

Technical Reference Document for Manure Storage Structures

DECOMMISSIONING OF MANURE STORAGE FACILITIES

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SECTION 1 - PURPOSE AND SCOPE

1.1. Purpose of The Technical Reference Document - The Technical Reference Document for the Decommissioning of Manure Storage Facilities provides specifications and construction procedures to Engineers, contractors and owners of existing manure storage facilities in relation to the decommissioning of facilities no longer in service.

1.1.1. This Technical Reference Document is intended as a supplement to the Technical Reference Manual for Manure Structures.

1.1.2. In Manitoba, the regulatory agency is Manitoba Conservation.

1.1.3. The general information that is required by the regulatory agency for submitting a decommissioning plan is specified or referenced herein.

1.2. Definition – A manure storage facility is defined as a facility originally intended for the storage of livestock manure for a duration greater than 30 days.

1.3. Regulatory Requirement - The *Livestock Manure and Mortalities Management Regulation* (MR 42/98)

requirement regarding decommissioning a manure storage facility is as follows:

6.2(1) *If livestock production in an agricultural operation with a manure storage facility is discontinued or a manure storage facility is not in active service for more than one year, the operator shall without delay inform the director in writing*

(a) how the operator will maintain the structural integrity of the facility until he or she returns it to active service; or

(b) how and when the operator intends to decommission the facility.

SECTION 2 - DECOMMISSIONING PLAN

2.1. Submission of Plan - In order to comply with the above section, the proponent must submit a decommissioning plan for approval by the director. If the plan is considered appropriate given the environmental circumstances, the director will provide written authorization which may include terms and conditions.

2.2. Application for Registration - All manure storage facilities not constructed under the authority of a permit as a part of Section 16.3 of MR 42/98, shall be the object of an application for registration of a facility without a permit.

2.3. General Requirement - Any plan for the decommissioning of a manure storage facility shall include the following aspects:

- The manure accumulated in the storage facility shall be removed and/ or disposed of according to Section 3 of this protocol;
- All pumps and pumping accessories shall be disabled and removed or physically severed;
- All pipes contaminated with manure shall be either removed or physically severed;
- Any exposed pipes/ holes that may pose a public safety concern shall be removed or filled;
- Special consideration shall be given to manure storage tanks as a confined space with a potential for gas generation;
- Any space, pit or hole due to the decommissioning of the facility shall be filled with clean soil, pit run gravel or any other approved fill material;
- All monitoring wells shall be removed as per Section 4 of this protocol; unless the director requires them to be maintained;
- All abandoned wells shall be sealed in accordance with “*Guide for Sealing Abandoned Water Well in Manitoba*” published by Water Stewardship;

(http://www.gov.mb.ca/waterstewardship/water_info/misc/abandoned_wells.pdf)

- Unused wet-well/ collection pits shall be decommissioned as per Section 4 of this protocol;
- All decommissioning activities shall have no impact on any adjacent bodies of water;
- All possible sources of manure gases and their potential accumulation shall be accounted for *Workplace Safety and Health Regulation* (MR 217/2006).

2.4. Final Landscaping

- The area shall be landscaped to shed all precipitation and runoff water from the site to a low area or borrow pit on the property;
- The manure storage area shall be capped and mounded with fill such that settlement of the fill material over time will not result in a depression and subsequent ponding. Any excavated soil contaminated with manure may be used in a mix with soil for capping the site. Such application shall be in compliance with Section 12 of MR 42/98. Additional fill from a borrow pit may be required. The borrow pit area shall be stripped of top soil and stockpiled for later use;
- The site shall be brought to a clean and tidy condition after the decommissioning of the facility.

SECTION 3 - MANURE REMOVAL AND LAND APPLICATION

3.1 Manure Removal - All manure storage facilities that are to be decommissioned shall be emptied prior to decommissioning. The manure that has accumulated within the manure storage facility must be removed and/or disposed of in accordance with MR 42/98.

3.2 Disposal and Land Application - Manure shall be stored, handled, disposed of, or land applied in accordance with a manure management plan registered with the Director in accordance with Section 13 of MR 42/98.

3.3 Soil Under the Facility Floor - Unless otherwise stated by the director, the soil immediately under the facility floor may be left in place. The soil that is left in place shall be covered immediately to limit the oxygen contact in order to prevent nitrification of the ammonia-nitrogen generally found in that soil.

SECTION 4 – LIFT STATIONS AND WET WELLS

4.1 Application - This section also applies to all wet wells, transfer pits and collection pits.

4.2 Recycle/Disposal - The physical structure, pumping equipment and accessories shall be removed, recycled or disposed of.

4.3 Reuse/Reroute - An owner/operation that wishes to reuse the physical structure (lift station/ wet well/ transfer station/ collection pit etc.) for any use other than its original design shall have it certified for such use by a professional engineer.

4.4 Certification - An owner/ operation that wish to reuse the lift station by rerouting piping to the new storage facility shall have it certified for use by a professional engineer.

4.5 Well Cover/Lid - In the event the pumping equipment and accessories are to be decommissioned but the physical structure is to be left in place; the well shall be fitted with a secure cover/ lid.

