Manitoba

Environment | Environmental Management

Bldg. 2, 139 Tuxedo Avenue
Winnipeg, Manitoba
R3N 0H6

Fax (204) 945-5229

FAXED and REGISTERED MAIL

CLIENT FILE NO.: 144.30

December 16, 1996

Mr. Nelson Fulford, C.E.T.
The Town of The Pas
P. O. Box 870
The Pas MB R9A 1K8

Dear Mr. Fulford:

I am writing in response to your appeal from Environment Act Licence No. 2209 S1 issued on July 15, 1996.

I can now advise that a decision on the appeal of the Licence has been reached. In accordance with Section 27(2)(c), the Minister has decided to vary the Licence as follows:

- amending Clause 12(a) to remove the requirement for design drawings to be submitted at least the prescribed one month time period prior to construction;
- amending Clause 12(b) to extend the time allowed to submit the "as constructed" drawing from within one month to within 3 months of completion of construction;
- amending Clause 15 to remove the compulsory testing of the soil liner of the sludge storage and drying cell and instead require soil testing only upon written request from the Director;
- amending Clause 24(a) to limit the winter hydraulic loading to a monthly average of 5188 cubic metres per day and the summer hydraulic loading to a monthly average of 7125 cubic metres per day;
- amending Clause 24(b) to limit the winter organic loading to a monthly average of 578 kilograms per day and the summer organic loading to a monthly average of 1020 kilograms per day; and
- amending the Licence by adding definitions for winter and summer months.

This decision has been approved by the Lieutenant Governor in Council as required by Section 27(3) of the Act. Enclosed is varied Environment Act Licence No. **2209 S1 E.**

Yours truly,

Larry Strachan, P. Eng.
Director
Environment Act

Enclosure
cc: Hon. Glen Cummings
N.B. Brandson
C. B. Orcutt
S. Scrafield
S. Davis

Environment Act Licence
Loi sur l'environnement Licence

Manitoba Environment
Environnement Manitoba

Licence No./Licence n° 2209 S1 E

Issue Date/Date de délivrance December 3, 1996

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

THIS LICENCE IS ISSUED TO:

TOWN OF THE PAS: "The Licencee"
(Stage 1 Licence)

for the alteration and operation of the Development being a wastewater treatment plant and new sludge drying and storage cell located in the north half of Section 2, Township 56, Range 26, WPM in the Local Government District of Consol and with discharge of treated effluent via a constructed ditch leading to Grace Lake, in accordance with the Proposal filed under The Environment Act on May 20, 1993, the 'Town of The Pas Sewage Lagoon Sludge Study Status Report January, 1996', and the 'Town of The Pas Wastewater Treatment Lagoon Upgrading Project Update Report Summary, June, 1996', and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

"aeration cell" means a cell of a wastewater treatment lagoon system in which mechanical or diffused-air aeration is used to supplement the oxygen supply for treatment purposes;

"**affected area**" means a geographical area affected by an odour nuisance;

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

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

"cut-off" means a vertical or slanted trench filled with compacted clay, or a wall constructed from compacted clay;

"Director" means a person so designated pursuant to the Environment Act;

"effluent" means treated wastewater flowing or pumped out of the Development into the environment;

"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;

"five-day biochemical oxygen demand" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within 5 days at a temperature of 20 °C;

"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;

"industrial use agreement" means a signed agreement between an industry and a municipality to discharge industrial wastewater into a specified municipal wastewater collection and treatment system;

"industrial wastewater" means liquids derived from an industry which have come in contact with substances used in or derived from an industrial process, or cooling water directly or indirectly associated with an industrial process, or any combination thereof;

"influent" means water, wastewater or other liquid flowing into a wastewater treatment facility;

"monthly" means at an interval between sample collection events of not less than 21 days and greater than 35 days;

"MPN index" means the most probable number of coliform organisms in a given volume of wastewater or effluent which, in accordance with statistical theory, would yield the observed test result with the greatest frequency;

"new industrial wastewater" means wastewater that was not discharged into the wastewater collection system prior to the issuance of the Licence or wastewater for which the quality, quantity and timing of discharges into the wastewater collection system has significantly increased;

"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 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), 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 and who do not live in the same household within a 90 day period;

"quarterly" means at an interval of not less than 80 days and not greater than 100 days;

"rip rap" means small, broken stones or boulders placed compactly or irregularly on dykes or similar embankments for protection of earthen surfaces against the wave action or current of liquids;

"septage" means the sludge produced in individual on-site sewage disposal systems such as septic tanks;

"sewage" means all wastewater except industrial wastewater;

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

"sludge drying and storage cell" means a cell of a wastewater treatment system which receives sludge from the aeration cell;

"summer months" means the months May, June, July, August, September, and October;

"suspended solids" means that portion of the total solids retained by a filter;

"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;

"total solids" means the residue left in a vessel after evaporation of a sample and its subsequent drying;

"wastewater" means liquids containing pollutants, as defined in The Environment Act, originating from domestic, commercial or industrial sources, which are designated for discharge into the environment;

"winter months" means the months of November, December, January, February, March, and April.

