environmental farm plan
sustainably farmed

INFOSHEET #4

FERTILIZER STORAGE AND HANDLING

How to address concerns identified in Environmental Farm Plan Worksheet #4

Based on Environmental Farm Plan Workbook, 5th ed. 2025

This infosheet outlines options to address concerns identified in your Environmental Farm Plan (EFP) as they relate to on-farm storage and handling of fertilizer products.

For fertilizer storages and handling facilities in a Source Water Protection Zone, you may need to take measures to reduce risk. The **Farm Source Water Protection Plan framework** and workbook can help you work through the Source Water Protection Framework and its application on your farm.

For help with technical terms, please see the full glossary in your EFP Workbook.

All options in this infosheet are classed as **Actions, Compensating Factors,** or **Monitoring**.

- **Actions** address the identified concern, and will change the EFP rating to (3) or (4) Best.
- **Compensating Factors** are alternatives that will adequately address the concern, but will not change the rating in the EFP worksheet.
- **Monitoring** is an alternative in special circumstances only. When and how monitoring can be used is explained in the infosheet.

In most cases, you'll need more information before choosing and implementing options. Sources for more information are noted at the end of this infosheet.

Sustainable Canadian Agricultural Partnership
OSCIA
Ontario
Canada

MIXING AND LOADING

4–1. Distance from mixing/loading area to nearest surface water

BACKGROUND

Increasing the distance between the fertilizer mixing/loading area and surface water, reduces the risk of contaminating surface water supplies.

Sloping topography and heavier soils will further increase the chance of contaminated runoff reaching surface water if a fertilizer spill occurs.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Relocate the fertilizer mixing/loading area greater than 60 m (200 ft.) away from surface water.

OPTION 2 – ACTION

Increase the flow path distance between surface water and the fertilizer mixing/loading area:

- reshape land or build a diversion to direct runoff away from surface water to a location in the field or along a flow path where it will not likely reach surface water
- ensure any land-forming changes will not cause or increase erosion on your property or neighbouring lands
- seek professional assistance to site and design berms if considering such work, particularly along larger watercourses
- contact your local Conservation Authority to see whether a permit is required to do work adjacent to surface water, and for additional information
- ensure the flow path length meets or exceeds the minimum distance specified in the (3) category

OPTION 3 – MONITORING

For mixing/loading areas with an impermeable floor with no cracks or leaking, and a full curb installed to collect spills:

- monitor the mixing/loading area on a regular schedule – visually checking for spills, leaks, cracks or seepage of liquids from the structure

Always maintain or exceed minimum separation distances between mixing/loading areas and surface water.

4–2. Distance from mixing/loading area to well

BACKGROUND

Increasing the distance between the mixing/loading area and well, reduces the risk of contaminating groundwater supplies.

Soil type, depth to water table, and bedrock will also influence the contamination potential.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Locate the mixing/loading area the required distance away from the well:

- the mixing/loading area should be downslope of well if possible
- well water should be tested once a year for parameters such as nitrate until the new mixing/loading area is built
- the new location should change the final EFP distance rating to a (3) or (4) Best

OPTION 2 – ACTION

Construct a new well the required distance from the fertilizer mixing/loading area:

- the old well must be properly abandoned according to Regulation 903 (Section 21) under the Ontario Water Resources Act
- the new location should change the final EFP distance rating to a (3) or (4) Best
- well water should be tested once a year for parameters such as nitrate

OPTION 3 – MONITORING WELL WATER

For existing fertilizer mixing/loading areas with an impermeable floor with no cracks or leaks, and a full curb installed to collect spills:

- test well water at least once a year for parameters such as nitrate
- be prepared if test results show contamination – prepare a plan of action to help you quickly identify and address the source of contamination

The soil type, depth to water table, and bedrock will all influence the potential for groundwater contamination. For more information about soil types on your property, consult soil maps and reports for your area.

4–3. Spill or leak containment in mixing/loading area

BACKGROUND

Fertilizer spills or leaks from the mixing/loading area must be contained and cleaned up quickly.

Fertilizer spills can contaminate groundwater or surface water.

If a water source is contaminated as a result of a spill or leak from a fertilizer storage, the landowner may be liable.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Construct a mixing/loading area with an impermeable floor, curb and permanent roof to prevent rainfall from contacting spilled fertilizer.

