

Environment Act Licence Loi sur l'environnement Licence

Manitoba
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Licence No./Licence n° 2435 RR

Issue Date/Date de délivrance December 23, 1999

Revised: December 30, 1999
July 12, 2002

**IN ACCORDANCE WITH THE MANITOBA ENVIRONMENT ACT (C.C.S.M. c. E125)
THIS LICENCE IS ISSUED PURSUANT TO SECTIONS 11(1) AND 14(2) TO:**

**THE RURAL MUNICIPALITY OF HEADINGLEY AND
THE PROVINCE OF MANITOBA REPRESENTED BY THE MINISTER
OF TRANSPORTATION AND GOVERNMENT SERVICES; "the Licences"**

for the construction and operation of the Development being a modified Sequencing Batch Reactor wastewater treatment plant located on lot No. 36 and 32, Parish of Headingley and on Lot No. 227, Parish of St. Francois Xavier located within the Rural Municipality of Headingley, and in accordance with the Notice of Alteration filed by The Manitoba Water Services Board under Section 14 of The Environment Act on March 4, 1999, the Notice of Alteration dated March 28, 2002 and the additional information dated June 17, 2002 and July 11, 2002 and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"**accredited laboratory**" means an analytical facility accredited by the Standard Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Conservation to be equivalent to the SCC, or be able to demonstrate, upon request, that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the international standard ISO/IEC 17025, or otherwise approved by the Director;

"**affected area**" means a geographical area excluding the property of the development;

"**approved**" means approved by the Director in writing;

"**as constructed drawings**" means engineering drawings complete with all dimensions which indicate all features of the Development as it has actually been built;

"**bioassay**" means a method of determining toxic effects of industrial wastes and other wastewaters by using viable organisms;

"**composite sample**" means a quantity of wastewater consisting of a minimum of 10 equal volumes of effluent, or flow proportional volumes collected over a 24-hour period, and may be collected manually or by means of an automatic sampling device;

"**Director**" means an employee so designated pursuant to The Environment Act;

**** A COPY OF THIS LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES ****

"**effluent**" means treated wastewater flowing or pumped out of the sewage treatment plant or overflow detention pond;

"**fecal coliform**" means aerobic and facultative, Gram-negative, nonspore-forming, rod-shaped bacteria capable of growth at 44.5°C, and associated with fecal matter of warm-blooded animals;

"**final discharge point**" means the effluent monitoring facilities located in the transition box at the outlet of the UV system, as shown in Cross Section 2 of Drawing No. P03 which forms part of this Licence;

"**grab sample**" means a quantity of wastewater taken at a given place and time;

"**influent**" means water, wastewater, or other liquid flowing into the sewage treatment plant;

"**five-day biochemical oxygen demand**" (BOD₅) means that part of oxygen usually associated with biochemical oxidation of organic material within 5 days at 20°C;

"**Maximum Influent**" means the maximum flow rate of wastewater entering the plant without the treatment or disinfection by structural modification;

"**ultimate biochemical oxygen demand**" means a maximum or theoretical value, based on oxygen, in the wastewater, used to define the ultimate, theoretical, maximum, secondary, biochemical oxygen demand in a system;

- a) biochemical oxygen demand based on
- b) reacting in the ultimate amount, or
- c) present in the wastewater in the ultimate amount, in accordance with the provisions of this licence;

if the ultimate, theoretical, maximum,

- a) in the subject of at least 4 weather observations measured by the Director in a given municipality in the Province and within a 90 day period, next to one of the following systems (filling volume values a), b) or c), when the next three to five units immediately, or
- a) in the subject of at least one weather observation, measured by the Director in a given municipality in the Province, from a person living within values a), b) or c), and the Director is of the opinion that if the value, based on oxygen, used to define the ultimate, theoretical, maximum, secondary, biochemical oxygen demand in a given municipality, within a 90 day period, from 3 different periods when the next five to five units immediately;

"**overflow detention pond**" means the overflow pond located adjacent to the sewage treatment plant that is designed for temporary storage of wastewater;

