



**Conservation**

Environmental Stewardship Division  
Environmental Assessment and Licensing Branch  
123 Main Street, Suite 160, Winnipeg, Manitoba R3C 1A5  
T 204 945-7100 F 204 945-5229  
[www.gov.mb.ca/conservation/envapprovals](http://www.gov.mb.ca/conservation/envapprovals)

August 29, 2008  
Files: 102.50 & 4307.10

Ian Christiansen, P.Eng.  
Director of Engineering Services and Water Resources  
Development Services Division  
Department of Engineering  
City of Brandon  
410 – 9<sup>th</sup> Street  
Brandon, Manitoba R7A 6A2

Dear Mr. Christiansen:

**Re: Request for Alteration to City of Brandon's Sludge Management Program at the Industrial and Municipal Wastewater Treatment Facilities**

I am responding to your April 8, 2008 letter and associated April 2008 Notice of Alteration (NoA), titled "Request for Alteration to the City of Brandon's Sludge Management Program at the Industrial and Municipal Wastewater Treatment Facilities" and prepared by Earth Tech (Canada) Inc. as well as the supplementary April 23, 2008 addendum to the April 2008 NoA. The alterations are associated with City of Brandon's wastewater treatment activities including the following:

- wastewater collection and conveyance systems, wastewater treatment plant and wastewater treatment lagoon system and associated components comprising the municipal wastewater treatment facility (MWWTF) – Environment Act Licence No. 2351 S2 R;
- treatment, removal, transportation and application onto agricultural land of biosolids from the City of Brandon's wastewater treatment plant – Environment Act Licence No. 2485;
- treatment of sanitary and pre-treated process wastewater at the City of Brandon's industrial wastewater treatment facility (IWWTF) – Environment Act Licence No. 2747; and
- withdrawal and disposal of biosolids from the anaerobic basin of the City of Brandon's industrial wastewater treatment facility – Environment Act Licence No. 2506.

The letter and NoA indicate that the City of Brandon wishes to expand its sludge holding capability within the confines of the existing lagoon system of the MWWTF to:

- accommodate biosolids generated from the IWWTF and the MWWTF;

- ensure sufficient stabilization for all biosolids generated by the IWWTF and the MWWTF; and
- provide storage for the biosolids generated as part of a future Centralized Wastewater Treatment Facility (CWWTF).

You indicate that these alterations are considered to be an integral part of associated plans for the CWWTF originally presented to Manitoba Conservation.

The letter, NoA, and the addendum to the NoA indicate that the following alterations and activities are proposed:

1. Construction of two new sludge storage cells within the existing Cell No. 3 of the wastewater treatment lagoon system.
2. Installation of a new forcemain to convey waste activated sludge (WAS) from the IWWTF to an existing WAS pipe that conveys WAS from the MWWTF to the sludge storage cells of the wastewater treatment lagoon system;
3. Installation of a new pipeline to convey supernatant from the sludge storage cells to the IWWTF aeration basin;
4. Incorporating metal salt dosing to WAS at the IWWTF and MWWTF;
5. Incorporating metal salt dosing to the liquid stream at the MWWTF;
6. Incorporating a new emulsion type polymer system for periodic dosing of polymer into WAS at the MWWTF;
7. Relocating the septage receiving facility from Cell No. 3A to the MWWTF, with solids from the septage being transferred to the Eastview Landfill and liquids discharging to the MWWTF headworks for treatment; and
8. Removing approximately 40,000 tonnes of clay type soil from the area in which the two new sludge storage cells within Cell No. 3 will be constructed and transferring the soil to an adjacent area in the northwest corner of Cell No. 3.

Upon review of the April 8, 2008 letter, the associated April 2008 NoA, and the supplementary April 23, 2008 addendum to the April 2008 NoA, we are satisfied that the identified changes in the environmental effects as would result from the proposed alterations will be insignificant. Therefore, pursuant to Section 14(2) of The Environment Act, I hereby approve the implementation of the proposed alterations as minor alterations. In accordance with Section 14(2) of The Environment Act, authorization is hereby given to implement the proposed alterations as described in the April 8, 2008 letter and associated April 2008 NoA. The required revisions to Environment Act Licence Nos. 2351 S2 R and 2747 have been made. Other adjustments to these licences, such as adding clauses relating to ultraviolet disinfection to the licence associated with the MWWTF, were also made. Environment Act Licence Nos. 2351 S2 RR and 2747 R are attached.

I wish to emphasize, however, that the anticipated alterations associated with establishing the future proposed CWWTF will be regarded as major alterations requiring the submission of an Environment Act Proposal. Note also that there is some risk associated with assuming that the current and proposed sludge management practices will not be impacted by review of that EAP.

If you have any questions, please contact Robert Boswick, Environmental Engineer, at 945-6030.

Yours truly,



Tracey Braun, M.Sc.  
Director  
Environment Act

#### Attachments

- c. Bruce Wright, Regional Director, Western Region – Manitoba Conservation  
Stephen Biswanger, P. Eng., Earth Tech (Canada) Ltd.  
Public Registries

# LICENCE

Licence No. / Licence n° 2351 S2 RR

Issue Date / Date de délivrance December 3, 1999

Revised : February 1, 2001

Revised : August 29, 2008

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 Sections 11(1) and 14(2) / Conformément au Paragraphe 11(1) et 14(2)

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

THE CITY OF BRANDON; the Licencee

to operate a Development, being:

- an existing wastewater collection system within the City of Brandon;
  - an existing wastewater treatment plant (WWTP) located in part of the NE 1/4 of Section 17-10-18 WPM; and
  - an existing wastewater treatment lagoon system located in Sections 21 and 22-10-18 WPM;
- with treated effluent from the WWTP and the wastewater treatment lagoon system, combined sewer overflows, and diverted excess wet weather wastewater flows being directed to the Assiniboine River, in accordance with the Proposal dated November 7, 1990, the Proposal dated August 19, 1992, the Notice of Alteration dated June 15, 1998,

and

to construct and operate:

- an existing sludge transfer forcemain from the WWTP to the sludge lagoons in the existing wastewater treatment lagoon system;
- new additional sludge lagoon cells Cell 3B and Cell 3C within the area of the existing Cell 3 forming part of the existing wastewater treatment lagoon system;
- a new forcemain to convey supernatant from the sludge lagoons cells to the I-WWTF that is operating under Environment Act Licence No. 2747 R;

- a new forcemain to convey waste activated sludge from the I-WWTF that is operating under Environment Act Licence No. 2747 R to the existing waste activated sludge pipe that conveys waste activated sludge from the WWTP to the sludge storage cells of the wastewater treatment lagoon system;
- a new septage receiving facility at the WWTP;
- an existing ultraviolet light disinfection system; and
- an existing gravity direct discharge system for the treated effluent from the WWTP to the Assiniboine River;

in accordance with the Proposal dated June 19, 1998, "The City of Brandon Wastewater Treatment Plant Master Plan Final Report" dated July, 1999, and the Notice of Alteration dated August 24, 2000, and the Notice of Alteration consisting of a Request for Alteration to the City of Brandon's Sludge Management Program at the Industrial and Municipal Wastewater Treatment Facilities letter dated April 8, 2008, the associated report dated April 2008, and the supplementary April 23, 2008 addendum to the April 2008 Notice of Alteration, 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 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 in writing;

