COMMUNITY LEARNING SESSION – ENVIRONMENTAL ASSESSMENT & LICENSING IN MANITOBA

CRYSTAL SPRING COLONY WASTEWATER TREATMENT LAGOON

Manitoba Environment and Climate Change
Environmental Approvals Branch / Environmental Compliance and Enforcement Branch

June 4, 2025

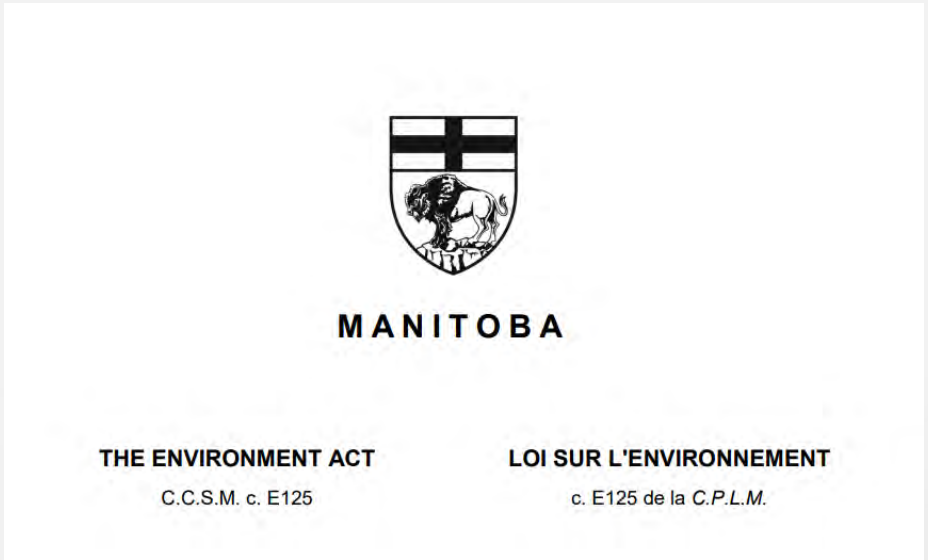
Agenda

- Manitoba Environmental Assessment and Licensing process
- Wastewater Treatment Lagoons
- Crystal Spring Colony Wastewater Treatment Lagoon
- Questions

OVERVIEW OF:

THE ENVIRONMENTAL ASSESSMENT AND LICENSING PROCESS

Intent and purposes


MANITOBA

THE ENVIRONMENT ACT

C.C.S.M. c. E125

LOI SUR L'ENVIRONNEMENT

c. E125 de la *C.P.L.M.*

1(1) The intent of this Act is to develop and maintain an environmental protection and management system in Manitoba which will ensure that the environment is protected and maintained in such a manner as to sustain a high quality of life, including social and economic development, recreation and leisure for this and future generations, and in this regard, this Act

(a) is complementary to, and support for, existing and future provincial planning and policy mechanisms;

(b) provides for the environmental assessment of projects which are likely to have significant effects on the environment;

(c) provides for the recognition and utilization of existing effective review processes that adequately address environmental issues;

(d) provides for public consultation in environmental decision making while recognizing the responsibility of elected government including municipal governments as decision makers; and

(e) prohibits the unauthorized release of pollutants having a significant adverse effect on the environment.

Manitoba Environmental Assessment and Licensing Process

Principles:

- Environmental protection
- Public health protection
- One window–identify all regulatory needs
- Public participation
- Transparent/fair/consistent
- Flexible

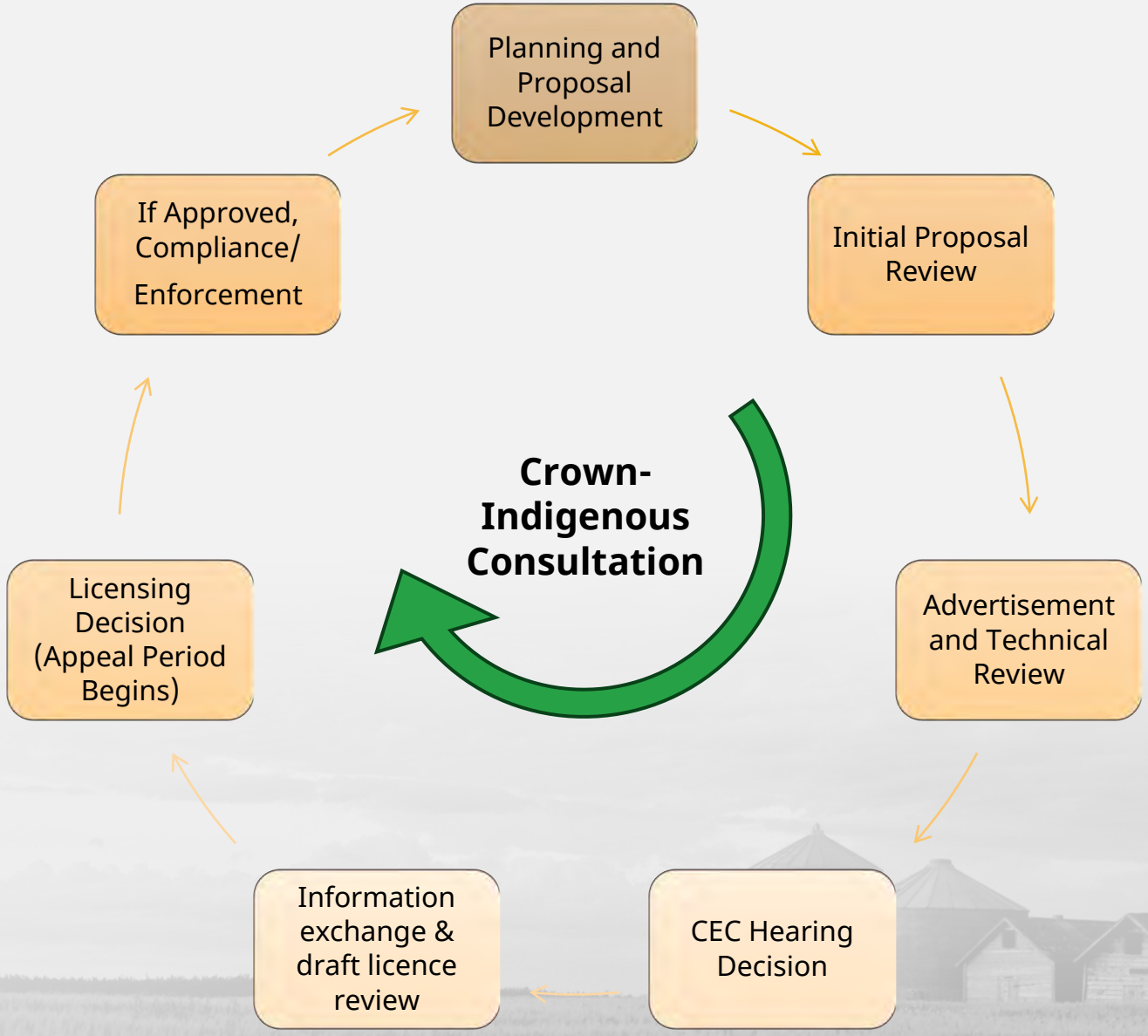
The Environment Act – Class of Development

Class	Decision-Maker	Application Fee	Examples
1	Director	$1000	Bulk material handling, commercial composting
2	Director	$7500	Food processing, manufacturing, mining, wastewater treatment
3	Minister	Variable ($7500 - $125,000)	Large energy production, electrical transmission and water development projects