OPTION 2 – ACTION

Construct a mixing/loading area with an impermeable floor, curb, and drain to a holding tank large enough to contain all collected liquids.

Consider these factors:

- volume of contaminated liquids collected in the sump as a result of rainfall on the mixing/loading area
- cost of storage facility versus covering the mixing/loading area with a permanent roof
- removal system for contaminated liquids in sump, including costs

OPTION 3 – ACTION

No regular mixing/loading area at one location:

- mix and load product at application site, away from surface water, wells, etc.:
  - may require a portable water supply
  - will require moving the loading site frequently in the field

A permanent roof is the best way to keep rainwater out of the mixing/loading area.

4–4. Backflow prevention on water supply

BACKGROUND

The backflow from a fertilizer tank can quickly contaminate a water well or surface water.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Use a separate water tank to supply water to the fertilizer applicator:

- pump water from a source (well, watercourse, etc.) into a water-holding tank at the permanent mixing/loading area with a permanent anti-backflow device attached to the water supply line feeding the tank
- pump water from a source (well, watercourse, etc.) into a mobile water-holding tank and haul to a mixing/loading area in the field located at the required distance from wells and surface water

OPTION 2 – ACTION

For direct filling, install a permanent anti-backflow device in the water supply line:

- place a check valve in the supply line near the tap

OPTION 3 – ACTION

For direct filling, maintain a permanently fixed 6-inch air gap between the water supply line and the fertilizer tank.

Using a separate tank to supply water to the fertilizer tank will eliminate potential backflow.

4–5. Filling supervision and oversight

BACKGROUND

When applicator tanks are being filled, overfilling and spills can happen quickly with a moment's inattention. Surface and groundwater contamination can result.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Ensure constant supervision of the applicator tank while filling.

4–6. Handling system

BACKGROUND

The less handling and exposure of liquids to open air, the lower the risk of a spill and contamination of surface and groundwater supplies.

WHAT CAN YOU DO?

OPTION 1 – ACTION

When transferring liquid material, be aware you are handling a dangerous material:

- install a closed system for the transfer of liquid fertilizer products from storage tanks to fertilizer applicator
- when pouring by hand, provide easy access to the fill opening

A closed system for product transfer reduces the risk of a spill.

CLEANUP AND DISPOSAL

4–7. Disposal of rinsate (rinse water) from sprayers, spreaders, applicators and containers

BACKGROUND

Treat fertilizer rinsate in the same way as the fertilizer itself and apply it to crops so as not to contaminate water supplies.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Apply fertilizer rinsate to field crop soil at adequate separation distances from surface water and wells to achieve a rating of 3 or better:

- collect each type of fertilizer rinsate separately so that nutrient value can be calculated, and to ensure there is no reaction
- apply rinsate only to the appropriate field crop at recommended rates

For more about planning and procedures, refer to the EFP Emergency Plan.

4–8. Dry fertilizer loading area

BACKGROUND

Contain and clean up spills of dry fertilizer as soon as possible so as not to contaminate water supplies.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Store and load dry fertilizer on an impermeable pad.

Sweep pad down daily or immediately after any spillage:

- apply any spilled fertilizer to fields at recommended rates

Keep mixing and loading area covered with a roof.

Store and load dry fertilizer on an impermeable pad.

4–9. Storage and handling areas

BACKGROUND

Having a written emergency plan in place and spill cleanup equipment available will be important to minimize any possible damage that may happen as the result of a spill.

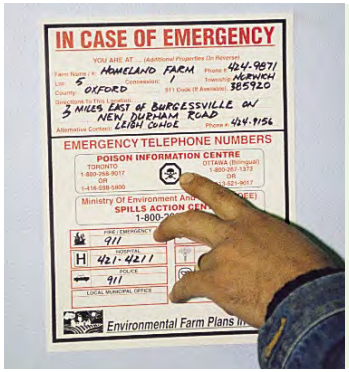
Completing and displaying the emergency plan will make everyone aware of who to notify and what procedures to follow to stop a spill and then clean it up.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Prepare a written emergency plan and have spill cleanup equipment available either on your farm or at a readily accessible location:

- include essential details such as telephone numbers
- keep the plan in a location where it is readily accessible
- inform others on the farm of the plan and its location



Be prepared for a spill: document what to do, tell others, and have cleanup equipment and materials at hand.

