

Licence No.: 2399

Licence Issued: July 6, 1999

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

THE TOWN OF CARMAN; "the Licence"

for reconstruction and operation of the existing Development being a wastewater collection system and a wastewater treatment lagoon located on Sections 29 and 30, Township 13, Range 4 WPM and with discharge of treated effluent to the Boyne River, in accordance with the Proposal filed under The Environment Act on January 20, 1999, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"accredited laboratory" means a laboratory accredited by the Standard Council of Canada (SCC), another accrediting agency recognized by Manitoba Environment to be equivalent to the SCC, or at a laboratory which can demonstrate to Manitoba Environment that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the Canadian Standard Can/CSA-Z753, extension of the international standard ISO 9000, Guide 25;

"approved" means approved by the Director in writing;

"appurtenances" means machinery, appliances, or auxiliary structures attached to a main structure to enable it to function, but not considered an integral part of it;

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

"ASTM" means the American Society for Testing and Materials;

"bentonite" means specially formulated standard mill grade sodium bentonite conforming to American Petroleum Institute Specification 13-A;

"cut-off" means a vertical-side trench filled with compacted clay or sand-bentonite mixture or a wall constructed from compacted clay;

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

"effluent" means treated wastewater flowing or pumped out of the wastewater treatment lagoon or sewage treatment plant for release into the environment;

"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;

"five-day biochemical oxygen demand" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within five days at a temperature of 20° C;

"flooding" means the flowing of water onto lands, other than waterways, due to the overtopping of a waterway or waterways;

"high water mark" means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is at the maximum allowable liquid level;

"hydraulic conductivity" means the quantity of water that will flow through a unit cross-sectional area of a porous material per unit of time under a hydraulic gradient of 1.0;

"individual" means one person for each household or unique address;

"industrial wastewater" means wastewater derived from an industry activity which manufactures, handles or processes a product;

"influent" means water, wastewater, or other liquid flowing into a wastewater treatment facility;

"in-situ" means on the site;

"low water mark" means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is discharged;

"MPN Index" means the most probable number of coliform organisms in a given volume of wastewater which, in accordance with statistical theory, would yield the observed test result with the greatest frequency;

"primary cell" means the first in a series of cells of the wastewater treatment lagoon system and which is the cell that receives the untreated wastewater;

"riprap" means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earth surfaces against wave action or current;

"secondary cell" means a cell of the wastewater treatment lagoon system which is the cell that receives partially treated wastewater from the primary cell;

"septage" means the sludge produced in individual on-site wastewater disposal systems such as septic tanks;

"sewage" means household and commercial wastewater that contains human waste;

"sludge" means accumulated solid material containing large amounts of entrained water, which has separated from wastewater during processing;

"sludge solids" means solids in sludge;

"total coliform" means a group of aerobic and facultative anaerobic, Gram-negative, nonspore-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;

"wastewater treatment lagoon" means the component of this development which consists of an impoundment into which wastewater is discharged for storage and treatment by natural oxidation; and

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

GENERAL REQUIREMENTS

1. The Licencee shall direct all sewage generated within the Town of Carman toward the wastewater treatment lagoon or other approved sewage treatment facilities.
2. The Licencee shall operate and maintain the wastewater treatment lagoon in such a manner that:
 - a. the release of offensive odours is minimized;

- b. the organic loading on the primary cell, as indicated by the five-day biochemical oxygen demand, is not in excess of 56 kilograms per hectare per day; and
 - c. the depth of liquid in all primary and secondary cells does not exceed 1.5 metres.
3. The Licencee shall install and maintain a fence around the wastewater treatment lagoon to limit access.
4. The Licencee shall, in case of physical or mechanical breakdown of the wastewater collection and/or treatment system:
 - a. notify the Director immediately;
 - b. identify the repairs required to the wastewater collection and/or treatment system;
 - c. undertake all repairs to minimize unauthorized discharges of wastewater; and
 - d. complete the repairs in accordance with any written instructions of the Director.
5. In addition to any of the limits, terms and conditions specified in this Licence, the Licencee shall, upon the request of the Director:
 - a. sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment, handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;
 - b. determine the environmental impact associated with the release of any pollutant(s) from the Development; or
 - c. provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.
6. The Licencee shall, unless otherwise specified in this Licence:
 - a. carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the most current 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 Pollution Control Federation, or in accordance with an equivalent analytical methodology 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 and in an electronic format acceptable to the Director, within 60 days of the samples being taken.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

