



Environment, Climate and Parks
Environmental Approvals Branch
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File No.: 844.40

April 19, 2023

Gaylene Mischuk
Parks Branch
Box 2550, 79-3rd Street West, 2nd Floor
The Pas, Manitoba R9A 1M4
Gaylene.Mischuk@gov.mb.ca

Dear Gaylene Mischuk:

**Re: Paint Lake Provincial Park – Wastewater Treatment Lagoon Expansion -
Environment Act Licence No. 1304 R**

Thank you for your October 24, 2022, proposal. Enclosed is Environment Act Licence No. 1304 R to the Parks Branch to construct and operate an expanded wastewater treatment lagoon serving Paint Lake Provincial Park.

The Parks Branch must follow all licence requirements and federal and provincial regulations and have approval from the director under The Environment Act to alter the development.

Anyone affected by the issuance of this licence may appeal the decision to the Minister of Environment and Climate. Appeals must be submitted in writing to the Minister at minec@leg.gov.mb.ca by April 19 2023.

If you have any questions about this approval, please contact Cristal Huculak, Regional Supervisor, Environmental Compliance and Enforcement Branch at Cristal.Huculak@gov.mb.ca or 204-620-5797. For clauses 22 – 25, the environment officer of the Environmental Approvals Branch is Bruce Webb, who may be contacted at Bruce.Webb@gov.mb.ca.

Sincerely,

Original signed by

Siobhan Burland Ross
A/Director

Enclosure

- c. Warren Luky
- Sandra Crawford
- Andrea Hatley
- Rebecca Luhn-Jenson, Parks Branch
- Rebecca Toews, Manitoba Water Services Board
- Cristal Huculak
- Bruce Webb

LICENCE

File No.: 844.40

Licence No. / Licence n°: 1304 R

Issue Date / Date de délivrance : August 30, 1989

Revised : March 19, 2023

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)

In accordance with section 11(1) / Conformément au paragraphe 11(1)

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

PARKS BRANCH; "the licensee"

for the construction and operation of the development being a wastewater treatment lagoon with a hydraulic storage capacity of 30,150 cubic metres (131 cubic metres per day) located in Paint Lake Provincial Park and a wastewater collection system serving Paint Lake Provincial Park as shown in Figure 1 attached to this licence, with treated effluent to be discharged to a natural wetland north of the lagoon, and in accordance with the proposal filed under The Environment Act on October 24, 2022, and additional information dated February 10, 2023, and subject to the following specifications, limits, terms and conditions:

DEFINITIONS

In this licence,

"accredited laboratory" means an analytical facility accredited by the Standards Council of Canada (SCC), or accredited by another accrediting agency recognized by Manitoba Environment and Climate 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;

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

"approvals branch" means the Environmental Approvals Branch of Manitoba Environment and Climate, or any future branch responsible for issuing licences under The Environment Act;

"approved" means approved by the director or assigned environment officer in writing;

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

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

"cut-off" means a vertical-side trench filled with compacted clay or a sand and bentonite mixture or a wall constructed from compacted clay;

"day" or **"daily"** means any 24-hour period;

"director" means an employee so designated under The Environment Act;

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

"environment officer" means an employee so designated under The Environment Act;

"fecal coliform" means aerobic and facultative, Gram-negative, non-spore-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 5 days at a temperature of 20°C;

"five-day carbonaceous biochemical oxygen demand (CBOD₅)" means that part of the oxygen demand usually associated with biochemical oxidation of carbonaceous organic matter within five days at a temperature of 20°C, excluding the oxygen demand usually associated with the biochemical oxidation of nitrogenous organic matter;

"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 obtained at a given place and time;

"high water mark" means the line on the interior surface of the aerated and storage cells which is normally reached when the cell is at the maximum allowable liquid level or the line of the exterior of the perimeter dykes which is reached during local flooding;

"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;

"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;

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

"pollutant" means a pollutant as defined in The Environment Act;

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

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

"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;

"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;

"total residual chlorine" means the sum of free chlorine and combined chlorine, including inorganic chloramines;

"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, industrial and process wastewater; and

"wastewater treatment lagoon" means the component of this development which consists of an impoundment into which wastewater is discharged for treatment and storage.