MANAGEMENT OF NH_3 (ANHYDROUS AMMONIA)

4-10. NH_3 management

BACKGROUND

Anhydrous ammonia (NH_3) is the most dangerous fertilizer product used in Ontario agriculture because it is a compressed toxic gas. It demands a high level of careful handling and training.

WHAT CAN YOU DO?

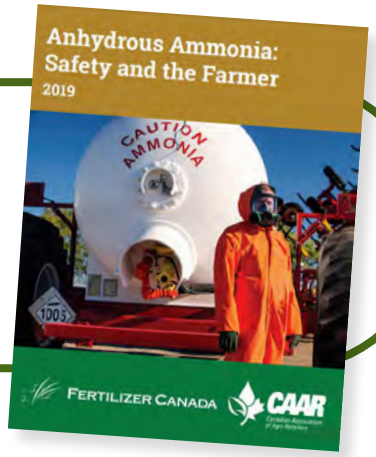
OPTION 1 – ACTION

Ensure everyone who handles NH_3 is aware of its dangers and the precautions to be taken:

- require safety training for everyone using NH_3 – training is available through most NH_3 suppliers
- require all workers to be familiar with the emergency plan and its location
- inspect all tanks, hoses and safety equipment before use, and replace or repair damaged equipment
- supply operators with neoprene gloves and safety goggles when using NH_3
- attach safety water bottles to each piece of NH_3 equipment

Every person handling, transporting or offering to transport ammonia must be adequately trained, and hold a valid training certificate under Transportation of Dangerous Goods regulations.

For more information on safe handling of Anhydrous Ammonia, read Fertilizer Canada's Farmer Training Manual.



Safe handling of NH_3 requires training, equipment and strict adherence to procedures. Everyone who may be involved in handling this gas should be trained accordingly.

LOCATION

4–11. Distance from fertilizer storage to nearest surface water

BACKGROUND

Increasing the distance between the fertilizer storage and surface water, reduces the risk of contaminating surface water supplies.

If a fertilizer spill occurs, sloping topography and heavier soils increase the chance of contaminated runoff reaching surface water.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Move the fertilizer storage greater than 60 m (200 ft.) away from surface water.

OPTION 2 – ACTION

Increase the flow path distance between surface water and the fertilizer storage:

- reshape land or build a diversion to direct runoff away from surface water to a location in the field or along a flow path where it will not likely reach surface water
- ensure any land-forming changes will not cause or increase erosion on either your property or neighbouring lands
- seek professional assistance to site and design berms if considering such work, particularly along larger watercourses
- contact your local Conservation Authority to see whether a permit is required to do work adjacent to surface water, and for additional information

Note that the flow path length must meet or exceed the minimum distance specified in the (3) category.

OPTION 3 – MONITORING

For existing liquid storages that have secondary containment with an impermeable floor that is not cracked or leaking and a full curb/berm installed to collect spills, and for dry fertilizer storages with an impermeable floor:

- monitor storage on an established schedule, visually checking for spills, leaks, cracks or seepage from the storage
- install a locked tap on any liquid storage tanks

See Fertilizer Canada's Liquid and Dry fertilizer storage guidance documents:

Liquid Fertilizer Storage Guidance

Fertilizer Bin Storage Guidance

4-12. Distance from fertilizer storage to well

BACKGROUND

Increasing the distance between the fertilizer storage and well, reduces the risk of contaminating groundwater supplies.

Soil type, depth to water table and bedrock also influence contamination potential.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Locate storage the required minimum distance away from the water well:

- storage should be downslope of well if possible
- the new storage location should change the final EFP distance rating to a (3) or (4) Best
- well water should be tested once a year for parameters such as nitrate until the new storage is in operation
- this is most suitable for portable storage

OPTION 2 – ACTION

Construct the new water well the required distance from the fertilizer storage:

- the old well must be properly abandoned according to Reg. 903 (Section 21) under the Ontario Water Resources Act
- the new location should change the final EFP distance rating to a (3) or (4) Best
- well water should be tested once a year for parameters such as nitrate until the new water well is installed

Test the well water once a year for parameters such as nitrate.

Fencing and locked buildings deter vandalism and theft and keep children out.

