

An aerial photograph of a river valley. In the foreground, a large tree with green leaves stands on a grassy bank. Below it, a river flows through a valley. On the left bank, there is an industrial facility with several large buildings and a parking lot. A bridge crosses the river in the middle ground. On the right bank, there is another industrial area with more buildings and a parking lot. A highway runs along the right side of the river. The background shows a hilly landscape with more trees and a small town.

APPENDIX 11

Supplemental Terrestrial Information

**Environmental Assessment of
Canadian Strategic Infrastructure Funded
Upgrades to the City of Winnipeg
Water Pollution Control Centres**

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Terrestrial Information**

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APPENDIX 11A

Temporary Storage of Biosolids

Environment Act

Licence No. 1089 E RR

Environment Act Licence Loi sur l'environnement Licence

Manitoba
Conservation
Conservation
Manitoba



Licence No./Licence n° 1089 E RR

Issue Date/Date de délivrance February 21, 1989

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

CITY OF WINNIPEG; "the Licencee"

for the operation of the Development being the operation of a sludge dewatering system, a facility for the temporary storage of biosolids in the Rural Municipality of West St. Paul (legal description of land as specified in Appendix "A" attached), the transportation of biosolids, and the disposal of biosolids on agricultural land 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;

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

"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 and sludge, resulting from wastewater treatment processes, that have received adequate treatment to permit the material to be recycled;

"digestion" means the degradation of organic matter brought about through the action of microorganisms in the absence of elemental oxygen and having a minimum mean cell residence time as indicated below for the appropriate operating temperature:

<u>Operating Temperature</u> <u>Degrees Celsius</u>	<u>Mean Cell Residence Time</u> <u>Days</u>
18	22
24	16
30	11
35	8
40	8

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

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

"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;

"fourth order waterway" means a drain or watercourse formed at the point of confluence of at least two third order waterways and may have tributaries of the third order and lower;

"mean cell residence time" means the average time that a given unit of cell mass stays in an anaerobic digester and shall be determined by the following equation:

$$\frac{\text{Volume of the Reactor} \times \text{Cell Concentration}}{\text{Flow Rate} \times \text{Cell Concentration}};$$

"odour nuisance" means a continuous or repeated odour, smell or aroma, in an affected area, 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 in a form satisfactory to the Director and from 5 different persons falling within clauses a), b) or c), and who do not live in the same household, received by the Director within a 90 day period; or
- e) is the subject of at least one written complaint 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 from 5 different persons who do not live in the same household within a 90 day period;

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

"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 Association;

"temporary storage facility" means the facility for the temporary storage of digested and mechanically dewatered sewage sludge (biosolids) located at a site with the legal description as specified in Appendix "A" attached to this Licence, in the Rural Municipality of West St. Paul;

"third order waterway" means a drain or watercourse formed at the point of confluence of at least two second order waterways and may have tributaries of the second order and lower;

"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 150/91; 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 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.

2. The Licencee shall, unless otherwise approved by the Director:
 - a) carry out all preservations and analyses of 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;
 - 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.

3. The Licencee shall, in the case of physical or mechanical breakdown of the sludge treatment system and the biosolids handling and disposal systems that could affect compliance with this Licence:
 - a) notify the Director immediately;
 - b) identify the repairs required; and
 - c) complete the repairs in accordance with the written instructions of the Director.

4. The Licencee shall not cause or permit an odour nuisance to be created as a result of the construction, operation or alteration of the Development, and shall take such steps as the Director may require to eliminate or to mitigate an odour nuisance.

SPECIFICATION, LIMITS, TERMS AND CONDITIONS

5. The Licencee shall operate and maintain the mechanical dewatering equipment to achieve a level of at least 20 percent total solids, by weight after the dewatering process.
6. The Licencee shall only store biosolids at the temporary storage facility in circumstances when agricultural land is not accessible for direct biosolids disposal.
7. The Licencee shall ensure that the biosolids are removed from the temporary storage facility for application to agricultural land as soon as the agricultural land is available.
8. The Licencee shall ensure that any leachate at the temporary storage facility is collected and conveyed back to the treatment plant.
9. With the exception of the use of the temporary storage facility in accordance with Clause 6 of this Licence, the Licencee shall not stockpile sewage sludge or biosolids in the Rural Municipality of West St. Paul, without the prior written approval of the Municipality.
10. The Licencee shall, prior to disposing of biosolids on agricultural land, subject the biosolids to digestion and mechanical dewatering.
11. The Licencee shall ensure that trucks used for the transportation of biosolids are constructed to prevent leakage of leachate and are covered, to the satisfaction of an Environment Officer, to prevent spillage and blow-off of material.
12. The Licencee shall not permit the application of biosolids to land where, prior to such application:
 - a) soil tests show the concentration of sodium bicarbonate extractable phosphorus, as P, exceeds 60 micrograms per gram in the upper 15.0 centimetres;
 - b) soil tests show the level of nitrate-nitrogen exceeds 67 kilograms per hectare in the upper 60 centimetres;
 - c) soil tests show the soil pH to be lower than pH 6.0; and
 - d) the surface slope of the land is greater than 3%.
13. The Licencee shall not permit the deposit of biosolids:
 - a) less than 300 metres from any occupied residence (other than the residences associated with the farms on which biosolids are applied);
 - b) less than 15 metres from a First Order Waterway; and
 - c) less than 30 metres from a Second, Third, or Fourth Order Waterway, and less than 90 metres from any other waterway.