Environmental Approvals Branch

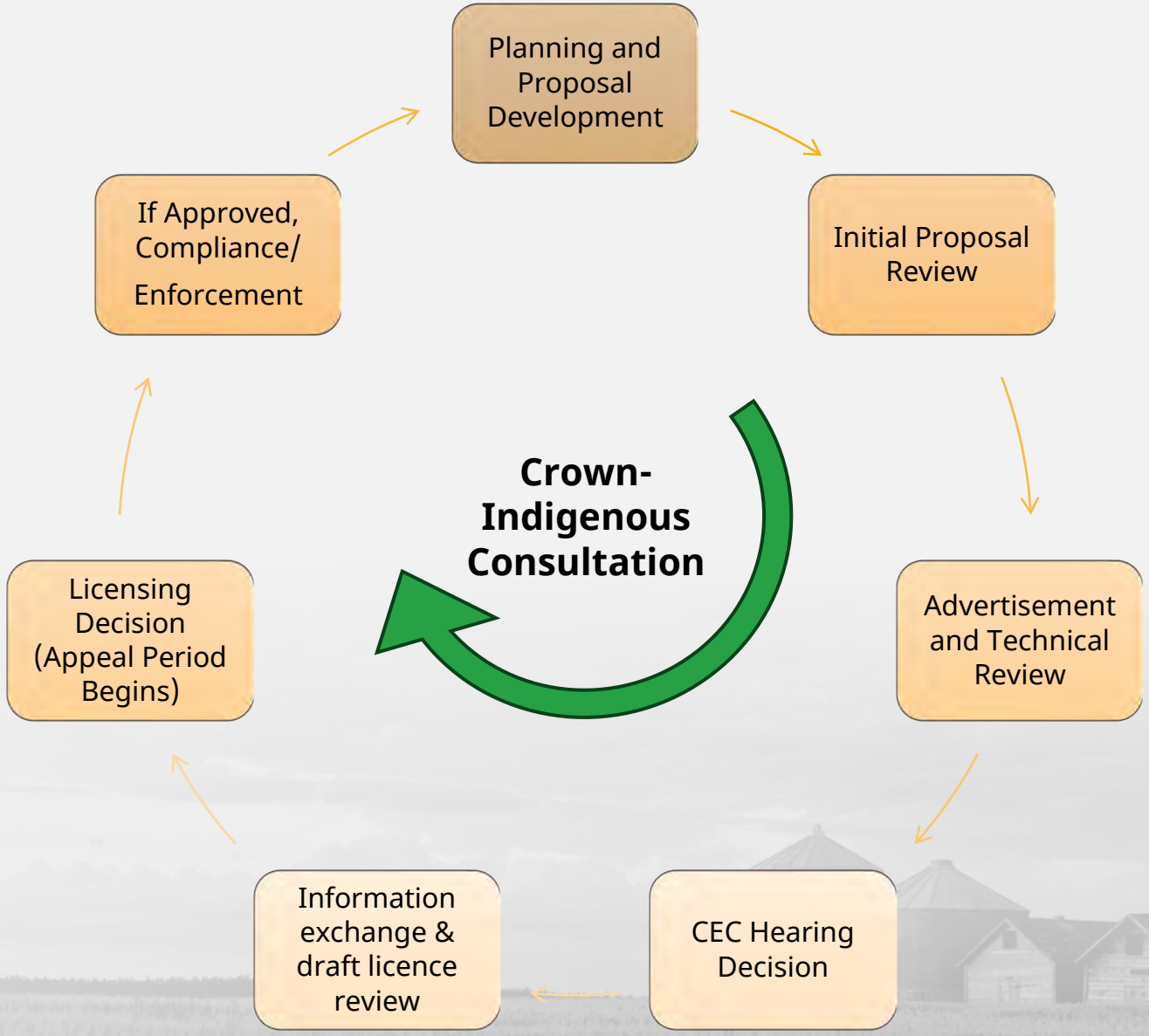
- Lead Environmental Approvals Process (administer the Act)
- Protect public health & environment
- Provide clarification of requirements to proponents
- Ensure public participation and manage technical review
- Crown-Indigenous Initial Assessment and Consultations
- Evaluate impacts & mitigation measures
- Prescribe licence terms and conditions

Manitoba's Environmental Assessment and Licensing Process



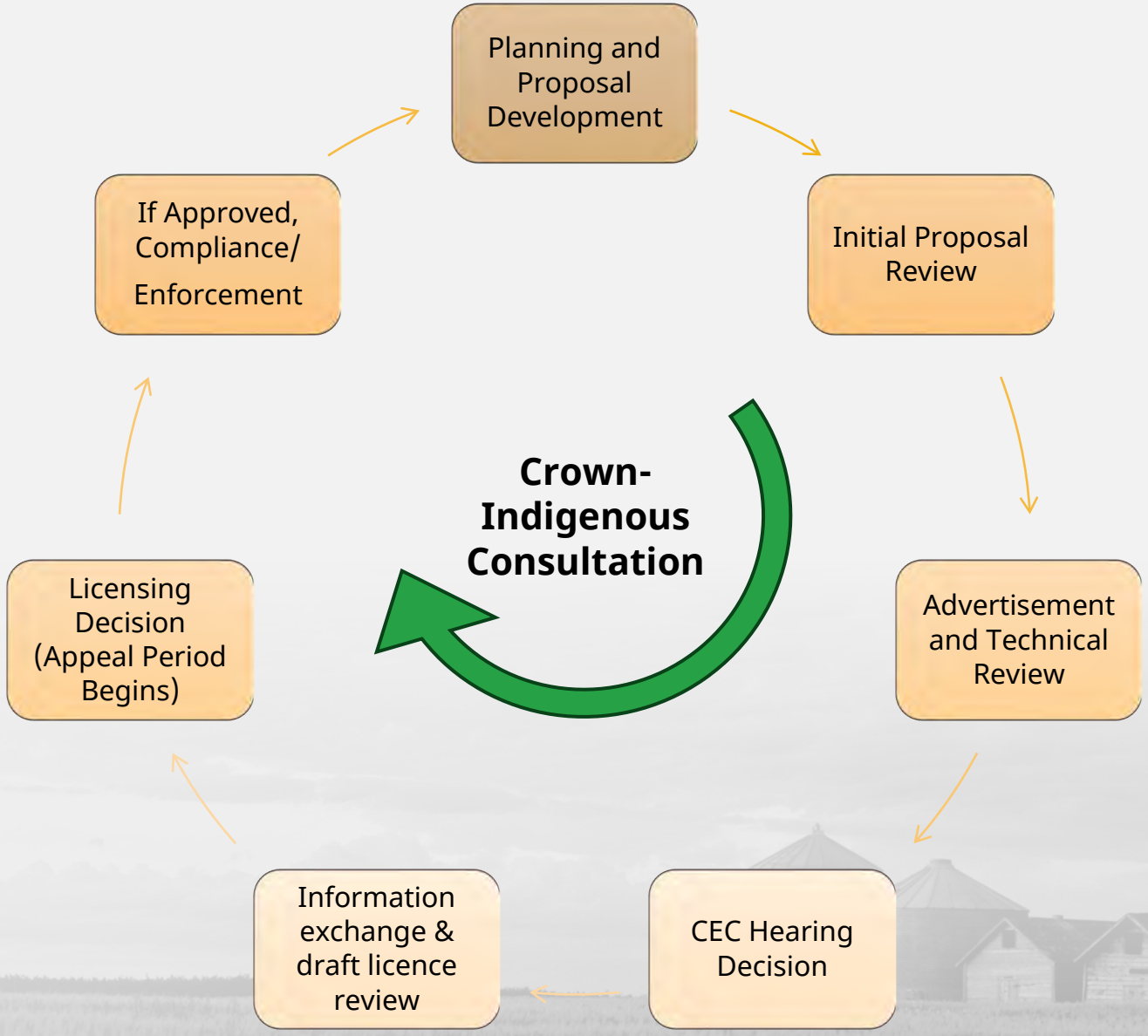
Planning

- Pre-proposal discussions
- Departmental guidelines and best practices
- Public engagement