**"as constructed drawings"** means engineering drawings complete with all dimensions which indicate all features of the Development as it has actually been built;

**"ASTM"** means the American Society for Testing and Materials;

**"bentonite"** means specially formulated standard grade sodium bentonite conforming to American Petroleum Institute Specification 13-A;

**"calibrate"** means to determine, check, or rectify the graduation of any instrument giving quantitative measurement;

**"composite sample"** means a quantity of undiluted effluent composed of a minimum of 24 sequential series of discrete equal volumes of effluent collected at a rate proportionate to the flow rate of the effluent over a period of 24 consecutive hours;

**“day”** or **“daily”** means any period of 24 consecutive hours;

**“Director”** means an employee so designated pursuant to the Environment Act;

**“effluent”** means treated or untreated wastewater released into the environment from the Development;

**“excess wet weather wastewater flows”** means untreated wastewater flows in the wastewater collection system which are boosted as a result of spring run-off or precipitation events and which exceed a flow rate of 67.9 million litres per day;

**“fecal coliform”** means aerobic and facultative, Gram-negative, nonspore-forming, rod-shaped bacteria capable of growth at 44.5 °C, and associated with fecal matter of warm-blooded animals;

**“final discharge point”** means an effluent quality control point as designated within this Licence, unless otherwise re-designated in writing by the Director;

**“five-day carbonaceous biochemical oxygen demand (CBOD<sub>5</sub>) ”** means that part of the oxygen demand usually associated with biochemical oxidation of carbonaceous organic matter within 5 days at a temperature of 20°C, excluding BOD associated with nitrogenous organic matter;

**“grab sample”** means a quantity of undiluted effluent collected at any given time;

**“high water mark”** means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is at the maximum allowable liquid level;

**“hydraulic conductivity”** means the quantity of water that will flow through a unit cross-sectional area of a porous material per unit of time under a hydraulic gradient of 1.0;

**“I-WWTF”** means the City of Brandon’s industrial wastewater treatment facility;

**“kg/d”** means kilograms per day;

**“low water mark”** means the line on the interior surface of the primary and secondary cells which is normally reached when the cell is discharged;

**“mg/L”** means milligrams per litre;

**“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 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 within a 90-day period and in a form satisfactory to the Director, 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;

**“PMU storage cell”** means a lagoon cell for the storage of spent pregnant mares urine;

**“PMU”** means pregnant mares urine;

**“rip rap”** means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earth surfaces against wave action or current;

**“septage”** means the sludge produced in individual on-site wastewater disposal systems such as septic tanks;

**“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 Federation;

**“supernatant”** means the liquid remaining above the dewatered sludge solids after sedimentation;

**“TKN”** means total kjeldahl nitrogen;

**“total coliform”** means a group of aerobic and facultative anaerobic, Gram-negative, nonspore-forming, rod-shaped bacteria, that ferment lactose with gas and acid formation within 48 hours at 35 °C, and inhabit predominantly the intestines of man or animals, but are occasionally found elsewhere and include the sub-group of fecal coliform bacteria;

**“truck dumping station”** means a facility used to receive, store and meter wastewater, including septage, which has been hauled to the sewage treatment plant with a truck;

**“undiluted”** means not having water added for the purposes of meeting the limits of this Licence;

“**UV disinfection**” means a disinfection process for treating wastewater using ultraviolet radiation;

“**UV dose**” means the unit of intensity of ultra violet light that is required to kill bacteria and viruses present in the sewage effluent;

“**WASP**” means the Water Analysis Simulation Program developed by the U.S. Environmental Protection Agency;

“**wastewater**” means any liquid containing a pollutant (as defined in The Environment Act);

“**week**” or “**weekly**” means any period of 7 consecutive days;

“**WWTP**” means wastewater treatment plant; and

“**wastewater treatment lagoon system**” means an impoundment consisting of a series of lagoon cells into which wastewater is discharged for storage and treatment by natural oxidation or by a combination of mechanical aeration and natural oxidation.

## GENERAL TERMS AND CONDITIONS

This Section of the Licence contains requirements intended to provide guidance to the Licencee in implementing practices to ensure that the environment is maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for present and future Manitobans.

1. 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 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) have all analytical determinations undertaken by an accredited laboratory.
3. The Licencee shall report all the information requested through the provisions of this Licence in a manner and form acceptable to the Director.
4. The Licencee shall construct and maintain a truck dumping station for truck hauled wastewater and septage. The truck dumping facility shall be equipped with an influent pipe fitted with a quick-coupler. All trucks used to deliver wastewater are to be equipped with a flexible hose and matching adapters for the quick-coupler. All wastewater delivered to the truck dumping station is to be discharged through the hose and influent pipe into the coarse screens area of the WWTP.
5. The Licencee shall install adequate instrumentation to provide constant monitoring of the UV process to ensure compliance with the disinfection requirements. Such instrumentation shall include but not be limited to the following:
  - a) a UV sensor to monitor lamp intensity;
  - b) appropriate alarm and shutdown systems;
  - c) a lamp monitoring system to identify the location of individual lamp failures;
  - d) an hour meter which cannot be reset to display actual hours of UV lamp operation; and
  - e) protective circuits for overcurrent and ground current leakage detection.

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

### **Respecting the Construction, Operation and Integrity of the Development**

6. The Licencee shall maintain the aerated Cell 4 and the clarification Cell 4A, and construct and maintain the spent PMU storage Cell 4B as well as the sludge holding Cell 3B and sludge holding Cell 3C of the wastewater treatment lagoon system, as identified in Appendix 'C' attached to this Licence, with continuous liners under all interior surfaces of the cells prior to placing these cells into operation, in accordance with the following specifications:
  - a) the liners shall be made of clay;
  - b) the liners shall be at least one metre in thickness;