14. The Licencee shall not permit the deposit of biosolids in excess of 56 tonnes per hectare dry weight on any parcel of land except on designated test plots in accordance with the approval of the Technical Advisory Committee, pursuant to Clause 18 of this Licence. Multiple applications of biosolids are permissible provided the total loading limit of 56 tonnes per hectare dry weight is not exceeded.
15. The Licencee shall not permit the application of biosolids to lands subject to flooding.
16. The Licencee shall ensure that biosolids applied to agricultural land are incorporated into the soil as soon as is practicable.
17. The Licencee shall ensure that, on all agricultural lands onto which the biosolids are applied, a crop other than a fruit or vegetable crop is planted at the commencement of the next growing season following such application.
18. The Licencee shall cooperate with a Technical Advisory Committee formed for the purpose of examining and considering research, development, planning and operating data concerning the Development, and to report on the following matters on review of this Licence:
 - a) the appropriateness of the current biosolid spreading rate or other rates in terms of environmental, economic, agronomic, and community considerations;
 - b) the fate of biosolid constituents such as nitrogen, phosphorus, heavy metals and microbiological pathogens in terms of atmospheric losses, crop losses, and losses to surface water runoff;
 - c) aesthetic considerations, especially those of odours from the temporary storage facility and biosolid spreading operations;
 - d) the sampling and testing programs for biosolids, soils, and surface water for nutrients, heavy metals, and microbiological pathogens; and
 - e) the appropriateness of establishing a permit system for each land application of biosolids, which permit system might include soil testing and typing, and the specification of individual biosolid application rates related to soil type, existing nutrients, and proposed crop.

The terms of reference of the Committee shall not be limited to the foregoing. The Committee may also investigate other relevant matters such as alternative uses of biosolids for improvement of saline soils or for fertilization and conditioning of tree plantations.

19. The composition of the Technical Advisory Committee shall be as follows:
 - a) two representatives from Manitoba Conservation (Environment) with one acting as Chairman;
 - b) two representatives from the City of Winnipeg named by the City; and
 - c) a representative from each of Manitoba Health (Environmental Health), Manitoba Conservation (Hydrology), Manitoba Agriculture (Soils and Crops), the University of Manitoba Faculty of Agriculture (Soils and Crops) and the Rural Municipality of West St. Paul.

20. The Licencee shall form and chair a Committee consisting of a representative from the Rural Municipality of West St. Paul, other municipalities in which biosolids are applied and Manitoba Conservation (Environment). This Committee shall address matters relating to Clause 18 c) of this Licence and report to the Technical Advisory Committee.

21. The Licencee shall conduct a monitoring program, in accordance with Appendix "B" to this Licence, to determine:
 - a) the effect of biosolid application on runoff water quality;
 - b) the effect of biosolid application on soil quality; and
 - c) the composition of the biosolids.

22. The Licencee shall, on or before the 31st day of January of each year, submit to the Director, with a copy to the Rural Municipality of West St. Paul and to each Municipality in which biosolids have been disposed of, a report which will include the following:
 - a) details of the biosolids distribution program carried out during the previous calendar year, including a description of the location of the land on which the biosolids were applied and the dry weight of biosolids distributed per hectare;
 - b) details of the biosolids application program proposed to be carried out during the one-year period following the issuance of the report, including a description of the location of the land on which application will be carried out, the proposed dates of application, and the proposed dry weight of biosolids per hectare of agricultural land;
 - c) the results of analysis of biosolids, soil, and surface water runoff, where the biosolids are applied as well as odour complaint investigations concerning biosolids storage and application; and
 - d) a description of any changes in the procedures normally used for the operation of the temporary storage facility.

