Environment Act Licence
Loi sur l'environnement Licence

Manitoba Conservation
Conservation Manitoba

Licence No./Licence nº 2485

Issue Date/Date de délivrance October 18, 2000

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

THE CITY OF BRANDON; "the Licencee"

for the operation of the Development being the treatment of biosolids from the City of Brandon's wastewater treatment plant, the removal of biosolids from the sludge holding cells located in Section 22, Township 10, Range 18WPM, the transportation of biosolids, and the application of the biosolids onto agricultural land in accordance with the Proposal dated May 31, 2000, and the amendments and clarifications made to the Proposal dated July 27, 2000 and September 21, 2000, 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 able to demonstrate, upon request, 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, or otherwise approved by the Director;

"affected area" means a geographical area excluding the property of the Development;

"approved" means approved in writing;

"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 practical sources of water supply;

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

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

"first order waterway" means a drain or watercourse 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;

"NIST" means the National Institute of Standards and Technology;

"odour nuisance" means a continuous or repeated odour, smell or aroma, in an affected area, which is which is offensive, obnoxious, troublesome, annoying, unpleasant, or disagreeable to a person:

(a) residing in the affected area;
(b) working in the affected area; or
(c) present at a location in the affected area which is normally open to the members of the public;

if the odour, smell or aroma

(d) is the subject of at least 5 written complaints received by the Director in a form satisfactory to the Director and within a 90 day period, and from 5 different persons falling within clauses a), b) or c) who do not live in the same household; or
(e) is the subject of at least one written complaint, received by the Director in a form satisfactory to the Director, from a person falling within clauses (a, (b or (c) and the Director is of the opinion that if the odour, smell or aroma had occurred in a more densely populated area there would have been at least 5 written complaints received within a 90 day period from 5 different persons who do not live in the same household;

"plant-available nitrogen" means nitrogen which is readily available to plants by uptake through the roots and is determined by adding 20 percent of the organic nitrogen (as nitrogen), 100 percent of the ammonia (as nitrogen) and 100 percent of the nitrate (as nitrogen);

"reference material" means soil or sludge material which is used as a reference;

"reference value" means the value established by the agency that supplied the reference material;

"second order waterway" means a drain or watercourse servicing a watershed with a drainage area greater than one square mile or having a tributary or tributaries which are first order waterways;

"sludge solids" means gritty matter in sludge;

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

"soils series" means classifications of soils as defined in "Soils of the Brandon Region Study Area, Canada Manitoba Soil Survey 1976" by W. Michalyna, G.P. Podolsky, and Wm. Gardiner;

"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; and

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

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. In addition to 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 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 Licencee 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; and

   (b) ensure that all analytical determinations are undertaken by an accredited laboratory.

3. The Licencee 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.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Respecting the Dredging, Handling and Transportation of Biosolids

4. The Licencee shall ensure that, prior to the removal of the biosolids for application onto land, the biosolids have been retained in isolation for at least one year, or undergone an equivalent digestion process acceptable to the Director.

5. The Licencee shall ensure that any cell of the wastewater treatment lagoon system, from which biosolids are to be removed, is isolated from the rest of the wastewater treatment lagoon system while the biosolids are being mixed or removed from the cell.

6. The Licencee shall ensure that the biosolids are transported in containers capable of preventing the loss of any biosolids, or liquids thereof, to the satisfaction of an Environment Officer.

7. The Licencee shall ensure that:
   (a) any access roads used for hauling biosolids to the biosolids application sites are acceptable to the Rural Municipality wherein the said biosolids application sites are located; and

   (b) upon the completion of each annual biosolids application program, the condition of the utilized access roads is restored by the Licencee to a pre-existing state as surveyed and agreed upon between the Licencee and the relevant Rural Municipality in advance of each year's biosolids application program.

Respecting the Application of Biosolids to Land

8. The Licencee shall ensure that:
   (a) the biosolids are applied only onto agricultural land; and

   (b) commencing on the first day of November, 2000 and continuing thereafter, ensure that on or before March 15th of each year, a public notice is printed in the local newspapers to advise local residents of the location and approximate size of the land areas intended to be used as biosolids application sites in the prevailing calendar year.

9. The Licencee shall ensure that biosolids are not applied onto any land:
   (a) where the soil is frozen;

   (b) 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);

   (c) less than 1 kilometre from a residential area;

   (d) less than 15 metres from a first order waterway;

   (e) less than 30 metres from a second, or higher order waterway;

   (f) less than 50 metres from any groundwater well;

   (g) less than 5 metres from the mapped boundary of a soil series consisting of:
      (i) the Arizona Series; and
      (ii) any other soil series, or combination of soil series and conditions, determined by the Licencee, or by the Director, to be unsuitable for the application of biosolids; or

   (h) that is subject to flooding.