4-13. Safety and security

BACKGROUND

Easily accessible, unlocked fertilizer storage buildings are vulnerable to vandalism and theft. They can also be a hazard to children playing in the area.

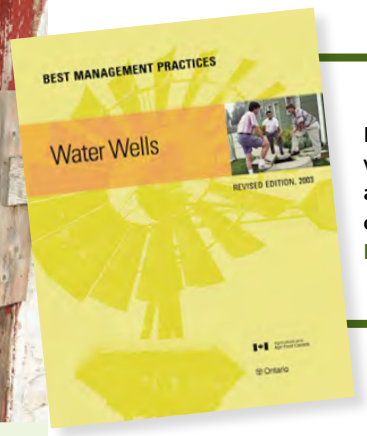
Storage sites should be protected by security fencing and locks. Equipment such as sight gauges on liquid storage help with monitoring. Routine inspection of tanks, valves and plumbing to verify site security is advised.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Have a dedicated fenced area or locked building for storing fertilizer products, as well as:

- sight gauges and locks on valves
- regular inspection of any tanks, valves and plumbing



For more information about well construction, maintenance and safeguarding well water quality, see Best Management Practices: Water Wells.

4-14. Dry formulation (bag and bulk)

BACKGROUND

For health and safety reasons, it is important to store fertilizer in a location where it will not contaminate water and not create a health hazard for humans and animals.

Store fertilizers in a separate facility where fumes, explosions and water from a fire will not affect the health and safety of humans and livestock.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Store fertilizer in a locked, fenced area or separate free-standing storage building:

- fertilizer is stored on an impermeable surface
- all spills are cleaned up in a timely manner

OPTION 2 – ACTION

Store fertilizer in a designated area that is partitioned off within another storage area in the same building:

- fertilizer may be stored on a permeable surface
- any spills are cleaned up in a timely manner

This option is not as costly as a free-standing separate storage.

Store fertilizer with care to minimize risks to humans, animals and water quality.

Ensure that the secondary containment area is impermeable.

4-15. Liquid formulation containment

BACKGROUND

Contain liquid fertilizer spills or leaks in the storage area so as not to contaminate groundwater or surface water. Impermeable floors can contain small spills and allow them to be easily cleaned up.

Covering the storage area with a roof prevents overflow spills during heavy rainfall events.

WHAT CAN YOU DO?

OPTION 1 – ACTION

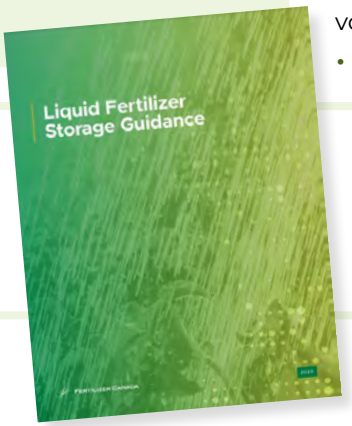
Ensure the secondary containment area is impermeable (e.g., sealed concrete, with full curb) and of sufficient size to contain a minimum of 110% of the volume of the storage of the largest tank:

- design and place the floor slab so that cracking will be minimized
- do not have a floor drain
- ensure there is a locked tap in place on storage tanks

OPTION 2 – ACTION

Construct a clay-lined berm system around the liquid storage to provide secondary containment of sufficient size to contain a minimum of 110% of the volume of the largest tank:

- ensure there is a locked tap in place on storage tanks



See Fertilizer Canada's liquid fertilizer storage guidance documents:

Liquid Fertilizer Storage Guidance

4–16. Liquid formulation tank integrity

BACKGROUND

A leak from the tank can have very serious consequences. It is therefore very important that the storage tank meets all requirements.

When defects are detected, tank repairs should be completed in a timely manner by a qualified individual. If defects are detected in polyethylene tanks for liquid fertilizer storage, repair is not recommended. In this case, tanks should be replaced.

All tank contents should be clearly identified.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Ensure the tank's integrity meets the required standards:

- specific gravity rating of at least 1.5
- all pipework, hoses and valves are made from corrosion-resistant materials
- inspected on an established schedule

For more information about preventing catastrophic tank failure, see these publications:

Poly Tanks for Farms – Tank Inspection

Fibreglass Tanks: For Storage, Transport and Application

Inspect storage tanks before, during, and after seasonal usage.