GENERAL TERMS AND CONDITIONS

1. The licensee shall at all times maintain a copy of this licence at the development or at the premises from which the development's operations are managed.
2. In addition to any of the limits, terms and conditions specified in this licence, the licensee shall, upon the request of the director:
 - a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of pollutant storage, containment, treatment, handling, disposal or emission systems, for such pollutants or ambient quality, aquatic toxicity, leachate characteristics and discharge or emission rates, for such duration and at such frequencies as may be specified;
 - b) determine the environmental impact associated with the release of any pollutant(s) from the development;
 - c) conduct specific investigations in response to the data gathered during environmental monitoring programs; or
 - d) provide the director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.
3. The licensee shall, unless otherwise specified in this licence:
 - a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the most current edition of Standard Methods for the Examination of Water and Wastewater or in accordance with equivalent preservation and analytical methodologies approved by the director;
 - b) have all analytical determinations undertaken by an accredited laboratory; and
 - c) report the results to the director, in writing and in electronic format acceptable to the director, within 60 days of the samples being taken.
4. The licensee shall submit all information required to be provided to the director or environment officer under this licence, in written and electronic format, in such form (including number of copies), and of such content as may be required by the director or environment officer, and each submission shall be clearly labelled with the licence number and file number associated with this licence.
5. The licensee 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.
6. The licensee shall direct all wastewater generated within Paint Lake Provincial Park toward the wastewater treatment lagoon or other approved wastewater treatment facilities.
7. The licensee shall actively participate in any future watershed-based management study, plan and/or nutrient reduction program, approved by the director, for Paint Lake, the Grass River, and associated waterways and watersheds.

SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

Construction - General

8. The licensee 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 and the name of the contractor responsible for the construction.
9. The licensee shall notify permanent and seasonal residents of the park of the construction schedule of the development not more than two weeks after selecting the contractor, and not less than two weeks prior to beginning construction. Notification shall be provided by delivering notice to all residences. Notification of sludge transfer from the treatment cells of the development to the sludge disposal cell shall be provided to all residents not less than two weeks before beginning this activity.
10. The licensee shall comply with the requirements of The Heritage Resources Act, and suspend construction and immediately notify the Historic Resources Branch if heritage resources are encountered during the construction of the development.
11. The licensee shall locate fuel storage and equipment servicing areas established for the construction and operation of the development a minimum distance of 100 metres from any waterbody, and shall comply with the requirements of the Storage and Handling of Petroleum Products and Allied Products Regulation, or any future amendment.
12. The licensee shall dispose of non-reusable construction debris from the development at a waste disposal ground operating under the authority of a permit issued under the Waste Management Facilities Regulation, or any future amendment, or a licence issued under The Environment Act.
13. The licensee shall, during construction of the development, operate, maintain and store all materials and equipment in a manner that prevents any deleterious substances (fuel, oil, grease, hydraulic fluids, coolant, paint, uncured concrete and concrete wash water, etc.) from entering the wastewater treatment lagoon, the discharge route and associated watercourses, and have an emergency spill kit for in-water use available on site during construction.
14. The licensee shall, during construction and maintenance of the development, prevent the introduction and spread of foreign aquatic and terrestrial biota by cleaning equipment prior to its delivery to the site of the development and complying with the Aquatic Invasive Species Regulation, or any future amendment.
15. The licensee shall:
 - a) conduct all ditch related work activities during no flow or dry conditions and not during the April 1 to June 15 fish spawning and incubation period.
 - b) not construct the wastewater treatment lagoon or wastewater collection system during periods of heavy rain;

