



Environment, Climate and Parks
Environmental Approvals Branch
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File No.: 5951.00

June 15, 2022

Chris Carroll, P.Eng., MBA
Manager of Wastewater Services Division
City of Winnipeg
110-1199 Pacific Avenue
Winnipeg MB R3E 3S8
ccarroll@winnipeg.ca

Dear Chris Carroll:

Re: Environment Act Licence No. 3377

Thank you for your proposal. The Environment Act licensing process is intended to promote a healthy environment, society, and economy for now and tomorrow.

Enclosed Licence No. 3377 is issued to the City of Winnipeg. The licence is for annual land application of the city's biosolids materials onto agricultural lands.

The City of Winnipeg must operate the development according to all licence requirements as well as all applicable federal, provincial and municipal regulations and by-laws.

The licence holder must submit a notice of alteration to the director for approval prior to altering the development as licensed.

Anyone affected by the issuance of this licence may appeal this decision to the Minister of Environment, Climate and Parks. If you wish to appeal, please send your reasons, in writing, to the Minister's attention by July 15, 2022.

If you have any questions regarding this approval, please contact Nada Suresh, Regional Supervisor, Environmental Compliance and Enforcement Branch at Nada.Suresh@gov.mb.ca or 204-945-8214.

Sincerely,

Original Sigend by
James Capotosto
Director

Enclosure

- c. Darren Keam, M.Sc., P.Ag. - WSP Canada
Matthew Klowak - City of Winnipeg
Kristal Harman, Yvonne Hawryliuk, Nada Suresh - Environmental Compliance and Enforcement
Siobhan Burland Ross, Robert Boswick - Environmental Approvals
Public Registry

LICENCE

Client File No. 5951.00

Licence No. / Licence n°: 3377
Issue Date / Date de délivrance : June 15, 2022

In accordance with The Environment Act (C.C.S.M. c. E125)
Conformément à la Loi sur l'environnement (C.P.L.M. c. E125)

Pursuant to Section 11(1) / Conformément au Paragraphe 11(1)

THIS LICENCE IS ISSUED TO: / CETTE LICENCE EST DONNÉE À:

CITY OF WINNIPEG: "the Licensee"

for the operation of the development being the withdrawal of dewatered biosolids that has undergone digestion from the City of Winnipeg North End Water Pollution Control Centre located at 2230 Main Street in the City of Winnipeg, establishment and operation of temporary field storage facilities for dewatered biosolids, transfer of the dewatered biosolids to the temporary field storage facilities, and application of the dewatered biosolids to agricultural land in accordance with the Proposal filed under The Environment Act on February 2, 2018, and subsequent information provided in a letter dated May 11, 2018 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 Environment, Climate and Parks to be equivalent to the SCC, or at a laboratory which can demonstrate to Environment, Climate and Parks that it has the quality assurance/quality control (QA/QC) procedures in place equivalent to accreditation based on the international standard ISO/IEC 17025, or otherwise approved by the director;

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

"approved" means approved by the director, or an assigned environment officer, 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, resulting from wastewater treatment processes, that have received adequate treatment to permit the material to be recycled;

"dewatered" means having had a portion of the water present in a material extracted;

"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 temperature;

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

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

"environment officer" 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;

"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;

"leachate" means liquid that has percolated through waste or other permeable matter, and contains soluble, dissolved or suspended materials derived from the waste or other permeable matter;

"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:

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

"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 an affected area;
- (b) working in an affected area; or
- (c) present at a location in an affected area which is normally open to 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, 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);

"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;

"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;

"storm water" means surface water from rain, snow, or ice melting and running off from the surface of a drainage area;

"temporary field storage facility" means an engineered facility used for the temporary storage of biosolids and/or related handling equipment;

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

"waste management facility" means a landfill, a composting facility, a transfer station, a material recovery facility or a remote seasonal waste facility;

"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 the Waste Management Facility Regulation, or any future amendments thereto, or a licence pursuant to The Environment Act; 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 licensee 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.

