Modifications, informed the Licensee that further information is required or that the review of the proposal will require more than 60 days;
  - d) An Inspector has authorized the proposed Modifications and provided a letter of notification to the Board; and,
  - e) The Board has not rejected the proposed Modifications.
  
2. Within 90 days of the completion of Modifications referred to in Part F, Item 1, the Licensee shall provide as-built drawings stamped by a Professional Engineer to the Board.



## **Part G: Conditions Applying to Contingency Plans**

1. The Licensee shall annually review the Spill Contingency Plan and shall submit updates to the Plan to the Board for approval at the following times:
  - a) when necessary to reflect changes in operation or technology; and
  - b) upon the request of an Inspector or the Board.
  
2. If during the period of this Licence, a spill or unauthorized discharge of Waste occurs or is foreseeable, the Licensee shall:
  - a) implement the Spill Contingency Plan;
  - b) report the incident immediately via the 24 Hour Spill Reporting Line (867) 920-8130 in accordance with the instructions contained in the Spill Report Form NWT 1752/0593 or subsequent editions;
  - c) report each spill and Unauthorized Discharge to an Inspector within 24 hours; and
  - d) within 30 days of an Unauthorized Discharge or an incident reported under Part I, Item 2b), the Licensee shall submit a detailed report to the Board and an Inspector. The report shall include descriptions of root causes, response actions, and any changes to procedures to prevent similar occurrences in the future.





## **Part H: Conditions Applying to Operation and Maintenance**

1. The Licensee shall annually review the Operation and Maintenance Plans for the Sewage and Solid Waste Disposal Facilities and shall submit updates to the Plan to the Board for approval at the following times:
  - a) when necessary to reflect changes in operation or technology; and
  - b) upon the request of an Inspector or the Board.
2. By May 1, 2015, the Licensee shall submit a Landfarm Operation and Maintenance Plan to the Board for approval. The Plan shall include the remediation procedures and associated timelines for cleanup of the existing contaminated soils in the Landfarm.
3. Prior to the placement of any additional contaminated soils into the Landfarm, the Licensee must demonstrate to the Board that the Landfarm is suitable for ongoing operation, submit an updated Landfarm Operation and Maintenance Plan to the Board, and receive approval from the Board.



**Part I: Conditions Applying to Closure and Reclamation**

1. The Licensee shall submit to the Board, for approval, a Closure and Reclamation Plan at least six months prior to the closure of any of the Sewage or Solid Waste Disposal Facilities. The Closure and Reclamation Plan shall contain the information set out in Schedule 4.



**Schedule 1**  
**Annual Report**

The Annual Report referred to in Part B, Item 1, shall include, but not be limited to, the following information:

- a) The monthly and annual quantities in cubic metres of fresh water obtained from all sources;
- b) The monthly and annual quantities in cubic metres of each and all Waste discharged, including sludge from the Water Supply Facilities;
- c) A summary of Modifications and/or major maintenance work carried out on the Water Supply and Waste Disposal Facilities, including all associated structures;
- d) Tabular summaries of all data generated under the Surveillance Network Program;
- e) A list of all unauthorized discharges;
- f) A summary of sludge management activities, if any;
- g) An outline of any spill training and communications exercises carried out;
- h) A summary of any closure and reclamation work completed during the year and an outline of any work anticipated for the next 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) The monthly and annual quantities of solid Waste removed from the sewage facilities for disposal;
- k) A summary of any updates or revisions to the Management Plans and Operation & Maintenance Plans; and,
- l) Any other details on water use, operating procedures, Modifications, maintenance work, or other topics, requested by the Board on or before November 1 of the year being reported.



