



**Conservation and Water Stewardship**

Environmental Stewardship Division  
Environmental Approvals Branch  
123 Main Street, Suite 160, Winnipeg, Manitoba R3C 1A5  
T 204 945-8321 F 204 945-5229  
www.gov.mb.ca/conservation/eal

**File: 5172.00**  
**EAL No. 2732 S1**

April 16, 2015

Laura Murray  
Chief Administrative Officer  
Rural Municipality of Dauphin  
Box 574  
Dauphin, MB R7N 2V4

Dear Ms. Murray:

**Re: Rural Municipality of Dauphin – Industrial Wastewater Treatment Lagoon**

Environment Act Licence No. 2732 S1 was issued for the above facility on August 15, 2006. The licence contains a standard revocation clause that causes the licence to be revoked if construction has not commenced within three years of the date of the licence.

It is our understanding that construction of this facility has not commenced and that there is no longer intent to construct and operate the facility.

This letter is to formally notify you that the licence is no longer valid, and that our file for the project has been closed.

Yours truly,

*“original signed by”*

Tracey Braun, M.Sc.  
Director

c: Dave Shwaluk, A./General Manager, Manitoba Water Services Board  
Don Labossiere, Director, Environmental Compliance and Enforcement Branch  
Tim Prawdzik, Provincial Manager, Environmental Compliance and Enforcement Branch  
Nicole Lavallee, Environment Officer, Environmental Compliance and Enforcement Branch  
Tania Steele, Approvals Clerk, Environmental Approvals Branch

THE ENVIRONMENT ACT  
LOI SUR L'ENVIRONNEMENT  
LICENCE

Manitoba  
Conservation



Conservation  
Manitoba

Licence No./Licence n° 2732 S1  
Issue Date/Date de délivrance August 15, 2006

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

Pursuant to Sections 11(1) and 13(1) / Conformément au Paragraphes 11(1) et 13(1)

THIS STAGE 1 LICENCE IS ISSUED TO:/CET ETAPE 1 LICENCE EST DONNÉ À:

R. M. OF DAUPHIN; "the Licencee"

to construct a Development comprised of an industrial wastewater treatment facility (I-WWTF) to be located on the southern portion of the northern half of Sec. 23, Twp. 25, Rge. 19 WPM, together with:

- a wastewater pumping station to be located near the Ranchers Choice wastewater equalization basin;
- a sub-surface HDPE forcemain, 4.95 km long, connecting the pumping station to the I-WWTF; and
- a sub-surface gravity outfall line from the I-WWTF towards, and connecting with, the existing gravity outfall line from the City of Dauphin's existing municipal wastewater treatment facility;
- two clay lined sludge holding ponds; and
- a 600 metre access road;

in accordance with a Stage 1 Proposal received from the Proponent on January 31, 2006, and supported by:

- a report dated January, 2006, prepared by Earth Tech (Canada) Inc., providing a project description and an environment impact statement for the Stage 1 construction activities;
- a report dated January, 2006, prepared by Earth Tech (Canada) Inc., titled "City of Dauphin Industrial Wastewater Treatment Facility Functional Design" intended to outline the functional design of the recommended advanced wastewater treatment facility for treating effluent from the Ranchers Choice beef processing facility; and
- an "Aquatic Impact Assessment" report dated December 05, 2005, and prepared by North/South Consultants on the potential impacts to the Vermilion River;

all submitted under The Environment Act, 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 Conservation to be equivalent to the SCC, or be able to demonstrate, upon request, that it has

**\*\* A COPY OF THIS LICENCE MUST BE KEPT ON SITE AT THE DEVELOPMENT AT ALL TIMES \*\***

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;

“**BOD<sub>5</sub>**” means five-day biochemical oxygen demand;

“**Director**” means an employee of the department appointed as such by the Minister;

“**effluent**” means treated wastewater released from the I-WWTF;

“**Escherichia coli (E. coli)**” means that species of bacteria in the fecal coliform group that is found in large numbers in the gastrointestinal tract and feces of warm blooded animals and man, the presence of which is considered indicative of fresh fecal contamination, and which is used as an indicator organism for the presence of less easily detected pathogenic bacteria;

“**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;

“**HDPE**” means high density polyethylene;

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

“**I-WWTF**” means industrial wastewater treatment facility;

“**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;

“**MWAT**” means the maximum weekly average temperature;

“**MWQSOG**” means the “Manitoba Water Quality Standards, Objectives and Guidelines” (Final Draft : November 22,2002);

