

**NATURAL RESOURCES CONSERVATION SERVICE  
INTERIM CONSERVATION PRACTICE STANDARD**

**AGRICHEMICAL HANDLING FACILITY**

(No.)  
Code 702

**DEFINITION**

An Agrichemical Handling Facility (AHF) consists of components that provide containment and a barrier to the movement of agrichemicals, constructed at locations where storage, loading, mixing, and clean-up of agrichemicals occur.

**PURPOSE**

To provide secondary containment to prevent degradation of surface water, ground water, and soil from an unintentional release of pesticides or fertilizers.

**CONDITION WHERE PRACTICE APPLIES**

This practice applies where (1) current methods of storage, loading and mixing of agrichemicals, and rinsing of equipment have the potential for impairing soil, water, air, plant, and animal resources and (2) nutrient and/or pest management plans have been developed which include the re-use or disposal of materials resulting from operation of the Agrichemical Handling Facility.

**CRITERIA**

**General Criteria Applicable to All Purposes**

Agrichemical Handling Facilities shall be planned, designed, and installed to meet all federal, state, local, and tribal laws and regulations.

The walls and floors designed of the AHF may be constructed of earth, steel, reinforced concrete, pre-cast concrete blocks, solid masonry, or other suitable material. All components shall be designed to withstand the full hydrostatic head of any discharged liquid and all other anticipated live and dead loads.

Space for storage of equipment other than that directly related to the AHF operation shall not be included in the facility layout.

Secondary containment areas not protected from rainfall shall provide for a complete separation between bulk fertilizers and pesticides while maintaining their individual capacity.

Restrict access to agrichemical storage by children, pets, livestock, wildlife, and unauthorized persons. Refer to pesticide labels and state regulations for controlled access requirements at an AHF that includes pesticide storage.

Year round storage facilities shall be heated, if required, to comply with label requirements. Primary containment piping shall be located above the ground and within the secondary containment. No posts, pipes, hoses, discharge valves, or other devices may pass through the floor, containment storage walls, or the sump.

Location: Stationary agrichemical containment facilities are not to be located on sites where mixing and loading has previously occurred. The AHF shall not be located on floodplains unless it is protected from inundation or damage from a 100 year flood event. The lowest component shall be at least 2 feet above the high water table. Subsurface drainage tubing that underlies the facility must be removed or broken in a manner to eliminate the risk of agrichemicals from entering the drainage system. The AHF location shall provide the following minimum separation distances: 150 ft from private wells; 2,000 feet from public wells; 200 feet from surface water bodies and wetlands; and 40 feet from fuel storage tanks.

**Liners.** The AHF must be constructed of materials that have a permeability of  $1 \times 10^{-7}$  cm/sec or less. Liners shall be designed to withstand hydrostatic head and anticipated traffic loads. The coating or liner shall be flexible enough to bridge joints and remain watertight. An impervious coating or liner material which will prevent deterioration of the concrete and absorption of pesticide will be applied, on all concrete surfaces including

mixing/loading areas and storage areas, exposed to pesticides. Coating materials must be designed to remain flexible after curing, aging, cold weather, sunlight, and exposure to anticipated agrichemicals, loads and traffic. Types of coatings to consider include, but are not limited to epoxy phenolic, epoxy novolac, vinyl ester, or a synthetic liner. The coatings or liner shall be installed in accordance with the manufacturer's specifications.

Exposed surfaces of fertilizer containment will be designed to resist penetration and absorption or fertilizer and fertilizer contaminated waters. An impervious coating or liner is required for secondary containment facilities constructed out of earth, concrete blocks or similar materials. For cast in place concrete walls and floors, an impervious coating or liner is not required for either liquid or dry fertilizers. Synthetic liners shall be a minimum thickness of 30 mils and shall be compatible with the materials being stored within the secondary containment area. Synthetic liners shall be installed under the supervision of a qualified representative of the manufacturer and all field constructed seams shall be tested and repaired in accordance with the manufacturer's recommendations.

**Foundation Preparation.** A concrete AHF shall be provided with a foundation of at least 4 inches of compacted sand on native mineral soil or compacted sub-base. The sand will have no more than 12 percent passing the No. 200 sieve (74 microns) and be free from clay lumps. Synthetic liners will be placed on relatively smooth ground that is free of stumps, roots, rocks, sticks, or other items that could puncture the liner or interfere with the operation. Surface preparation will be provided as required by the manufacturer.

