

**Licence No.: 2465**

**Licence Issued: July 13, 2000**

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

**ROLLING ACRES HOLDING CO. LTD.; "the Licencee"**

for the construction and operation of the Development being a wastewater collection system and a wastewater treatment lagoon located on the NW 1/4 35-16-15W and with discharge of treated effluent by irrigation onto land owned by the Licencee within SW 35-16-15W, in accordance with the Proposal filed under The Environment Act on July 6, 1998 and subsequent information provided on September 14, 1999, and March 8, 2000, 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 Conservation to be equivalent to the SCC, or at a laboratory which can demonstrate to Manitoba Conservation 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, or an assigned Environment Officer, 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;

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

**"effluent"** means treated wastewater flowing or pumped out of the wastewater treatment lagoon;

**"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;

**"in-situ"** means on the site;

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

**"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;

**"sewage"** means household wastewater that contains human waste;

**"SAR"** means sodium adsorption ratio;

**"Sodium adsorption ratio"** means the dimensionless value where:

$$\text{SAR} = \frac{0.043 \times \text{Sodium concentration}}{\sqrt{(0.025) \text{ Calcium concentration} + (0.04) \text{ Magnesium concentration}}}$$

**"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 the spent or used water of a community or industry which contains dissolved and suspended matter; and

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

### **GENERAL TERMS AND CONDITIONS**

This Section of the Licence contains requirements intended to provide guidance to the Licencee 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. The Licencee shall direct all wastewater generated within the Rolling Acres Colony farmsite toward the wastewater treatment lagoon or other approved sewage treatment facilities.
2. In addition to any of the following 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, 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.
3. 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" 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.
4. The Licencee shall construct, operate and maintain the wastewater treatment lagoon in such a manner that the release of offensive odours is minimized.
5. 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.
6. The Licencee shall notify the Director of, and receive approval from the Director for, any alteration in the Development as Licenced, prior to proceeding with such alteration.
7. The Licencee shall ensure that, during construction and operation of the Development, spills of fuels or other contaminants are reported to an Environment Officer in accordance with the requirements of *Manitoba Regulation 439/87* respecting *Environmental Accident Reporting*.
8. The Licencee shall, if human remains, or objects believed to be human remains, are exposed during construction, suspend work at that location until the Manager of Archeological Assessment Services, Historic Resources Branch, is contacted and a Branch archeologist has examined the site.

### **SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS**

9. The Licencee shall construct, operate and maintain the wastewater treatment lagoon 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 per day; and
  - b. the depth of liquid in the primary cell or secondary cells does not exceed 1.5 metres.
10. The Licencee shall install and maintain a fence around the wastewater treatment lagoon to control access.
11. The Licencee shall, prior to the construction of the dykes for the wastewater treatment lagoon remove all organic topsoil from the area where the dykes will be constructed.
12. The Licencee shall construct and maintain the wastewater treatment lagoon with a continuous liner 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  $1 \times 10^{-7}$  centimetres per second or less; and

- d. the liner shall be constructed to an elevation of 2.5 metres above the floor elevation of both the primary and the secondary cells.
13. 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 0.6 metres below the low water mark to protect the dykes from wave action.
14. 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.
15. 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.
16. The Licencee shall implement an ongoing program to ensure that burrowing animals are removed from the site of the wastewater treatment lagoon.
17. 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 15th day of October of any year and the 15th day of May of the following year.
18. The Licencee shall ensure that all effluent is disposed of by spray irrigation onto land owned by the Licencee and that:
  - a. effluent is only discharged to irrigate:
    - i. actively growing cereal, forage or oil seed crops; or
    - ii. grasslands which will not be utilized for grazing:
      - A. by dairy cattle for at least 30 days after effluent is applied; or
      - B. by livestock other than dairy cattle for at least 7 days after effluent is applied;
  - b. after agriculture crops are irrigated, harvesting of the crops does not take place for at least 7 days;
  - c. if corn has been grown, it is used solely for making silage;
  - d. for at least 10 continuous hours in every 24-hour period, no effluent is applied to the particular lands;
  - e. if ponding or surface runoff occurs during application, the gross depth of effluent applied during any application of effluent shall be reduced so that ponding or surface runoff does not occur;
  - f. if wind conditions cause the effluent to drift within restricted zones outlined in Clause 20 of this Licence, spray irrigation shall be stopped until the wind conditions subside;
  - g. prior to any discharge of the wastewater treatment lagoon effluent onto designated agricultural land, the liquid to be discharged from the wastewater treatment lagoon system is sampled at the outlet pipe of the secondary cell of the lagoon and the sample is analyzed for the following parameters:
    - i. chloride (soluble);
    - ii. electrical conductivity;
    - iii. sodium adsorption ratio;
    - iv. total nitrogen; and