"**sewage**" means human feces, urine, liquid, wastewater effluent, urine or laundry washing;

"**sewage effluent**" means sewage after it has undergone at least one level of physical, or biological treatment;

"**sludge**" means suspended solid material consisting largely of organic matter which has separated from wastewater during processing;

"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Waterworks Association and the Water Environment Federation;

"total coliform" means a group of aerobic and facultative anaerobic, gram-negative, non-spore-forming, rod-shaped bacteria, that ferment lactose with gas and acid formation within 48 hours at 35°C and inhabit predominantly the intestines of man or animals, but are occasionally found elsewhere and include the sub-group of fecal coliform bacteria;

"UV disinfection" means a disinfection process for treating wastewater using ultraviolet radiation;

"UV dose" means the unit of intensity of ultra violet light that is required to kill bacteria and viruses present in the sewage effluent; and

"wastewater" means the spent or used water of a community or industry which contains dissolved and suspended matter.

GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencees in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

1. In addition to any of the following specifications, limits, terms and conditions specified in this Licence, the Licencees shall, upon the request of the Director:
 - a) sample, monitor, analyze or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, handling, treatment and disposal systems, for such pollutants, ambient quality, aquatic toxicity, seepage characteristics and discharge rates and for such duration and frequencies as may be specified;
 - b) determine the environmental impact associated with the release of any pollutant from the Development; or
 - c) provide the Director within such time as may be specified, with such reports, drawings, specifications, analytical data, bioassay data, flow rate measurements and such other information as may from time to time be requested.

2. The Licencees shall, unless otherwise specified in this Licence:
 - a) carry out all preservations and analyses of liquid samples in accordance with the methods prescribed in the Standard Methods for the Examination of Water and Wastewater, or in accordance with equivalent preservation and analytical methodologies approved by the Director;
 - b) ensure that all analytical determinations are undertaken by an accredited laboratory; and
 - c) report the results to the Director, in writing, within 60 days of the samples being taken.

3. The Licencees shall submit all information required to be provided to the Director under this Licence, in writing, in such form (including number of copies), and of such content as may be required by the Director.
4. The Licencees shall ensure that the wastewater treatment plant is operated in such a manner that:
 - a) all the sewage generated within the existing and future plan for the R.M. of Headingley wastewater collection system, is directed towards the Headingley Correctional Institute Wastewater Treatment Plant;
 - b) only sewage as defined in this Licence is discharged into the wastewater treatment plant; and
 - c) waste solids and sewage sludge are treated and disposed at a facility approved by the Director.
5. The Licencees shall not cause or permit an odour nuisance to be created as a result of the construction, operation or alteration of the Development, and shall take such steps as the Director may require to eliminate or mitigate an odour nuisance.
6. The Licencees shall install, operate, and maintain an effluent discharge pipeline from the sewage treatment plant into the Assiniboine River, and shall take the necessary steps to prevent freezing of the effluent in the pipeline.
7. The Licencees shall ensure that adequate instrumentation is installed to provide constant monitoring of the UV process to ensure compliance with the disinfection requirements. Such instrumentation shall include but not be limited to the following:
 - a) a UV sensor to monitor lamp intensity;
 - b) appropriate alarm and shutdown systems;
 - c) a lamp monitoring system to identify the location of individual lamp failures;
 - d) an hour meter which cannot be reset to display actual hours of UV lamp operation; and
 - e) protective circuits for overcurrent and ground current leakage detection.
8. The Licencees shall install and maintain a fence around the overflow detention pond to limit access.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

9. The Licencees shall, prior to the construction of the dykes for the overflow detention pond:
 - a) remove all organic topsoil from the area where the dykes will be constructed; or
 - b) remove all organic material for a depth of 0.3 metres and a width of 3.0 metres from the area where the cut-off will be constructed.
10. The Licencees shall construct and maintain the overflow detention pond with a continuous liner, including cut-offs, under all interior surfaces of the cells in accordance with the following specifications:
 - a) the liner shall be made of clay;
 - b) the liner shall be at least one metre in thickness;