**Schedule 2**  
**Characterization of Water Treatment Plant Sludge**

The characterizations referred to in Part D, Item 13, shall include, but not be limited to, the following information:

- Percentage solids
- BOD
- cBOD5
- COD
- TOC
- Conductivity
- pH
- Ammonia
- TKN
- Phosphorous
- Cations/anions
- Metals
- Coliforms



**Schedule 3**  
**Sewage Treatment System Studies**

- a) The Rae Sewage Treatment System Efficacy Study, referred to in Part D, Item 14, shall include:
- Interpretation of the relevant (2014-R2, 2014-R3, and 2014-R4) SNP results with a discussion of the effectiveness of the Rae Sewage Treatment System
  - Topographic data of Rae wetland
  - Hydraulic retention times of Rae wetland
  - Loading rates of Rae wetland
- b) The Edzo Sewage Treatment System Efficacy Study, referred to in Part D, Item 15, shall include:
- Interpretation of the relevant (2014-E2, 2014-E3, and 2014-E4) SNP results with a discussion of the effectiveness of the Edzo Sewage Treatment System
  - Topographic data of Edzo wetland
  - Hydraulic retention times of Edzo wetland
  - Loading rates of Edzo wetland



**Schedule 4**  
**Closure and Reclamation Plan**

With regard to the facility being closed, the Plan shall include, but not be limited to, the following:

- A description of existing conditions (including photos);
- A description of monitoring activities conducted prior to closure and a summary of results obtained;
- Contaminated site remediation;
- The potential for contamination of groundwater and runoff water (leachate prevention);
- Consideration of altered drainage patterns;
- Type and source of cover materials;
- Future area use;
- Hazardous Wastes removal, transportation, and disposal;
- A post-closure monitoring plan;
- An implementation schedule; and,
- Maps delineating all disturbed areas, borrow material locations, and site facilities.



**Surveillance Network Program  
Annexed to Water Licence W2014L3-0002**

**The Surveillance Network Program (SNP) is effective on the effective date of the Licence.**

**A. Reporting Requirements**

1. The Licensee shall provide results from SNP 2014-R2 to an Inspector prior to initiating decant.
2. The Licensee shall include all of the data and information required by the Surveillance Network Program in the Annual Report as specified in Part B, Item 1, of this Licence. The Licensee shall also provide SNP data at other times, if requested by an Inspector or the Board.

**B. Sampling and Analysis Requirements**

1. 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 methods approved by the Analyst.
2. All analyses shall be performed in a laboratory approved by the Analyst.
3. More frequent sample collection may be required at the request of an Inspector



### C. Surveillance Network Program Stations

SNP Station	Location	Frequency	Parameters	Rationale
2014-E1 (Active)	The raw water intake line at the Water Supply Facilities Serving Edzo	Daily	Cubic metres	To determine the quantity of water used as potable water in Edzo
2014-E2 (Active)	Sewage Disposal Facility prior to flowing outward to overflow ditches	Monthly from June to October (inclusive)	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	This sample will indicate effluent quality prior to leaving the lagoon system and indicate the level of treatment from the two cells.
		Monthly from June to October (inclusive)	Sodium, Potassium, Magnesium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Total Zinc	
2014-E3 (Active)	Point of junction at the outflow ditches from the Sewage Disposal Facilities Serving Edzo	Monthly from June to October (inclusive)	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	To monitor effluent quality from the Sewage Disposal Facilities Serving Edzo prior to entering wetland treatment
		Once between June and October	Sodium, Potassium, Magnesium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Total Zinc	
2014-E4 (Active)	Discharge from Sewage Disposal Facilities Serving Edzo downstream of junction of overflow ditches and before	Monthly from June to October (inclusive)	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	To monitor effluent quality from the Sewage Disposal Facilities Serving Edzo prior to entering Great Slave Lake
		Monthly from June to October	Sodium, Potassium, Magnesium, Sulphate,	