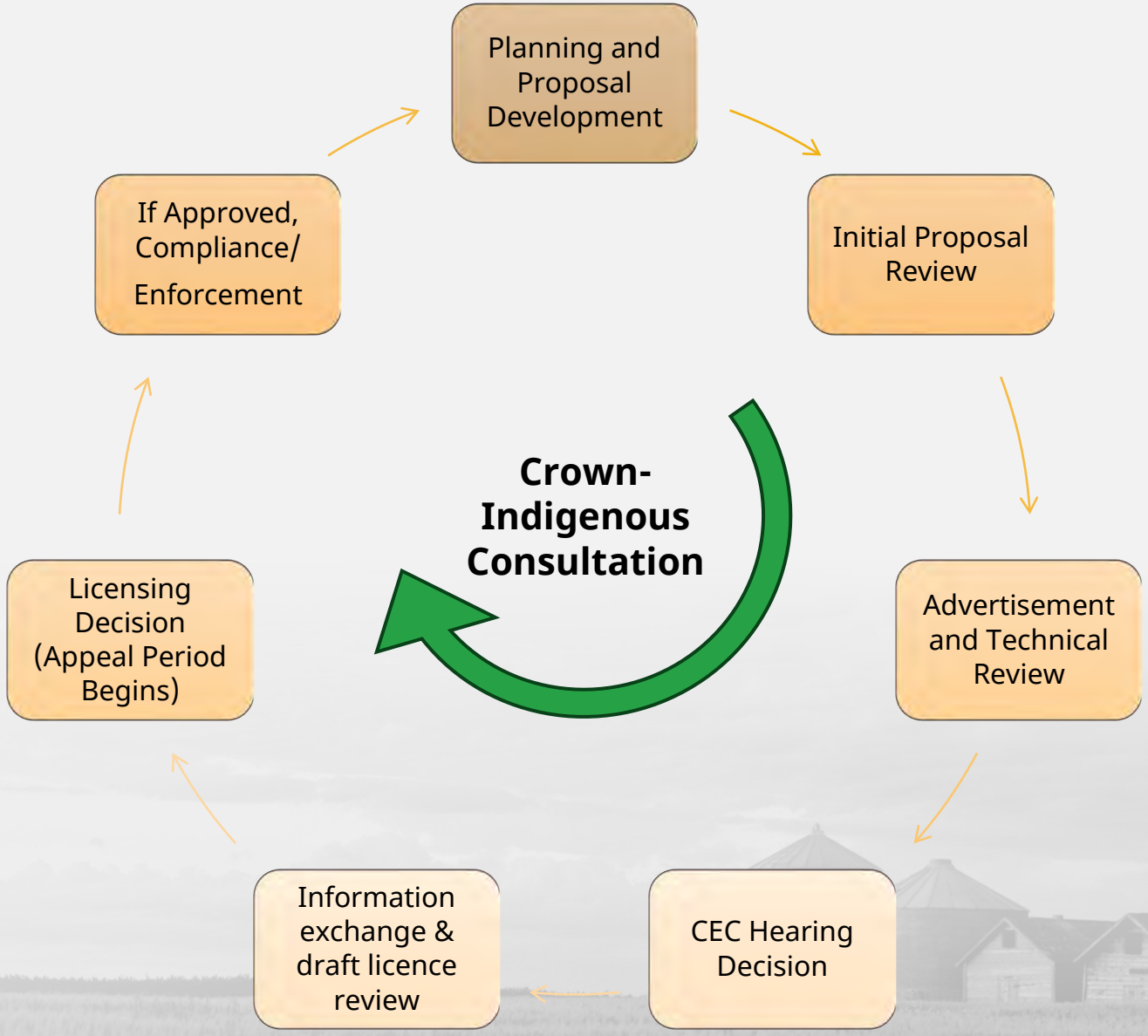
Initial Review

- A departmental contact is assigned
- Department reviews the proposal to ensure it is complete



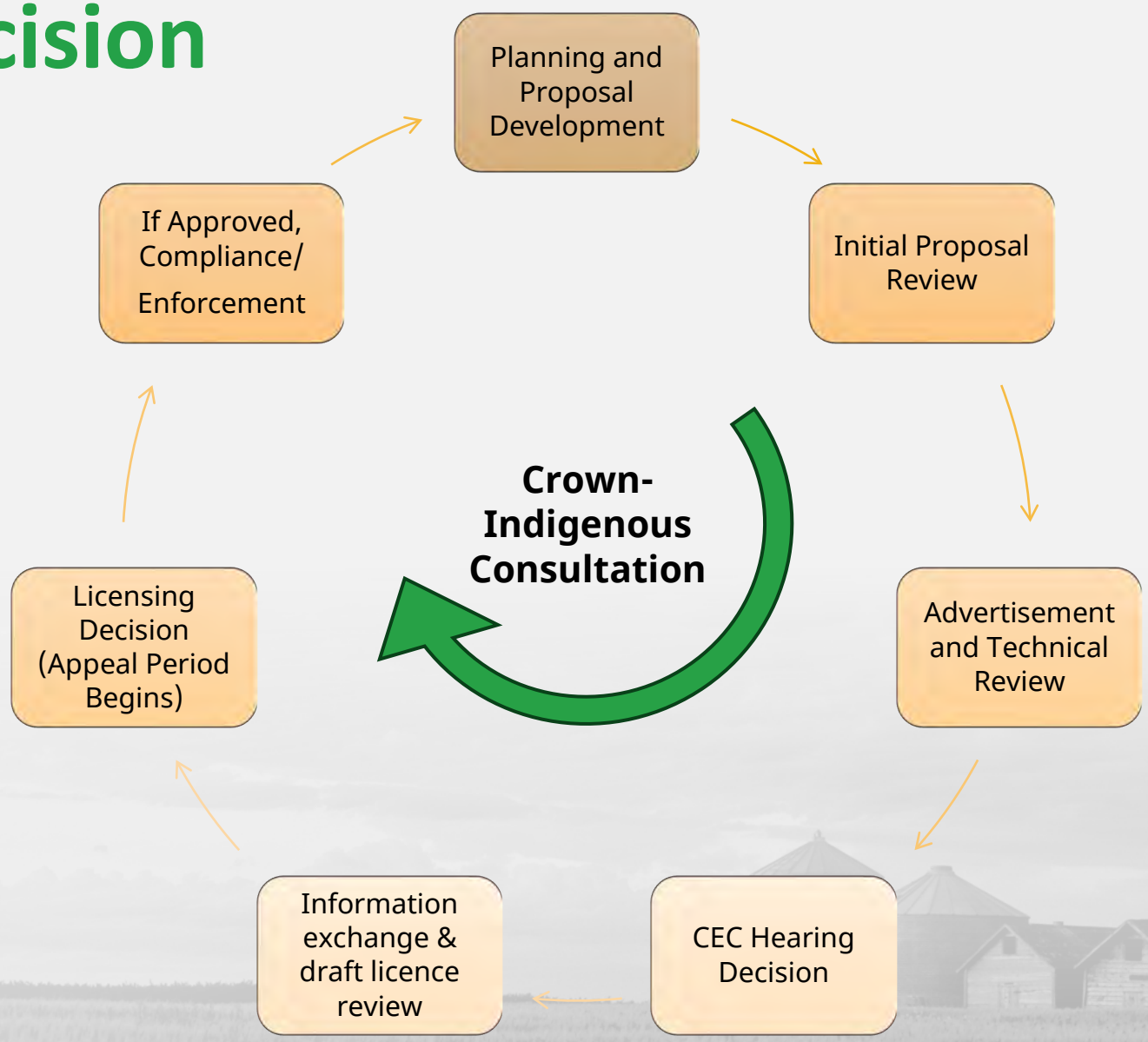
Advertisement

- Newspaper/public registry posting for public comment – typically 30 days
- Send to technical advisory committee for technical review
- Department contact technical review
- Requests for additional information/clarification



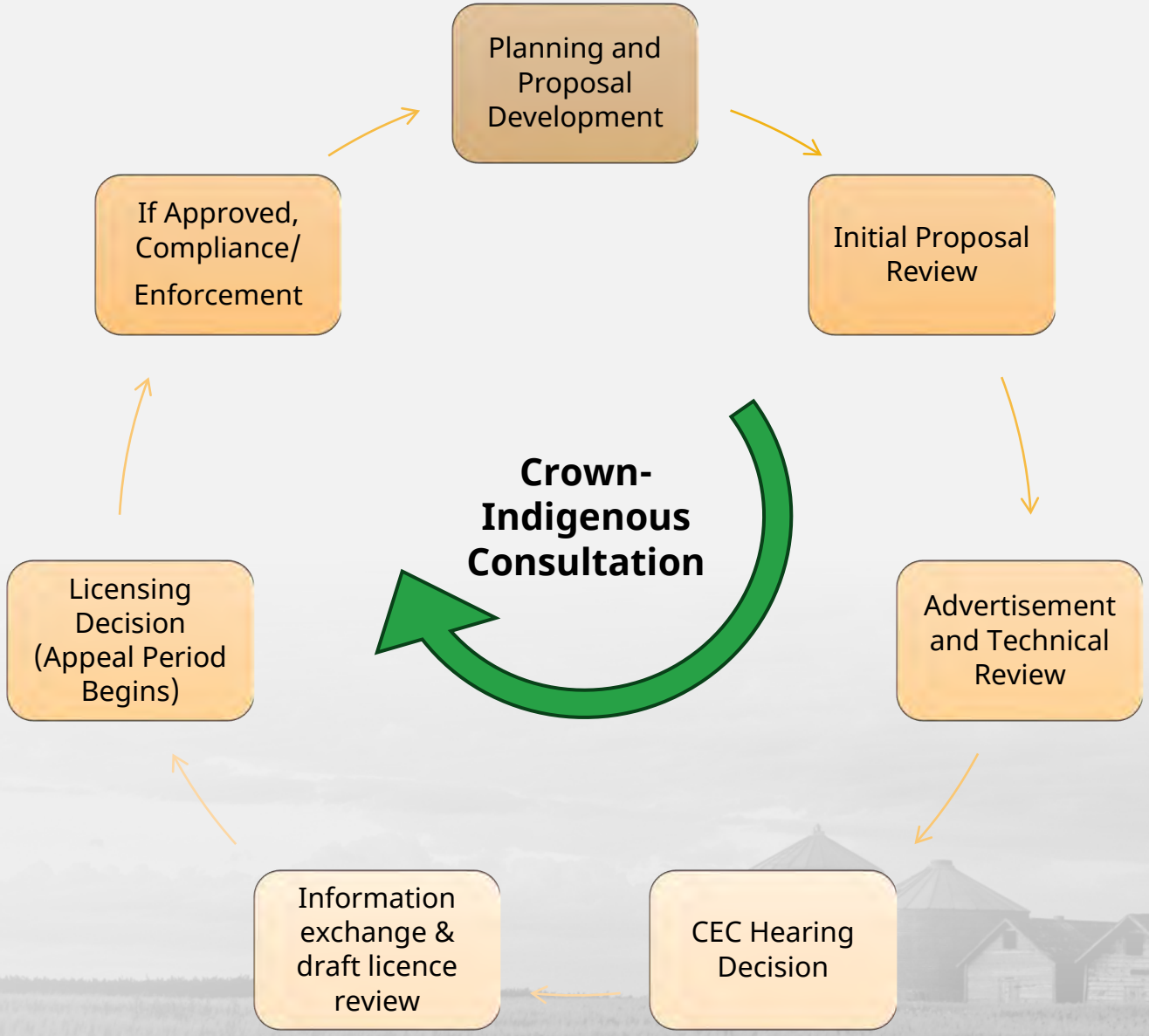
CEC Hearing Decision

- Where there are public concerns, director decides to recommend to minister to call for CEC hearing or not
- Factors include the nature of the concerns, nature of the potential environmental impacts