- c) the liners shall have a hydraulic conductivity of  $1 \times 10^{-7}$  centimetres per second or less; and
  - d) the liners shall extend to an elevation of one metre above the maximum liquid level of each cell.
7. The Licencee shall, with respect to the PMU storage Cell 4B, as well as the sludge holding Cell 3B and sludge holding Cell 3C of the wastewater treatment lagoon system, as identified in Appendix "C" attached to this Licence, and prior to placing these cells into operation:
- a) take and test undisturbed soil samples, in accordance with Appendix "D" attached to this Licence, from the liner of the constructed cells; with the number and location of samples and test methods to be specified by the designated Environment Officer up to a maximum of ten samples;
  - b) arrange with the designated Environment Officer a mutually acceptable time and date for any required soil sampling between the 15th day of May and the 15th day of October of any year; and
  - c) not less than 2 weeks before the cell is placed in operation, submit to the Director the results of the hydraulic conductivity tests carried out on the liner.
8. The Licencee shall:
- a) prepare as constructed drawings, satisfactory to the Director, pertaining to:
    - i) the constructed configurations, dimensions, elevations, liner design cross-sections and inter-connecting piping respecting Cell 3B and Cell 3C and Cell 4B (if and when lined) of the wastewater treatment lagoon system, as identified in Appendix 'C' attached to this Licence;
    - ii) all sludge transfer forcemains from all sources to the sludge lagoons;
    - iii) the new supernatant pipeline from the sludge storage cells (to the IWWTF);
    - iv) the ultraviolet disinfection system; and
    - v) the direct effluent gravity discharge line leading from the WWTP to the Assiniboine River; and
  - b) submit two sets of the as constructed drawings, each labelled 'As Constructed' or 'As Built', to the Director within 2 months after each of the projects has been completed.
9. The Licencee shall ensure that:
- a) an enclosed, secured and heated monitoring station building is provided, and at all times maintained for use by an Environment Officer, at each effluent discharge point used to convey effluent towards the Assiniboine River from the wastewater collection and treatment systems, excluding those combined sewer outfalls identified in Appendix 'A' attached to this Licence;

- b) each monitoring station building is accessible to an Environment Officer at all times; and
  - c) each monitoring station building is of sufficient size to allow for the installation of a portable flow monitoring device and a composite sampler, with provisions made at the monitoring station for the new direct effluent discharge line from the WWTP to accommodate two composite samplers whereby one of the composite sampler locations can be maintained secure to access.
10. The Licencee shall ensure that:
- a) the Cell No. 5 effluent discharge point is constructed, equipped and maintained so that the volume of effluent release into the environment is continuously measured using an area velocity open channel flow rate measuring device and totalizer known as an ISCO Model 4250, or an approved equivalent device, and that it is equipped and maintained with an electronic interface compatible with the departmentally owned ISCO sampler, with the flow meter controls and recorder located within the heated monitoring station building;
  - b) the outfall from Cell 4A to Cell 5 is constructed, equipped and maintained so that the volumes of wastewater transfers from Cell 4A into Cell 5, as identified in Appendix 'C' attached to this Licence, are continuously measured using an area velocity open channel flow rate measuring device and totalizer known as an ISCO Model 4250, or an approved equivalent device, and that it is equipped and maintained with an electronic interface compatible with the departmentally owned ISCO sampler;
  - c) wastewater flow meters, satisfactory to the Director, are installed and maintained to measure the treated or untreated wastewater flows, and excess wet weather wastewater flows, being transferred from the WWTP to the wastewater treatment lagoon system;
  - d) a continuous wastewater flow meter and totalizer, acceptable to the Director, and equipped and maintained with an electronic interface compatible with the departmentally owned ISCO sampler, is installed immediately upstream of the ultraviolet light effluent disinfection system on the direct effluent discharge conduit leading from the WWTP to the Assiniboine River;
  - e) a continuous wastewater flow meter and totalizer, acceptable to the Director, is installed on the sludge forcemain leading from the WWTP to the sludge lagoons;
  - f) all wastewater and effluent flow meters are installed at locations acceptable to the Director;
  - g) all wastewater and effluent flow meters are continuously maintained in proper working order; and

- h) each wastewater and effluent flow meter required for the purposes of this Licence is calibrated by a qualified person once every 12 months, as well as upon any additional request from an Environment Officer, to an accuracy within  $\pm 2$  percent.
11. The Licencee shall maintain an all-weather access road to the spent PMU off-loading facility of the wastewater treatment lagoon system.
  12. The Licencee shall ensure that if, in the opinion of the Director, significant erosion of the interior surfaces of any of the dykes of the wastewater treatment lagoon system and sludge holding cells occurs, rip rap shall be placed on the interior dyke surfaces from 0.6 metres above the high water mark to at least 0.6 metres below the low water mark to protect the dykes from wave action.
  13. The Licencee shall, in the case of any physical or mechanical breakdown of the Development:
    - a) notify the Director immediately;
    - b) identify the repairs required to be made to the wastewater collection system or the treatment system; and
    - c) complete the repairs in accordance with such written instructions as may be issued by the Director.
  14. 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 mitigate an odour nuisance.
  15. The Licencee shall utilize UV lamps that have a rated output of at least 254 nanometres (nm) capable of delivering a germicidal dose in excess of 30,000 microwatt seconds/sq cm.
  16. The Licencee shall operate and maintain the UV units to give a germicidal dose of 80% or more of the design germicidal dose, at the end of the lamp life.

**Respecting the Handling of Wastewater and Sludge**

17. The Licencee shall direct all wastewater collected in the wastewater collection system into the WWTP (unless otherwise approved by the Director), except for:
  - a) combined sewer overflow discharges into the Assiniboine River that may occur during spring runoff and precipitation events from those combined wastewater and storm water sewer outfalls which are located on the City of Brandon wastewater collection system and are identified in Appendix 'A' attached to this Licence;

- b) untreated wastewater flows greater than 24.6 million litres per day but less than 67.9 million litres per day, provided they are diverted into Cell 3 or Cell 4 of the wastewater treatment lagoon system; and
  - c) untreated excess wet weather wastewater flows being equal to or greater than 67.9 million litres per day which would be diverted to the Assiniboine River at manhole MH-109 as identified in Appendix 'B' attached to this Licence.
18. The Licencee shall direct:
- a) all, or any portion, of the wastewater released from the WWTP either;
    - i) into the Assiniboine River via the discharge pipeline leading from the ultraviolet disinfection unit to the Assiniboine River; or
    - ii) into Cell 3 or Cell 4 of the wastewater treatment lagoon system;
  - b) all spent PMU into the aerated Cell 4, or into storage Cell 4B (after it is lined), of the wastewater treatment lagoon system, or to any other licenced wastewater treatment facility approved by the Director to receive the spent PMU;
  - c) all wastewater from Cell 4B into Cell 4 of the wastewater treatment lagoon system;
  - d) all wastewater from Cell 4 into Cell 4A of the wastewater treatment lagoon system;
  - e) all wastewater from Cell 4A into Cell 5 of the wastewater treatment lagoon system;
  - f) all wastewater from Cell 3 into Cell 5; and
  - g) all sludge wasted from the WWTP, and any excess sludge wasted from Cell 3, Cell 4, Cell 4A, Cell 4B or Cell 5, into any of the sludge storage cells Cell 1, Cell 2, Cell 3A or Cell 3B or Cell 3C (after they are constructed and lined) of the wastewater treatment lagoon system;
- whereby Cells 1, 2, 3, 3A, 3B, 3C, 4, 4A, 4B and 5 are as identified in Appendix 'C' attached to this Licence.
19. The Licencee shall ensure that the conduit connecting Cell 4 to Cell 5 via manhole MH 11, as identified in Appendix 'C' attached to this Licence, is maintained closed to the passage of any wastewater from Cell 4 to Cell 5, unless otherwise approved by the Director.
20. The Licencee shall not dispose of sludge from any of the sludge or wastewater storage cells of this Development into the environment, except in accordance with Environment Act Licence No. 2485 or any future revision thereto.