10. The Licencee shall ensure that biosolids are not applied onto any land:
   (a) where the depth of clay or clay till is less than 1.5 metres between the soil surface and the water table;

   (b) within 100 metres of an identifiable boundary of an aquifer which is exposed to the ground surface;

   (c) where, prior to the application of biosolids, the soil pH is less than 6.0;

   (d) where the surface slope of the land is greater than 5 percent;

(e) where, prior to the application of biosolids, the level of nitrate-nitrogen exceeds 100 kilograms per hectare in the upper 60 centimetres of the soil; or

(f) where, prior to the application of biosolids, the concentration of sodium bicarbonate extractable phosphorus, as P, exceeds 60 micrograms per gram in the upper 15 centimetres of the soil.

11. The Licencee shall, each year:
(a) at least 30 days prior to the commencement of any application of biosolids to land, produce scaled site plan drawings of each site intended for the application of biosolids, showing all the applicable features and set back boundaries relevant to the surface and sub-surface criteria specified in Clauses 9 and 10 of this Licence, and indicating the total remaining eligible area (in hectares) available in each intended biosolids application site; and

(b) stake out the determined boundaries of each intended biosolids application site in advance of the application of biosolids, to ensure that the biosolids are applied to the land in conformity with Clauses 9 and 10 of this Licence.

12. The Licencee shall ensure that all biosolids applied to land are:
(a) injected into the soil and that the depth at which the biosolids are introduced into the soil is a minimum of 15 centimeters below the soil surface; or

(b) mounded with soil to a depth of 15 centimeters above the level at which the biosolids were introduced into the soil in such a manner as to cover all of the biosolids.

13. The Licencee shall ensure that:
(a) the biosolids remains in the furrow opening; and

(b) the surface expression of the injected biosolids is acceptable to an Environment Officer.

14. The Licencee shall ensure that:
(a) the application rate of biosolids onto land does not exceed 15 tonnes per hectare, on a dry weight basis; and

(b) the amount of plant-available nitrogen added to the land from all sources does not exceed 100 kilograms per hectare during any year in which biosolids were applied.

15. The Licencee shall ensure that cattle are not allowed to pasture on land on which biosolids have been applied, for a period of three years from the date of application of the biosolids.

16. 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;
(c) an oil seed crop;
(d) field peas; or
(e) lentils.

17. The Licencee shall ensure that the cumulative weight per hectare of each heavy metal in the soil, as calculated by adding the amount of each heavy metal in the biosolids applied to the background level of the same metal, does not exceed the following levels: *

Metal	Kilogram per Hectare
Arsenic	21.6
Cadmium	2.5
Chromium (total)	115.2
Copper	113.4
Lead	126
Mercury	11.9
Nickel	90
Zinc	360

* Calculated 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 in accordance with Schedule 'B' attached to this Licence.

Respecting Air Emissions

18. The Licencee shall not construct, alter or operate the Development, or permit the Development to be constructed, altered or operated, in a way that causes or results in an odour nuisance, and shall take steps as the Director may require to eliminate or to mitigate an odour nuisance.

Respecting Contingency Plans and Emergency Response Plans

19. The Licencee shall:
    (a) within two months of the date of issuance of this Licence, submit to the Director, for approval, a proposed Emergency Response Plan, consistent with the departmental "Industrial Emergency Response Planning Guide (MIAC, September, 1996)" to address such matters as significant spills of biosolids or petroleum fuels; and

    (b) continually maintain the approved Emergency Response Plan in a current status for the duration of the Development.

Respecting Monitoring, Record Keeping and Reporting

20. The Licencee shall:
    (a) develop and annually carry out a biosolids sampling and analysis program, acceptable to the Director, to determine:
        (i) the volume and solids content of the biosolids removed on a daily basis; and
        (ii) the volume and the solids content of biosolids applied to each biosolids application site;

    (b) submit the details of this program to the Director by December 31, 2000; and

    (c) submit to the Director the details of any future revised sampling and analysis program, at least 30 days prior to being implemented.

21. The Licencee shall:
    (a) develop and annually carry out a field monitoring program, acceptable to the Director, on the biosolids application sites used in the prevailing year, to determine:

(i) the levels of the parameters pertinent to "Soil" as listed in Schedule 'A' attached to this Licence;
(ii) the surface slope of the land;
(iii) the presence of clay and clay till to a depth of 1.5 metres;
(iv) the number of hectares in each biosolids application site that can receive biosolids in accordance with the requirements of this Licence; and
(v) the number of hectares on which biosolids were applied on a daily basis;

(b) submit the details of this program to the Director by December 31, 2000; and

(c) submit to the Director the details of any future revised field monitoring program, at least 30 days prior to its intended implemented.

22. The Licencee shall submit to the Director, each year and at least 30 days prior to the commencement of any application of biosolids onto land, one set of scaled site plan drawings produced pursuant to Clause 11 of this Licence for the biosolids application sites intended to be used in that year.

23. The Licencee shall annually conduct a monitoring and analysis program that is acceptable to the Director, and in accordance with Schedules 'A' and 'B' attached to this Licence to determine:
(a) the composition of the biosolids;

(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 during the previous 3-year period.