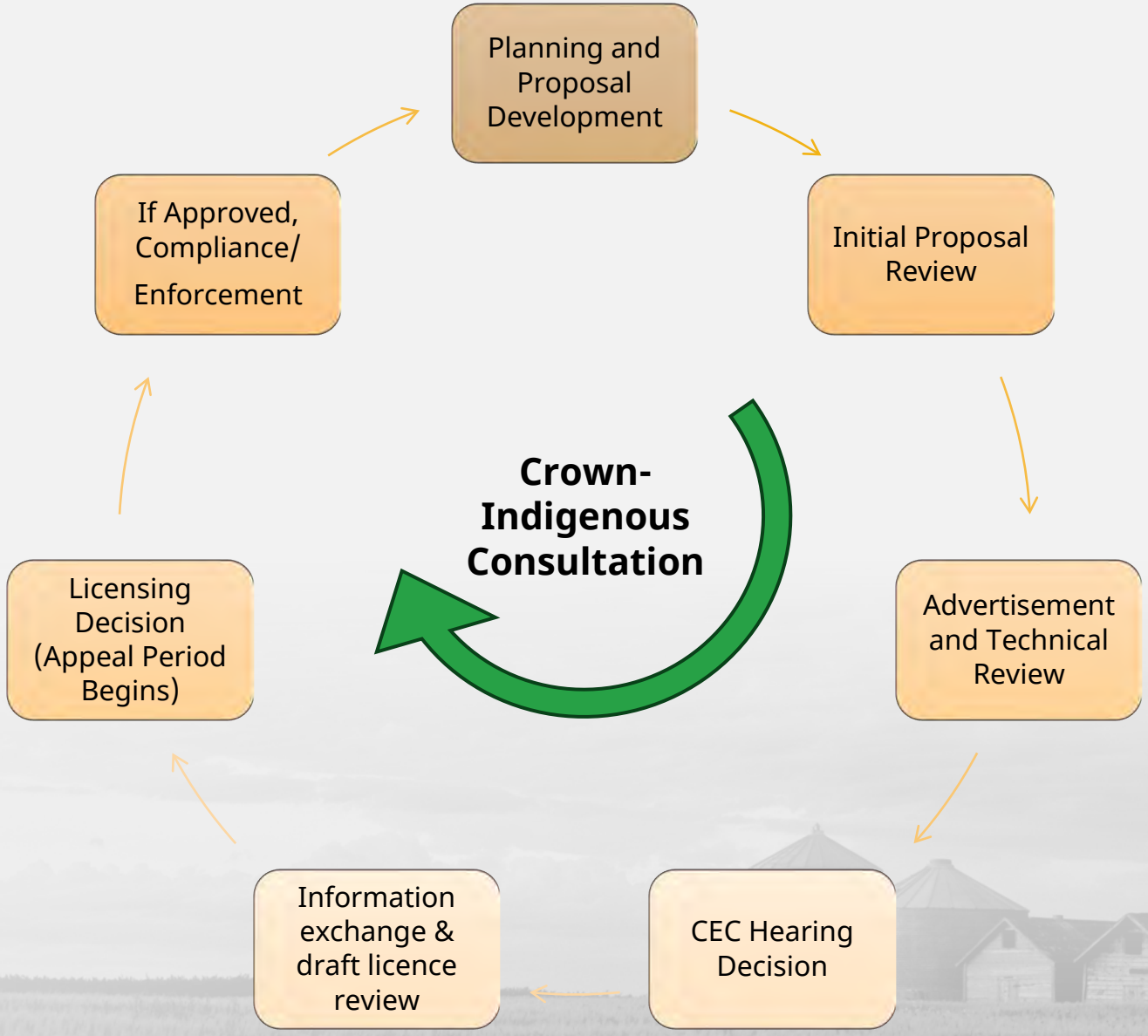
Drafting Terms

- Development of draft terms and conditions
- Additional requests for clarification
- Review of draft licence by technical advisory committee
- Review of draft licence by proponent



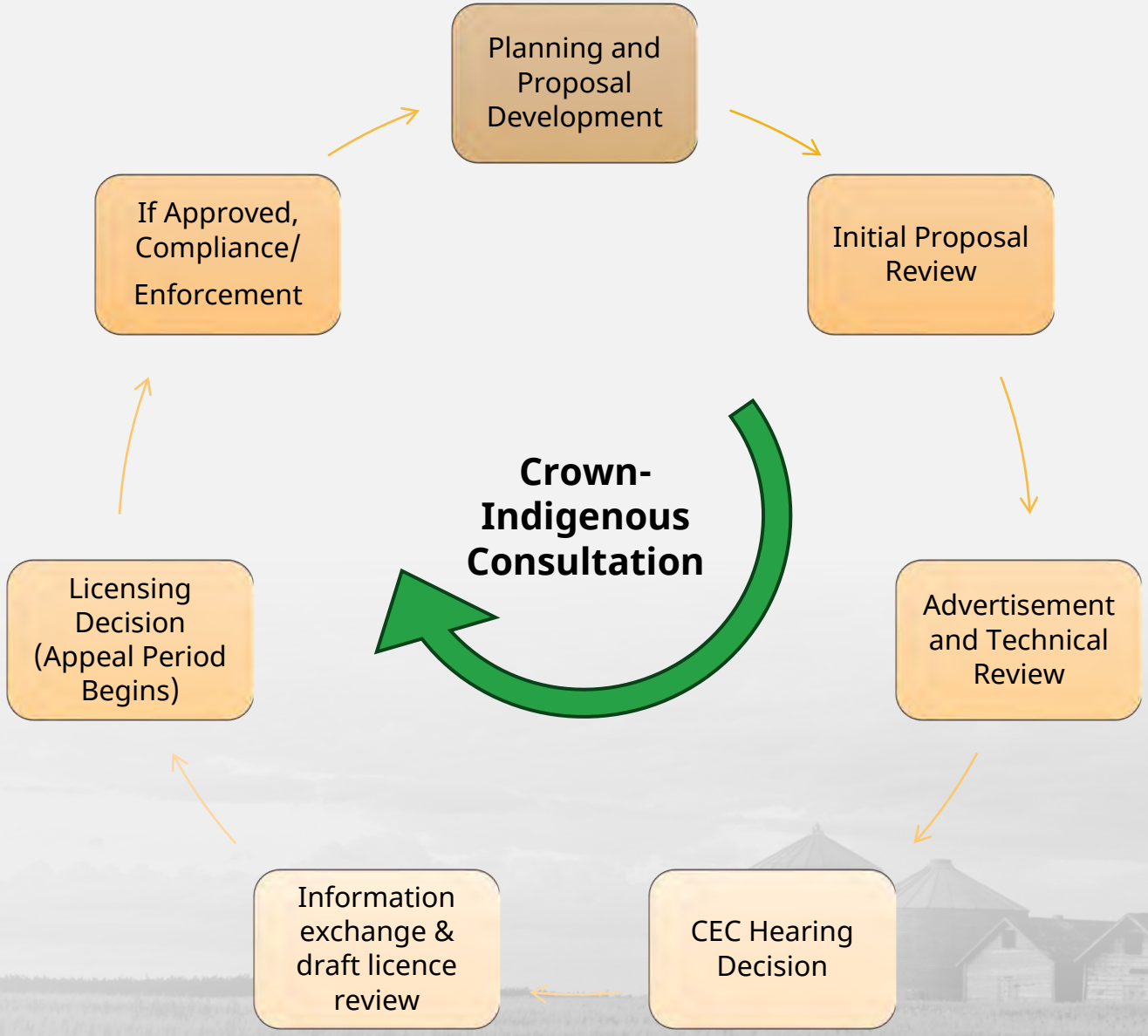
Decision

- Crown-Indigenous consultation complete
- If approved, with what terms and conditions
- Posted to public registry and emailed
- Appealable to minister