### **Respecting Effluent Discharges**

21. The Licencee shall discharge effluent directly to the Assiniboine River from:
- a) the WWTP only through the final discharge point of the WWTP, being any point past the ultraviolet disinfection unit along the discharge conduit leading from the ultraviolet disinfection unit to the Assiniboine River;
  - b) the wastewater treatment lagoon system only through the final discharge point of the wastewater treatment lagoon system, being manhole MH 12 of Cell 5 of the wastewater treatment lagoon system, as identified on Appendix 'C' attached to this Licence.
22. The Licencee shall not discharge effluent from the final discharge point of:
- a) the WWTP, if the quality of the effluent is such that:
    - i) the organic content in the effluent, as indicated by the five-day carbonaceous biochemical oxygen demand determined from any composite sample of effluent collected at the final discharge point, is in excess of 25 mg/L;
    - ii) the total suspended solids content in the effluent, as determined from any composite sample of effluent collected at the final discharge point, is in excess of 30 mg/L;
    - iii) the fecal coliform count in the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample, as determined by the monthly geometric mean of 1 grab sample collected at equal time intervals on each of a minimum of 3 consecutive days per week; or
    - iv) the total coliform count in the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample, as determined by the monthly geometric mean of 1 grab sample collected at equal time intervals on each of a minimum of 3 consecutive days per week; or
  - b) Cell 5 of the wastewater treatment lagoon system, if the quality of the effluent is such that:
    - i) the organic content in the effluent, as indicated by the five-day carbonaceous biochemical oxygen demand, is in excess of 25 mg/L;
    - ii) the total suspended solids content in the effluent, is in excess of 30 mg/L;
    - iii) from the 1st day of June to the 30th day of September of any year:
      - A. the fecal coliform content in the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample; and
      - B. the total coliform content in the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample.
23. The Licencee shall ensure that, on any day, and under prevailing Assiniboine River flow rates equal to or greater than the 7Q10 flow rates (see Appendix 'E' attached to this Licence) for the corresponding period, the daily sum of:
- a) the ammonia nitrogen loading ( $\text{NH}_4^+ + \text{NH}_3$  expressed as kg/d of N) released from the WWTP; plus

- b) the ammonia nitrogen loading ( $\text{NH}_4^+ + \text{NH}_3$  expressed as kg/d of N) released from the wastewater treatment lagoon system; plus
  - c) the ammonia nitrogen loading ( $\text{NH}_4^+ + \text{NH}_3$  expressed as kg/d of N) allocated by licence to Simplot Canada Limited (see Appendix 'F' attached to this Licence) for release to the Assiniboine River on the same day; plus
  - d) the ammonia nitrogen loading ( $\text{NH}_4^+ + \text{NH}_3$  expressed as kg/d of N) released by the Licencee from the Maple Leaf Meats hog processing plant wastewater treatment facility on the same day;  
does not exceed 100% of the theoretical assimilative capacity of the Assiniboine River, as determined through the use of the Department's ammonia nitrogen mass balance model or the Assiniboine River WASP model in a manner satisfactory to the Director, for that same day within the receiving area of the river, before the Manitoba Surface Water Quality Objective for un-ionized ammonia (as  $\text{NH}_3$ ) is exceeded in the immediate downstream fully mixed zone, as based on the prevailing discharge flow rates from each of the three ammonia discharge sources and on the prevailing ambient ammonia nitrogen concentration, pH and temperature of the Assiniboine River at 18th Street in the City of Brandon.
24. Notwithstanding Clause 19 of this Licence, the Licencee shall not, on any day, and under prevailing Assiniboine River flow rates equal to or greater than the 7Q10 flow rates listed in Appendix 'E' attached to this Licence for the corresponding period, release a quality of effluent from the Development which:
- a) causes, or contributes to, the un-ionized ammonia concentration (expressed as mg/L of  $\text{NH}_3$ ) in the Assiniboine River, at the nearest downstream model predicted fully mixed river monitoring station, to exceed the Manitoba Surface Water Quality Objective for un-ionized ammonia under the prevailing pH and temperature of the river measured at the same downstream monitoring station; or
  - b) causes, or contributes to, the dissolved oxygen level in the water column of the Assiniboine River, at the nearest downstream model predicted location of lowest dissolved oxygen, to drop to less than 5.0 mg/L.

#### **Respecting Monitoring, Record Keeping and Reporting**

25. The Licencee shall, with respect to the clarification Cell 4A of the wastewater treatment lagoon system, as identified in Appendix "B" attached to this Licence, and only during such times when wastewater is being released from the cell:
- a) take two composite samples of the wastewater each week, with a minimum separation time of 3 days between samples;
  - b) measure the pH and temperature (as °C) in the cell on one occasion during the sampling period for each composite sample; and

- c) analyze each composite sample of wastewater for:
    - i) five-day carbonaceous biochemical oxygen demand (expressed as mg/L);
    - ii) chemical oxygen demand (expressed as mg/L);
    - iii) total suspended solids (expressed as mg/L);
    - iv) pH;
    - v) ammonia nitrogen ( $\text{NH}_4^+ + \text{NH}_3$  expressed as mg/L of N);
    - vi) total nitrogen ( $\text{TKN} + \text{NO}_3^- + \text{NO}_2^-$  expressed as mg/L of N); and
    - vii) total phosphorus (expressed as mg/L of P).
26. The Licencee shall, with respect to effluent released from the WWTP, as well as at such times when effluent is released into the environment from Cell 5 of the wastewater treatment lagoon system:
- a) take weekly composite samples of the effluent being released at each respective final discharge point of the WWTP and of Cell 5 of the wastewater treatment lagoon system, with a minimum separation time of 5 days between samples, and have them analyzed for:
    - i) five-day carbonaceous biochemical oxygen demand (expressed as mg/L);
    - ii) total suspended solids (expressed as mg/L);
    - iii) pH;
    - iv) ammonia nitrogen ( $\text{NH}_4^+ + \text{NH}_3$  expressed as mg/L of N);
    - v) total nitrogen ( $\text{TKN} + \text{NO}_3^- + \text{NO}_2^-$  expressed as mg/L of N); and
    - vi) total phosphorus (expressed as mg/L of P);
  - b) once each day at equal time intervals for a minimum of three (3) consecutive days per week, collect a grab sample of the effluent at the final discharge point of the WWTP and have it analyzed for:
    - i) fecal coliform (expressed as MPN per 100 millilitres of sample); and
    - ii) total coliform (expressed as MPN per 100 millilitres of sample); and
  - c) determine and record the monthly geometric mean for each of the fecal coliform and the total coliform counts based on all the data collected during each month for each coliform type.
  - d) take weekly grab samples of the effluent, at the final discharge point of Cell 5 of the wastewater treatment system, with a minimum separation time of 5 days between samples, and have them analyzed for:
    - i) fecal coliform (expressed as MPN per 100 millilitres of sample); and
    - ii) total coliform (expressed as MPN per 100 millilitres of sample);
  - e) determine and record the volumes (in cubic metres) of effluent released at each respective final discharge point during each 24-hour period during which each composite sample was taken; and
  - f) determine and record the 24-hour ammonia nitrogen loading ( $\text{NH}_4^+ + \text{NH}_3$  expressed as kilograms per day of N), the total nitrogen loading and the total phosphorus loading based on each effluent composite sample, as well as



determine the respective combined daily loadings from the WWTP and Cell 5 of the wastewater treatment lagoon system for these substances on each composite sampling date.