- c) the liner shall have a hydraulic conductivity of 1×10^{-7} centimetres per second or less at all locations; and
 - d) the liner shall be constructed to an elevation of 2.5 metres above the floor of the overflow detention pond.
11. The Licencees shall arrange with the designated Environment Officer a mutually acceptable time and date for any required soil sampling between the 15th day of May and the 15th day of October of any year.
 12. The Licencees shall take and test samples, in accordance with Schedule 2 attached to this Licence, from the liner of the overflow detention pond; the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of 10 samples.
 13. The Licencees shall, within 60 days of the date on which the samples were taken, submit to the Director the results of the tests carried out pursuant to Clause 12 of this Licence.
 14. The Licencees shall ensure that if, in the opinion of the Director, significant erosion of the interior surfaces of the dykes of the overflow detention pond occurs, riprap shall be placed on the interior dyke surfaces from 0.6 metres above the high water mark to at least 0.6 metres below the low water mark to protect the dykes from wave action.
 15. The Licencees shall ensure that septage is not discharged into the overflow detention pond.
 16. The Licencees shall provide and maintain a grass cover on the dykes of the overflow detention pond and shall regulate the growth of the vegetation so that the height of the vegetation does not exceed 0.3 metres on all dykes.
 17. The Licencees shall annually remove by mechanical methods all reeds, rushes and trees located above the low water mark in the overflow detention pond.
 18. The Licencees shall implement an ongoing program to ensure that burrowing animals are removed from the site of the overflow detention pond.
 19. The Licencees shall ensure that the sewage load on the wastewater treatment plant does not exceed the design capacities as follows:
 - a) hydraulic loading not to exceed 2700 m^3 for any 24-hour period; and
 - b) organic loading not to exceed 675 kilograms of five-day biochemical oxygen demand (BOD_5) per day.
 20. The Licencees shall ensure that the UV lamps have a rated output of at least 253 nanometres (nm) capable of delivering a germicidal dose in excess of 30,000 microwatt seconds/sq cm.
 21. The Licencees shall ensure that the UV units are sized to give a germicidal dose of 20,000 microwatt seconds/sq cm or more, at the end of the lamp life.

22. The Licencees shall not discharge sewage effluent from the sewage treatment plant, where:
- a) the organic content of the effluent, as indicated by the five-day biochemical oxygen demand (BOD₅), is in excess of 30 milligrams per litre;
 - b) the fecal coliform content of the sewage effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample at the final discharge point as determined by the monthly geometric mean of 1 grab sample collected at equal time intervals on each of a minimum of 3 consecutive days per week;
 - c) the total coliform content of the sewage effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample at the final discharge point as determined by the monthly geometric mean of 1 grab sample collected at equal time intervals on each of a minimum of 3 consecutive days per week;
 - d) the suspended matter content of the sewage effluent, as indicated by the non-filterable residue is in excess of 30 milligrams per litre;
 - e) the concentration of total ammonia is in excess of the loadings indicated in Schedule 1 attached to this licence; or
 - f) the total chlorine residual content is in excess of 11 µg/L at the final discharge point, when chlorine is used as the disinfection agent.

MONITORING AND REPORTING SPECIFICATIONS

23. The Licencees shall provide a system acceptable to the Director, to measure the sewage flows to the wastewater treatment plant, prior to operating the wastewater treatment plant.
24. The Licencees shall arrange for the taking of samples of influent sewage at the inlet chamber of the pre-react zone, and of treated sewage effluent at the final discharge point.
25. The Licencees shall provide a heated and secured effluent monitoring station acceptable to the Director and equipped with:
- a) a direct access way for an effluent sampling line to a location near the discharge from the UV disinfection chamber; and
 - b) an electrical power source of 15 amperes at 110 volts.
26. The Licencees shall:
- a) take one composite sample of effluent from the sewage treatment plant during the discharge period once each month;
 - b) have the composite effluent sample analyzed at an accredited laboratory for five day biochemical oxygen demand, field temperatures, field pH, ammonia and total suspended solids, using methods from the Standard Methods for the Examination of Water and Wastewater, or using other methods approved by the Director;
 - c) have the grab samples analyzed at an accredited laboratory for fecal coliform content and total coliform content using methods from the Standard Methods for the Examination of Water and Wastewater, or using other methods approved by the Director; and
 - d) report the results to the Director within 60 days of the samples being taken.