- c) place and/or isolate all dredged and construction material where it will not erode into any watercourse;
 - d) implement effective long-term sediment and erosion control measures to prevent soil-laden runoff, and/or silt from entering any watercourse during construction and until vegetation is established;
 - e) routinely inspect all erosion and sediment control structures and immediately complete any necessary maintenance or repair;
 - f) revegetate soil exposed during the construction of the development with native or introduced grasses or legumes. Native species shall be used to revegetate areas where native species existed prior to construction; and
 - g) use rock that is free of silt and clay for riprap.
16. The licensee shall, in the case of physical or mechanical equipment breakdown or process upset where such breakdown or process upset results or may result in the release of a pollutant in an amount or concentration, or at a level or rate of release, that causes or may cause a significant adverse effect, immediately report the event by calling Manitoba Environment and Climate's 24-hour environmental accident reporting line at 204-944-4888 (toll-free 1-855-944-4888). The report shall indicate the nature of the event, the time, estimated volume and estimated duration of the event and the reason for the event.
17. The licensee shall, following the reporting of an event under Clause 16:
- a) identify the repairs required to the mechanical equipment;
 - b) undertake all repairs to minimize unauthorized discharges of a pollutant;
 - c) complete the repairs in accordance with any written instructions of the director; and
 - d) submit a report to the director about the causes of breakdown and measures taken, within one week of the repairs being done.
18. The licensee shall install and maintain a fence around the wastewater treatment lagoon to limit access. The fence shall be a minimum of 1.2 metres high and have a locking gate, which shall be locked at all times except to allow access to the wastewater treatment lagoon.
19. The licensee shall construct and maintain an all-weather access road and a wastewater dumping station for truck-hauled wastewater. The dumping facility shall have a surface splash ramp with a smooth hard surface that can be easily washed free of solids.

Construction – Clay Liner

20. The licensee shall, prior to the construction of the dykes for the wastewater treatment lagoon:
- a) remove all organic material from the area where the wastewater treatment lagoon will be constructed; or
 - b) remove all organic material down to a depth to the top of the liner material and for a width of 3.0 metres from the area where the liner will be constructed.
21. The licensee shall construct and maintain the wastewater treatment lagoon with a continuous liner, including cut-offs, under all interior surfaces of the cells in accordance with the following specifications:
- a) the liner shall be made of clay;

- b) the liner shall be at least 1.0 metre in thickness;
 - c) the liner shall have a hydraulic conductivity of 1.0×10^{-7} centimetres per second or less at all locations; and
 - d) the liner shall be constructed to an elevation of 2.5 metres above the base of the primary and the secondary cells.
22. The licensee shall arrange with the designated environment officer of the approvals branch 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, unless otherwise approved by the environment officer of the approvals branch.
23. The licensee shall take and test undisturbed soil samples, in accordance with Schedule “A” attached to this licence, from the liner of the wastewater treatment lagoon; the number and location of samples and test methods to be specified by the designated environment officer of the approvals branch up to a maximum of 20 samples.
24. The licensee shall, not less than 2 weeks before the wastewater treatment lagoon is placed in operation, submit for the approval of the environment officer of the approvals branch the results of the tests carried out under clause 23 of this licence.

Record Drawings

25. The licensee shall:
- a) prepare “record drawings” for the development and shall label the drawings “Record Drawings”; and
 - b) provide to the director, within four months of the environment officer’s approval of the reports required by clause 24 of this licence, one electronic copy of the “record drawings”.

Operation

26. The licensee shall obtain and maintain classification of the development under the Water and Wastewater Facility Operators Regulation or any future amendment and maintain compliance with all requirements of the regulation including, but not limited to, the preparation and maintenance of a table of organization, emergency response plan and standard operating procedures.
27. The licensee shall carry out the operation of the development with individuals properly certified to do so under the Water and Wastewater Facility Operators Regulation or any future amendment. In the event that the development is reclassified under the regulation, the licensee shall provide a development plan to the director to have certified operator(s) upgrade their certification.
28. The licensee shall operate and maintain the wastewater treatment lagoon in such a manner that:
- a) the organic loading on the primary cell, as indicated by the five-day biochemical oxygen demand, is not in excess of 56 kilograms per hectare per day;
 - b) the depth of liquid in the primary and the secondary cells does not exceed 1.5 metres; and