“**noise nuisance**” means a continuous or repeated noise, in an affected area, which is troublesome, annoying or disagreeable to a person;

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

if the unwanted sound

- (d) is the subject of at least 5 written complaints, received by the Director in a form satisfactory to the Director 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 unwanted sound 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;

**“30-day rolling average”** means the arithmetic average of any daily reported data plus the preceding 29 consecutive days of reported data;

**“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 and 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;

### GENERAL TERMS AND CONDITIONS

1. In addition to any of the limits, terms and conditions specified in this Licence, the Licencee shall, upon the request of the Director:
  - (a) sample, monitor, analyze and/or investigate specific areas of concern regarding any segment, component or aspect of any activity or substance or emissions associated with the construction of the Development, for such pollutants and for such duration and such frequencies as may be specified;
  - (b) determine the environmental impact associated with the release of any pollutant(s) from the Development; or
  - (c) provide the Director, within such time as may be specified, with such reports, drawings, specifications, analytical data, descriptions of sampling and analytical procedures being used, bioassay data, flow rate measurements and such other information as may from time to time be requested.

2. The Licencee shall, unless otherwise specified in this Licence:
  - (a) carry out all preservations and analyses on liquid samples in accordance with the methods prescribed in the most current 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 an equivalent analytical methodology approved by the Director; and
  - (b) have all analytical determinations are undertaken by an accredited laboratory.
3. The Licencee shall report all the information requested through the provisions of this Licence in a manner and form acceptable to the Director.

### SPECIFICATIONS, LIMITS, TERMS AND CONDITIONS

#### Respecting the Expected Design Capability and Performance of the I-WWTF

4. The Licencee shall design and construct the I-WWTF to be capable of:
  - (a) treating a minimum of 3,158 m<sup>3</sup> per week of Ranchers Choice 1-shift per day pretreated and equalized wastewater, plus any sanitary wastewater generated at the I-WWTF; and
  - (b) producing an effluent quality whereby, (when excluding the presence or influence of any treated effluent from the City of Dauphin's municipal wastewater treatment facility, and operating under a scenario of nil or minimal release of water from the Vermilion Reservoir):
    - (i) the suspended solids content can be reduced to 25 mg/l or less;
    - (ii) the BOD<sub>5</sub> can be reduced to 25 mg/l, or less, with the goal of not causing the dissolved oxygen content in downstream impacted waters of the Vermilion River to be degraded to levels less than as required per the MWQSOG);
    - (iii) the ammonia nitrogen expressed as N content can be reduced to levels consistent with, or less than as required as per the MWQSOG on a real-time basis for the protection of fish present downstream in the receiving Vermilion River, with even further reductions, if necessary, to further limit the depletion of any prevailing minimal in-stream dissolved oxygen (D.O.) so as to avoid instances of fish kill (excluding such circumstances and locations whereby it can be technically demonstrated that, even under non-impacted conditions, a deficit in the minimum required D.O. level does or would naturally occur);
    - (iv) the temperature of the effluent temperature can be reduced to less than 4 °C during ice cover conditions in the Vermilion River so as to avoid possible thermal shocks to any impacted fish;
    - (v) the temperature of the effluent can be sufficiently reduced during warmer periods of the year to levels close to the prevailing natural temperature of the Vermilion River, such that the temperatures of the impacted Vermilion River would not be directly elevated such as to cause the in-stream temperature to exceed the MWAT (as may be established in a manner consistent with the MWQSOG) for the protection of the

- most sensitive species of fish that may be present downstream, or that may be attracted to migrate upwards along the Vermilion River;
- (vi) on any day, the total nitrogen content can be reduced to no greater than 15 mg/l as N, (measured as a 30-day rolling average);
  - (vii) on any day, the total phosphorus can be reduced to no greater than 1.0 mg/l as P (measured as a 30-day rolling average);
  - (viii) the fecal coliform content, as indicated by the MPN index, can be reduced to 200 per 100 millilitres of sample, as determined by the monthly mean of 1 grab sample collected at equal time intervals on each of a minimum of 3 consecutive days per week; and
  - (ix) the E. coli content, as indicated by the MPN index, can be reduced to 200 per 100 millilitres of sample, as determined by the monthly mean of 1 grab sample collected at equal time intervals on each of a minimum of 3 consecutive days per week .