Recycle or dispose of unidentifiable containers at an approved site after they have been adequately rinsed of fertilizer solution.

4–17. Small containers – 60 L (13 gallons) or less

BACKGROUND

Legible and proper labelling is important to reduce the risk of improper use. Improperly mixed, some products can give off dangerous gases, creating a safety hazard.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Keep products in original containers with proper labels:

- keep sample labels on file in the farm office in case the original label becomes unreadable – most suppliers will supply product sample labels on request
- make sure the containers have no holes and the metal/plastic is in good condition
- recycle or dispose of damaged and unidentifiable containers at an approved site after they have been adequately rinsed of fertilizer solution

4-18. Large containers – more than 60 L (13 gallons)

BACKGROUND

Legible and proper labelling is important to reduce the risk of improper use. Improperly mixed, some products can give off dangerous gases, creating a safety hazard.

WHAT CAN YOU DO?

OPTION 1 – ACTION

Keep product in original containers with proper labels. Keep sample labels on file:

- keep sample labels on file in the farm office in case the original label becomes unreadable – most suppliers will supply product sample labels on request
- ensure container integrity and a proper tight lid
- check that valves have no leaks and are locked
- verify the site gauge is in place and can be easily read
- dispose of damaged and unidentifiable containers at an approved disposal site after they have been adequately rinsed of fertilizer solution

For more information about empty container recycling/disposal, see:

www.cleanfarms.ca/programs-at-a-glance/on-programs-events/

Keep products in original, clearly labelled containers.

Scheduled monitoring of both the storage and the containment area reduces the risk of loss of material.

4-19. Liquid fertilizer storage monitoring

BACKGROUND

Monitoring of both the storage and the containment area on a regularly scheduled basis reduces the risk of loss of material.

WHAT CAN YOU DO?

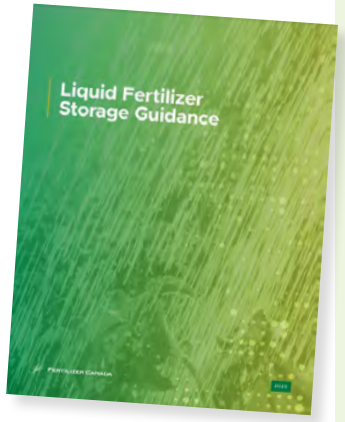
OPTION 1 – ACTION

Schedule monitoring and inspections, and keep records:

- daily visual inspections of secondary containment areas when in use will detect minor leaks before they become major
- yearly inspection of the storage tank, associated piping, and valve system prior to use is recommended
- inspection records should be kept onsite

For more information about liquid fertilizer environmental containment and diking guidelines, see Fertilizer Canada's liquid fertilizer storage guidance documents:

Liquid Fertilizer Storage Guidance



FOR MORE INFORMATION

ONTARIO MINISTRY OF AGRICULTURE, FOOD AND AGRIBUSINESS (OMAFA)

- Agricultural Information Contact Centre (AICC)
  Toll free: 1-877-424-1300 | e-mail: ag.info.omafa@ontario.ca

  Find most of the resources listed below at www.ontario.ca

Best Management Practices Series

- Water Wells

FERTILIZER CANADA

- Tel: 613 230-2600 | email info@fertilizercanada.ca

Standardized codes of practice

- Anhydrous Ammonia
- Ammonium Nitrate and Calcium Ammonium Nitrate
- Anhydrous Ammonia Farmer Safety Training
- Bin Storage Guidance
- Liquid Storage Guidance

ONTARIO AGRI BUSINESS ASSOCIATION

- Tel: 519 822-3004
- Health and Safety Training

INDUSTRY PROGRAMS

- Ontario Soil and Crop Improvement Association
  - Emergency Plan
- Ontario Pesticide Education Program – Grower Pesticide Safety Course
- Empty Pesticide Container Recycling and Obsolete Pesticide Disposal (Cleanfarms.ca); Toll-free: 1-877-622-4460
- Resource Productivity and Recovery Authority
  - Where to Recycle

LEGISLATION/ACTS

- Ontario Water Resources Act, R.S.O. 1990
- R.R.O. 1990, Reg. 903: Wells