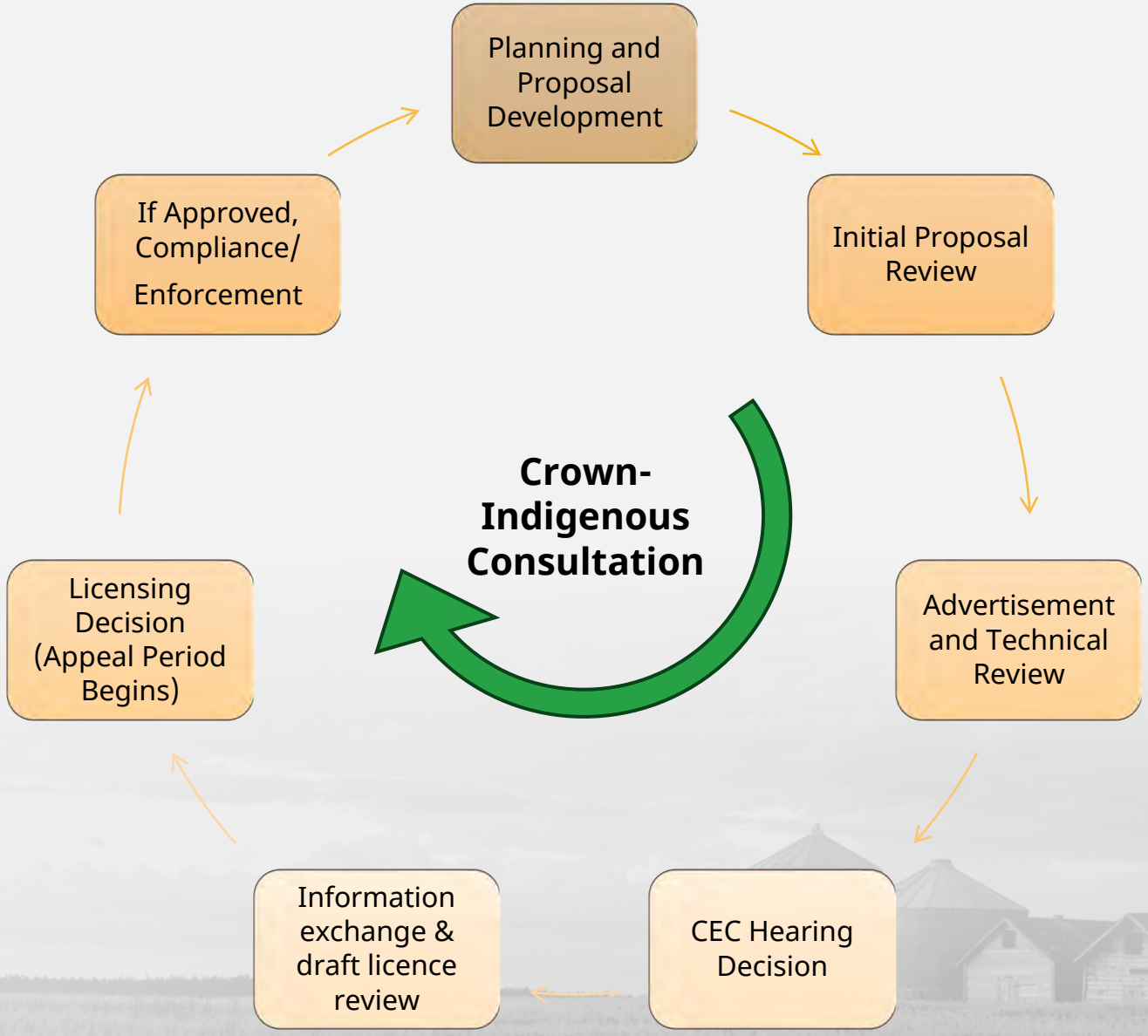


Compliance

- Legally binding terms and conditions
- Environmental Compliance and Enforcement Branch
  - Site visits/ inspections
  - Data/Reports
  - Complaints



Manitoba's Environmental Assessment and Licensing Process



Environmental assessments consider potential impacts to:

- Water quality
- Air quality, greenhouse gases, odour, noise
- Terrestrial & aquatic environment – soil, fish and wildlife
- Transportation, traffic related concerns
- Potential pollutants release, their sources and health implications
- Heritage resources
- Socio-economic impacts
- And also
  - Public issues and concerns
  - Chemicals/spill prevention
  - Land use and other regulatory requirements

Manitoba Environmental Assessment and Licensing Process

Licences are site-specific and are developed through the environmental assessment and licensing process to address concerns raised by the public and the technical advisory committee. Typical licence clauses address:

- Pre-construction
- Construction
- Notification
  - Inspections
- Discharge limits – soil, water and air
- Monitoring
- Reporting
- Emergency response plan
- Odour and noise
- Spill reporting
- Decommissioning

Enforcement of Licence Conditions

Environmental Approvals Branch

- Site inspections after construction to confirm that the project complies with regulatory requirements and design specifications
- Review and approve reports submitted per licence conditions.
- Assess Notice of Alteration requests for any proposed alterations to a project

Environmental Compliance and Enforcement Branch

- Regular inspection program for licensed developments
- Review annual reports submitted per licence conditions
- Respond to public complaints (e.g., odour and noise)
- Follow up on non-compliance and may issue warnings, tickets, or take other enforcement action

OVERVIEW OF:

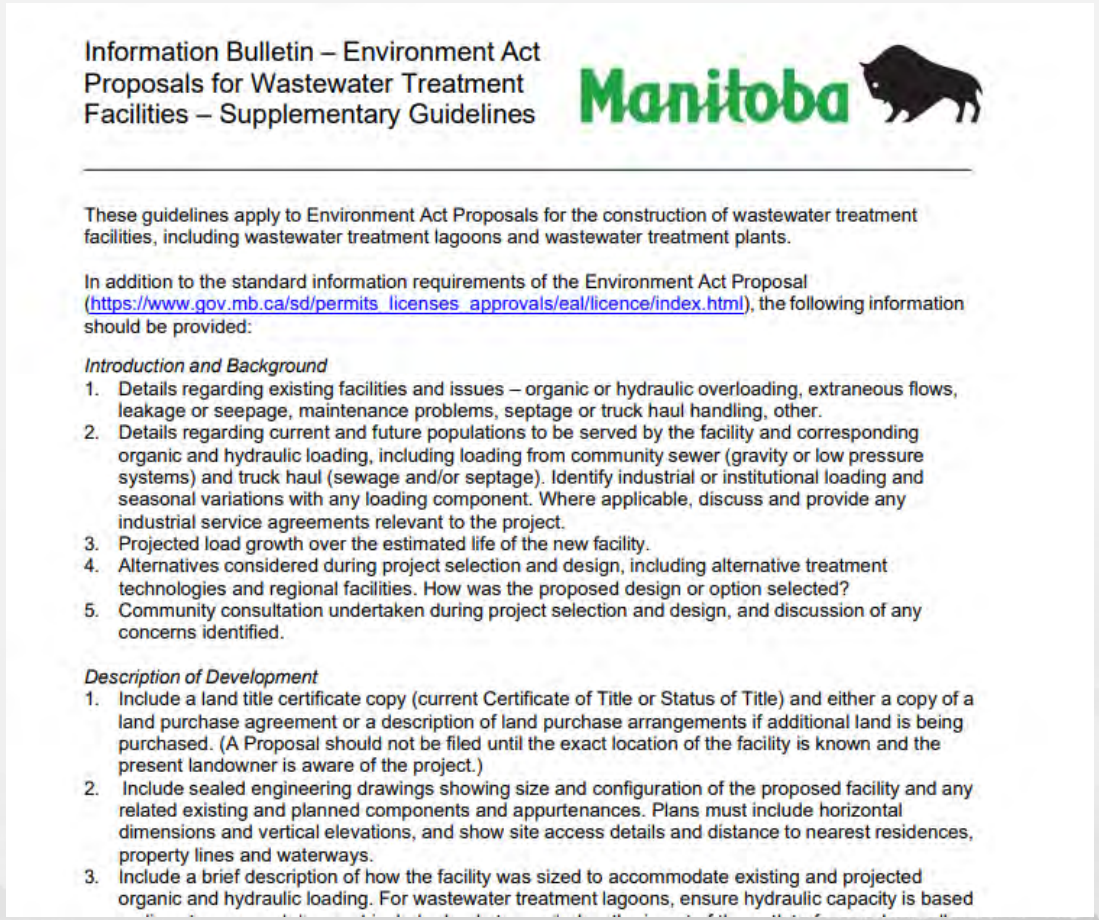
WASTEWATER TREATMENT LAGOONS

Wastewater Treatment Facilities

The department is responsible for licensing, inspecting, and monitoring wastewater treatment systems, including municipal and industrial wastewater treatment plants and lagoons, and large wastewater management systems, including holdings tanks and septic fields >10,000 L/d.

A professional engineer licensed to practice in Manitoba must be consulted for the design of these facilities prior to construction and/or operation within the province.

Department Guidance for Proposals



Information Bulletin – Environment Act
Proposals for Wastewater Treatment
Facilities – Supplementary Guidelines

Manitoba

These guidelines apply to Environment Act Proposals for the construction of wastewater treatment facilities, including wastewater treatment lagoons and wastewater treatment plants.

