



Conservation
Environmental Stewardship Division
Environmental Assessment and Licensing Branch
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File 2677.10
May 25, 2010

Dillon Shingler
Manitoba Aboriginal & Northern Affairs
27-2nd Avenue, S.W. (Box 15), Rm 428
Dauphin, MB R7N 3E5

Dear Mr. Shingler:

**Re: Community of Barrows Wastewater Treatment Lagoon - Environment Act Licence
No. 2800 – Notice of Alteration**

Receipt of the January 2010 Construction Drawings received April 1, 2010 and the April 8, 2010 letter from Genivar on behalf of the Community of Barrows and Manitoba Aboriginal and Northern Affairs is acknowledged as a notice of alteration in accordance with Section 14 of The Environment Act.

The requested changes to the Development as Licensed, are to remove the accumulated sludge from the existing primary and secondary cells of the wastewater treatment lagoon and dewater the sludge in geotextile bags located in a dewatering area lined with a 20 mil reinforced polyethylene liner. The supernatant resulting from the dewatering process would be pumped to the active primary cell of the wastewater treatment lagoon. Once the dewatered sludge meets slump testing requirements, the dewatered sludge would be placed on the lined interior portion of the wastewater treatment lagoon cells above the rip rap. Placement of all dewatered sludge would be completed prior to November 1st, 2010.

The potential environmental effects of the requested changes are considered to be a minor alteration in accordance with section 14(2) of The Environment Act. Accordingly, the request as indicated in the January 2010 Construction Drawings and the April 8, 2010 letter is approved subject to the limits, terms and conditions set forth in the attached revised Environment Act Licence No. 2800 R.

If you have any questions, please contact Rafiqul Chowdhury at 945-2614.

Yours truly,

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

c. Don Labossiere, Director – Environmental Operations, Manitoba Conservation
Jason Bunn – Genivar (Fax: 474-2864)
Public Registries

LICENCE

Licence No. / Licence n°	<u>2800 R</u>
Issue Date / Date de délivrance	<u>Jan. 9, 2008</u>
Revised :	<u>May 25, 2010</u>

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

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

MANITOBA ABORIGINAL AND NORTHERN AFFAIRS; "the Licencee"

for the remediation, expansion and operation of the Development being a wastewater collection system and wastewater treatment lagoon located in the southwest quarter of Section 3-45-28 WPM and the northwest quarter of Section 34-44-28 WPM at Barrows, Manitoba with discharge of treated effluent in a northerly direction into a swale which connects with a tributary of Red Deer Lake, in accordance with the Proposal filed under The Environment Act on November 30, 2006 and subsequent information provided on January 29, 2007 and June 13, 2007 and the Notice of Alteration received on April 12, 2010 and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this Licence,

"**access road**" means a road that leads from a Provincial Trunk/Highway, Provincial Road, or a municipal road;

"**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 be 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;

"**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;

"**ASAE**" means American Society of Agricultural Engineers;

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

"**dewatering cell**" means a structure used to contain wastewater while the sludge solids separate from the supernatant;

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

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

"**Environment Officer**" means an employee so appointed pursuant to The Environment Act;

"**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 (BOD₅)**" means that part of the oxygen demand usually associated with biochemical oxidation of organic matter within five days at a temperature of 20° C;

"**flooding**" means the flowing of water onto lands, other than waterways, due to the overtopping of a waterway or waterways;

"**grab sample**" means a quantity of wastewater taken at a given place and 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;

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

"**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;

"**mil**" means one-thousandth of an inch;

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

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

- a) residing in the affected area;

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

if the odour, smell or aroma

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

"primary cell" means the first in a series of cells of the wastewater treatment lagoon system and which is the cell that receives the untreated wastewater;

"PVC" means polyvinyl chloride;

"riprap" 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;

"secondary cell" means a cell of the wastewater treatment lagoon system which is the cell that receives partially treated wastewater from the primary cell;

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

"sewage" means household and commercial wastewater that contains human waste;

"sludge solids" means solids in sludge;

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

"Standard Methods for the Examination of Water and Wastewater" means the most recent edition of Standard Methods for the Examination of Water and Wastewater published jointly by the American Public Health Association, the American Waterworks Association and the Water Environment Association;

"supernatant" means the liquid remaining above the sludge solids after sedimentation;