27. The Licencees shall:
 - a) prepare "as constructed drawings" for the Development, including the sewage treatment facility, the overflow detention pond and the effluent discharge pipeline complete with final elevations, and shall label the drawings "As Constructed"; and
 - b) provide to the Director, on or before December 1, 2002, two sets of "As Constructed Drawings" of the Development.

28. The Licencees shall, in case of physical or mechanical breakdown of the wastewater collection and/or treatment system, including the UV disinfection system and overflow detention pond:
 - a) notify the Director immediately;
 - b) identify the repairs required to the waste collection and/or treatment system; and
 - c) complete the repairs in accordance with the written instructions of the Director.

29. The Licencees shall, in the event the overflow detention pond is used for temporary overflow storage of wastewater:
 - a) prepare a detailed report of the event which includes:
 - i) the reason the overflow detention pond was used;
 - ii) what, if any, equipment failure resulted in the use of the overflow detention pond;
 - iii) the amount of wastewater stored in the overflow detention pond; and
 - iv) the duration the overflow detention pond was in use;
 - b) submit the report to the Director within 30 days of the event; and
 - c) at the request of the Director and in accordance with any written instructions, undertake an assessment to determine the adequacy of the hydraulic capacity of the wastewater treatment plant.

30. The Licencees shall submit to the Director for approval, not later than February 15, 2000, a detailed sampling and monitoring program for determining the Water Quality of the Assiniboine River for a period of 3 years following the commissioning of the plant. The program shall contain the frequency and location of sampling of the Water Quality of the Assiniboine River with respect to the following parameters:
 - a) temperature;
 - b) total Kjeldhal nitrogen;
 - c) nitrate/nitrite - N;
 - d) total phosphorus;
 - e) pH;
 - f) chloramines, during the emergency use of chlorine;
 - g) ammonia; and
 - h) other parameters, specified by the Director, resulting from upgraded treatment system upset or malfunction.

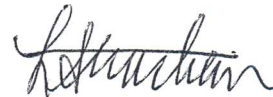
31. The Licencees shall submit to the Director for approval, not later than February 15, 2000, a detailed sampling and monitoring program for a period of 3 years following the commissioning of the plant, of the bivalve community

composition and productivity in beds immediately upstream and downstream of the outfall, and at the reference station Bed 1 established by Manitoba Conservation. The program shall contain the frequency and location of sampling upstream and downstream and the frequency of sampling at the reference station.

32. The Licencees shall submit to the Director for approval, not later than January 15, 2000, a monitoring program of ice thickness and stability of the Assiniboine River for a period of 3 years following the commissioning of the plant to establish the effects of thermal discharge during the winter period. The program shall contain the location and frequency of monitoring during the winter period.
33. The Licencees shall, not less than 60 days after the results of the sample analysis are received, submit to the Director the results of the monitoring program for each year of the monitoring program carried out pursuant to Clauses 18, 19 and 20 of this Licence.
34. The Licencees shall submit to the Director for approval an action plan containing public safety requirements with respect to the ice thickness during the winter period. The action plan shall be prepared in consultation with the R.M. of Headingley, the Headingley Correctional Institute and the Harbour Master for Winnipeg's Harbour Patrol.

REVIEW AND REVOCATION

- A. This Licence replaces Licence No. 2435 R, which is hereby rescinded.
- B. If, in the opinion of the Director, the Licencees have exceeded or are exceeding or have or are failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.
- C. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of The Environment Act.