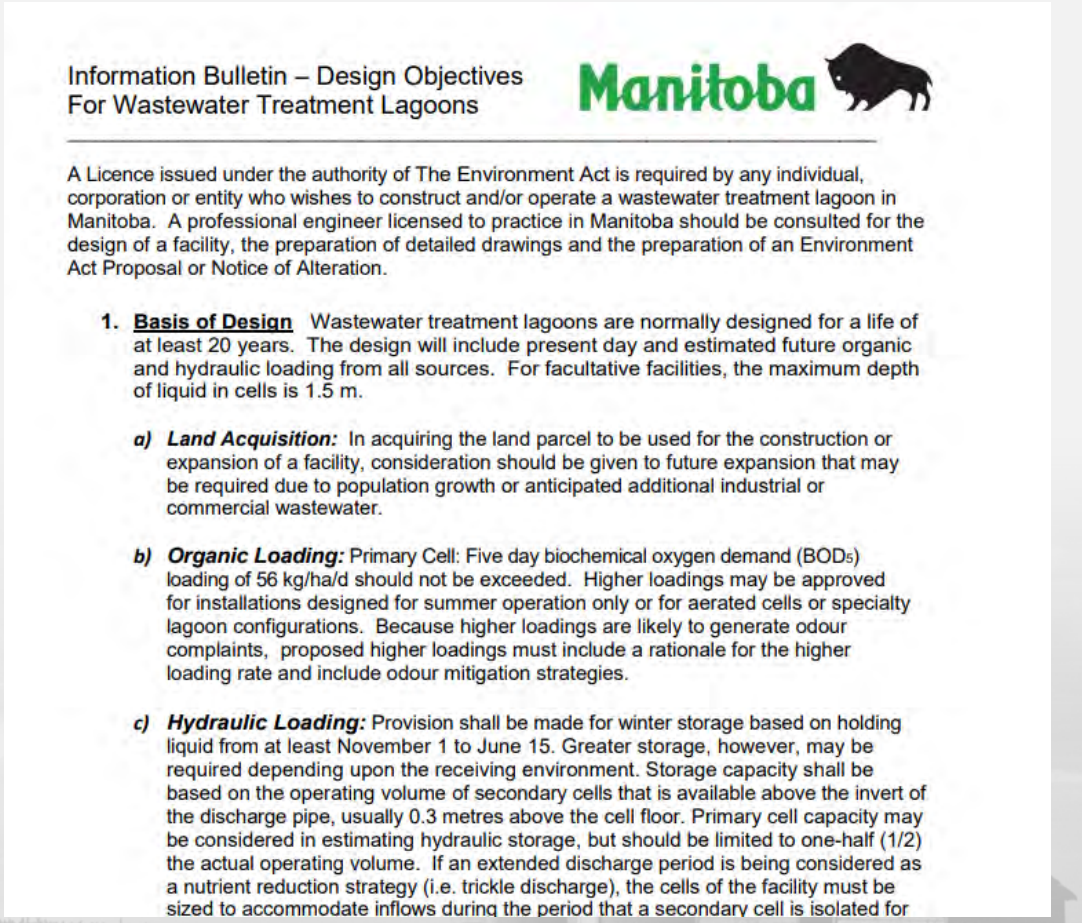
In addition to the standard information requirements of the Environment Act Proposal (https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html), the following information should be provided:

Introduction and Background

1. Details regarding existing facilities and issues – organic or hydraulic overloading, extraneous flows, leakage or seepage, maintenance problems, septage or truck haul handling, other.
2. Details regarding current and future populations to be served by the facility and corresponding organic and hydraulic loading, including loading from community sewer (gravity or low pressure systems) and truck haul (sewage and/or septage). Identify industrial or institutional loading and seasonal variations with any loading component. Where applicable, discuss and provide any industrial service agreements relevant to the project.
3. Projected load growth over the estimated life of the new facility.
4. Alternatives considered during project selection and design, including alternative treatment technologies and regional facilities. How was the proposed design or option selected?
5. Community consultation undertaken during project selection and design, and discussion of any concerns identified.

Description of Development

1. Include a land title certificate copy (current Certificate of Title or Status of Title) and either a copy of a land purchase agreement or a description of land purchase arrangements if additional land is being purchased. (A Proposal should not be filed until the exact location of the facility is known and the present landowner is aware of the project.)
2. Include sealed engineering drawings showing size and configuration of the proposed facility and any related existing and planned components and appurtenances. Plans must include horizontal dimensions and vertical elevations, and show site access details and distance to nearest residences, property lines and waterways.
3. Include a brief description of how the facility was sized to accommodate existing and projected organic and hydraulic loading. For wastewater treatment lagoons, ensure hydraulic capacity is based



Information Bulletin – Design Objectives
For Wastewater Treatment Lagoons

Manitoba

A Licence issued under the authority of The Environment Act is required by any individual, corporation or entity who wishes to construct and/or operate a wastewater treatment lagoon in Manitoba. A professional engineer licensed to practice in Manitoba should be consulted for the design of a facility, the preparation of detailed drawings and the preparation of an Environment Act Proposal or Notice of Alteration.

1. **Basis of Design** Wastewater treatment lagoons are normally designed for a life of at least 20 years. The design will include present day and estimated future organic and hydraulic loading from all sources. For facultative facilities, the maximum depth of liquid in cells is 1.5 m.

   a) ***Land Acquisition:*** In acquiring the land parcel to be used for the construction or expansion of a facility, consideration should be given to future expansion that may be required due to population growth or anticipated additional industrial or commercial wastewater.

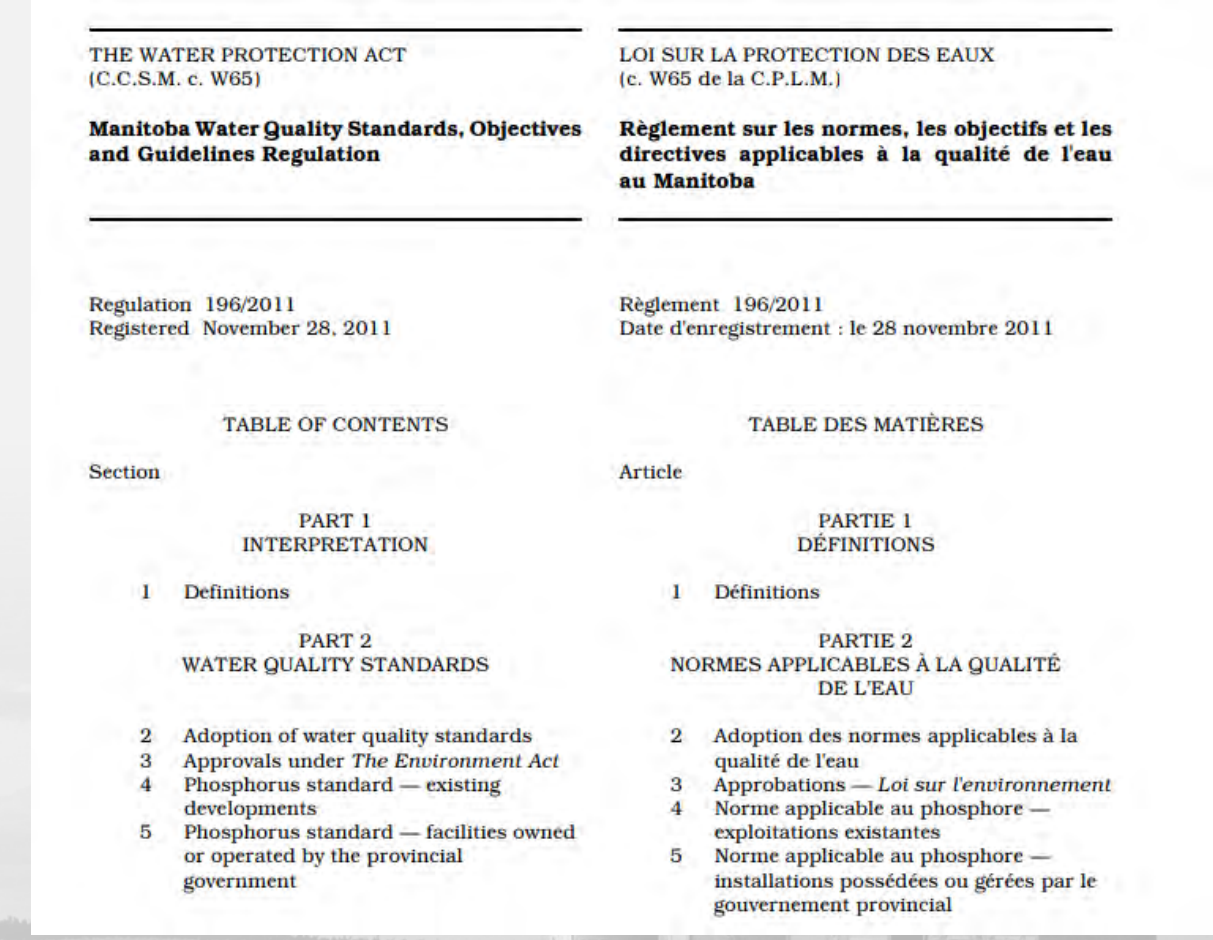
   b) ***Organic Loading:*** Primary Cell: Five day biochemical oxygen demand (BOD_5) loading of 56 kg/ha/d should not be exceeded. Higher loadings may be approved for installations designed for summer operation only or for aerated cells or specialty lagoon configurations. Because higher loadings are likely to generate odour complaints, proposed higher loadings must include a rationale for the higher loading rate and include odour mitigation strategies.