Retain Copy of Licence

1. The Licensee shall at all times maintain a copy of this licence at the development or at the premises from the development's operations are managed.

Future Sampling

2. In addition to any of the limits, terms and conditions specified in this licence, the Licensee 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;
 - c) conduct specific investigations in response to the data gathered during environmental monitoring programs; or
 - d) 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 Licensee 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;
 - b) carry out all sampling of, and preservation and analyses on, soil, compost, and air samples in accordance with methodologies approved by the director;
 - c) have all analytical determinations undertaken by an accredited laboratory; and
 - d) 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.

Reporting Format

4. The Licensee shall submit all information required to be provided to the director or environment officer under this licence, in writing, in such form (including number of copies), and of such content as may be required by the director or environment officer, and each submission shall be clearly labelled with the Licence Number and Client File Number associated with this licence.

Equipment Breakdown or Process Upset

5. The Licensee shall, in the case of physical or mechanical equipment breakdown or process upset where such breakdown or process upset results or may result in the release of a pollutant in an amount or concentration, or at a level or rate of release, that causes or may cause a significant adverse effect, immediately report the event by calling 204-944-4888 (toll-free 1-855-944-4888). The report shall indicate the nature of the event, the time and estimated duration of the event and the reason for the event.
6. The Licensee shall, following the reporting of an event pursuant to Clause 5:
 - a) identify the repairs required to the mechanical equipment;
 - b) undertake all repairs to minimize unauthorized discharges of a pollutant;
 - c) complete the repairs in accordance with any written instructions of the director; and
 - d) submit a report to the director about the causes of breakdown and measures taken, within one week of the repairs being done.
7. The Licensee shall, during construction and operation of the development, report spills of fuels or other contaminants to an environment officer in accordance with the requirements of Manitoba Regulation respecting Environmental Accident Reporting or any future amendment thereof.

Respecting Nutrient Management

8. The Licensee shall, during all biosolids land application activities, comply with the requirements of the Manitoba Water Protection Act, Nutrient Management Regulation, and Surface Water Quality Standards, Objectives and Guidelines Regulation and the Manitoba Water Resources Administration Act and Designated Flood Area Regulation or any future amendments thereof.

Respecting Odour Nuisance

9. The Licensee shall:
 - a) 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 mitigate an odour nuisance; and
 - b) prepare and maintain an odour management plan, including complaint handling, and implement the plan in a manner acceptable to the environment officer.

Respecting Emerging Substances of Concern

10. The Licensee shall regularly monitor academic literature relative to emerging substances of concern relative to wastewater treatment and biosolids management activities associated with this licence and provide reports of such monitoring to the advisory committee described in Clauses 47 and 48 of this licence.

Environmental Coordinator

11. The Licensee shall designate an employee, within 60 days of the date of issuance of this licence, as the Licensee's environmental coordinator, whose job description will include assisting the Licensee in complying with the limits, terms and conditions in this licence and assisting senior management of the Licensee to manage environmental issues at the development. The name of the environmental coordinator shall be submitted in writing to the director within 14 days of appointment and any subsequent appointment.

Future Studies

12. The Licensee shall actively participate in any future watershed-based management study, plan or nutrient reduction program, approved by the director, for the Red River and associated waterways and watersheds.