7. The Licencee shall reconstruct and maintain the wastewater treatment lagoon system with a continuous liner, including cutoffs, under all interior surfaces of the cells such that:
 - a. the cutoff shall be keyed into the underlying clay layer a minimum of 1 metre;
 - b. the cutoff shall be filled with a sand-bentonite mixture with a minimum of 5 percent bentonite by weight;
 - c. prior to placement in the trench constructed for the cutoff, the sand and bentonite shall be blended into a consistent mixture;
 - d. prior to placement of the sand-bentonite mixture in the trench, the trench shall be probed with a rod to check that soil from the trench wall has not fallen into the bottom of the trench;
 - e. the cutoff shall be a minimum of 0.75 metre in thickness having a hydraulic conductivity of 1×10^{-7} centimetres per second or less;
 - f. the cutoff shall be covered with a clay cap that shall be at least one metre in thickness and shall

- have a hydraulic conductivity of 1×10^{-7} centimetres per second or less;
 - g. the cutoff and clay cap shall be installed to an elevation of 2.4 metres above the base of the cells;
and
 - h. the underlying clay layer shall be continuous under the entire wastewater treatment lagoon and shall be at least one metre in thickness and have a hydraulic conductivity of 1×10^{-7} centimetres per second or less.
8. Notwithstanding Clause 7 of this Licence, the Licencee may construct a section of the cutoff around an area for future expansion, as indicated in Schedule "B" of this Licence, such that:
- a. the cutoff shall be made of clay;
 - b. the cutoff shall be keyed into the underlying clay layer a minimum of 1 metre;
 - c. the cutoff shall be at least one metre in thickness;
 - d. the cutoff shall have a hydraulic conductivity of 1×10^{-7} centimetres per second or less at all locations; and
 - e. the cutoff shall be constructed to an elevation of 1.05 metres above the floor elevation of cells.
9. The Licencee shall notify the Director before any modifications are made to the dykes and the liner in the area for future expansion, as indicated in Schedule "B" of this Licence.
10. The Licencee shall:
- a. maintain a freeboard level of 1 metre above any liquid in the area between the wastewater treatment lagoon cells and the dykes surrounding the area for future expansion, as indicated in Schedule "B" of this Licence; and
 - b. return all liquid collected in this area, to a secondary cell of the wastewater treatment lagoon.
11. The Licencee shall not discharge effluent from the wastewater treatment lagoon:
- a. where the organic content of the effluent, as indicated by the five day biochemical oxygen demand, is in excess of 30 milligrams per litre;
 - b. where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample;
 - c. where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample; or
 - d. between the 1st day of November of any year and the 15th day of June of the following year, unless prior approval, by the Director, is given.
12. The Licencee shall arrange with the designated Environment Officer a mutually acceptable time and date for any required sampling of the liner between the 15th day of May and the 15th day of October of any year.
13. The Licencee shall take and test samples, in accordance with Schedule "A" attached to this Licence, from the liner of the wastewater treatment lagoon, the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of 50 samples.
14. The Licencee 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 13 of this Licence.
15. The Licencee shall ensure that if, in the opinion of the Director, significant erosion of the interior surfaces of the dykes occurs, rip rap 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.
16. The Licencee shall provide and maintain a grass cover on the dykes of the wastewater treatment lagoon 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 Licencee shall annually remove by mechanical methods all reeds, rushes and trees located above the low water mark in every cell of the wastewater treatment lagoon.
18. The Licencee shall implement an ongoing program to ensure that burrowing animals are removed from the site of the wastewater treatment lagoon.
19. The Licencee shall, prior to the discharge of effluent:
 - a. take samples of the wastewater in the cell which is to be discharged and have the samples analyzed for: biochemical oxygen demand, fecal coliform level and total coliform level, using methods from the latest edition of "Standard Methods for the Examination of Water and Wastewater" or using other methods approved by the Director; and
 - b. provide a copy of the wastewater analysis reports to the Director within 30 days from the date of receipt of the reports.
20. The Licencee shall conduct an annual wastewater flow study by measuring the pumping capacity of each pump at a lift station through which all the wastewater flows, measuring the operating time for each pump and calculating the total annual wastewater flow and the average daily wastewater flow rate. The Licencee shall file a copy of the report including all field measurements with the Director.
21. The Licencee shall submit a plan for two sets of piezometers to monitor groundwater elevations in the area surrounding the wastewater treatment lagoon site and shall obtain the Director's approval for the plan. The plan shall include the number, location and design of the piezometers. One piezometer set must be designed to monitor the groundwater elevations on the west side of the wastewater treatment lagoon site and the other piezometer set must be designed to monitor the groundwater elevations along the south of the lagoon site.
22. The Licencee shall install two sets of piezometers in the area around the wastewater treatment lagoon site and shall carry out the monitoring program in accordance with the plan approved by the Director.
23. The Licencee shall install a continuous tracing cable along the outer wall at the top of the sand-bentonite cutoff prior to placing the clay cap.
24. The Licencee shall ensure that septage is not discharged into the wastewater treatment lagoon between the 15th day of October of any year and the 1st day of June of the following year.
25. The Licencee shall submit the results of the monitoring program to the Director on an annual basis in accordance with the plan approved by the Director.
26. The Licencee shall:
 - a. prepare "as constructed drawings" for the Development and shall label the drawings "As Constructed"; and
 - b. provide to the Director, on or before 1st day of May, 2000, two copies of the "as constructed drawings" of the wastewater treatment lagoon.
27. The Licencee shall:
 - a. submit a plan, on or before April 1, 2000 for a phased sewer maintenance and repair program to the Director for approval; and
 - b. implement the phased sewer maintenance and repair program in accordance with the approval of the Director.