- c) a minimum of 1.0 metre freeboard is maintained in the primary and the secondary cells at all times.
29. The licensee shall not discharge septage into the wastewater treatment lagoon between the 15th day of October of any year and the 15th day of June of the following year.
30. The licensee shall not discharge effluent from the wastewater treatment lagoon:
- where the organic content of the effluent, as indicated by the five day carbonaceous biochemical oxygen demand, is in excess of 25 milligrams per litre;
 - where the total suspended solids content of the effluent is in excess of 25 milligrams per litre, unless the exceedance is caused by algae;
 - where the coliform content of the effluent, as indicated by one of either the fecal coliform or the *E. coli* content measured by the MPN index, is in excess of 200 per 100 millilitres of sample;
 - where the unionized ammonia content of the effluent is in excess of 1.25 milligrams per litre, expressed as nitrogen (N), at 15°C ±1°C;
 - between the 1st day of November of any year and the 15th day of June of the following year;
 - when flooding from any cause is occurring along the effluent drainage route; or
 - when the discharge of effluent would cause or contribute to flooding in or along the effluent drainage route.
- Parts d) and e) of this clause apply only after the commissioning of the upgraded components of the development. Until that time, the earliest permissible date for effluent discharge is May 16 of any year.
31. The licensee shall not discharge effluent from the wastewater treatment lagoon where the total phosphorus content of the effluent is in excess of 1.0 milligrams per litre as determined in Clause 40 of this licence. If the effluent does not meet this requirement in two consecutive discharge events, or as required by the director, the effluent sampling point shall revert to the secondary cell and chemical precipitation shall be used to meet phosphorus discharge requirements.
32. The licensee shall, when chlorine is used as a disinfecting agent:
- notify the environment officer in advance;
 - dechlorinate effluent prior to discharge;
 - obtain grab samples prior to and daily during the discharge period and have them analyzed for total residual chlorine; and
 - not discharge effluent where the concentration of the total residual chlorine is in excess of 0.02 milligrams per litre.

Maintenance

33. The licensee shall, if in the opinion of the environment officer, significant erosion of the interior surfaces of the dykes occurs, repair the dyke to the satisfaction of the environment officer. Upon approval of the environment officer, install riprap as necessary. The riprap shall be placed on the interior dyke surfaces from 0.6 metres above the high water mark to the bottom of the dykes to protect the dykes from wave action.

34. The licensee 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.
35. The licensee 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.
36. The licensee shall implement an ongoing program to remove burrowing animals from the site of the wastewater treatment lagoon.

MONITORING AND REPORTING

37. The licensee shall immediately notify the director each time the operating depth of any cell of the wastewater treatment lagoon does not comply with the maximum operating depth and minimum freeboard requirements for that cell as specified in clause 28 of this licence.
38. The licensee shall, if reporting is required under clause 37 of this licence in two consecutive years:
 - a) engage the services of a qualified consultant, acceptable to the director, to undertake an investigation of the wastewater treatment lagoon and related infrastructure, to determine the ability or inability of the existing system to meet the hydraulic loading capacity of the serviced area. The investigation shall include but not be necessarily limited to:
 - i) diagnosis of the cause(s) of the recent exceedances of maximum operating depth;
 - ii) sources of infiltration into the wastewater system including the wastewater collection system;
 - iii) current hydraulic loading of the system;
 - iv) lack of storage capacity due to sludge build-up within existing cells;
 - v) the organic loading on the primary cell in terms of the five day biochemical oxygen demand; and
 - vi) operating procedures;
 - b) provide to the director, within four months of the notification given under clause 37 of this licence, an engineering report describing in detail the results and observations concluded by the investigation; and
 - c) provide to the director, within four months of the report provided under sub-clause b) of this section, a remedial action plan in the form of a detailed engineering report describing recommended modifications, repairs or upgrading works to overcome excessive hydraulic loading of the system.
39. The licensee shall, prior to each effluent discharge campaign, obtain grab samples of the treated wastewater from the secondary cell of the development and have them analyzed for:
 - a) the organic content as indicated by the five-day carbonaceous biochemical oxygen demand and expressed as milligrams per litre;
 - b) the total suspended solids content expressed as milligrams per litre;
 - c) the fecal coliform content as indicated by the MPN index and expressed as MPN per 100 millilitres per sample; and
 - d) the unionized ammonia nitrogen expressed as milligrams per litre.