#### **Respecting the Design and Construction of the Sludge Holding Ponds**

5. The Licencee shall design and construct each sludge holding pond to accommodate the storage for at least 5,520 cubic metres of sludge (exclusive of any added free-board), and to facilitate the control or mitigation of offensive odours (gases) that would be produced while the sludge from the I-WWTF is being stored for one year until it can be incorporated into qualifying areas of agricultural land.
6. The licencee shall, prior to the construction of each pond, remove all organic topsoil for a depth of at least 0.3 metres from the area where the base and dikes will be situated.
7. The licencee shall design and construct the slopes of the interior surfaces to be no steeper than 3:1 (H:V).
8. The Licence shall design and construct each earthen sludge holding pond to be lined with a continuous layer of compacted clay measuring at least 1.0 metre in thickness (measured perpendicular to the surface of the liner) and possessing a minimum in-place hydraulic conductivity of at least  $1 \times 10^{-7}$  cm/sec. at all locations.
9. The Licencee shall, subsequent to the construction of the sludge holding ponds, arrange to have the compacted clay liners sampled and tested for their hydraulic conductivity, with the results of the tests submitted to the Director for approval before each pond is commissioned into service.
10. The Licencee shall arrange with the designated Environment Officer a mutually acceptable time and date for any required soil sampling between the 15<sup>th</sup> day of May and the 15<sup>th</sup> day of October of any year.
11. The Licencee shall take and test undisturbed soil samples, in accordance with Schedule "A" attached to this Licence, from the liner of each sludge holding pond; the number and locations

of samples (to a maximum of 14 samples per pond) and test methods to be specified by the designated Environment Officer.

12. The Licencee shall, not less than 2 weeks before each sludge holding pond is placed into operation, submit to the Director the results of tests carried out pursuant to Clause 11 of this Licence.

#### **Respecting the Design and Operation of the Wastewater Forcemain**

13. The Licencee shall, before commencing the directional drilling and installation of the forcemain under the Vermilion River, submit to the Director an explanation and drawings of the leakage detection strategy to be incorporated into the design of that portion of the forcemain which will pass under the Vermilion River, together with a description of the monitoring strategy to be employed during the future active use of the forcemain.

#### **Respecting Design Drawings**

14. The Licencee shall, at least 2 weeks before commencing the construction of any of the following works:
  - (a) the equalized wastewater pumping station;
  - (b) the wastewater forcemain;
  - (c) the I-WWTF (including all pipelines between the treatment plant components);
  - (d) the UV disinfection facility, (if applicable)
  - (e) the influent and treated effluent sampling station(s);
  - (f) the discharge line to the Vermilion River; and
  - (f) each sludge holding pond;submit to the Director one copy of the construction drawings and specifications, for each respective project contract, stamped by a Professional Engineer of the Province of Manitoba.
15. The Licencee shall within 3 months following the completed construction of each contracted project associated with the Development, submit to the Director two sets of as constructed drawings, with each drawing stamped 'As Constructed' or 'As Built'.

#### **Respecting Wastewater Monitoring Facilities**

16. The Licencee shall equip the wastewater influent line of the I-WWTF with an in-line continuous flow metering device capable of measuring daily and cumulative flow rates to within a  $\pm 2\%$  accuracy and possessing interface devices to actuate pumps or samplers for collecting flow proportionate 24-hour composite samples of influent wastewater.
17. The Licencee shall, with respect to the design of the I-WWTF and the effluent outfall line to the Vermilion River, provide:
  - (a) an enclosed, heated and securable final effluent monitoring station sized to accommodate the simultaneous set-up and operation of up to two flow proportionate 24-hour composite wastewater samplers, equipped with interfaces to the effluent flow metering device

whereby at least one of the interfaces is compatible with the departmentally owned ISCO sampler;

- (b) facilities to obtain grab samples of treated and disinfected effluent;
- (c) facilities to continuously measure and record the temperature of the effluent being released to the Vermilion River relative to the ambient upstream temperature of the Vermilion River; and
- (d) a flow meter to continuously measure and record the daily and cumulative quantity of wastewater being released from the I-WWTF to the Vermilion River to an accuracy of at least  $\pm 2\%$ , and possessing interface devices to actuate pumps or samplers for collecting flow proportionate volumes of effluent samples;

whereby all of the above determinations must be made upstream of the point of confluence with any effluent releases from the City of Dauphin's municipal wastewater treatment facility.

#### **Respecting Surface Runoff**

- 18. The Licencee shall construct silt fences in the drainage routes transporting surface runoff off the property of the Development, and keep the silt fences maintained in a functioning manner until vegetation has been re-established on the disturbed areas.
- 19. The Licencee shall not permit or cause any pollutant to be directed into or transported by any surface drainage route leading off the property of the Development.