27. The Licencee shall once every week, on the same day that the effluent from the Development is sampled at the final discharge points:
- a) collect a representative grab sample of the Assiniboine River at 18th Street in Brandon and have it analyzed for:
    - i) field and lab pH;
    - ii) field temperature ( $^{\circ}\text{C}$ ); and
    - iii) ammonia nitrogen (mg/L as N); and
  - b) determine and record the flow rate of the Assiniboine River at the Canada Survey flow rate monitoring station on the Assiniboine River just upstream of the City of Brandon where Canada Highway No. 1 crosses the Assiniboine River.
28. The Licencee shall, during each month, and for each effluent sampling day used in carrying out the requirements of Sub-clause 23(a) this Licence, determine in a manner acceptable to the Director, and record:
- a) the 100% theoretical assimilative capacity of the Assiniboine River within the receiving area of the river (being affected by ammonia discharges from the Development, Simplot Canada Limited and the Maple Leaf Meats hog processing plant wastewater treatment facility), as determined through the use of the Department's ammonia nitrogen mass balance model or the Assiniboine River WASP model, before the Manitoba Surface Water Quality Objective for unionized ammonia (as  $\text{NH}_3$ ) is exceeded in the immediate downstream fully mixed zone, as based on the prevailing discharge rates from each of the three ammonia discharge sources and on the prevailing ambient ammonia nitrogen concentration, pH and temperature of the Assiniboine River at 18th Street in the City of Brandon; and
  - b) the individual and sum total of:
    - i) the ammonia nitrogen loading (expressed as kg/d of N) released from the Development; plus
    - ii) the ammonia nitrogen loading (expressed as kg/d of N) allocated by licence to Simplot Canada Limited (Appendix 'C' attached to this Licence) for release to the Assiniboine River on the same day; plus
    - iii) the ammonia nitrogen loading (expressed as kg/d of N) released by the Licencee from the Maple Leaf Meats hog processing plant wastewater treatment facility on the same day.
29. The Licencee shall, during each month of each year:
- a) continuously measure and record the total volume (in cubic metres) of:
    - i) effluent being released from the WWTP into the Assiniboine River;
    - ii) effluent being directed from the WWTP to Cell 3 or Cell 4 of the wastewater treatment lagoon system, as identified in Appendix 'C'

- attached to this Licence, for reasons of additional treatment or due to the elevation of the water of the Assiniboine River exceeding 357.2 metres above sea level; and
- iii) excess wet weather wastewater flows being diverted from the WWTP and directed into Cell 3 or Cell 4 of the wastewater treatment lagoon system, as identified in Appendix 'C' attached to this Licence;
- b) to an accuracy within  $\pm 2$  percent;
  - c) continuously measure and record the total volume (in cubic metres) of spent PMU being directed into the aerated Cell 4 of the wastewater treatment lagoon system, as identified in Appendix 'C' attached to this Licence, to an accuracy within  $\pm 2$  percent;
  - d) continuously measure and record the total volume (in cubic metres) of wastewater being directed from Cell 4A into Cell 5 of the wastewater treatment lagoon system, as identified in Appendix 'C' attached to this Licence, to an accuracy within  $\pm 2$  percent; and
  - e) continuously measure and record the total volume (in cubic metres) of effluent being discharged from Cell 5 of the wastewater treatment lagoon system, as identified in Appendix 'C' attached to this Licence, to an accuracy within  $\pm 2$  percent.
30. The Licencee shall submit monthly reports on the analytical values, and the information determined and recorded pursuant to Clauses 22, 23, 24, 25 and 26 of this Licence, to the Director, in writing and in an electronic format acceptable to the Director, no later than 30 days after the end of the month during which the information was collected or compiled.
31. The Licencee shall, under prevailing river flow rates equal to or greater than the 7Q10 flow rate for the period:
- a) as soon as, and for as long as, the sum total of ammonia nitrogen loadings into the Assiniboine River reaches 90 percent or more of the prevailing theoretical 100 percent assimilative capacity of the Assiniboine River for ammonia nitrogen, and once a week on the same day as the effluent from the Development is sampled:
    - i) sample the Assiniboine River at the nearest downstream model predicted fully mixed river monitoring station for pH, temperature and ammonia nitrogen, and determine and record the in-situ concentration of un-ionized ammonia (as  $\text{NH}_3$ ); and
    - ii) measure and record the dissolved oxygen level in the water column of the Assiniboine River at the downstream model predicted location of lowest dissolved oxygen;
  - b) as soon as, and for as long as, the sum total of ammonia nitrogen loadings into the Assiniboine River reaches 95 percent or more of the prevailing theoretical 100 percent assimilative capacity of the Assiniboine River for ammonia nitrogen:

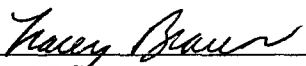
- i) sample the Assiniboine River three times a week (every second day) at the nearest downstream fully mixed river monitoring station for pH, temperature and ammonia nitrogen, and determine and record the in-situ concentration of un-ionized ammonia (as NH<sub>3</sub>); and
    - ii) measure and record the dissolved oxygen level in the water column of the Assiniboine River three times a week (every second day) at the downstream model predicted location of lowest dissolved oxygen; and
  - c) submit the information determined pursuant to Sub-clauses 28(a) and 28(b) of this Licence to the Director as soon as possible.
32. The Licencee shall submit to the Director a certificate of calibration, signed by a person qualified to calibrate the flow meters, for each flow meter used to determine the information requested through Clause 26 of this Licence, within two weeks of the completion of each flow meter calibration, identifying the plus or minus percent error associated with each calibrated flow meter.
33. The Licencee shall, respecting instances of diversions of raw wastewater to the Assiniboine River from Manhole MH-109 located on the wastewater collection system upstream of the WWTP, as shown in Appendix 'B' attached to this Licence:
- a) report in writing to the Director, within 24 hours of each occurrence, any instances of unscheduled diversions of raw wastewater to the Assiniboine River from Manhole No. 109, and advise the Director of the reason, the date and time of commencement, the duration, and the estimated quantity; and
  - b) notify the Director, and downstream users of the Assiniboine River, at least one week in advance of any likely instances of scheduled diversions of raw wastewater to the Assiniboine River from Manhole MH-109, advising the Director and the downstream users of the circumstance(s) necessitating the diversion(s) and why no alternative options are available.
34. The Licencee shall, if any in-house analytical or bacteriological determinations are being undertaken, or are under consideration to be undertaken in the future, for the purpose of satisfying the effluent quality reporting requirements specified in this Licence, submit a written report to the Director, once every two months outlining the progress being made towards achieving accreditation for the in-house laboratory regarding the relevant analytical or bacteriological determinations.
35. The Licencee shall submit to the Director:
- a) a written report, once every two months, outlining the progress being made towards:
    - i) quantifying, characterizing and managing the septage and Ayerst Organics washdown loads into the Development's wastewater collection system; and