40. The licensee shall obtain grab samples of water flowing out of the natural wetland north of the development before each effluent discharge campaign. Grab samples shall then be obtained every two weeks during each effluent discharge campaign. Samples shall be analysed for the total phosphorus content expressed as milligrams per litre. Samples obtained during discharge periods shall be used to determine an average for total phosphorus during each discharge period, expressed as milligrams per litre, based on not less than two grab samples.
41. The licensee shall during each year maintain the following records and retain them for a minimum period of five calendar years:
 - a) reports of visual inspections conducted a minimum of once per month;
 - b) wastewater sample dates;
 - c) original copies of laboratory analytical results of the sampled wastewater;
 - d) a summary of laboratory analytical results;
 - e) cell isolation dates (i.e., valve operation records);
 - f) effluent discharge dates;
 - g) estimated effluent discharge volumes;
 - h) maintenance and repairs;
 - i) expansions to the collection system with associated capacity assessment;
 - j) updated organization charts identifying all certified operators, including backup operators; and
 - k) a summary of any wastewater collection system overflows.
42. The licensee shall submit an annual report to the environment officer by February 28 of the following year including all records required by clause 41 of this licence.
43. The licensee shall, during the first year of operation of the development following the issuance of this licence that a discharge must occur, obtain and analyze grab samples of the effluent during each effluent discharge campaign and report the results of the analysis in accordance with Schedule “B” attached to this licence.
44. The licensee shall, within one year of the date of this licence, provide a report to the director assessing the ability of the natural wetland north of the development to remove phosphorus in the effluent of the development to a concentration of 1 milligram per litre. The report shall include consideration of the size of the wetland, baseline concentrations of phosphorus in the wetland, the anticipated retention time of effluent in the wetland, the anticipated concentration of phosphorus in the effluent leaving the secondary cell of the development, and implementation of operational practices such as trickle discharge and vegetation harvesting that may support the ability of the wetland to remove phosphorus.

SLUDGE FROM EXISTING CELLS

45. The licensee shall remove sludge from the existing primary cell and secondary cell 2 of the development and dispose of it following the additional information dated February 10, 2023:
 - a) a sludge disposal cell shall be constructed as shown in Figure 2;
 - b) the liner of the sludge disposal cell shall meet the requirements of clauses 20 – 24 of this licence;

- c) sludge shall be transferred from the existing cells to the disposal cell;
- d) supernatant from the disposal cell shall be pumped to the primary cell;
- e) the disposal cell shall be capped with not less than one metre of compacted clay by the fall of the year in which the sludge is placed in the disposal cell, unless otherwise authorized by the Director. A request for an extension in capping the disposal cell shall be accompanied by a plan to control odour while the cell remains uncapped.
- f) the cap shall be graded to provide positive drainage for rainfall and snowmelt on the cap; and
- g) the cap shall be maintained and reshaped as needed to prevent water from seeping below the cap and to prevent the exposure of sludge above the cap.

Alterations

46. The licensee shall notify the director and receive the approval of the director for any alterations to the development as licensed, prior to proceeding with such alterations.