- v. total phosphorus; and
  - h. if effluent application by spray irrigation is indicated to be resulting in detrimental impact(s) to vegetation and/or nutrient and salinity characteristics of the soils in and around the area being irrigated, the Licencee shall take steps necessary, such as a reduction in salt use, to mitigate such detrimental impact(s).
19. The Licencee shall ensure that:
- a. the chloride (soluble) of the wastewater treatment lagoon effluent discharged onto designated agricultural land does not exceed 150 mg/l;
  - b. the electrical conductivity ( $EC_w$ ) of the wastewater treatment lagoon effluent discharged onto designated agricultural land does not exceed 1500  $\mu$ S/cm; and
  - c. the sodium adsorption ratio of the wastewater treatment lagoon effluent discharged onto designated agricultural land does not exceed 6.
20. The Licencee shall not discharge effluent, by spray irrigation:
- a. within 300 metres of any dwelling not owned or lawfully controlled by the Licencee;
  - b. within 100 metres of any surface watercourse or groundwater well;
  - c. within 100 metres of any property boundary; or
  - d. on land with a surface slope in excess of twelve percent.
21. The Licencee shall ensure that lands which have been irrigated with effluent are not used for the growing of vegetable crops for a period of three years after the effluent was applied to those lands.
22. The Licencee shall, immediately upon becoming aware or being notified that the design capacity of the wastewater treatment lagoon will be exceeded in the foreseeable future, initiate effective efforts to provide increased wastewater treatment capacity for the area serviced by the wastewater treatment lagoon.
23. The Licencee shall ensure that fuel storage and equipment servicing areas established for the construction and operation of the Development are located a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of *Manitoba Regulation 97/88R* respecting *Storage and Handling of Gasoline and Associated Products*.

### **MONITORING AND REPORTING**

24. The Licencee shall prior to each effluent discharge, obtain 3 grab samples of the treated wastewater and have them analyzed for:
- a. the organic content as indicated by the five day biochemical oxygen demand and expressed as milligrams per litre;
  - b. the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample; and
  - c. the total coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample.
25. The Licencee shall:
- a. during each year maintain records of:
    - i. wastewater sample dates;
    - ii. original copies of laboratory analytical results of the sampled wastewater;
    - iii. effluent discharge dates;

- b. make the records being maintained pursuant to sub-Clause 25 (a) of this Licence available to an Environment Officer upon request; and
  - c. keep the maintained records of any one calendar year available for inspection for a period of three years following the respective calendar year in which they were recorded.
26. The Licencee 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.
  27. The Licencee shall take and test undisturbed soil samples, in accordance with Schedule "A" attached to this Licence, from the liner; the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of 20 samples.
  28. The Licencee shall, not less than 2 weeks before the wastewater treatment lagoon is placed in operation, submit to the Director the results of the tests carried out pursuant to Clause 27 of this Licence.
  29. The Licencee shall advise the Director of the commissioning date of the wastewater treatment lagoon.
  30. The Licencee shall, within 3 months of commissioning the wastewater treatment lagoon:
    - a. prepare "as constructed drawings" for the Development and shall label the drawings "As Constructed"; and
    - b. provide to the Director two sets of "as constructed drawings" of the wastewater treatment lagoon.

### **REVIEW AND REVOCATION**

- A. 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.
- B. If the Licencee has not commenced construction of the Development within three years of the date of this Licence, the Licence is revoked.
- 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: 4359.00**

**Schedule A**

**To Environment Act Licence No. 2465**

#### **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 remolded and which is homogeneous and unweathered. The triaxial test shall be used for all samples taken from disturbed and remolded 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.

#### 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.