

# Environment Act Licence

Manitoba  
Environment



Licence No. 2133

Issue Date October 23, 1995

In accordance with the Manitoba Environment Act (C.C.S.M. c. E125)

THIS LICENCE IS ISSUED TO:

**3215580 MANITOBA LTD.; "the Licencee"**

for the construction and operation of a Development, being a standard 2-cell wastewater treatment lagoon serving the Heartland Colony, as proposed in The Environment Act Proposal dated March 15, 1995, and as shown in Appendix 'A' attached to this Licence, and located in the south-eastern part of Section 3, Township 12, Range 6 EPM in the R.M. of Springfield, with the treated effluent to be discharged into a system of drainage ditches leading to Satans Creek and thence to Cooks Creek, which flows into the Red River, subject to the following specifications, limits, terms and conditions:

## DEFINITIONS

In this Licence:

"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 grade sodium bentonite conforming to American Petroleum Institute Specification 13-A;

"cut-off" means a vertical or slanted trench filled with compacted clay, or a wall constructed from compacted clay;

"Director" means an employee of the department appointed as such by the Minister pursuant to The Environment Act;

"effluent" means treated wastewater flowing or pumped out of the wastewater treatment lagoon 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 5 days at a temperature of 20 °C;

“hazardous waste” means a product, substance or organism that meets the criteria set out in the Classification Criteria for Products, Substances and Organisms Regulation, Manitoba Regulation 282/87, and that is intended for treatment or disposal and includes recyclable material;

“high water mark” means the line on the interior surface of a lagoon cell 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;

“livestock waste” means solid and/or liquid excretions from livestock;

“livestock” means animals or poultry not kept exclusively as pets, excluding bees;

“low water mark” means the line on the interior surface of a lagoon cell which is normally reached when the cell is discharged;

“mg/L” means milligrams per litre;

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

“pest” means any injurious, noxious or troublesome, insect, weed, rodent, fungus, algae, or other plant or animal;

“pesticide” means any chemical or biological agent registered under the Pest Control Products Act of Canada and used or represented as a means for preventing, destroying, mitigating or controlling any pest;

“primary cell” means the first in a series of cells making up a wastewater treatment lagoon system which receives untreated or pretreated wastewater;

“rip rap” means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earthen surfaces against the wave action or current of liquids;

“secondary cell” means a cell of a wastewater treatment lagoon system which receives partially treated wastewater from the primary cell;

“septage” means the sludge produced in individual on-site sewage disposal systems such as septic tanks;

“sewage” means untreated household wastewater that contains human waste;

“sludge” means accumulated solid material containing large amounts of entrained water, which has separated from wastewater;

“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” means liquids containing pollutants, as defined in The Environment Act, which are designated for discharge into the environment; and

“wastewater treatment lagoon” means an impoundment consisting of a series of lagoon cells into which wastewater is discharged for storage and for treatment by natural oxidation.

### GENERAL SPECIFICATIONS

1. Notwithstanding any of the following specifications, 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, handling, treatment, and disposal or emission systems, for such pollutants, ambient quality, aquatic toxicity, seepage characteristics and discharge or emission rates, and for such duration and frequencies as may be specified; and/or
  - (b) determine the environmental impact associated with the release of any pollutants from the Development; and/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.
2. The Licencee shall carry out all preservations and analyses of liquid samples in accordance with the methods prescribed in 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 Pollution Control Federation, or in accordance with equivalent preservation and analytical methodologies approved by the Director.
3. The Licencee shall report all the information requested through the provisions of this Licence in a manner and form acceptable to the Director.