   c) ***Hydraulic Loading:*** Provision shall be made for winter storage based on holding liquid from at least November 1 to June 15. Greater storage, however, may be required depending upon the receiving environment. Storage capacity shall be based on the operating volume of secondary cells that is available above the invert of the discharge pipe, usually 0.3 metres above the cell floor. Primary cell capacity may be considered in estimating hydraulic storage, but should be limited to one-half (1/2) the actual operating volume. If an extended discharge period is being considered as a nutrient reduction strategy (i.e. trickle discharge), the cells of the facility must be sized to accommodate inflows during the period that a secondary cell is isolated for

https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html

Manitoba Water Quality Standards, Objectives and Guidelines

- *Water Quality Standards* follow current and existing provincial and federal legislation and regulations which form a legal basis for controlling pollutants entering Manitoba waters from a variety of sources (e.g., municipal and industrial wastewater discharges).



THE WATER PROTECTION ACT
(C.C.S.M. c. W65)

Manitoba Water Quality Standards, Objectives and Guidelines Regulation

Regulation 196/2011
Registered November 28, 2011

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LOI SUR LA PROTECTION DES EAUX
(c. W65 de la C.P.L.M.)

Règlement sur les normes, les objectifs et les directives applicables à la qualité de l'eau au Manitoba

Règlement 196/2011
Date d'enregistrement : le 28 novembre 2011

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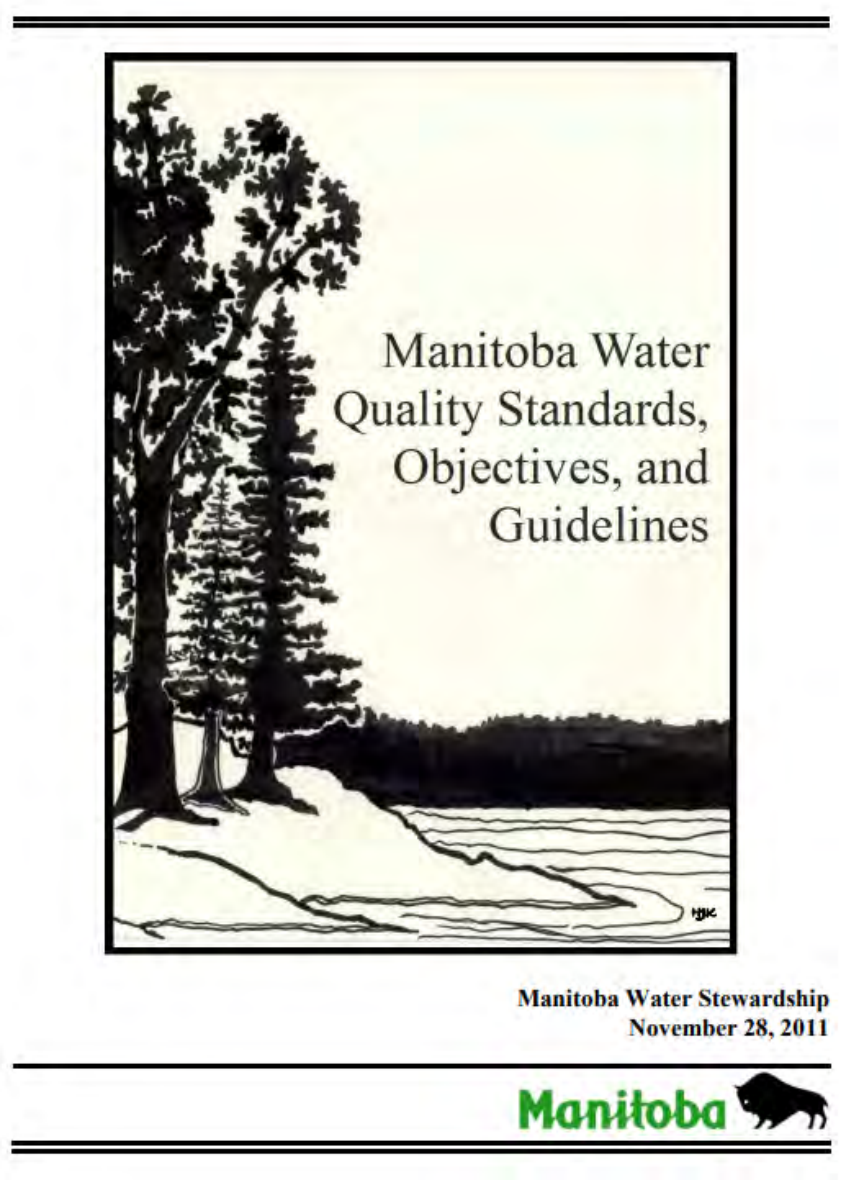
5 Norme applicable au phosphore — installations possédées ou gérées par le gouvernement provincial