SECTION 5 - EARTHEN MANURE STORAGE FACILITIES

5.1 Complete Decommissioning

5.1.1 All manure shall be removed and disposed of as described in Section 3 of this protocol.

5.1.2 Pumps and all manure contaminated pipes shall be either physically removed or severed.

5.1.3 Topsoil shall be stripped from the dike areas and stockpiled for later use as capping material.

5.1.4 Above-grade berms shall be pushed into the storage as fill. A minimum level of compaction is required and shall be achieved by circulating over 100 percent of the fill area with heavy excavating equipment.

5.1.5 A final 10 cm (4 inch) cover of arable topsoil shall be constructed over the mounded area.

5.1.6 Fertilizer or manure shall be applied as required to provide a suitable fertility for crop growth.

5.1.7 Deep rooted perennial vegetation (i.e. alfalfa or trees) shall be sowed or planted for a minimum of 4 to 5 years and harvest annually in the case of crops.

5.2 Decommission for use other than Manure Storage

5.2.1 All manure shall be removed and disposed of as described in Section 3 of this protocol.

5.2.2 Pumps and all manure contaminated pipes shall be either physically removed or severed as per Section 2 of this protocol.

5.2.3 The existing facility may be used for other purposes such as retention ponds or wetlands.

5.2.4 Emergency spillways shall be provided. Such spillway shall direct overflow water away from any water course that leaves the property.

5.3 – GCL, HDPE & PVC Lined Earthen Manure Storage Facilities

5.3.1 Special Considerations - In addition to above procedures, special consideration must be given to storages constructed with Geosynthetic Clay Liners (GCL), Polyvinylchloride (PVC) and High Density Polyethylene (HDPE) liners.

5.3.2 GCL Lined Facilities - GCL lined storage facilities shall be decommissioned as described in Section 5.1 of this protocol.

5.3.3 Removal of GCL - GCL may be removed from the area. The removed liners shall go to a licensed or permitted waste disposal ground as approved by the director.

5.3.4 GCL to Remain - The GCL may be left behind in the area. The liners that remain shall be sufficiently perforated prior to the area being filled; so that the liners do not provide a hydraulic barrier that would over saturate the area.

5.3.5 HDPE & PVC Lined Facilities - HDPE & PVC lined storage facilities shall be decommissioned as described in Section 5.1 of this protocol.

5.3.6 Removal of HDPE & PVC Liners - HDPE & PVC liners may be removed from the area. The removed liners shall go to a disposal site as approved by the Director.

5.3.7 HDPE & PVC Liners to Remain - HDPE & PVC liners may be left behind in the area. The liners that remain shall be sufficiently perforated prior to the area being filled; so that the liners do not provide a hydraulic barrier that would over saturate the area.

5.3.8 Retain for Other Purposes - HDPE & PVC lined facilities that have not exhibited signs of leakage can be decommissioned as described in Section 5.2.2.

5.3.9 Safety Consideration - PVC & HDPE lined sites that are decommissioned as per Section 5.2.2 shall be fenced, locked and have warning signs posted, to minimize the dangers posed by the slippery steep surfaces of the facility.

5.4 Monitoring Wells

Existing Monitoring Wells shall be maintained in good condition and made accessible for sampling by Manitoba Conservation or sampled by the proponent at the Director's request.

SECTION 6 – CONCRETE & STEEL TANKS

Decommissioning strategies for these facilities are dependent on the type and design of the tank as well as their level of deterioration. Above-ground steel tanks may no longer be suitable for any use as they may be corroded or damaged to the point of being a safety liability. Also concrete tanks may be constructed fully below grade, partially in ground or fully above-grade.

6.1 Steel Tank: Option A – Recycle/ Disposal

6.1.1 Steel tanks shall be recycled in an appropriate manner. The tank shall be dismantled and steel panels may be recycled.

6.1.2 If the tank is to be disposed of, it shall be disposed of in a licensed or permitted waste disposal ground as approved by the director.

6.2 Steel Tank: Option B – Reuse

6.2.1 The steel tank that is to be converted for any other use (reuse) other than its original design shall be certified for such use by a professional engineer.

6.3 Concrete Tank: Option A – Recycle/ Disposal

6.3.1 Concrete tanks that are to be recycled shall be demolished completely including the floor.

6.3.2 The concrete rubble from demolition shall be used as fill or disposed off to a licensed or permitted waste disposal ground as approved by the director.

6.4 Concrete Tank: Option B - Backfill

6.4.1 The storage facility shall be completely backfilled with inert material such as sand or uncontaminated soil. Option B applies to below grade storage facilities only.

6.5 Concrete Tank: Option C - Reuse

6.5.1 The concrete tank that is to be converted for any other use (reuse) than it's original design shall be certified for such use by a professional engineer.

6.5.2 Special consideration shall be given to public safety when below-grade tanks and some partially above-grade tanks are planned for an alternate use

SECTION 7 – RESOURCE INFORMATION

The Livestock Manure and Mortalities Management Regulation (MR 42/98)

Workplace Safety and Health Regulation (MR 217/2006)

Guide for Sealing Abandoned Water Well in Manitoba

Technical Reference Manuals for Liquid Manure Storage Structures