"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;

"wastewater" means the spent or used water of a community or industry which contains dissolved and suspended matter;

"wastewater collection system" means the sewer and pumping system used for the collection and conveyance of domestic, commercial and industrial wastewater; and

"wastewater treatment lagoon" means the component of this development which consists of an impoundment into which wastewater is discharged for storage and treatment by 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. The Licencee shall direct all wastewater generated within the Community of Barrows to the wastewater treatment lagoon or other approved wastewater treatment facility.
2. 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.
3. The Licencee shall, unless otherwise specified in this Licence:
 - a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in "Standard Methods for the Examination of Water and Wastewater" or in accordance with an equivalent analytical methodology approved by the Director;
 - b) have all analytical determinations undertaken by an accredited laboratory; and
 - c) report the results to the Director, in writing or in a format acceptable to the Director, within 60 days of the samples being taken.

4. The Licencee shall, in case of physical or mechanical breakdown of the wastewater collection and/or treatment system:
 - a) notify the Director immediately;
 - b) identify the repairs required to the wastewater collection and/or treatment system;
 - c) undertake all repairs to minimize unauthorized discharges of wastewater; and
 - d) complete the repairs in accordance with any written instructions of the Director.
5. The Licencee shall, during construction and operation of the Development, report spills of fuels or other contaminants are reported to an Environment Officer in accordance with the requirements of *Manitoba Regulation 439/87* respecting *Environmental Accident Reporting*.
6. The Licencee shall, during construction and operation of the Development:
 - a) immediately report any reportable spills to Manitoba Conservation's Accident Reporting Line at (204) 944-4888; and
 - b) provide a follow-up report to the Director on a reportable environmental accident outlining the cause(s) and proposing corrective action to prevent reoccurrence.
7. The Licencee shall allow the operation of the Development only by individuals properly trained and qualified to do so.
8. The Licencee shall submit all information required to be provided to the Director under this Licence, in writing, in such form (including number of copies), and of such content as may be required by the Director.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

9. The Licencee shall notify the assigned Environment Officer not less than two weeks prior to beginning construction of the Development. The notification shall include the intended starting date of construction, the name of the contractor responsible for the construction and the name of the on-site contact person.
10. The Licencee shall install and effectively maintain a fence with warning signs surrounding the wastewater treatment lagoon with a lockable gate to control access.
11. The Licencee shall construct and effectively maintain an all-weather access road to the wastewater treatment lagoon.
12. The Licencee shall construct a truck dumping station for truck hauled wastewater. The truck dumping facility shall have a surface splash ramp with a smooth hard surface that can be easily washed free of solids.

13. The Licencee shall operate and maintain the wastewater treatment lagoon in such a manner that:
 - a) the release of offensive odours is minimized;
 - b) the organic loading on the primary cell, as indicated by the five-day biochemical oxygen demand, is not in excess of 35 kilograms per hectare per day;
 - c) the depth of liquid in the primary cell or secondary cells does not exceed 1.5 metres; and
 - d) a 1.0 metre freeboard is maintained in primary and secondary cells at all times.

14. The Licencee shall, prior to the construction of the wastewater treatment lagoon:
 - 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 the cut-off will be constructed.

15. The Licencee shall construct and maintain a continuous liner, including cover material, underlying the wastewater treatment lagoon, such that:
 - a) the liner is constructed from polyvinyl chloride geomembrane (PVC);
 - b) the liner has a minimum thickness of 30 mils;
 - c) the liner is installed in accordance with ASAE Standard EP340.2 for the Installation of Flexible Membrane Linings;
 - d) the liner shall be installed to a minimum elevation of 2.5 metres above the base of both the primary and secondary cells;
 - e) the liner is free of holes and has a hydraulic conductivity not exceeding 3.0×10^{-9} centimetres per second over the entire surface area of the liner;
 - f) the liner is tested for the integrity of all field seams by the air lance or ultrasonic pulse echo test method, in accordance with ASTM Standard D 4437-99, and a testing report is prepared and submitted to the Director for approval; and
 - g) the liner shall be covered with sand or other granular cover material to a minimum depth of 0.3 metre measured perpendicular to the surface of the liner.

16. The Licencee shall construct and maintain an effective gas relief system under the primary and secondary cells of the liner of the wastewater treatment lagoon.