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. Clauses 20 to 27 in this Licence do not become effective until the commissioning date for the Development, as identified by the Licencee to the Director pursuant to Clause 19 of this Licence.

2. Notwithstanding any of the following specifications, limits, terms and conditions specified in this Licence, the Licencee shall, upon the request of the Director:
   a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, handling, treatment, and disposal systems, for such pollutants, ambient quality, aquatic toxicity, seepage characteristics and discharge rates, and for such duration and frequencies as may be specified; and/or
   b) determine the environmental impact associated with the release of any pollutants from the Development; and/or
   c) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, bioassay data, flow rate measurements and such other information as may from time to time be requested.

3. The Licencee shall carry out all preservations and analyses of liquid samples in accordance with the methods prescribed in 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 Pollution Control Federation, or in accordance with equivalent preservation and analytical methodologies approved by the Director.

4. Unless otherwise specified, all information required to be provided to the Director under this Licence shall be in writing, in such form (including number of copies), and of such content, as may be required to the Director.

5. The Licencee shall:
   a) annually inspect the aeration system and make any necessary repairs;
   b) maintain an ongoing record of the most recent 5 years of inspection dates, observations, maintenance and repairs; and
   c) make this record available to an Environment Officer upon request.

6. The Licencee shall in the event of a physical or mechanical breakdown of the wastewater collection and/or treatment system:
   a) notify the Director as soon as possible and identify the repairs required to the wastewater collection and/or treatment system; and
   b) undertake the repairs as soon as possible and, if applicable, in accordance with any written instructions from the Director.

7. The Licencee shall construct and maintain an all-weather access road and a sewage and septage dumping station for truck hauled sewage and septage, with the dumping facility having an inclined splash ramp with a flat, smooth and hard surface that can be easily washed free of solids.

8. The Licencee shall:
   a) install and maintain a fence around the new and existing sewage treatment and sludge drying and storage cell of the Development to control access; and
   b) erect and maintain warning signs along the fence indicating the nature of the facility and advising against trespassing, with each side of the new and existing

facilities provided with at least one or more such signs not separated by no more than 150 metres as measured along the perimeter length of the fence.

9. The Licencee shall file a proposal for the disposal of dried sludge from the Development not later than July 1, 1997.

10. The Licence shall submit, to the Director, not later than October 31, 1997, a plan for effective nutrient removal from the Development.

11. The Licencee shall, as deemed necessary by the Director, carry out any remedial measures or modifications in respect to matters authorized under this Licence.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Construction Phase

12. The Licencee shall:
    a) submit to the Director two sets of design drawings prior to the commencement of any construction respecting the Development; and
    b) submit to the Director two sets of as constructed drawings no later than three months after the completed construction of the Development.

13. The Licencee shall, prior to the construction of the dykes for the sludge drying and storage cell:
    a) remove all organic topsoil from the area where the dykes will be constructed; or
    b) remove all organic material for a depth of 0.3 metres and a width of 3.0 metres from the area where any cut-off will be built.

14. The Licencee shall construct and maintain the sludge drying and storage cell:
    a) with a continuous liner under all interior surfaces of the cells in accordance with the following specifications:
        i) the liner shall be constructed of clay;
        ii) the liner shall be at least 1.0 metre in thickness; and
        iii) the liner shall have a hydraulic conductivity of $1x10^{-7}$ centimetres per second or less; and
    b) with any cut-off in the dykes of the sludge drying and storage cell in accordance with the following specifications:
        i) the cut-off shall be constructed of clay which has been mechanically compacted;
        ii) the cut-off shall be at least 1.0 metre in thickness;
        iii) the cut-off shall have a hydraulic conductivity of $1x10^{-7}$ centimetres per second or less;
        iv) the cut-off shall be keyed into the underlying clay liner a minimum of 0.3 metres; and
        v) the cut-off shall be constructed to the top elevation of the sludge storage cells.