## CONSTRUCTION SPECIFICATIONS

4. The Licencee shall, prior to the construction of the dykes for the new primary and secondary cells, remove all organic topsoil from the area where the dykes will be constructed.
5. The Licencee shall construct and maintain the primary and secondary cells of the Development:
  - (a) with a continuous liner under all interior surfaces of the cells in accordance with the following specifications:
    - (i) the liner shall be constructed of clay;
    - (ii) the liner shall be at least 1.0 metre in thickness;
    - (iii) the liner shall have a hydraulic conductivity of  $1 \times 10^{-7}$  centimetres per second or less;
    - (iv) the liner shall be constructed to an elevation of 2.4 metres above the floor elevation of the primary and secondary cells; and
    - (v) the liner shall be properly sealed around all the influent, transfer and discharge piping to ensure the full integrity of the liner;
  - and;
  - (b) with any cut-off in the dykes of the Development in accordance with the following specifications:
    - (i) the cut-off shall be constructed of clay which has been mechanically compacted;
    - (ii) the cut-off shall be at least 1.0 metre in thickness;
    - (iii) the cut-off shall have a hydraulic conductivity of  $1 \times 10^{-7}$  centimetres per second or less;
    - (iv) the cut-off shall be keyed into the underlying clay liner a minimum of 0.3 metres; and
    - (v) the cut-off shall be constructed to an elevation of 2.4 metres above the floor elevation of the primary and secondary cells.
6. The Licencee shall, before introducing wastewater into each of the constructed cells of the Development, evaluate the hydraulic conductivity of the interior 1.0 metre of soil lining the inner surfaces of the primary and secondary cells in accordance with the requirements of Clause 5 of this Licence.
7. The Licencee shall demonstrate the degree of conformity of the clay liners of all the earthen cells associated with the Development to the hydraulic conductivity criteria specified in Clause 6 of this Licence by:
  - (a) arranging with the designated Environment Officer a mutually acceptable date and time, between the 15th day of May and the 15th day of October of any year, for the required soil sampling specified in Clause 6 of this Licence;
  - (b) taking and testing undisturbed soil samples, in accordance with Schedule 'A' attached to this Licence, from the liner and the cut-offs (if any), with the number and location of samples and the test methods to be specified by the designated Environment Officer up to a maximum of 10 samples for each cell of the Development; and

- (c) submitting the results of the hydraulic conductivity tests to the Director not less than two weeks before each of the constructed primary and secondary cells of the Development receive any wastewater.
8. The Licencee shall ensure that access to the Development is provided by means of an all weather road.
9. The Licencee shall:
- (a) install and maintain a fence around the constructed cells of the wastewater treatment lagoon facility in order to control access, with the fence appropriately distanced from the outside toe of the perimeter dykes or the perimeter ditch so as to facilitate the access of vehicles or machinery for proper maintenance of the dykes and perimeter ditches; and
  - (b) erect and maintain warning signs along the fence indicating the nature of the facility and advising against trespassing, with each side of the new and existing facilities provided with at least one or more such signs separated by no more than 150 metres as measured along the perimeter length of the fence.
10. The Licencee shall notify the Director in writing at least one week in advance of the date on which the constructed Development is to be commissioned into use.
11. The Licencee shall prepare and submit to the Director two sets of 'as constructed drawings', labelled 'As Constructed', of the wastewater treatment lagoon and all appurtenances no later than one month following the completed construction of the Development.

#### **OPERATING LIMITS, TERMS AND CONDITIONS**

12. Upon the date on which the new Development is commissioned into use, and any time thereafter, the Licencee shall direct all sewage, and only that sewage generated at the Heartland Colony, into the primary cell of the Development, unless otherwise approved by the Director.
13. The Licencee shall not discharge the following substances into the Development:
- (a) pesticides;
  - (b) hazardous wastes; and
  - (c) livestock waste.
14. The Licencee shall ensure that the Development is not used as a dumping station for truck hauled sewage and septage from sources other than the Heartland Colony.
15. The Licencee shall operate and maintain the Development in such a manner that:
- (a) 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 (of liquid surface area at 1.5 metres depth) per day; and
  - (b) the depth of liquid does not exceed 1.5 metres in each of the primary and secondary cells.