17. The Licencee shall notify the Director two weeks prior to commencing the installation of the liner and the gas relief system.

18. The Licencee shall not cover the PVC liner or use the wastewater treatment lagoon until receiving the approval of the Director of the report submitted pursuant to sub-Clause 15 f) of this Licence.

19. The Licencee shall complete the installation of the synthetic liner at the wastewater treatment lagoon between the 15th day of May and the 15th day of October of any year.
20. The Licencee shall not discharge or permit the discharge of septage into the wastewater treatment lagoon between the 1st day of November of any year and the 15th day of June the following year.
21. The Licencee shall not discharge effluent from the wastewater treatment lagoon:
 - a) where the organic content of the effluent, as indicated by the five-day biochemical oxygen demand (BOD₅), is in excess of 25 milligrams per litre;
 - b) where the fecal coliform content of the effluent, as indicated by the MPN index, is in excess of 200 per 100 millilitres of sample;
 - c) where the total coliform content of the effluent, as indicated by the MPN index, is in excess of 1500 per 100 millilitres of sample;
 - d) where the total suspended solids content of the effluent is in excess of 25 milligrams per litre, unless the exceedance is caused by algae;
 - e) where the total residual chlorine content of the effluent is in excess of 0.02 milligrams per litre;
 - f) between the 1st day of November of any year and the 15th day of June of the following year;
 - g) when flooding from any cause is occurring along the effluent drainage route; or
 - h) when such a discharge would cause or contribute to flooding in or along the effluent drainage route.
22. The Licencee shall place rip rap 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 if, in the opinion of the Director, significant erosion of the interior surfaces of the dykes occurs.
23. The Licencee shall provide and maintain a grass cover on the dykes of the wastewater treatment lagoon and shall regulate the growth of the vegetation so that the height of the vegetation does not exceed 0.3 metres on all dykes.
24. The Licencee shall annually remove by mechanical methods all reeds, rushes and trees located above the low water mark in every cell of the wastewater treatment lagoon, while ensuring the integrity of the PVC geomembrane liner is maintained at all times.
25. The Licencee shall implement an ongoing program to ensure that burrowing animals are removed from the site of the wastewater treatment lagoon.

MONITORING AND REPORTING

26. The Licencee shall prior to each effluent discharge campaign obtain grab samples of the treated wastewater and have them analyzed for:

- a) the organic content as indicated by the five-day biochemical oxygen demand and expressed as milligrams per litre;
 - b) the organic content as indicated by the five-day carbonaceous biochemical oxygen demand and expressed as milligrams per litre;
 - c) the total suspended solids content expressed as milligrams per litre;
 - d) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample;
 - e) the total coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample; and
 - f) the total residual chlorine content as determined at the wastewater treatment lagoon site at the time of sampling and expressed as milligrams per litre.
27. The Licencee shall:
- a) during each year maintain records of:
 - i) wastewater sample dates;
 - ii) original copies of laboratory analytical results of the sampled wastewater; and
 - iii) effluent discharge dates;
 - b) make the records being maintained pursuant to sub-Clause 27 a) of this Licence available to an Environment Officer upon request; and
 - c) keep the maintained records of any one calendar year available for inspection for a period of three years following the respective calendar year in which they were recorded.
28. The Licencee shall actively participate in any future watershed based management study, plan and/or nutrient reduction program, approved by the Director, for the Red Deer Lake and/or associated waterways.
29. The Licencee shall submit to the Director for approval, within six months of the date of this Licence, a comprehensive groundwater monitoring plan for the site of the Development to monitor for liner integrity, to be carried out as approved by the Director.
30. The Licencee shall, during the first year of operation of the Development following the construction of the wastewater treatment lagoon that a discharge must occur, obtain two representative grab samples of the effluent during each effluent discharge campaign. The grab samples shall be obtained near the start of each discharge and near the end of each discharge, and shall be analysed and reported in accordance with Schedule "A" attached to this Licence.
31. The Licencee shall:
- a) prepare "as constructed drawings" for the Development and shall label the drawings "As Constructed"; and
 - b) provide to the Director, on or before 1st day of January 2011, two sets of "as constructed drawings" of the wastewater treatment lagoon.


