

## Decommissioning and/or Recommissioning Existing Nutrient Storage Facilities

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There are many nutrient (e.g., manure) storage facilities in Ontario. For a number of reasons — if the facility is damaged, no longer required for the operation or if a livestock operation has changed hands or has been eliminated — an operator may wish to decommission a nutrient storage facility temporarily or indefinitely (Figure 1).

The [Nutrient Management Act, 2002](#) (NMA), does not regulate the decommissioning of nutrient storage facilities in Ontario. This factsheet offers some guidance for dealing with unused solid and liquid nutrient storage facilities, providing suggestions for:

- indefinitely suspending the use of a nutrient storage facility
- permanently decommissioning a nutrient storage facility
- recommissioning an existing nutrient storage facility

### RISKS ASSOCIATED WITH NUTRIENT STORAGE FACILITIES

An improperly decommissioned nutrient storage facility can be a safety hazard. Children and adults are at risk of being hurt or even killed if the hazards are severe enough. Falling into the storage and drowning are very real possibilities. As well, the

storage facility may cause an adverse environmental impact on surface or subsurface water sources.

When buying an existing farm, be aware that nutrient storage facilities may be hidden below the soil surface or covered with earth or a concrete pad. There have been cases in Ontario where large equipment driving over the top of a nutrient storage facility has caused the storage to collapse, creating a very hazardous situation.



**Figure 1.** This unused manure tank is no longer environmentally sound. The excavator is in the process of demolishing and burying the structural materials on-site.

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Earthen manure storages may look like water ponds over time.

There is a good chance that a livestock operation includes a liquid and/or solid nutrient storage on site. For liquid storages, look for visible cues that indicate that a storage facility exists, such as access holes or old fences. It is important to ask questions of previous owners about the farm's operations. These hidden facilities can represent a serious safety hazard. Take extra care if children have access to the area.

### **SUSPENDING THE USE OF A NUTRIENT STORAGE FACILITY (INDEFINITELY OR TEMPORARILY)**

There is no limitation on how long a nutrient storage facility can be temporarily taken out of operation, as long as it is maintained in a state of good repair.

A poorly maintained or decommissioned nutrient storage facility contains nutrients that can become pollutants if a structural failure or overflowing occurs. In addition, these facilities can be a human safety hazard, especially if they have poorly maintained safety fences or access points.

OMAFRA recommends a periodic inspection of all nutrient storage facilities, whether they are used or not. The purpose of the inspection is to determine if they are structurally sound, if enough capacity exists to prevent overflowing and if all safety components, such as hatches, railings and fences, are present and in good repair.

### **Solid Nutrient Storage Facilities**

In general, the storage of solid nutrients presents fewer environmental risks than the storage of liquid nutrients. However, if liquids (e.g., seepage, washwater, precipitations) accumulate in a solid nutrient storage facility, or runoff is not properly managed, a solid nutrient storage facility may pose as high a risk as a liquid nutrient storage facility. Conduct regular inspections of these facilities to verify their integrity and ensure that they manage potential runoff adequately.

Consider alternative uses or permanent decommissioning of a solid nutrient storage facility

after the clean-up process. In most cases, this involves emptying the storage facility of nutrient materials (e.g., manure) using normal handling equipment. Manage the nutrient material according to a nutrient management strategy or plan, if your farm is phased-in under the NMA, or following best management practices (BMPs) for managing nutrients on farm.

### **Liquid Nutrient Storage Facilities**

Liquid nutrient storage facilities often present higher risks than solid nutrient storage facilities. To minimize the risks, consider the following recommendations, where applicable:

- Manage the contents to protect the storage facility from frost damage and deterioration and preserve its structural integrity. Maintain a minimum depth of liquids above the floor and surrounding groundwater in the facility over the winter period to avoid damage. Such details should be available from the builder or engineering firm that was associated with the construction of the storage facility.
- Maintain a minimum freeboard of 300 mm (12 in.) at all times. An operator can expect an uncovered storage to slowly fill with precipitation over time, requiring partial emptying on a periodic basis.
- Conduct a visual inspection, at least once per year, to look for potential structural concerns and to ensure that all safety hazards are addressed.
- Make sure the gravity transfer systems associated with the storage facility are properly decommissioned to minimize the risk of injury to anyone or damage to the equipment. Check with the manufacturer for recommendations. Do not create a trapped zone of liquid in a sealed pipe; these zones can develop high gas pressure over time, causing valves to stick or pipes to fail.