16. The Licencee shall discharge effluent from the Development into the environment only through the final discharge point, being the end-of-pipe of the "discharge pipe" from the secondary cell of the Development, shown in Appendix 'A' attached to this Licence, unless otherwise re-designated in writing by the Director.
17. The Licencee shall not release effluent from the Development into the environment:
  - (a) during the calendar period extending from the first day of November in any year up to and including the thirty-first day of August in the following year;
  - (b) at a discharge rate which is likely to cause, or contribute to, the flooding of any private or public land downstream of the discharge point; or
  - (c) if the quality of any grab sample taken of the effluent is such that:
    - (i) the organic content of the effluent, as indicated by the five-day biochemical oxygen demand, is greater than 30 milligrams per litre;
    - (ii) the fecal coliform content of the effluent, as indicated by the MPN index, is greater than 200 per 100 millilitres of sample; or
    - (iii) the total coliform content of the effluent, as indicated by the MPN index, is greater than 1500 per 100 millilitres of sample.
18. The Licencee shall not deposit, into the environment, any sludge which may be withdrawn from the Development in the course of its operation, other than to a site already licensed or permitted to accept such material, or to a proposed site approved by the Director.
19. The Licencee shall:
  - (a) construct and maintain a fence around the Development at sufficient distance from the outside toe of the outer dykes to permit the access of dyke maintenance vehicles and machinery; and
  - (b) maintain warning signs along the fence indicating the nature of the facility and advising against trespassing, with each side of the Development provided with at least one or more such signs not separated by no more than 150 metres as measured along the perimeter length of the fence.
20. If in the opinion of the Director, significant erosion of the granular material covering the liner is occurring or has occurred in the course of the operation of the Development, the Licencee shall make such repairs and/or place rip rap on the interior dyke surfaces from 0.6 metres above the high water mark to 0.6 metres below the low water mark to protect the dykes from wave action to the degree satisfactory to the Director.
21. If in the opinion of the Director, the release of nutrients in the effluent from this Development is or may be contributing to the accelerated growth of vegetation in the receiving surface drains or waterways to the extent of adversely impacting the hydraulic efficiencies of any of these surface drains or waterways, the Licencee shall implement such mitigation measures as may be specified by the Director.

22. The Licencee shall, in case of a 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.

#### **REVIEW OR REVOCATION**

23. If in the opinion of the Director the Licencee has failed or is failing to comply with any of the specifications, limits, terms or conditions set out herein, the Director may, temporarily or permanently, revoke this Licence.
24. This Licence may be reviewed at any time if, in the opinion of the Director, any changes made to the proposal and the manner of operation of the Development as stated in the Licencee's Proposal dated March 15, 1995, and the supplementary information dated September 6, 1995 are likely to alter the environmental effects of the Development, or if any information acquired through the provisions of this Licence, or otherwise, gives rise to new evidence to warrant any change(s) to this Licence.



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**Larry Strachan, P. Eng.**  
**Director**  
**Environment Act**

**File: 4027.0**

## SCHEDULE 'A'

### Soil Sampling:

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract soil 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 cutoffs at the interior base of the dyke or with a clay cutoff in the centre of the dyke. The drill rig shall have the capacity to drill to the maximum depth of the clay cutoff plus an additional 2 metres. The drill rig shall be equipped with both standard and hollow stem augers. The minimum hole diameter 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. Soil 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 soil testing method that must be used on each sample. The oedometer method may be used for a sample were 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 and weathered soils.
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 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.

Cont'd . . .



Soil Testing Methods:

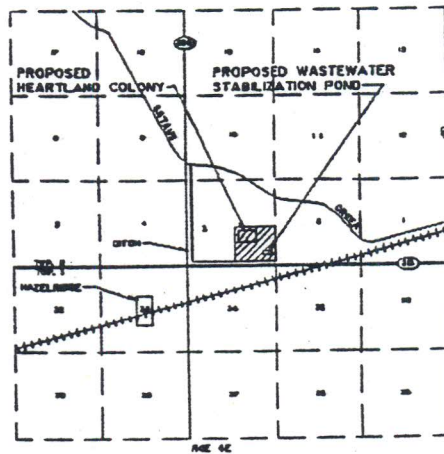
1. Triaxial Test Method

- (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 which 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) The complete laboratory report, as outlined in ASTM D 5084, shall be supplied for each soil sample collected in the field.