SPECIFICATIONS. LIMITS. TERMS AND CONDITIONS

Respecting Operations – General

13. The Licensee shall subject the biosolids to digestion and mechanical dewatering prior to storing biosolids at a temporary storage facility or disposing biosolids on agricultural land.
14. The Licensee shall operate and maintain the mechanical dewatering equipment for digested and dewatered biosolids to achieve a level of at least 20 percent total solids, by weight after the dewatering process.
15. The Licensee shall submit to the director, prior to any temporary field storage or land application of biosolids, certificates of title and land ownership agreements for each parcel of land on which biosolids are to be temporarily stored and on which biosolids are to be applied.
16. The Licensee shall notify the environment officer not less than ten days prior to the commencement of removal, transportation and land incorporation of biosolids. The notification shall include the intended starting date of the activities and the name of the contractor responsible for the activities.
17. The Licensee shall, during removal, transportation, temporary storage, and application of biosolids to land, operate, maintain and store all materials and equipment in a manner that prevents any deleterious substances (fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete and concrete wash water, etc.) from leaving work locations or entering adjacent watercourses.
18. The Licensee shall locate all fuel storage and equipment servicing areas established for the construction and operation of the Development a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of Manitoba Regulation respecting Storage and Handling of Petroleum Products and Allied Products or any future amendment thereof.

Respecting Operations – Withdrawal, Handling, and Transportation of Biosolids

19. The Licensee shall transport biosolids in containers in such a manner to prevent loss of biosolids and associated liquids to the satisfaction of an environment officer.
20. The Licensee shall:
 - a) only use access roads for hauling biosolids to the biosolids temporary storage site(s) and land application site(s) that are acceptable to the municipality wherein temporary biosolids storage site(s) and application site(s) are located; and
 - b) upon the completion of each annual biosolids temporary storage and application program, restore the condition of the utilized access roads as agreed upon between the Licensee and the municipality in advance of each year's biosolids application program.

Respecting Operations – Temporary Field Storage and Land Application of Biosolids

21. The Licensee shall only store biosolids at a temporary field storage facility in circumstances when agricultural land is not readily accessible or available for continuous biosolids land application.
22. The Licensee shall not remove biosolids from temporary biosolids storage facilities except for transport to and application on land parcels identified as qualifying to receive the biosolids, unless otherwise approved by the director.
23. The Licensee shall limit access to temporary field storage facilities to persons specifically participating in associated activities and limit general public access to such sites to the satisfaction of the environment officer.
24. The Licensee shall control and manage surface water resulting from precipitation at temporary field storage facilities during periods of biosolids storage to the satisfaction of the environment officer.
25. The Licensee shall establish, operate, and maintain temporary field storage facilities in such manner to control vector attraction and activity at such sites to the satisfaction of the environment officer.
26. The Licensee shall maintain temporary field storage facilities in such manner as to not create potential threats to the environment, public health, or wildlife to the satisfaction of the environment officer.
27. The Licensee shall collect any leachate produced and/or storm water collected at the temporary field storage facilities for conveyance to a City of Winnipeg wastewater treatment plant licensed under The Environment Act for treatment or for alternative use(s) or treatment approved by the director.
28. The Licensee shall dispose of non-reusable construction debris from the development:
 - a) at a waste disposal ground operating under the terms of a permit issued pursuant to the Waste Management Facilities Regulation, or any future amendment thereof, or a licence issued pursuant to The Environment Act; or
 - b) at a temporary storage facility(s) or by other alternative method satisfactory to the environment officer.

29. The Licensee shall recycle all materials used in the construction and operation of any temporary field storage facility as may be agreeable to the environment officer.
30. The Licensee shall:
 - a) only apply biosolids onto agricultural land or other licensed facilities approved by the director; and
 - b) at least two months prior to each intended temporary field storage and application of biosolids to land events, provide a public notice to advise local residents of the location and approximate size of the land areas intended to be used as biosolids temporary storage and land application sites in the prevailing calendar year, to the satisfaction of the environment officer.
31. The Licensee shall apply biosolids to the identified agricultural land by incorporating it into the soil a minimum of 15 centimetres below the soil surface within 48 hours of application, or as otherwise approved by the environment officer.
32. The Licensee shall apply biosolids such that the amounts of residual nitrate-nitrogen in the 0-24 inch soil depth and Olsen-P phosphorus in the 0-6 inch soil depth do not exceed the limits of the most limiting Nutrient Management Zone, regardless of size, set forth in the Nutrient Management Regulation under The Water Protection Act or any future amendment thereof.
33. The Licensee shall not permit the temporary storage or land application of biosolids:
 - a) between November 10th of any year and April 10th of the following year, unless otherwise authorized in writing by the director;
 - b) to frozen soil;
 - c) less than 75 metres from any occupied residence (other than the residence occupied by the owner of the land on which the biosolids are to be applied);
 - d) less than 400 metres from a residential area;
 - e) less than 8 metres from a major wetland, bog, marsh or swamp;
 - f) less than 15 metres from a first order waterway;
 - g) less than 30 metres from a second, third or fourth order waterway and less than 90 metres from any other waterway;
 - h) less than 50 metres from any groundwater well; or
 - i) on land that is subject to flooding.
34. The Licensee shall not temporarily store or apply biosolids on land:
 - a) with a depth of clay or clay till of 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; or
 - c) where the surface slope of the land is greater than 5 percent.
35. The Licensee shall not apply biosolids on land:
 - a) where, prior to the application of biosolids, the soil pH is less than 6.0; or
 - b) where, prior to the application of biosolids, the concentration of sodium bicarbonate extractable phosphorous, as P, exceeds 60 micrograms per gram in the upper 15 centimetres of the soil.