	entering Great Slave Lake	(inclusive)	Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Total Zinc	
2014-E5 (Inactive)	Great Slave Lake downstream from Sewage Disposal Facilities Serving Edzo	Monthly from June to October (inclusive)	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	To monitor water quality in the receiving environment <b>if 2014-E4 is unable to be sampled</b>
		Once between June and October	Sodium, Potassium, Magnesium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Total Zinc	
2014-R1 (Active)	The raw water intake line at the Water Supply Facilities Serving Rae	Daily	Cubic metres	To determine the quantity of water used as potable water in Rae
2014-R2 (Active)	Sewage Disposal Facilities Serving Rae near decant structure	At least ten days prior to decant	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	To monitor effluent quality prior to discharge into Rae Wetland Treatment System
2014-R3 (Active)	Point of outflow from the Sewage Disposal Facilities Serving Rae at the culvert crossing the Rae Access road	Weekly, beginning two weeks before decant, continuing every three days during decant flow, and one additional sample one week following the end of decant flow	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	To monitor effluent quality following initial wetland treatment
		Once between June and October	Sodium, Potassium, Magnesium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury,	



			Total Zinc	
2014-R4 (Active)	At the end of Rae Wetland prior to entering Frank's Channel	Weekly, beginning two weeks before decant, continuing every three days during decant flow, and one additional sample one week following the end of decant flow. During decant flow, this sample should be collected one day following collection of the sample at 2014-R3, or as determined by the retention time of the wetlands, to ensure that the effluent has reached this location.	BOD <sub>5</sub> , CBOD, Faecal Coliforms, pH, Suspended Solids, Ammonia-Nitrogen, Total Phosphate	To monitor effluent quality prior to entering to the receiving environment
		Once between June and October	Sodium, Potassium, Magnesium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Total Zinc	
2014-R5 (Active)	Run-off from old Solid Waste Disposal Facilities (north-west of Landfarm)	Twice per year during the months of June and September	pH, Total Zinc, Sodium, Suspended Solids, Magnesium, Total Phosphate, Potassium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Faecal Coliform, BTEX, TPH	To monitor potential impacts to groundwater and surface water surrounding the Solid Waste Disposal Facilities and Landfarm
2014-R6 (Active)	New Solid Waste Disposal Facilities (north of waste footprint)	Twice per year during the months of June and September	pH, Total Zinc, Sodium, Suspended Solids, Magnesium, Total Phosphate, Potassium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Faecal Coliform, BTEX, TPH	To monitor potential impacts to groundwater and surface water surrounding the Solid Waste Disposal Facilities



2014-R7 (Active)	New Solid Waste Disposal Facilities (north-east of waste footprint, south-east of SNP station 2014-R6)	Twice per year during the months of June and September	pH, Total Zinc, Sodium, Suspended Solids, Magnesium, Total Phosphate, Potassium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Faecal Coliform, BTEX, TPH	To monitor potential impacts to groundwater and surface water surrounding the Solid Waste Disposal Facilities
2014-R8 (Active)	New Solid Waste Disposal Facilities (south of waste footprint, north of waterbody)	Twice per year during the months of June and September	pH, Total Zinc, Sodium, Suspended Solids, Magnesium, Total Phosphate, Potassium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Faecal Coliform, BTEX, TPH	To monitor potential impacts to groundwater and surface water surrounding the Solid Waste Disposal Facilities
2014-R9 (Active)	New Solid Waste Disposal Facilities (south of waste footprint, east of waterbody, south-east of SNP station 2014-R8)	Twice per year during the months of June and September	pH, Total Zinc, Sodium, Suspended Solids, Magnesium, Total Phosphate, Potassium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Faecal Coliform, BTEX, TPH	To monitor potential impacts to groundwater and surface water surrounding the Solid Waste Disposal Facilities
2014-R10 (Active)	New Solid Waste Disposal Facilities (south of waste footprint, west of waterbody, south-west of SNP station 2014-R9)	Twice per year during the months of June and September	pH, Total Zinc, Sodium, Suspended Solids, Magnesium, Total Phosphate, Potassium, Sulphate, Total Phenols, Oil and Grease, Conductivity, Calcium, Total Lead, Total Chromium, Total Nickel, Total Iron, Total Cadmium, Total Copper, Total Mercury, Faecal Coliform, BTEX, TPH	To monitor potential impacts to groundwater and surface water surrounding the Solid Waste Disposal Facilities