24. The Licencee shall, on or before the 15th day of March of each year, submit to the Director a report on the biosolids application program carried out during the previous 12-month period, which will include the following:
(a) details of the biosolids injection program including:
(i) a description of each parcel of land on which biosolids were distributed;
(ii) the background levels of soil parameters as listed in Schedule 'A' attached to this 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 Schedule 'A' attached to this Licence; and
(v) the cumulative weight, in kilograms per hectare, 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 added per hectare for each parcel of land;

(c) the results of analysis and determinations made respecting the biosolids and soil as required by Clauses 20, 21, and 23 of this Licence;

(d) a copy of the analytical procedures used and the results of analysis of reference materials in accordance with Schedule 'B' attached to this Licence; and

(e) the type of crops grown on the land on which biosolids were applied during the previous 3 years as of the date of application of the biosolids.

REVIEW AND REVOCATION

A. This Licence is subject to review on or about June 1, 2002.

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 the Licencee has not commenced operation of the Development within one year of the date of this Licence, the Licence is revoked.

D. 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

File: 3144.10

SCHEDULE 'A'

Respecting Biosolids

1. A representative sample of biosolids shall be collected every year from each sludge holding cell from which biosolids will be removed. A representative sample of biosolids shall be a composite of samples of biosolids taken from a minimum of 8 different locations distributed by surface area and depth within the sampled cell.

2. The sample of biosolids shall be analyzed for the following parameters:*

a.	conductivity	j.	lead
b.	pH	k.	mercury
c.	total solids	l.	nickel
d.	volatile solids	m.	potassium
e.	nitrate nitrogen	n.	cadmium
f.	total Kjeldahl nitrogen	o.	copper
g.	ammonia nitrogen	p.	zinc
h.	organic nitrogen	q.	chromium
i.	total phosphorus	r.	arsenic

* Analysis for heavy metals must be carried out in accordance with Schedule 'B' attached to this Licence.

Respecting Soil

3. Composite samples from each field onto which biosolids will be applied shall be taken prior to application of biosolids. Each field of twenty-four hectares or less shall be sampled from a minimum of twelve representative sites or a minimum of one sample site per two hectares for larger fields. Each sample site shall be sampled from 0 to 15 centimetres and from 0 to 60 centimetres. The entire core extracted for each sample shall be collected. All samples from similar depths within a field shall be bulked in one container for thorough mixing prior to analysis yielding two samples per field.

4. Soil samples from 0 centimetres to 15 centimetres shall be analyzed for the following: *

a.	pH	g.	cadmium
b.	potassium	h.	chromium
c.	nickel	i.	copper
d.	mercury	j.	lead
e.	zinc	k.	arsenic
f.	sodium bicarbonate extractable phosphorus, as P		

* Analysis for heavy metals must be carried out in accordance with Schedule 'B' attached to this Licence.

5. Soil samples from 0 to 60 centimetres shall be analyzed for the following:

a.	nitrate nitrogen	b.	total nitrogen

Respecting Crops

6. The type of crop grown on lands on which biosolids have been applied during the previous 3-year period shall be listed along with the legal description of the land and the date of application of biosolids.

SCHEDULE 'B'

The analysis for all metals shall be carried out in accordance with the following requirements:

1. Soil and biosolids samples shall be prepared using non-contaminating grinding and sieving procedures such as agate or porcelain mortar and pestle along with nylon sieves. Soil samples shall be ground to at least 100 mesh size prior to digestion or sample pretreatment.

2. Analysis for heavy metals must be carried out following strong acid digestion.

3. The laboratory performing these analyses shall operate an acceptable quality assurance program including the following:
   (a) Samples of reference material shall be analyzed to monitor the accuracy of the biosolids and soil analyses and each set of ten or less samples of biosolids or soil shall include, a minimum of the following:
      (i) For biosolids samples:
         - one NIST domestic biosolid sample (SRM 2781);

      (ii) For soil samples:
         - one NIST Estuarine Sediment sample (SRM 1646a); or
         - one NIST San Joaquin Soil sample (SRM 2709); or
         - a replacement reference soil sample, acceptable to the Director, with analyte concentrations that reflect values found in the field samples; and

   (b) Field duplicates of samples shall be analyzed based on a frequency of one in each set of ten or less field samples and that the acceptance criteria for duplicate analysis should be within ± 10 percent.

4. A copy of the analytical procedures and the analytical results for the reference materials, and any other controls used in the analysis, shall be submitted with the field sample results.

5. If the analytical results of the reference materials do not meet the following criteria, the soil and/or biosolids samples must be re-analyzed:

Arsenic	± 35 percent from the reference value
Cadmium	± 25 percent from the reference value (for values above 1 µg/g)
Cadmium	± 35 percent from the reference value (for values below 1 µg/g)
Chromium	± 25 percent from the reference value
Copper	± 25 percent from the reference value
Lead	± 25 percent from the reference value
Mercury	± 35 percent from the reference value
Nickel	± 25 percent from the reference value
Zinc	± 25 percent from the reference value