- ii) securing auxiliary heat from Manitoba Hydro, or any other practical source, to heat low temperature influent wastewater being directed into the sequencing batch reactors of the WWTP; and
  - b) a final report outlining to what degree the new information obtained pursuant to Sub-clause 32(a) of this Licence will affect the treatment performance of the proposed altered WWTP.
- 36. The Licencee shall, in the course of operating the sludge line from the WWTP to the sludge lagoons of the wastewater treatment lagoon system:
  - a) continually ensure that all of the leak detection provisions incorporated into the design of the sludge line approved by the Director on March 10, 2000, are continually maintained in a fully operating condition; and
  - b) notify the Director immediately of any instance whereby the leak detection devices are activated outside of routine testing conditions.
- 37. The Licencee shall:
  - a) maintain a record of all wastewater and septage hauled to the WWTP, including the number of loads on a daily and weekly basis, the volume of each load, the name of the hauler, and the source of the contents of each load according to the type of waste and the name and location of each property serviced;
  - b) make all records available to an Environment Officer upon request; and
  - c) submit an annual report of all the waste hauling information to the Director within 30 days of the end of the 12 month period.
- 38. The Licencee shall submit to the Director an Environment Act Proposal to upgrade the sewage treatment plant to nutrient reductions to achieve a maximum allowable phosphorus limit of 1 mg/l and a maximum allowable nitrogen limit of 15 mg/l based on 30 day rolling averages.

#### **REVIEW OR REVOCATION**

- A. Environment Act Licence No. 2351 S2 R is rescinded upon successful commissioning of the approved alterations associated with the April 8, 2008 Notice of Alteration.
- B. If, in the opinion of the Director, the Licencee has failed or is failing to comply with any of the specifications, limits, terms or conditions set out herein, the Director may, temporarily or permanently, revoke this Licence.

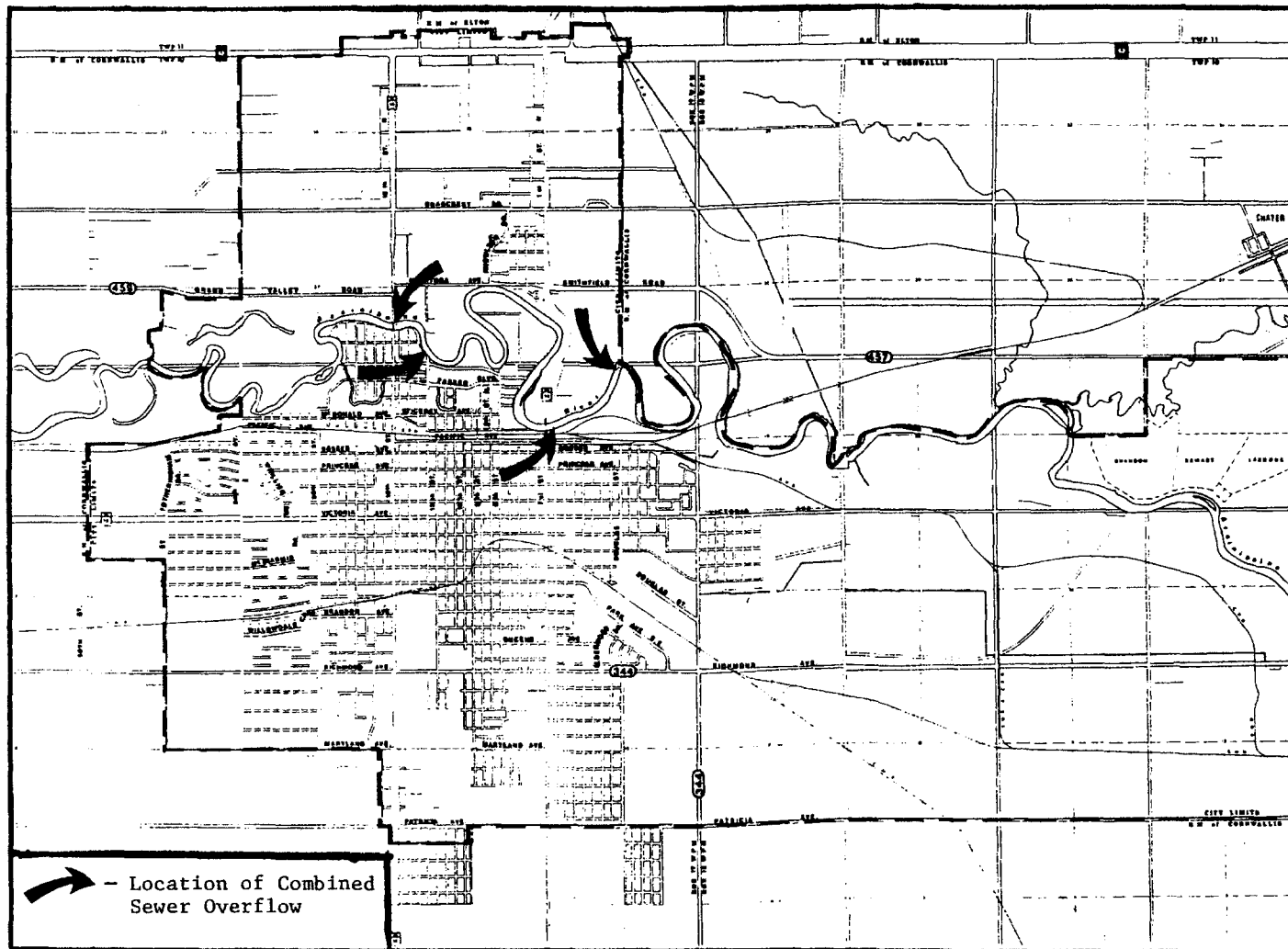
- C. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of The Environment Act.