Larry Strachan, P. Eng.
Director
Environment Act

Client File No.: 449.20

Schedule 1
To Environment Act Licence No. 2435 RR

Month	Maximum Allowable Total Ammonia in Wastewater Effluent (kg/d)
January	27
February	27
March	27
April	13.5
May	13.5
June	13.5
July	13.5
August	13.5
September	13.5
October	27
November	27
December	27

Soil Sampling:

1. The Licencees shall provide a drilling rig, acceptable to the designated Environment Officer, to extract samples from the liner that is not placed or found at the surface of the lagoon structure. This includes all wastewater treatment lagoons constructed with clay cut-offs at the interior base of the dyke or with a clay cut-off in the centre of the dyke. The drill rig shall have the capacity to drill to the maximum depth of the clay cut-off plus an additional depth of 2 metres. The drill rig shall be equipped with both standard and hollow stem augers. The minimum diameter of the hole shall be 5 inches.
2. For lagoon liners placed or found at the surface of the lagoon structure, the Licencees shall provide a machine, acceptable to the designated Environment Officer, capable of pressing a sampling tube into the liner in a straight line motion along the centre axis line of the sample tube and without sideways movement.
3. Samples shall be collected and shipped in accordance with ASTM Standard D 1587 (Standard Practice for Thin-Walled Tube Sampling of Soils), D 4220 (Standard Practice for Preserving and Transporting Soil Samples) and D 3550 (Standard Practice for Ring-Lines Barrel Sampling of Soils). Thin-walled tubes shall meet the stated requirements including length, inside clearance ratio and corrosion protection. An adequate venting area shall be provided through the sampling head.
4. At the time of sample collection, the designated Environment Officer shall advise the Licencees as to the soil testing method that must be used on each sample. The oedometer method may be used for a sample where the Environment Officer determines that the soil sample is taken from an undisturbed clay soil which has not been remoulded and which is homogeneous and unweathered. The triaxial test shall be used for all samples taken from disturbed and remoulded soils or from non-homogenous or weathered soils.
5. The Licencees shall provide, to the designated Environment Officer and to the laboratory technician, a report on the collection of soil samples that includes but is not limited to the following: a plot plan indicating all drill holes, onsite visual observations, sample location, depth or elevation of sample, length of advance of the sample tube length of soil sample contained in the tube after its advancement, the soil test method specified by the Environment Officer for each soil sample and all necessary instructions from the site engineer to the laboratory technician.
6. All drill and sample holes shall be sealed with bentonite pellets after the field drilling and sampling has been completed.

Soil Testing Methods:

1. Triaxial Test Method
 - a) The soil samples shall be tested for hydraulic conductivity using ASTM D 5084 (Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter).
 - b) Soil specimens shall have a minimum diameter of 70 mm. (2.75 inches) and a minimum height of 70 mm (2.75 inches). The soil specimens shall be selected from a section of the soil sample that contains the most porous material based on a visual inspection. The hydraulic gradient shall not exceed 30 during sample preparation and testing. Swelling of the soil specimen should be controlled to adjust for the amount of compaction measured during sample collection and extraction from the tube and the depth or elevation of the sample. The effective stress used during saturation or consolidation of the sample shall not exceed 40 kPa (5.7 psi) or the specific stress level, that is expected in the field location where the sample was taken, which ever is greater.
 - c) A complete laboratory report, as outlined in ASTM D 5084, shall be supplied for each soil sample collected in the field.

2. Oedometer Test Method
 - a) The soil samples shall be tested for hydraulic conductivity using ASTM D 2435 (Standard Test Method for One-Dimensional Consolidation Properties of Soils).
 - b) Soil specimens shall have a minimum diameter of 50 mm. (2 inches) and a minimum height of 20 mm. (0.8 inches). The soil specimens shall be selected from a section of the soil sample that contains the most porous material based on a visual inspection. The soil specimen shall be taken from an undisturbed soil sample. The soil specimen shall be completely saturated.
 - c) A complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.