REVIEW AND REVOCATION

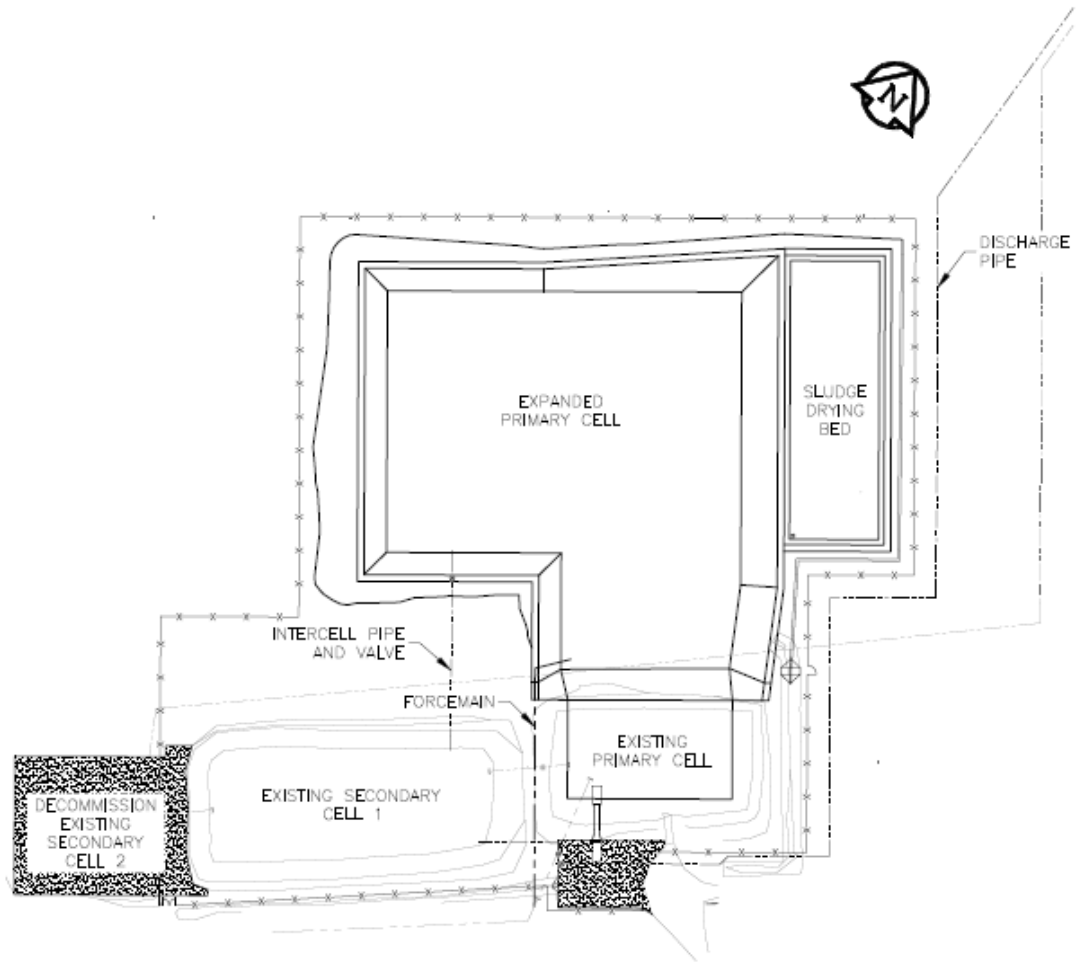
- A. Environment Act Licence No. 1304 is hereby rescinded.
- B. If, in the opinion of the director, the licensee has exceeded or is exceeding or has failed or is failing to meet the specifications, limits, terms, or conditions set out in this licence, the director may, temporarily or permanently, revoke this licence.
- C. If, in the opinion of the director, new evidence warrants a change in the specifications, limits, terms or conditions of this licence, the director may require the filing of a new proposal under section 11 of The Environment Act or request the filing of a Notice of Alteration.

Original signed by

Siobhan Burland Ross
Director

Figure 2 to Environment Act Licence No. 1304 R

Sludge Disposal Cell



Schedule "A" to Environment Act Licence No. 1304 R

Liner Sampling and Testing Requirements Under Clause 23.

Soil Sampling:

1. The licensee 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 licensee 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 licensee as to the soil testing method that must be used on each sample. The oedometer method may be used for a sample where 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 licensee 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 the following: a plot plan indicating all drill holes, onsite visual observations, 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.

Schedule "A" to Environment Act Licence No. 1304 R (cont'd)

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, whichever 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.

Schedule "B" to Environment Act Licence No. 1304 R

Initial Characterization of Wastewater Under Clause 43

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); and
2. Determine the temperature of each sample at the time of sampling.

Effluent Analysis:

1. For each grab sample, have the grab sample analysed 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 *Escherichia coli* (*E. Coli*) content as indicated 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) if chlorine was used as a disinfecting agent, 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.