  
\_\_\_\_\_  
**Tracey Braun, M.Sc.**  
**Director**  
**Environmental Assessment and Licensing Branch**

**File: 102.50**

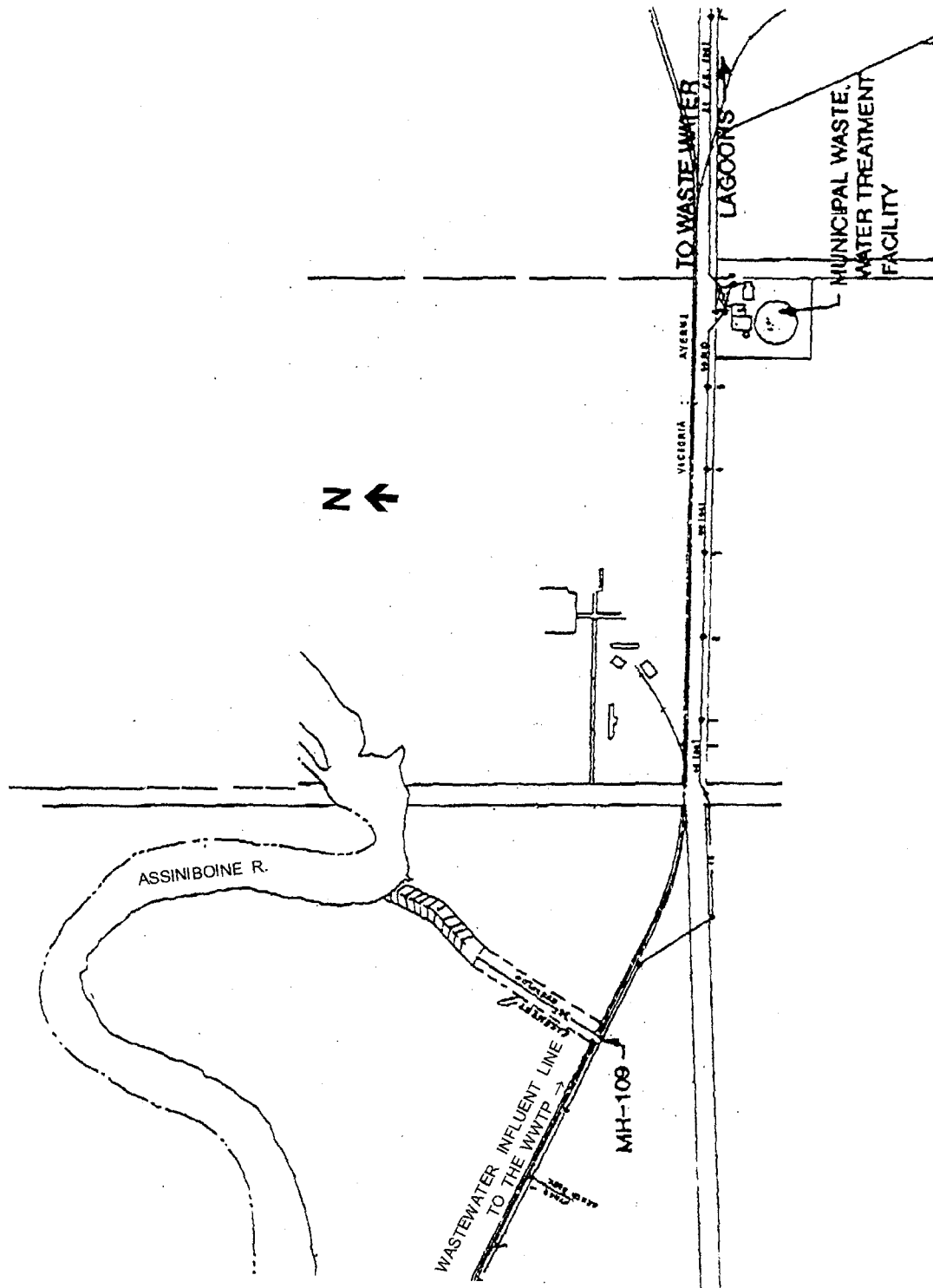
APPENDIX 'A'

**CITY OF BRANDON - COMBINED SEWER OVERFLOWS**



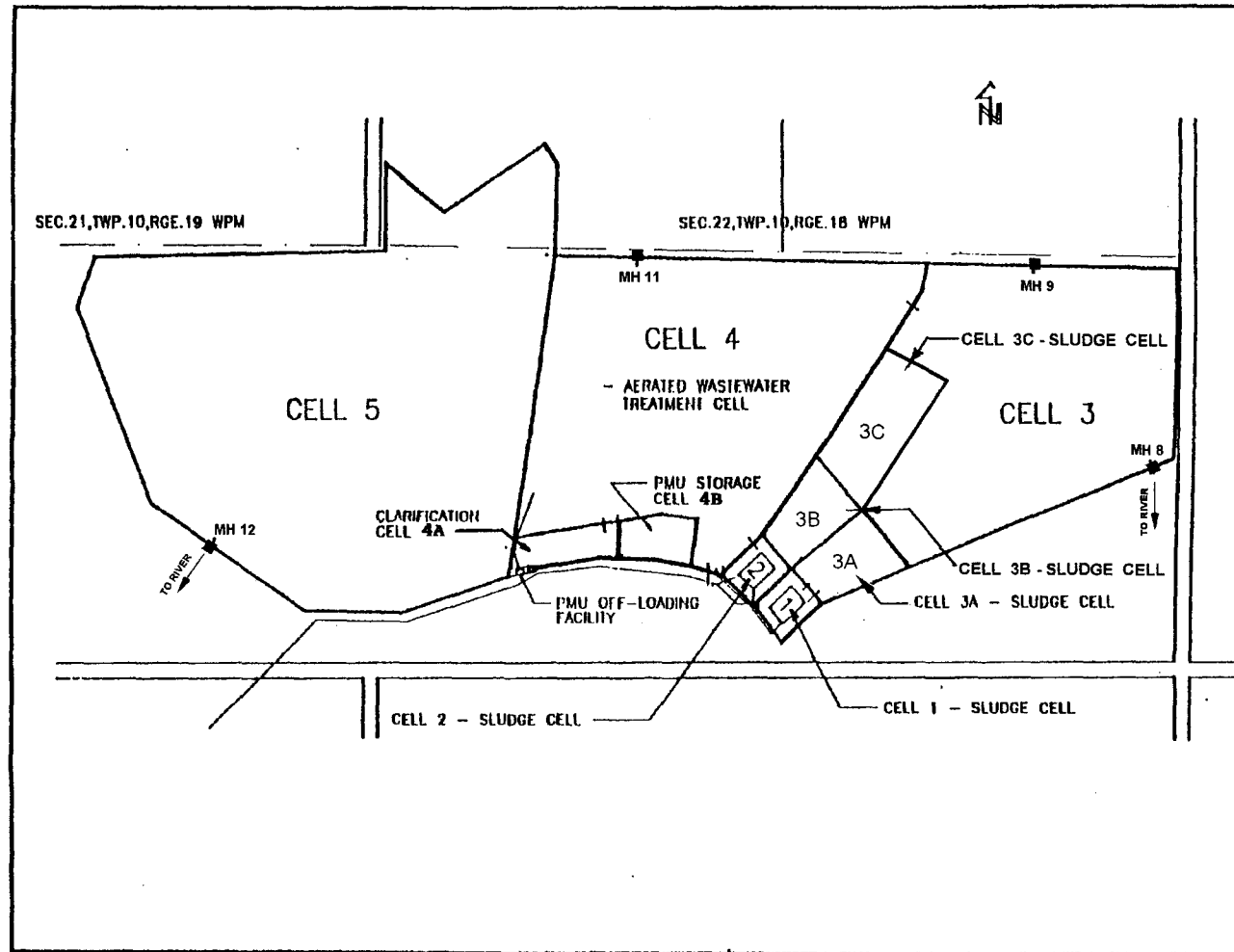
APPENDIX 'B'