36. The Licensee shall, each year:
- a) at least 30 days prior to the commencement of any application of biosolids to land, produce scaled site plans 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 33, 34, and 35 of this licence, and indicating the total remaining eligible area (in hectares) available in each intended biosolids application site; and
 - b) employ geographic information system mapping technology or physically mark 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 33, 34, and 35 of this licence.
37. The Licensee shall not allow cattle to pasture on land on which biosolids have been applied, for a period of three years from the date of application of the biosolids.
38. The Licensee shall, on all agricultural land onto which biosolids have been applied, plant one of the following crops at the commencement of the next growing season following such application and for a period of three years from the date of application of biosolids:
- a) a cereal crop;
 - b) a forage crop;
 - c) an oil seed crop;
 - d) field peas; or
 - e) lentils.
- For application on land not owned by the Licensee, this requirement shall be included in any agreement between the Licensee and the landowner.
39. The Licensee shall apply biosolids onto agricultural land such 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: *

<u>Metal</u>	<u>Kilogram per Hectare</u>
Arsenic	21.6
Cadmium	2.5
Chromium (total)	115.2
Copper	113.4
Lead	126
Mercury	11.9
Nickel	90.0
Zinc	360.0

* 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” of this licence.

MONITORING AND REPORTING SPECIFICATIONS

40. The Licensee shall submit to the director, at least two weeks prior to commencing with the biosolids land application activities, the details of the biosolids sampling and analysis program used to determine if phosphorus-based or nitrogen-based sludge application limits are most appropriate and for determining field-specific application rates for the lands on which the biosolids are to be applied.
41. The Licensee shall submit to the director, not later than on or before the 15th day of March in the year following biosolids land applications, the details of the biosolids sampling and analysis programs used to determine the volumes and solids contents of the biosolids removed on a daily basis and the volume and the solids contents of biosolids applied to each field.
42. The Licensee shall conduct a monitoring and analysis program that is acceptable to the director, and in accordance with Schedules “A” and “B” of this licence to determine:
 - a) the composition of the biosolids;
 - b) the background levels of selected soil parameters for each parcel of land;
 - c) the surface slope of each parcel of land;
 - d) the presence of clay or clay till to a depth of 1.5 metres for each parcel of land;
 - e) whether metals-based, phosphorus-based, or nitrogen-based application limits are most appropriate for field-specific application rates for the lands on which the biosolids are to be applied; and
 - f) the crops grown on land on which biosolids have been applied during the previous 3-year period.
43. The Licensee shall, on or before the 15th day of March of each year that this licence is in effect, submit to the director a report, which will include the following:
 - a) details of the biosolids land application programs carried out during the previous 12 month period 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" of 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" of 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 of the biosolids and soil required by this licence;
 - d) a copy of the analytical procedures used and the results of analysis of reference materials in accordance with Schedule “B” of this licence;
 - e) the type of crops grown on land on which biosolids were applied during the previous 3-year period; and
 - f) details of any decommissioning of temporary biosolids storage facilities in accordance with Clause 50 of this licence.