#### **Respecting Groundwater Protection**

- 20. The Licencee shall pressure test the integrity of the connections of any underground piping, which is intended to transport wastewater under pressure, before such pipe connections are backfilled with earth, and advise the Director in writing once all the pressure tests have been successfully completed.
- 21. The Licencee shall, within 1 month of the date of issuance of this Licence, submit to the Director, for approval, a detailed groundwater monitoring strategy for the properties of the Development, prepared by a qualified professional, for the purpose of determining, on an ongoing basis, whether the construction activities and future operations activities have or are impacting the quality of the groundwater beneath the property of the Development (including the sludge ponds area), relative to the baseline quality of the groundwater before the commencement of construction on the property of the Development. The groundwater monitoring strategy shall describe:
  - (a) the rationale and strategic purpose for the proposed number, locations and depth of any groundwater monitoring wells proposed to be used relative to the site-specific upper aquifer groundwater conditions for the property of the Development;
  - (b) the elevations of the well head and of the upper aquifer water table at each proposed monitoring well;
  - (c) a site plan showing the locations of all the proposed monitoring wells relative to the I-WWTF and to the sludge holding ponds, and showing the true direction of groundwater flow of the upper aquifer based on the determined elevations of the water table at each of

the proposed monitoring wells and any other temporary observation wells as may be installed on-site for this purpose;

- (d) information on the adequacy of the yield from each of the proposed monitoring wells;
- (e) the water quality parameters proposed to be monitored; and
- (f) the frequency and elevation(s) at which the wells are proposed to be monitored.

#### **Respecting Sanitary Sewage**

22. The Licencee shall during the entire construction phase of the Development, comply with *Manitoba Regulation 83/2003*, or any future amendment thereto, in regards to any sanitary sewage generated at the construction site of the Development during the construction phase.

#### **Respecting Terrestrial Management**

23. The Licencee shall, before commencing any construction:

- (a) contact the Wildlife Ecosystem Protection Branch of MB Conservation for guidance on the identification and protection or transplantation of any endangered species of plants found on the construction site, or in any ditches on or immediately adjacent to the property of the Development;
- (b) have the search, identification and transplantation of any endangered species of plants undertaken by a professional person in this field; and
- (c) submit to the Director a brief report prepared by the person having conducted or supervised the work undertaken as per sub-clause 23(b) of this Licence, to document the findings and actions of this survey.

24. The Licencee shall minimize the disturbance of the any natural vegetation on the construction site, and re-vegetate disturbed and exposed areas with local indigenous vegetation to minimize the erosion and off-site transport of soil into ditches and waterways.

#### **Respecting Noise Emissions**

25. The Licencee shall not cause or permit a noise nuisance to be created as a result of the construction of the Development, and shall take such steps as the Director may require to eliminate or to mitigate a noise nuisance.

#### **Respecting Fugitive Dust Emissions**

26. The Licencee shall, during the construction phase of this Development, undertake an effective program of dust suppression such as to prevent or reduce the migration of fugitive dust in the direction of the nearby residential area, whereby such dust would be caused either directly or indirectly by any activity associated with the construction of this Development.

#### **Respecting Solid Wastes**

27. The Licencee shall not undertake any on-site burning of solid waste.

28. The Licencee shall maximize, wherever possible, the collection and recycling of recyclable wastes generated throughout the construction activities.

29. The Licencee shall not deposit solid waste into the environment except into a waste disposal ground operating under the authority of a permit issued pursuant to Manitoba Regulation 150/91, or any future amendment thereof, where the operator of that facility has agreed to accept the solid waste.

