

# Environment Act Licence

Manitoba  
Environment



Licence No. 1647

Issue Date MARCH 24, 1993

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

THIS LICENCE IS ISSUED TO:

## Town of Swan River: "the Licencee"

for the operation of the Development being the construction of a temporary dewatering cell and the removal of biosolids and sludge solids from a wastewater treatment lagoon located in the east half of Section 27, Township 36, Range 27 WPM and the application of biosolids to agricultural land and the disposal of sludge solids at a waste disposal ground and subject to the following specifications, limits, terms and conditions:

### DEFINITIONS

In this Licence,

"agricultural land" means land used solely for the growing of agricultural crops;

"aquifer" means a water saturated geologic unit that will yield water to wells or springs at a sufficient rate so that the wells or springs can serve as a practical source of water supply;

"biosolids" means accumulated organic solids, resulting from wastewater treatment processes, that have received adequate treatment to permit the material to be recycled;

- "designated Environment Officer" means the Environment Officer assigned responsibility for monitoring compliance with this Licence by the Director;
- "dewatering cell" means a structure used to contain wastewater while the sludge solids separate from the supernatant;
- "Director" means a Director designated under the Environment Act;
- "effluent" means treated wastewater flowing or pumped out of the wastewater treatment lagoon;
- "first order waterway" means drains or watercourses serving a watershed with a drainage area of up to one square mile;
- "flooding" means the flowing of water onto lands, other than waterways, due to the overtopping of a waterway or waterways;
- "livestock" means cattle, swine, horses, poultry and sheep;
- "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;
- "second order waterway" means drains or watercourses serving a watershed with a drainage area greater than one square mile or having a tributary or tributaries of the First Order;
- "secondary cell" means the second cell of the wastewater treatment lagoon system and which is the cell that receives partially treated wastewater from the primary cell;
- "sludge" means accumulated solid material containing large amounts of entrained water, which has separated from wastewater during processing;
- "sludge solids" means solids in sludge;
- "supernatant" means the liquid remaining above the sludge solids after sedimentation;

"surface expression" means the presence of biosolids at or near the ground surface in the furrow created by the injection equipment;

"waste disposal ground" means an area of land designated by a person, municipality, provincial government agency, or crown corporation for the disposal of waste and approved for use in accordance with Manitoba Regulation 98/88R;

"wastewater treatment lagoon" means an impoundment into which wastewater is discharged for storage and treatment by natural oxidation;

"water table" means the upper surface of the zone of saturation of a water bearing geologic unit;

### **GENERAL SPECIFICATIONS**

1. The Licencee shall maintain and operate the temporary dewatering cell in such a manner as to prevent the contamination of groundwater.
2. The Licencee shall, in case of physical or mechanical breakdown of the treatment, handling, transportation and/or injection system for sludge solids and biosolids:
  - (a) notify the Director immediately;
  - (b) identify the repairs required; and
  - (c) complete the repairs in accordance with any written instructions of the Director.

### **DISCHARGE LIMITS, TERMS AND CONDITIONS**

3. The Licencee shall ensure that biosolids are only applied to those lands identified in Appendix "A" to this Licence and that sludge solids are disposed of at a waste disposal ground.
4. The Licencee shall ensure that the cell of the wastewater treatment lagoon from which biosolids are to be removed is isolated from the rest of the wastewater treatment system while the biosolids are being mixed or removed from the cell.
5. The Licencee shall ensure that all containers on vehicles used to transport biosolids and sludge solids are totally enclosed to prevent odour emissions and are constructed and maintained to prevent leakage of biosolids and sludge solids to the satisfaction of the designated Environment Officer.
6. The Licencee shall ensure that all biosolids applied to agricultural land are injected into the soil and that the depth at which the biosolids are introduced into the soil, is a minimum of 15 centimetres below the soil surface or that soil is mounded to a depth of 15 centimetres above the level at which the biosolids were introduced into the soil in such a manner as to cover all of the biosolids.
7. The Licencee shall ensure that, when biosolids are applied to agricultural land:
  - (a) the application rate of biosolids does not exceed 75,000 litres per hectare per applicator pass;
  - (b) the biosolids remain in the furrow opening; and