https://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=196/2011

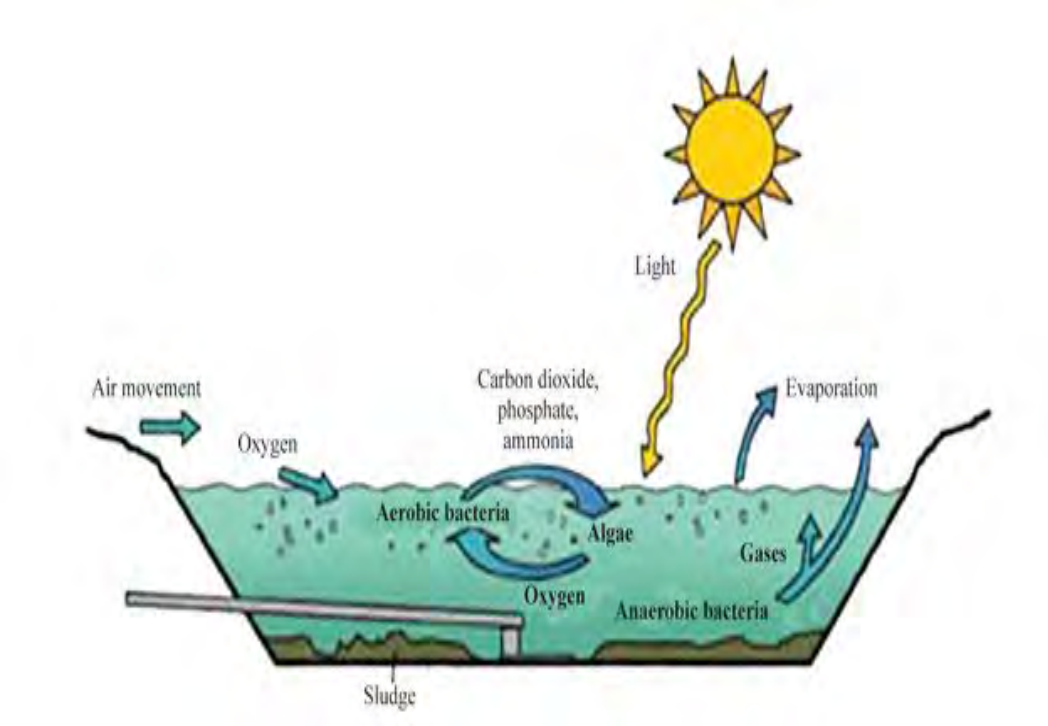


Nutrient Standards

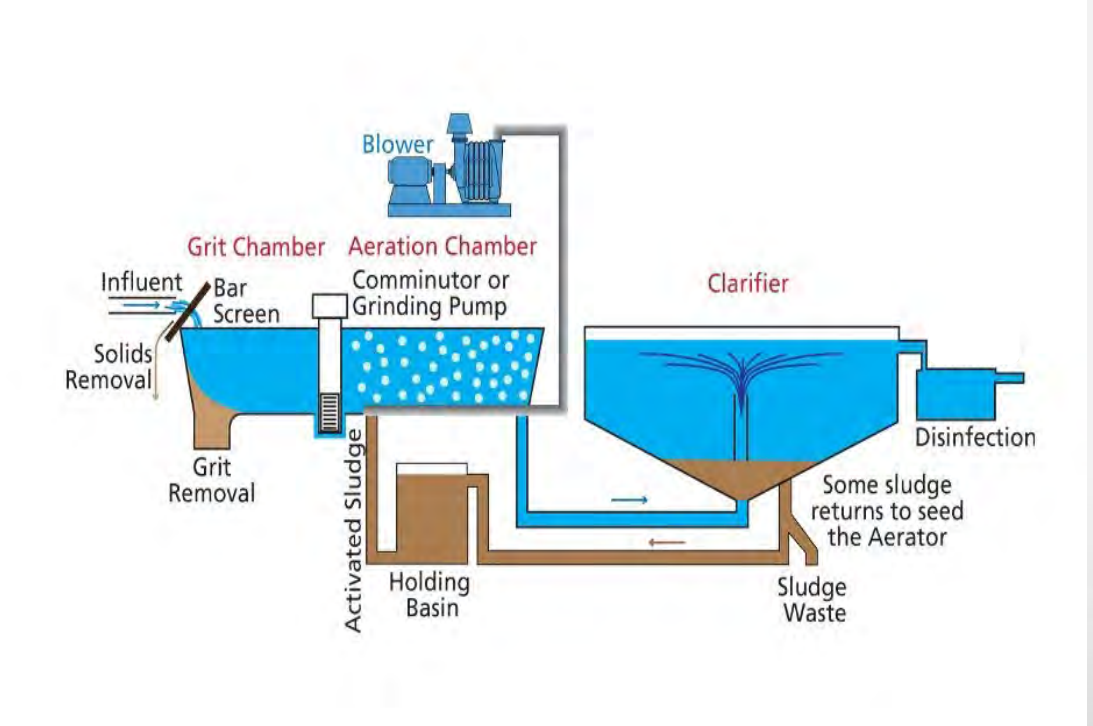
- 1 mg/L total phosphorus applies to all facilities population >2000
- 1 mg/L total phosphorus or demonstrated nutrient reduction strategy applies to all new or expanding facilities <2000
- 15 mg/L total nitrogen applies to new and expanding facilities >10,000

https://www.gov.mb.ca/sd/pubs/water/lakes-beaches-rivers/mb_water_quality_standard_final.pdf

Wastewater Treatment Facilities



Wastewater Treatment Lagoon
(https://extensionpubs.unl.edu/publication/g1423/na/html/view)



Wastewater Treatment Plants
(https://www.hoffmanandlamson.com/en-us/industries/water-and-wastewater-treatment)

Comparison of wastewater treatment plant vs. lagoon

Features	Small wastewater treatment plant	Wastewater treatment lagoon
Chemistry	- Use mechanical blower for oxygen. - Use microorganisms to break down waste	- Use natural wind. - Use microorganisms to break down waste
Disinfection	Use ultra-violet (UV) light or chlorine	Use natural sunlight (UV)
Effluent limits on parameters	Manitoba Water Quality Standards, Objectives, and Guidelines Regulation that are protective of human health, fish, and fish habitat.	Manitoba Water Quality Standards, Objectives, and Guidelines Regulation that are protective of human health, fish, and fish habitat.
Monitoring locations for effluent parameter compliance	The effluent discharge must continuously meet the parameter limits at the outfall.	The parameter limits must be met in the secondary cell of the wastewater lagoon prior to the discharge event.

What is a Wastewater Treatment Lagoon?

- A wastewater treatment lagoon is an engineered earthen pond constructed and lined with materials such as clay or plastic to prevent leakage.
- These lagoons treat wastewater using a combination of biological, chemical, and physical processes before releasing treated effluent into the environment.
- Certain microorganisms in wastewater lagoons break down waste with the help of sunlight and wind (as source of oxygen).
- The treated solids then settle to the bottom of the lagoon, forming what is known as sludge or biosolids.

Wastewater Treatment Facilities

- Primary cell receives wastewater, settling, biological treatment
- Secondary cell(s) for partially treated wastewater for further treatment, storage, disinfection

Wastewater Treatment Lagoons in Manitoba

- When properly engineered and maintained, wastewater treatment lagoons effectively reduce the impact on groundwater, surface water, and protect public health.

- They are energy-efficient, cost-effective, and relatively simple to operate. They are typically used for treating wastewater from municipal sources or medium-sized industrial facilities.

- Due to the relatively low cost of land in Manitoba, the province is home to nearly 350 wastewater treatment lagoons operating under Environment Act Licences.

OVERVIEW OF:

ENVIRONMENTAL ASSESSMENT AND LICENSING OF CRYSTAL SPRING COLONY WASTEWATER TREATMENT LAGOON

Crystal Spring Colony Wastewater Treatment Lagoon

- The Proposal is to build and operate a domestic wastewater treatment lagoon in the Rural Municipality of Armstrong.
- Source of wastewater: Domestic wastewater, truck wash runoff, and abattoir wastewater (excluding blood) for colony use only.
- The treated effluent to be discharged into the roadside 15 E drain and travelling 1.1 km north prior to discharging to Willow Creek, then flow approximately 15 km east into Lake Winnipeg.

Environmental Assessment and Licensing Process

- Design meets the departmental guidance provided for wastewater treatment facilities and wastewater lagoon design
- Proposal was sent to the technical advisory committee and as a result of some requests for additional information, the design was altered
- The technical advisory committee has no further concerns
- Terms and conditions in the licence can address public concerns raised

Crystal Spring Colony Wastewater Treatment Lagoon

Design Criteria

- Flood protection with a 200-year level.
- 1.0 m freeboard.
- Designed for a maximum of 250 people, with hydraulic and organic loading adjusted to include wastewater from the abattoir.
- Plastic lined (a 60-mil textured High Density Polyethylene) with gas relief system and leak detection system (PVC pipes underneath to catch wastewater and sump points).

Crystal Spring Colony Wastewater Treatment Lagoon

Setback Distance

Manitoba Guidelines

- From Populated Areas:
  - Minimum 460 metres from the boundary of a designated population center.
- From Individual Residences:
  - Minimum 300 metres.

Proposal

The lagoon design includes a minimum setback of 525 meters from individual residences.

Example of HDPE Liner

Crystal Spring Colony Wastewater Treatment Lagoon

Treated Effluent Quality

The effluent must comply with the wastewater effluent standards:

- Carbonaceous biochemical oxygen demand (CBOD5) <25 mg/L
- Total suspended solids (TSS) <25 mg/L, unless the exceedance is caused by algae
- Fecal Coliforms or *Escherichia coli* (*E. coli*) <200 organisms / 100mL
- Unionized ammonia <1.25 mg/L
- Total phosphorus <1 mg/L

Crystal Spring Colony Wastewater Treatment Lagoon

Treated Effluent Quantity

- Discharge will occur once or twice per year between June 15 and November 1, with no second discharge expected in a typical year.
- The lagoon effluent will be discharged via a trickle discharge, after the secondary cell has been tested and meets effluent quality requirements.
- The trickle discharge period will be a minimum of 2 weeks with an average flow rate of 14 L/s at maximum capacity.

Crystal Spring Colony Wastewater Treatment Lagoon

Flooding

- Wastewater treatment lagoons are designed and constructed above regulated flood levels, as outlined by Manitoba Transportation and Infrastructure. Flood protection was raised to a 200-year level for Crystal Spring Colony Wastewater Treatment Lagoon.
- A minimum freeboard of 1 metre is required for all lagoons to provide additional protection during high-water events.
- If flooded conditions are present, the lagoon will not be discharged. The licence includes conditions that will prevent effluent discharge that will cause flooding in the discharge route.
- Wastewater lagoon effluent discharge will occur between June 15 and November 1 of any year at dry conditions.

Crystal Spring Colony Wastewater Treatment Lagoon

Odour

- Lagoons may emit noticeable odours during seasonal transitions in the spring. However, a properly designed and well-maintained lagoon generally produces minimal or no odour.
- Vegetation on the south side will remain, proponent proposed to plant additional trees.
- Nuisance odour concerns may be reported to the department.
- If caused by overloading, measures such as desludging or aeration may be required.

Crystal Spring Colony Wastewater Treatment Lagoon

Lagoon Operation

- The wastewater treatment lagoon must be operated by an operator certified under the Water and Wastewater Facility Operators Regulation.
- The licence would include requirements for monitoring, reporting, record keeping, and inspections.
- Approval must be received from the department prior to emergency discharge.
- A Notice of Alteration must be submitted for any change in design or to increase capacity.

Crystal Spring Colony Wastewater Treatment Lagoon

Biosolids

- As a newly constructed lagoon, sludge/biosolids removal is not expected to be required for 10 – 20 years.
- Prior to any land application of biosolids, an Environment Act licence is required in accordance with legislative requirements.
- The colony farms over 3,700 acres within a 10 km radius, which may be used for future biosolids application.

Next Steps

- Draft terms and conditions are being developed.
- When a decision is made, it will be posted to the public registry and email notification sent to those who have participated in the process.

Thank You

Questions/Discussion