**Respecting Dangerous Goods or Hazardous Wastes**

30. The Licencee shall comply with all the applicable requirements of:
- (a) Manitoba Regulation 188/2001, or any future amendment thereof, respecting the storage and handling of petroleum products and allied products;
  - (b) the Manitoba Dangerous Goods Handling and Transportation Act, and regulations issued thereunder, respecting the handling, transport, storage and disposal of any dangerous goods brought onto or generated at the Development; and
  - (c) Manitoba Regulation 439/87, or any future amendment thereof, respecting the reporting of environmental accidents.
31. The Licencee shall:
- (a) not store any construction equipment fuel on the property of the Development, other than as authorized within the central refueling area;
  - (b) keep refueling activities confined to a selected central refueling area;
  - (c) construct and maintain clay or lined berms on three sides of the central refueling area keyed into a clay base;
  - (d) use only the central refueling area for the storage of contained lubricants and other petroleum products;
  - (e) collect all used oil and hydraulic fluids removed from on-site machinery, transport and store them in secure, properly labeled, non-leaking containers, and regularly send the containers to a recycling facility or a facility approved to accept hazardous wastes; and
  - (f) move refueling trucks off the property of the Development to a safe location when construction equipment is not being operated, unless otherwise authorized under Manitoba Regulation 188/2001, or any future amendment thereof, respecting the storage and handling of petroleum products and allied products.
32. The Licencee shall have adequate spill recovery equipment is available on-site at all times during the construction stage.

**Respecting Monitoring, Record Keeping and Reporting**

33. The Licencee shall:
- (a) have the construction activities inspected on a regular basis by a qualified person for the purpose of inspecting and reporting upon the degree of success to which the mitigative measures proposed for the Stage 1 construction phase are being satisfactorily carried out,

- and submit a monthly written report to the Director on the findings of the inspections until the construction phase is completed;
- (b) implement the approved groundwater monitoring strategy, and submit to the Director the results of all the analytical data obtained on the pre-development baseline water quality of the groundwater at the construction site of the I-WWTF, as well as the construction site for the proposed sludge holding ponds, along with the elevations at which the samples were taken, and including an interpretation of the monitoring results; and
  - (c) notify the Director as soon as possible of any fuel spilled on the property of the Development.

34. The Licencee shall, as soon as possible, upon the receipt of this Stage 1 Licence:

- (a) develop a monitoring/study program in close cooperation with the Water Stewardship Department and the Department of Fisheries and Oceans, for the approval of the Director, to address known data gaps both upstream and downstream of the proposed outfall of the I-WWTF, respecting such matters as, but not necessarily limited to: river water quality, river temperature data collected by means of installed temperature meters upstream and downstream of the effluent outfall; river hydraulics and flow rates, river sediment oxygen demand, use of the river by fish and other aquatic life, thermal plume delineation and other relevant data that would render a river water quality model to be more reliable in predicting the likely impacts of changes to be imposed on the Vermilion River and its aquatic life; and
- (b) implement the approved monitoring/study program upon receipt of the approval of the Director; and
- (c) submit to the Director quarterly reports on the data obtained through the implementation of the approved monitoring/study program, together with interpretations of the findings and the ramifications that the data may pose for maintaining the ongoing management of the water quality of the Vermilion River.

#### **Respecting Operations at the I-WWTF**

35. The Licencee shall not accept the receipt of any wastewater from Ranchers Choice Beef Co-op Ltd. until or unless:
- (a) the Licencee has received a Stage 2 operating licence authorizing the commissioning of the I-WWTF; and
  - (b) a binding Industrial Services Agreement has been signed between the Licencee and Ranchers Choice Beef Co-op Ltd.; and
  - (c) the operator of the R.M. of Dauphin's I-WWTF has authorized Ranchers Choice Beef Co-op Ltd, in writing, to commence the transfer of wastewater from the beef processing plant.

#### **Respecting In-stream Flow Needs Assessment for the Vermilion River**

36. In consideration of the water demand for the beef processing plant being sourced from the Vermilion Reservoir, the Licencee shall cooperate to the extent as may be requested by the City of Dauphin, the Intermountain Conservation District, and the Department of Water Stewardship in the development of an integrated watershed management plan that would

include the identification of water demand management initiatives, alternative sources for a sustainable water supply for the City of Dauphin, and the undertaking of an assessment of in-stream flow needs to maintain aquatic ecosystem health and to protect the fish habitat within the Vermilion River.

#### REVIEW OR REVOCATION

- A. If, in the opinion of the Director, the Licencee has failed or is failing to comply with any of the specifications, limits, terms or conditions set out herein, the Director may, temporarily or permanently, revoke this Licence.
- B. If the Licencee has not commenced construction of the Development within three years of the date of issuance of this Licence, this Licence is revoked.
- C. If, in the opinion of the Director, new evidence warrants a change in the specifications, limits, terms or conditions of this Licence, the Director may require the filing of a new proposal pursuant to Section 11 of The Environment Act.

  
Tracey Braun, M.Sc.  
Director  
Environment Act

**Schedule "A" to Environment Act Licence No. 2732 S1**

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 sludge pond structure. This includes all sludge ponds 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.

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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.