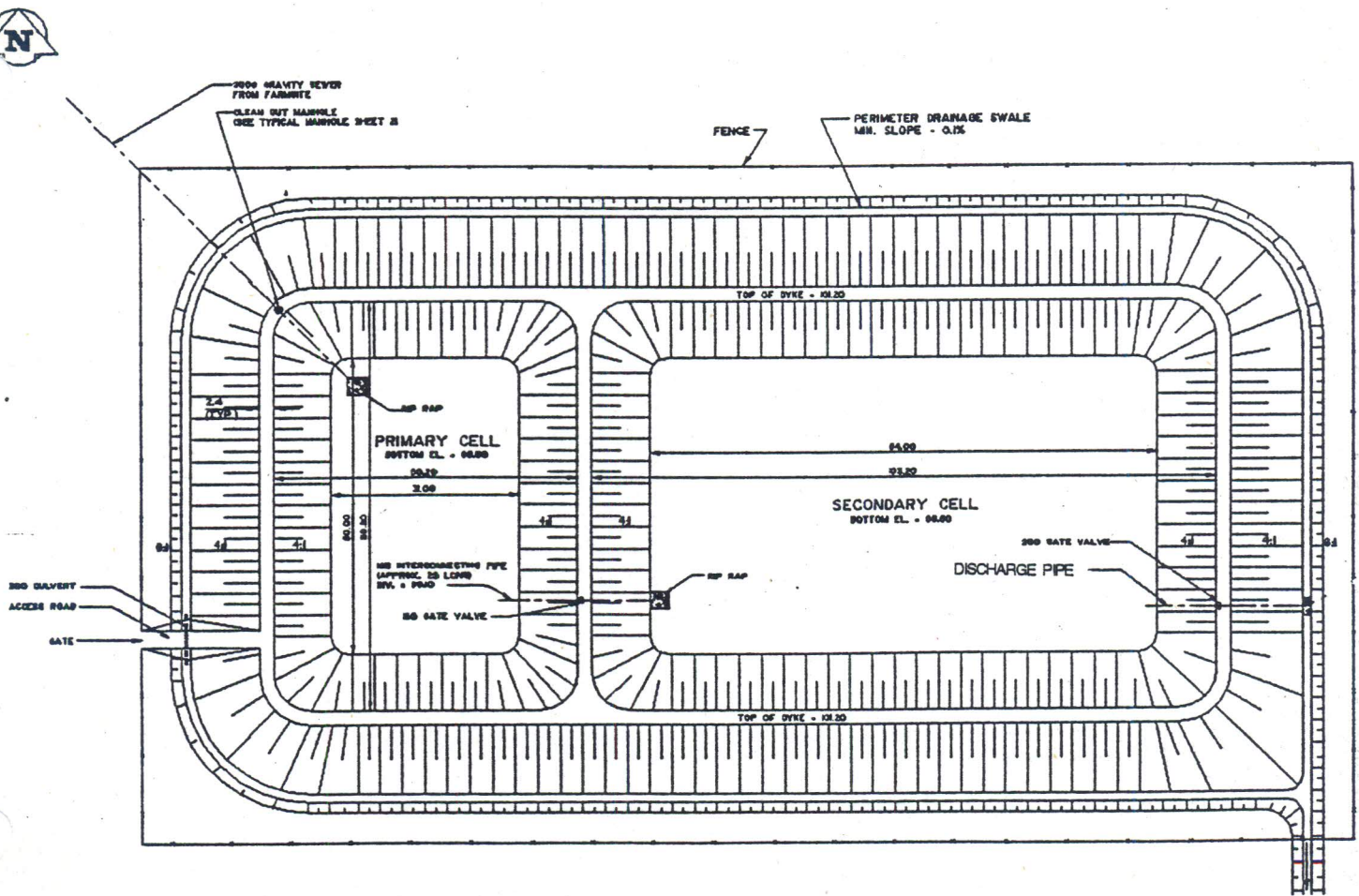
2. Oedometer Test Method

- (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 which 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) The complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.

APPENDIX 'A'



LOCATION PLAN  
 NOT TO SCALE



PLAN