- (c) the surface expression of the injected biosolids is acceptable to the designated Environment Officer.
8. The Licencee shall ensure that the application rate of biosolids to agricultural land does not exceed 15 tonnes per hectare on a dry weight basis.
  9. The Licencee shall not apply biosolids to frozen soil.
  10. The Licencee shall ensure that biosolids are not applied to land where prior to the intended application:
    - (a) the concentration of sodium bicarbonate extractable phosphorous, as P, exceeds 60 micrograms per gram in the upper 15 centimetres of the soil;
    - (b) the level of nitrate-nitrogen exceeds 67 kilograms per hectare, as  $\text{NO}_3\text{-N}$ , in the upper 15 centimetres of soil;
    - (c) the pH of the soil is less than 6; or
    - (d) the surface slope of the land is greater than 5 percent.
  11. The Licencee shall not permit the application of biosolids to agricultural land:
    - (a) less than 300 metres from any occupied residence (other than the residence occupied by the owner of the land on which the biosolids are to be applied);
    - (b) less than 1 kilometre from a residential area;
    - (c) less than 15 metres from a first order waterway;

- (d) less than 30 metres from a second, or higher, order waterway;  
or
  - (e) on land that is subject to flooding.
12. The Licencee shall ensure that biosolids are not applied on agricultural land:
- (a) with a depth of clay or clay till of less than 1.5 metres between the soil surface and the water table; or
  - (b) within 100 metres of an identifiable boundary of an aquifer which is exposed to the ground surface.
13. The Licencee shall ensure that on all agricultural land onto which biosolids have been applied, one of the following crops is planted at the commencement of the next growing season following such application and only these crops are grown for a period of three years from the date of application of the biosolids:
- (a) a cereal crop;
  - (b) a forage crop; or
  - (c) an oil seed crop.
14. The Licencee shall ensure that livestock are not allowed to graze on agricultural land on which biosolids have been applied, for a period of one year from the date of application of the biosolids.
15. The Licencee shall, after placing the sludge in the temporary dewatering cell, remove all the supernatant from the sludge and return the supernatant to the wastewater treatment lagoon, so that only sludge solids remain.

16. The Licencee shall, within 60 days of removing the supernatant, remove the sludge solids to a waste disposal ground.
17. The Licencee shall cover the sludge solids deposited at the waste disposal ground with soil to a minimum depth of 15 centimetres.

### **CONSTRUCTION SPECIFICATIONS**

18. The Licencee shall ensure that the temporary dewatering cell is constructed with compacted clay berms and is operated in a manner that the sludge and supernatant does not leak out of the cell.
19. The Licencee shall ensure that all temporary works are removed from the wastewater treatment lagoon site and the site is returned to its original state prior to September 1, 1994.

### **MONITORING AND REPORTING SPECIFICATIONS**

20. The Licencee shall develop and carry out a biosolids sampling and analysis program, acceptable to the Director, to determine the volume and the solids content of the biosolids removed on a daily basis and the volume and the solids content of the biosolids applied to each field. The Licencee shall make this information available to the designated Environment Officer on request.
21. The Licencee shall develop and carry out a field monitoring program on the biosolids application operation, which is acceptable to the Director, to determine:
  - (a) the concentration of sodium bicarbonate extractable phosphorous, as P, in the upper 15 centimetres of the soil;

- (b) the nitrate-nitrogen and total nitrogen, as  $\text{NO}_3\text{-N}$ , in the upper 15 centimetres of soil;
  - (c) the pH of the soil;
  - (d) the surface slope of the land;
  - (e) the type and classification of soil to a depth of 1.5 metres;
  - (f) the number of hectares in each field that can receive biosolids in accordance with this Licence; and
  - (g) the number of hectares on which biosolids were applied on a daily basis.
22. The Licencee shall conduct a monitoring, analysis, and recording program which is acceptable to the Director, and in accordance with Appendix "B" to this Licence to determine:
- (a) the composition of the sludge;
  - (b) the background levels of selected soil parameters for each parcel of land; and
  - (c) the crops grown on land on which biosolids have been applied for a period of 3 years after the application of biosolids.
23. The Licencee shall on or before the 31st day of December of each year that the Licence is in effect, submit to the Director a report which will include the following:
- (a) details of the biosolids injection program carried out during the previous 12 month period including:
    - (i) a description of each parcel of land on which the biosolids were distributed;