### **PERMANENT DECOMMISSIONING OF A NUTRIENT STORAGE FACILITY**

Before permanently decommissioning a nutrient storage facility, consider alternate uses. For example, a solid nutrient storage facility could serve as a foundation for a covered hay storage structure or a machinery storage structure. It could store non-agricultural source material (NASM), if it meets the requirements of the NMA or [Environmental](#)

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[Protection Act](#) (EPA). For more details on storing NASM, see the OMAFRA factsheet, *Storage of Non-Agricultural Source Materials (NASM) in a Permanent Storage Facility*. If no alternate uses are available, OMAFRA recommends that the storage be properly decommissioned.

Permanently decommissioning a facility can be necessary when it:

- no longer serves the operation
- has been replaced by a larger storage
- has deteriorated excessively
- will be too expensive to repair
- presents unacceptable liability to the owner
- has been ordered decommissioned because of adverse effect on surface water or groundwater

### **General Requirements**

While there are no specific decommissioning requirements under the NMA, follow these general guidelines for solid and liquid nutrient storage facilities:

- Remove all remaining organic materials (e.g., manure) that settled on the bottom and apply them to the land according to an approved nutrient management plan, if the farm is phased-in under the Nutrient Management Regulation, or following BMPs for managing nutrients on farm.
- Remove and/or cut off and block all associated transfer piping and equipment so there is no chance of leakage.
- Dispose of all construction materials according to provincial law.

### **Steel or Concrete Facilities**

In Ontario, there are no specific decommissioning requirements for concrete nutrient storages if the concrete facility is dismantled and buried on-site. However, consider hiring a qualified demolition company to dismantle the storage. Ensure that burial of the material does not result in an adverse impact to ground- or surface water. Consider the potential impact of buried material on the future use of the area. Recycle any storage-facility building materials taken off-site or dispose of them at a provincially approved facility.

For on-site decommissioning of steel or concrete facilities:

- Collapse the tank walls onto the floor if the tank is below grade. Destroy the integrity of the floor and walls so that they do not interfere with natural water flow and/or site drainage. Consider taking the construction debris off-site, if it will impact future use. Where applicable, recycle steel components.
- Cover the storage site with clean soil or fill material that has a similar permeability to surrounding soil. If the tank is above grade, truck the concrete material elsewhere on the site for use as an inert fill.
- Mound fill above original grade to compensate for settling, and top dress with 150 mm (6 in.) of topsoil.
- Establish vegetation.
- Do not allow water to pond above this site.

### **Earthen Storage Facilities**

For on-site decommissioning of earthen storage facilities:

- Remove all remaining organic materials (e.g., manure) that has settled on the bottom of the storage, including soil at the bottom and to the sides of an earthen storage facility that contains such material, and apply it to the land according to a nutrient management plan or BMPs.
- Fill storage with clean fill in layers 150–300 mm (6–12 in.) thick and compact each layer.
- Mound fill above original grade to compensate for settling, and top dress with 150 mm (6 in.) of topsoil.
- Establish vegetation, possibly a deep-rooted crop such as alfalfa.
- Do not allow water to pond above this site.

### **RECOMMISSIONING AN EXISTING NUTRIENT STORAGE FACILITY**

Before returning an existing nutrient storage facility to use, inspect the inside and outside of the facility.

Beware of potential hazardous gas trapped in storages that have not been used for a period of time. Before entering or going down into a storage facility, take all necessary safety precautions. For

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more information on hazardous gases, see the OMAFRA Factsheet, *Hazardous Gases*.

To complete a thorough inspection, empty the storage facility and follow any instructions from the builder or engineering firm. Observe the level of the water table in this area before performing this work. Do not undertake this work when the water table is higher than the floor of the facility, unless provisions are in place to reduce the chance of structural damage (e.g., foundation drains installed, engineering review completed).

During the inspection, check the inside and outside of the tank, any liners and transfer systems. Look for any signs of damage such as:

- cracks
- deteriorating concrete, steel, liner
- liquid seeping through cracks
- uneven surfaces

Where pipe sections go through a wall or floor, such as part of a transfer system, ensure that joints between the pipe and tank wall/floor are watertight. If a tank includes a liner, assess the liner's integrity.

A storage facility that has not been used for a period of time may have damage that cannot be identified during a visual inspection and may leak to an existing drainage system outside the storage. It is best to find any outside drainage systems and install an observation/shut-off catch basin into the outlet of the drainage lines. If this is not possible during the filling of the storage, especially a liquid nutrient storage facility, it is important to both monitor the levels of the storage to ensure the system continues to fill, and to monitor the expected outlet of any drainage system that could affect the storage. Take immediate steps to remedy any problems.

For more information on observation stations and shut-off valves, see the OMAFRA Factsheet, *Siting Requirements for Permanent Nutrient Storage Facilities*.

If there are any concerns about the integrity of the facility or associated liner and transfer system, hire an engineer to obtain professional advice.

The purpose of this factsheet is to create an awareness of safety issues and possibilities regarding the re-use and decommissioning of nutrient storage facilities.

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