15. The Licencee shall, upon the written request of the Director, demonstrate the degree of conformity of the liner to the criteria specified in Clause 14 of this Licence by:
    a) arranging with the designated Environment Officer a mutually acceptable date and time, between the 15th day of May and the 15th day of October of any year, for extracting soil samples at the sludge drying and storage cell;
    b) providing a drill rig which is acceptable to the designated Environment Officer;
    c) extracting undisturbed soil samples, in accordance with Schedule "A" attached to this Licence, from the liner and any cut-offs of the sludge drying and storage cell, with the number and location of samples to be specified by the designated Environment Officer up to a maximum of 20 samples;
    d) sealing all the drill holes with bentonite pellets after the field drilling and sampling have been completed;
    e) subjecting the extracted undisturbed soil samples to hydraulic conductivity tests; and
    f) submitting the results of the hydraulic conductivity tests to the Director not later than September 30, 1996.

16. The Licencee shall:
    a) ensure that any sludge, which may be withdrawn from the aeration cell of the existing wastewater treatment plant, is not deposited into the environment other than:
        i) to the sludge drying and storage cell;
        ii) to a site already licensed or permitted to accept such material; or
        iii) to a site approved by the Director and in a manner and within the time frames specified by the Director; and
    b) ensure that sludge removed from the aeration cell during the construction phase is not stored at the Development later than October 31, 1997, unless otherwise approved in advance by the Director.

17. The Licencee shall not discharge any effluent from the Development during the construction phase:
    a) at a discharge rate which is likely to cause, or contribute to, the flooding of any private or public land downstream of the discharge point; or
    b) if the quality of the effluent is such that in any grab sample taken of the effluent:
        i) the five-day biochemical oxygen demand is greater than 50 milligrams per litre;
        ii) the suspended solids content is greater than 30 milligrams per litre;
        iii) the fecal coliform content of the effluent, as indicated by the MPN index, is greater than 200 per 100 millilitres of sample; or
        iv) the total coliform content of the effluent, as indicated by the MPN index, is greater than 1500 per 100 millilitres of sample.

18. The Licencee shall ensure that septage is not discharged into the aeration cell during the construction activities at that cell.

19. The Licencee shall notify the Director, in writing, of the date on which the alteration of the aeration cell is completed. Such notification shall be provided within 3 days of the completion of the alteration of the aeration cell.

Operation Phase

20. The Licencee shall direct all wastewater generated within the Town of The Pas towards the Development, except for such categories of wastewater which are restricted by an industrial use agreement or approved by licence, permit, regulation or the Director to be disposed of by alternative means and/or at alternative locations.

21. The Licencee shall:
    a) not accept any new industrial wastewater into the Development, unless the industry proposing to discharge the industrial wastewater has first entered into an industrial use agreement with the Licencee, whereby such an agreement would specify and limit the quality, quantity and timing of discharges into the wastewater collection system, and would require the industry to advise the Licencee of any subsequent changes to these parameters;
    b) not enter into an industrial agreement with an industry whereby the quality, quantity or timing of discharges from such an industry is likely to cause an exceedance of the design hydraulic and/or organic loading capability of the Development, or is likely to cause periodic upsets of the said system; and
    c) enforce any industrial use agreement which is being violated.

22. The Licencee shall not deposit any wastewater, which is directed towards the Development, other than into the aeration cell of the Development, unless otherwise authorized by the Director.

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

24. The Licencee shall operate and maintain the Development in such a manner that:
    a) the hydraulic loading on the aeration cell does not exceed a 30-day arithmetic average of 5188 cubic metres per day during the winter months, and a 30-day arithmetic average of 7125 cubic metres per day during the summer months, as determined from wastewater flow rate measurements and combined with the volumes of hauled wastewater deposited into the aeration cell in a manner requested by the Director;
    b) the organic loading on the aeration cell, as indicated by the five-day biochemical oxygen demand, does not exceed a 30-day arithmetic average of 5578 kilograms per day during the winter months and a 30-day arithmetic average of 1020 kilograms per day during the summer months, as determined from wastewater flow rate measurements and flow proportioned composite samples taken of the wastewater over 24-hour periods and hauled wastewater deposited into the aeration cell in a manner requested by the Director;

c) a minimum of 2 milligrams of dissolved oxygen per litre is detectable at all times in the top 2.0 metres of the liquid in the aeration cell; and
d) the combined depth of wastewater and settled solids does not exceed 4.5 metres in the aeration cell.