REVIEW AND REVOCATION

- A. This Licence replaces Environment Act Licence No. 1137 which is hereby rescinded.
- B. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is 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.

"original signed by"

Larry Strachan, P. Eng.

Director

Environment Act

Client File No.: 56.30

Schedule "A" to Environment Act Licence No. 2399

Sampling:

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract samples from the liner which is not placed or found at the surface of the lagoon structure. This includes all wastewater treatment lagoons constructed with clay or sand-bentonite cutoffs. The drill rig shall have the capacity to drill to the maximum depth of the cutoff 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 Licencee 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 Licencee as to the testing method that must be used on each sample. The triaxial test shall be used for all samples taken from disturbed and remoulded soils, from non-homogenous or weathered soils. The rigid-wall, compaction-mold permeameter test shall be used on sand-bentonite mixtures.
5. The Licencee shall provide a report on the collection of soil samples to the designated Environment Officer and to the laboratory technician which includes but is not limited to: 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 were 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. Rigid-Wall, Compaction-Mold Permeameter Test Method

- a. The soil samples shall be tested for hydraulic conductivity with a rigid-wall, compaction permeameter using ASTM D 5856. The rigid wall permeameter shall be equipped with a variable pressure loading plate at the top of the rigid wall pressure cell.
- b. Soil specimens shall have a minimum diameter of 70 mm (2.75 inches) and a minimum height of 60 mm (2.36 inches). The soil specimens shall be selected from a section of the sample that contains the most porous material based on a visual inspection. The hydraulic gradient shall not exceed 30 during sample preparation. The specimen shall be fully saturated with water prior to commencing the test. The effective stress used during saturation of the sample shall not exceed 40 kPa (5.7 psi) or the specific stress level, that is expected in the field location were the sample was taken, which ever is greater. The vertical stress, during the test, shall not exceed the stress level, that is expected in the field location were the sample was taken.
- c. Additional bentonite shall not be used to coat the inside of the permeameter.
- d. A complete laboratory report, as outlined in ASTM D 5856, shall be supplied for each soil sample collected in the field.

Schedule "B" to Environment Act Licence No. 2399

See Hard Copy of Licence