REVIEW AND REVOCATION

- A. This Licence replaces Licence No. 1089 E R which is hereby rescinded.
- B. This Licence shall be reviewed on or before November 1, 2001.
- C. 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.
- 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

Client File No.: 963.20

CITY OF WINNIPEG
TEMPORARY STORAGE FACILITY
LEGAL DESCRIPTION OF LAND

PARCEL ONE:

All that portion of Lot Seventeen in the Outer Two Miles according to the Dominion Government Survey of the Parish of Saint Paul in Manitoba taken for Boyle (now Oliver) Avenue, as shewn coloured pink on a Plan registered in the Winnipeg Land Titles Office as No. 1665, now closed, excepting thereout, Firstly: all that portion thereof contained within the straight productions of the Northwestern and Southeastern limits of the land taken for the Right-of-Way of a power transmission line as shewn bordered red on a Plan registered in the said Office as No. 8195, Secondly: all that portion taken for a Public Road as shewn bordered pink on a Plan deposited in the said Office as No. 10671, and, Thirdly: all mines and minerals.

PARCEL TWO:

All those portions of Lot One, and Three to Six, both inclusive, and all Lots Seven to Twenty-Three, both inclusive, in Block Two, which Lots are shewn on a Plan of Survey of Part of Lots Sixteen and Seventeen in the Outer Two Miles of said Parish, registered in the said Office as No. 1665, taken for Sludge Drying Beds, as the same is shewn as Parcels Eleven and Twelve and outlined in pink on a Plan filed in the said Office as No. 9777, excepting out of said Parcel Eleven all that portion taken for the said Public Road on said Plan 10671.

PARCEL THREE:

All those portions of Lots Nine to Seventeen, both inclusive, and of Lot lettered "D" in the Outer Two Miles of said Parish, taken for said Sludge Drying Beds, as the same is shewn as Parcels One, Two, Four, Five, Six, Eight and Ten on said Plan No. 9777, excepting out of said Parcels Eight and Ten all those portions taken for said Public Road on said Plan No. 10671.

PARCEL FOUR:

All that portion of the Government Road Allowance South of and adjacent to said Lot Twelve and said Lot lettered "D", now closed, taken for said Sludge Drying Beds as the same is shewn as Parcels Three and Nine on the said Plan No. 9777, excepting out of said Parcel Nine all that portion taken for said Public Road on said Plan 10671.

PARCEL FIVE:

All that portion of Lot Seventeen in the Outer Two Miles of said Parish taken for said Sludge Drying Beds as the same is shewn as Parcel Seven on said Plan No. 9777.

CITY OF WINNIPEG
TEMPORARY STORAGE FACILITY AND BIOSOLID SPREADING
MONITORING PROGRAM

- SLUDGE:
1. A composite sample of biosolids deposited on land shall be collected biweekly.
 2. The sample of biosolids shall be analyzed for the following:
 - a. percent moisture;
 - b. ammonia nitrogen;
 - c. total Kjeldahl nitrogen;
 - d. total phosphorus;
 - e. conductivity;
 - f. cadmium;
 - g. copper;
 - h. chromium;
 - i. nickel;
 - j. lead;
 - k. zinc; and
 - l. pH.
- SOIL:
3. Composite samples from each field, that will receive biosolids, shall be taken prior to sludge application. 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 centimetres to 15.0 centimetres. The entire core extracted for each sample shall be collected. All samples within a field shall be bulked in one container for thorough mixing prior to analysis yielding one sample per field.
 4. Each soil sample shall be analyzed for the following:
 - a. percent moisture;
 - b. nitrate-nitrogen;
 - c. copper;
 - d. lead;
 - e. zinc;
 - f. pH;
 - g. cadmium;
 - h. nickel;
 - i. chromium;
 - j. conductivity;
 - k. sodium carbonate extractable phosphorus; and
 - l. cation exchange capacity.
- CROP:
5. Any voluntary sampling, as conducted by the Licencee, of crops grown on land on which biosolids were applied shall include analysis of the grain portion of the crop for the six metals previously mentioned. The stems and leaves should be analyzed periodically for nitrate-nitrogen if this material is being used for animal feed.

- RUNOFF: 6. Ditch water samples shall be collected upstream and downstream of the fields on which biosolids were applied. At least two locations upstream in the main collector ditches shall be so sampled. The sampling shall be initiated at the first sign of snow-melt and carried out frequently until the runoff period is over.
7. Collected ditch water samples shall be analyzed for the following:
- | | |
|-----------------------------|-----------------------------|
| a. total coliform bacteria; | b. fecal coliform bacteria; |
| c. ammonia; | d. total Kjeldahl nitrogen; |
| e. nitrate-nitrogen; | f. total phosphorus; and |
| g. conductivity. | |