44. The Licensee shall undertake annual post harvest soil testing of each field for Nitrate-N (0 – 24”) and phosphorus using the Olsen-P test (0 – 6”) for 3 years following biosolids application. Additionally, the Licensee shall supply information from the producer regarding the amounts of nutrients from other sources (fertilizer, manure, etc) being added to the field. Such soil test, fertilization, and cropping information shall be submitted to Environment, Climate and Parks on or before the 15th day of March of each year following a year when application of biosolids occurred.

Respecting Contingency Plans and Emergency Response Plans

45. The Licensee shall prepare, within 90 days of the date of issuance of this licence, and maintain an emergency response contingency plan in accordance with the Canadian Centre for Occupational Health and Safety “Emergency Response Planning Guide” or other emergency planning guidelines acceptable to the director.

Respecting Modifications to Related Processes

46. The Licensee shall, prior to implementation of modifications to associated wastewater treatment and biosolids management processes relevant to this licence, submit to the director for approval under Section 14 of The Environment Act the details of such modifications and their impact on biosolids quantity and quality and any subsequent impact to the land application process.

Respecting a Dedicated Advisory Committee

47. The Licensee shall, within six months of the date of this licence, establish an advisory committee formed for the purposes of:
- a) addressing and responding to public perception issues or concerns deemed by the director to be potentially significant or likely to challenge the environment and/or public health; and
 - b) advising on functional and technical aspects of the development.
48. The Licensee shall chair the advisory committee which shall be comprised of city staff, representatives of each host municipality specified by each host municipality and at least one Medical Officer of Health representative of Manitoba Health and a representative of related provincial departments such as Environment, Climate and Parks; Agriculture; or other relevant authority or department.

Respecting Decommissioning of Temporary Biosolids Storage Facilities

49. The Licensee shall, within one year of the date of this licence, submit to the director for review and approval a decommissioning or alternate use plan for the temporary biosolids storage facility located in the Rural Municipality of West St. Paul that is the subject of Environment Act Licence No.1089 E RR.
50. The Licensee shall decommission each temporary biosolids storage facility developed for biosolids land application activities under this licence to the satisfaction of the environment officer.

REVIEW AND REVOCATION

- A. Environment Act Licence No. 1089 E RR is hereby rescinded.
- B. If, in the opinion of the director, the Licensee 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, 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
James Capotosto
Director

SCHEDULE "A" TO ENVIRONMENT ACT LICENCE NO. 3377

Biosolids

At least once every two weeks, a representative sample of biosolids shall be collected from the Licensee's treatment facility. A representative sample of biosolids shall be a composite of biosolids samples taken over an 8-hour period from biosolids that will be removed from the Licensee's treatment facility for application to agricultural land in that year.

1. 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" of this licence.

Soil

1. 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.

2. 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" of this licence.

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

- | | |
|---------------------|-------------------|
| a. nitrate nitrogen | b. total nitrogen |
|---------------------|-------------------|

Crops

1. 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" TO ENVIRONMENT ACT LICENCE NO. 3377

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

1. The laboratory performing these analyses shall:
 - a) possess and maintain accreditation with the Canadian Association for Laboratories Accreditation Inc. (CALA);
 - b) operate a quality assurance program acceptable to the assigned environment officer;
 - c) monitor the accuracy of the biosolids and soil analyses for each set of ten or less samples of biosolids or soil through the use of a suitable reference material acceptable to the assigned environment officer; and
 - d) analyze field duplicates of samples 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.
2. A copy of the analytical procedures and the analytical results for associated reference materials used in the laboratory, and any other controls used in the analysis, shall be submitted with the field sample results.
3. If the analytical results of any associated 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 $\mu\text{g/g}$)
- Cadmium	± 35 percent from the reference value (for values below 1 $\mu\text{g/g}$)
- 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