SLUDGE REMOVAL FROM EXISTING CELLS

32. The Licencee shall:
 - a) construct the temporary dewatering cell with compacted berms lined with 20 mil reinforced polyethylene and operate the temporary dewatering cell in a manner such that sludge and supernatant do not leak out of the cell;
 - b) maintain and operate the temporary dewatering cell in such a manner as to prevent the contamination of groundwater and surface waters;
 - c) provide a minimum 1 metre buffer zone between the temporary dewatering cell perimeter berm and any adjoining property lines; and
 - d) install fencing and warning signs surrounding the temporary dewatering cell.
33. The Licencee shall isolate the cell of the wastewater treatment lagoon, from which sludge solids are to be removed, from the rest of the wastewater treatment system while the sludge solids are being mixed or removed from the cell.
34. The Licencee shall, after placing the sludge in the geotextile bags in the temporary dewatering cell, remove all the supernatant from the sludge and return the supernatant to the primary cell of the wastewater treatment lagoon, so that only sludge solids remain.
35. The Licencee shall only transport sludge solids from the geotextile bags in the temporary dewatering cell that:
 - a) are tested in accordance with C.S.A. Standard Test Method A23.2-5C; and
 - b) meet the slump test criteria for waste, having a slump of less than 150 mm.
36. The Licencee shall transport sludge solids in containers in such a manner as to prevent loss of sludge solids to the satisfaction of an Environment Officer.
37. The Licencee shall, in the case of physical or mechanical breakdown of the sludge treatment, handling, and transportation systems:
 - a) notify the Director immediately;
 - b) identify the repairs required; and
 - c) complete the repairs in accordance with the written instructions of the Director.
38. The Licencee 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.
39. The Licencee shall, prior to the 1st day of November, 2010, transfer all of the sludge solids which meet slump testing requirements from the temporary dewatering cell and place the material on the lined interior portion of the wastewater treatment cells above the rip rap.

40. The Licencee shall, prior to the 1st day of December, 2010:
- a) remove and properly dispose of all temporary works, including geotextile bags and lining system from the temporary dewatering cell;
 - b) return the wastewater treatment lagoon site to its original state; and
 - c) successfully seed the area of the temporary dewatering cell with grass.

REVIEW AND REVOCATION

- A. This Licence replaces Licence No. 2800 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.


Tracey Braun, M.Sc.
Director
Environment Act

Client File No.: 2677.10

Schedule "A" to Environment Act Licence No. 2800 R

Canadian Council of Ministers of the Environment
Initial Characterization of Wastewater

Facility Size: Very small (less than 500 m³/day)

Facility Type: Facultative wastewater treatment lagoon - intermittent discharge

Effluent Sampling:

During the first year of operation, for all discharge events:

1. Obtain a representative grab sample of the discharging effluent near the beginning of the discharge period and near the end of the discharge period (i.e. two samples for each discharge event.)
2. Determine the temperature of each sample at the time of sampling.
3. Carry out all preservations and analyses on 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;

Effluent Analysis:

1. For each grab sample, have the grab sample analysed by an accredited laboratory for:
 - a) the organic content as indicated by the five-day biochemical oxygen demand and expressed as milligrams per litre;
 - b) the organic content as indicated by the five-day carbonaceous biochemical oxygen demand and expressed as milligrams per litre;
 - c) the total suspended solids content expressed as milligrams per litre;
 - d) the *Esheria coli* (*E. Coli*) content as indicted by the MPN index and expressed as MPN per 100 millilitres per sample;
 - e) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample;
 - f) the total coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample;
 - g) total residual chlorine expressed as milligrams per litre;
 - h) total ammonia nitrogen expressed as milligrams per litre;
 - i) nitrate-nitrite nitrogen expressed as milligrams per litre;
 - j) total kjeldahl nitrogen (TKN) expressed as milligrams per litre;
 - k) dissolved phosphorus expressed as milligrams per litre;
 - l) total phosphorus expressed as milligrams per litre; and
 - m) pH.

Effluent Reporting:

1. For each grab sample, report the results to the Director, in writing or in an electronic format acceptable to the Director within 60 days of the sampling date. The report shall include the sampling date, sample temperature, the dates of the effluent discharge, and copies of the laboratory analytical results of the sampled effluent.