**CITY OF BRANDON - MH-109 ON WASTEWATER COLLECTION SYSTEM**



APPENDIX 'C'

**CITY OF BRANDON – WASTEWATER TREATMENT LAGOON SYSTEM**





**APPENDIX 'D'**

**Soil Sampling:**

1. The Licencee shall provide a drilling rig, acceptable to the designated Environment Officer, to extract soil samples from the liner which is not placed or found at the surface of the lagoon structure. This includes all wastewater treatment lagoons constructed with clay cutoffs at the interior base of the dyke or with a clay cutoff in the center of the dyke. The drill rig shall have the capacity to drill to the maximum depth of the clay cutoff plus an additional 2 metres. The drill rig shall be equipped with both standard and hollow stem augers. The minimum hole diameter shall be 5 inches.
2. For lagoon liners placed or found at the surface of the lagoon structure, the Licencee shall provide a machine, acceptable to the designated Environment Officer, capable of pressing a sampling tube into the liner in a straight line motion along the center axis line of the sample tube and without sideways movement.
3. Soil samples shall be collected and shipped in accordance with ASTM Standard D 1587 (Standard Practice for Thin-Walled Tube Sampling of Soils), D 4220 (Standard Practice for Preserving and Transporting Soil Samples) and D 3550 (Standard Practice for Ring-Lines Barrel Sampling of Soils). Thin-walled tubes shall meet the stated requirements including length, inside clearance ratio and corrosion protection. An adequate venting area shall be provided through the sampling head.
4. At the time of sample collection, the designated Environment Officer shall advise the Licencee as to the soil testing method that must be used on each sample. The oedometer method may be used for a sample were the Environment Officer determines that the soil sample is taken from an undisturbed clay soil which has not been remoulded and which is homogeneous and unweathered. The triaxial test shall be used for all samples taken from disturbed and remoulded soils or from non homogenous and weathered soils.
5. The Licencee shall provide a report on the collection of soil samples to the designated Environment Officer and to the laboratory technician which includes but is not limited to: a plot plan indicating sample location, depth or elevation of sample, length of advance of the sample tube length of soil sample contained in the tube after its advancement, the soil test method specified by the Environment Officer for each soil sample and all necessary instructions from the site engineer to the laboratory technician.
6. All drill and sample holes shall be sealed with bentonite pellets after the field drilling and sampling has been completed.

Soil Testing Methods:

1. Triaxial Test Method

- (a) The soil samples shall be tested for hydraulic conductivity using ASTM D 5084 (Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter).
- (b) Soil specimens shall have a minimum diameter of 70 mm (2.75 inches) and a minimum height of 70 mm (2.75 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The hydraulic gradient shall not exceed 30 during sample preparation and testing. Swelling of the soil specimen should be controlled to adjust for: the amount of compaction measured during sample collection and extraction from the tube and the depth or elevation of the sample. The effective stress used during saturation or consolidation of the sample shall not exceed 40 kPa (5.7 psi) or the specific stress level, that is expected in the field location were the sample was taken, which ever is greater.
- (c) The complete laboratory report, as outlined in ASTM D 5084, shall be supplied for each soil sample collected in the field.

2. Oedometer Test Method

- (a) The soil samples shall be tested for hydraulic conductivity using ASTM D 2435 (Standard Test Method for One-Dimensional Consolidation Properties of Soils).
- (b) Soil specimens shall have a minimum diameter of 50 mm (2 inches) and a minimum height of 20 mm (0.8 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The soil specimen shall be taken from an undisturbed soil sample. The soil specimen shall be completely saturated.
- (c) The complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.

Soil Testing Methods:

1. Triaxial Test Method

- (a) The soil samples shall be tested for hydraulic conductivity using ASTM D 5084 (Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter).
- (b) Soil specimens shall have a minimum diameter of 70 mm (2.75 inches) and a minimum height of 70 mm (2.75 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The hydraulic gradient shall not exceed 30 during sample preparation and testing. Swelling of the soil specimen should be controlled to adjust for: the amount of compaction measured during sample collection and extraction from the tube and the depth or elevation of the sample. The effective stress used during saturation or consolidation of the sample shall not exceed 40 kPa (5.7 psi) or the specific stress level, that is expected in the field location were the sample was taken, which ever is greater.
- (c) The complete laboratory report, as outlined in ASTM D 5084, shall be supplied for each soil sample collected in the field.

2. Oedometer Test Method

- (a) The soil samples shall be tested for hydraulic conductivity using ASTM D 2435 (Standard Test Method for One-Dimensional Consolidation Properties of Soils).
- (b) Soil specimens shall have a minimum diameter of 50 mm (2 inches) and a minimum height of 20 mm (0.8 inches). The soil specimens shall be selected from a section of the soil sample which contains the most porous material based on a visual inspection. The soil specimen shall be taken from an undisturbed soil sample. The soil specimen shall be completely saturated.
- (c) The complete laboratory report, as outlined in ASTM D 2435, shall be supplied for each soil sample collected in the field.

**APPENDIX 'E'**

7Q10 Flow Rates for the Assiniboine River at Brandon

<u>Month</u>	<u>7Q10 (cubic metres per second)</u>
January	6.4
February	6.6
March	4.9
April	7.0
May	6.6
June	5.8
July	5.4
August	4.7
September	4.6
October	4.9
November	5.6
December	6.0

**Note:** The above 7Q10 flow rates for the Assiniboine River at Brandon were developed by the Water Resources Branch in August, 1997. This Appendix 'E' may be revised by the Director if and when new information is received from the Water Resources Branch.

**APPENDIX 'F'**

Total Ammonia Nitrogen Loadings  
Licenced to Simplot Canada Limited for Release to the Assiniboine River  
through Environment Act Licence No. 1535

<u>Period</u>	<u>Ammonia Nitrogen Limits (kilograms per day as N)</u>
January	120
February	120
March	120
April	90
May 1-15	80
May 16-31	0
June	0
July	0
August	0
September 1-15	0
September 16-30	38
October	40
November	50
December	130