- (ii) the background levels of soil parameters, listed in Appendix "B" to the Licence, for each parcel of land;
  - (iii) the dry weight of biosolids applied per hectare;
  - (iv) the weight of each heavy metal, in milligrams per kilogram of soil, added to each parcel of land for the metals listed in Appendix "B" to this Licence; and
  - (v) the cumulative weight, in milligrams per kilogram of soil, of each heavy metal for each parcel of land as calculated by adding the amount of each heavy metal applied to the background level of the same metal.
- (b) the amount of nitrogen, phosphorus, and potassium which was applied per hectare for each parcel of land; and
- (c) the results of analysis of the sludge and soil required by Clause 18.
24. The Licencee shall ensure that the cumulative weight of each heavy metal, as calculated by adding the amount of each heavy metal applied to the background level of the same metal, does not exceed the following levels: \*

<u>Metal</u>	<u>Milligrams per Kilogram of Soil</u>
Cadmium	1.6
Copper	50
Nickel	50
Lead	50
Zinc	150
Mercury	0.5
Chromium	120

\* Calculated weight values shall be based on a soil bulk density of 1200 kilograms per cubic metre and a soil depth of 15 centimetres. Analysis for heavy metals must be carried out following strong acid digestion. The reference method of analysis must be that of atomic

absorption spectrometry and the limit of detection for each metal shall be no greater than 10 percent of the appropriate limit value.

25. The Licencee shall ensure that not more than one-third of the maximum addition of each heavy metal is applied in any single application of biosolids.

### TERMINATION

26. This Licence shall terminate on the 1st day of April 1998.

### REVOCATION

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 herein, the Director may revoke, temporarily or permanently, this Licence.



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Larry Strachan, P. Eng.  
Director  
Environment Act

FILE: 3422.00

**APPENDIX "A" TO LICENCE NO. 1647**

The following lands have been identified as part of the proposed development which includes the application of biosolids to agricultural soils:

1. Southeast, southwest, and northwest quarters of Section 17-36-27 WPM in the Rural Municipality of Swan River and
2. South half of Section 26-36-27 WPM in the Rural Municipality of Swan River.

## APPENDIX "B" TO LICENCE NO. 1647

### Sludge & Biosolids

1. A representative sample of the sludge shall be collected from each wastewater treatment lagoon cell from which biosolids will be removed. A representative sample of the sludge shall be a composite of sludge samples taken from a minimum of 5 locations distributed over the surface of the cell.
2. Sludge samples shall be analyzed for the following parameters: \*
  - a) total solids
  - b) nitrate nitrogen
  - c) total kjeldahl nitrogen
  - d) ammonia nitrogen
  - e) total phosphorus
  - f) cadmium
  - g) lead
  - h) mercury
  - i) nickel
  - j) copper
  - k) zinc
  - l) chromium

\* Analysis for heavy metals must be carried out following strong acid digestion. The reference method of analysis must be that of atomic absorption spectrometry and the limit of detection for each metal shall be no greater than 10 percent of the appropriate limit value. The laboratory performing these analysis shall operate an acceptable quality assurance program.

## **Soil**

1. Composite soil samples from each parcel of agricultural land, onto which biosolids will be applied, shall be taken prior to the application of biosolids. Each parcel of land containing 24 hectares or less shall be sampled from a minimum of twelve representative sites. Larger parcels of land shall be sampled from a minimum of one sample site for every two hectares in the parcel. Each sample site shall be sampled from a depth of 0 centimetres to 15 centimetres. The entire core shall be extracted for each sample site and collected in an appropriate container. All samples taken from a parcel of land shall be bulked in one container for thorough mixing, prior to analysis, yielding one composite sample per field.

2. Each soil sample shall be analyzed for the following parameters: \*

- a) pH
- b) nitrate nitrogen
- c) total nitrogen
- d) potassium
- e) sodium bicarbonate extractable phosphorus, as P
- f) cadmium
- g) lead
- h) mercury
- i) nickel
- j) copper
- k) zinc
- l) chromium

\* Analysis for heavy metals must be carried out following strong acid digestion. The reference method of analysis must be that of atomic absorption spectrometry and the limit of detection for each metal shall be no greater than 10 percent of the appropriate limit value. The laboratory performing these analysis shall operate an acceptable quality assurance program.

**Crops**

A list shall be prepared which includes the legal description of each parcel of land, on which biosolids have been applied; the type of crop grown on each parcel for a period of 3 years after the application of biosolids; and the date of application of the biosolids.