25. The Licencee shall not discharge effluent from the Development other than through the final discharge point, being the first access manhole of the effluent discharge pipe down stream of the chlorine contact chamber unless otherwise re-designated in writing by the Director.

26. The Licencee shall not discharge any effluent from the Development:
a) at a discharge rate which is likely to cause, or contribute to, the flooding of any private or public land downstream of the discharge point; or
b) if the quality of the effluent is such that in any grab sample taken of the effluent:
i) the five-day biochemical oxygen demand is greater than 30 milligrams per litre;
ii) the suspended solids content is greater than 30 milligrams per litre;
iii) the fecal coliform content of the effluent, as indicated by the MPN index, is greater than 200 per 100 millilitres of sample; or
iv) the total coliform content of the effluent, as indicated by the MPN index, is greater than 1500 per 100 millilitres of sample.

27. The Licencee shall not deposit any sludge, which may be withdrawn from the Development in the course of its operation, other than to a site already licensed or permitted to accept such material or to a site approved by the Director and in a manner and within the time frames specified by the Director.

Monitoring And Reporting

28. The Licencee shall, at the request of the Director:
a) install and maintain a flow measuring device, satisfactory to the Director, at the lift station, which is:
i) capable of measuring the pumped volume of wastewater to within an accuracy of ±5 percent and, if applicable, is recalibrated annually or at the request of an Environment Officer; and
ii) capable of activating a flow-proportional wastewater composite sampling device;
b) make the flow measuring device accessible to an Environment Officer upon request; and
c) continuously measure the quantity of wastewater being pumped to the aeration cell of the Development, and in each month determine and record as cubic metres the total quantity of wastewater pumped in that month.

29. The Licencee shall, at the request of the Director:
    a) equip the lift station with a flow-proportional composite wastewater sampler capable of functioning with the flow measuring device, and make the sampler available on request for use by an Environment Officer;
    b) obtain daily 24-hour flow-proportioned composite samples over 7 consecutive days of the wastewater being directed to the aeration cell;
    c) record the daily volumes of wastewater pumped to the aeration cell over the same 24-hour composite sampling periods on each of the same 7 consecutive days; and
    d) analyze the obtained samples for the five-day biochemical oxygen demand.

30. The Licencee shall, at the request of the Director, initiate and maintain a daily record of each hauled truck of wastewater, sewage and/or septage which is dumped into the aeration cell, including: the volume of each truck load, the name of the hauler, and the source and nature of the contents.

31. The Licencee shall, during periods in which effluent from the Development is being discharged:
    a) collect one set of grab samples of the effluent at the final discharge point monthly;
    b) analyze each set of samples for the following parameters:

i)	field temperature	expressed as degrees Celsius;
ii)	conductivity	expressed as µS/cm;
iii)	total alkalinity	expressed as mg/L of $CaCO_3$;
iv)	5-day biochemical oxygen demand	expressed as mg/L;
v)	total suspended solids	expressed as mg/L;
vi)	total dissolved solids	expressed as mg/L;
vii)	total kjeldhal nitrogen	expressed as mg/L of nitrogen;
viii)	nitrate-nitrite nitrogen	expressed as mg/L of nitrogen;
ix)	total ammonia	expressed as mg/L of nitrogen;
x)	total phosphorous	expressed as mg/L;
xi)	dissolved phosphorous	expressed as mg/L;
xii)	total chlorine residual	expressed as mg/L;
xiii)	total coliform content	expressed as MPN/100 ml of sample;
xiv)	fecal coliform content	expressed as MPN/100 ml of sample;
xv)	pH	expressed as pH units;

    and
    c) determine daily, and record, the amount of effluent discharged through the final discharge point by means of a method of measurement satisfactory to the Director.

32. The Licencee shall report the results of the analyses and/or information required to be determined and recorded pursuant to Clauses 28 to 31 of this Licence, to the Director within 60 days of the end of the month during which the samples were taken or the required determinations were made, as the case may be.

REVIEW OR REVOCATION

A. This Licence replaces Environment Act Licence No. 330 which is hereby rescinded.

B. If, in the opinion of the Director, the Licencee has exceeded or is exceeding or has or is failing to meet the specifications, limits, terms, or conditions set out in this Licence, the Director may, temporarily or permanently, revoke this Licence.

C. If the Licencee has not commenced construction of the Development within three years of the date of this Licence, the Licence is revoked.

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

J. Glen Cummings
Minister

FILE: 144.30

Schedule "A" to Environment Act Licence No. 2209 S1 E

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 centre 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 centre 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.