**Structural Requirements.** Concrete will be structurally designed for: 1) the wheel loads of the existing or anticipated loaded equipment; 2) the loads imposed by storage tanks and other equipment; and 3) temperature and shrinkage. If the containment is to serve as part of a foundation or supports a building or roof, consider the total load in the structural design of the concrete. When vertical frost footings are used, there must be a smooth transition from the footing to the floor along the interface with the subgrade to reduce the stress from drying shrinkage and expansion

and contraction from temperature changes of the concrete.

Roofs and all support structures will be designed for snow and wind loads as specified in accordance with the locally enforced building code. If there is no applicable local building code, roofs will be designed for snow and wind loads as specified in the current edition of the International Building Code.

Structural concrete components will comply with the guidance in the current ACI-350 – Environmental Structures, and ACI 360 – Design of Slabs on Grade. A waterstop is required at contraction or expansion joints or other locations where reinforcing steel is not continuous through a joint. When a synthetic liner is used over the concrete walls and/or floor, the slab may be non-reinforced concrete.

**Appurtenances:** Sumps shall be designed as shallow and small as practical while allowing sufficient size for cleaning. Construct sumps of corrosion and leak resistant material. If the sump will create a hazard to traffic, cover the sump opening with a corrosion resistant grating capable of supporting anticipated loads. A manually operated pump shall remove accumulated liquids. Underground outlets shall not be used. The sump or low point shall be located within the containment area.

No posts, pipes, hoses, discharge valves, or other devices may pass through the floor, containment storage walls, or the sump.

Design appurtenances to prevent damage from freezing and thawing. Use hoses, pipes, valves, connectors, filters, tanks, and related plumbing material compatible with the chemicals being handled. Suction hoses shall be designed for vacuum operation. Backflow prevention devices shall be provided on pipes supplying non-contaminated water. Design transfer piping to prevent backflow between the pump and the storage tank(s). Air gaps are acceptable backflow prevention measures. Check valves are not acceptable backflow prevention measures.

#### **Additional Criteria for Pesticides Mixing/Loading Pads**

The pad width shall be at least 2 feet wider than the widest piece of equipment and the pad length at least 2 feet longer than the maximum length of the application equipment.

Only the space necessary to accommodate entrance and exit ramps, worker access, tanks, pumps, power washers, hoses, temporary placement of chemical containers, storage of sprayers, and other necessary equipment shall be provided.

Except for access, the surface perimeter of the facility floor shall be a minimum of 6 inches above the surrounding ground surface.

Access shall be a graveled or a paved ramp with a maximum slope of 15 percent (6:1). A concrete pad shall be designed as a slab on grade based on methods described in ACI 360R, "Design of Slabs on Grade" or other similar industry guides. The slab shall be designed to minimize cracking. Joints will be designed with appropriate water stops.

Ramps, rounded curbing, or other methods will be designed to provide a smooth transition for entrances and exits. The floor of the facility shall slope at least 2 percent (1/4 inch per foot) from all areas to a watertight catch basin or sump. Minimally sized sumps, shallow depressions, or cleanup channels must be provided to collect spills, rinsate, sediment, etc. in each containment area. The mix load area shall provide the capacity to hold at least 125 percent of the volume of the largest application equipment tank. If the pad is covered by a roof to exclude precipitation the volume may be reduced to 110 percent of the volume of the largest application equipment tank used on the pad

#### **Additional Criteria for Pesticide Storage**

If more than 60 gallons (227 L) of Class I, II, or III flammable or combustible liquids or a single storage container larger than 5 gallons (19 L) of Class I, II, or III flammable or combustible liquids are stored in an agrichemical containment facility, National Fire Protection Association (NFPA) 30, Flammable and Combustible Liquids Code, Chapter 4, shall be followed. Storage cabinets or other remedies shall be installed.

Storage will be provided that will contain 125 percent of the largest container stored in the area. If the area is enclosed to exclude rainfall the containment volume may be 110 percent of the largest container in the storage area. Ventilate all enclosed areas while occupied. This may be accomplished by the use of door openings, removable walls or a forced air

ventilation system. The floor shall be graded to a low corner to collect liquids.

#### **Additional Criteria for Secondary Containment of Bulk Liquid Fertilizers**

Primary storage containers of bulk fertilizer shall be located within a walled or diked containment area. Primary storage containers shall be anchored, elevated, or secured by some other means as necessary to prevent flotation and resist wind loads and other sources of instability. Primary storage containers and appurtenances shall be constructed of materials that are resistant to corrosion, puncture, or cracking.

Primary storage containers shall be labeled as fertilizer in order to identify the contents within. The storage container labeling shall be in a prominent location with lettering that is a minimum of 4 inches in height. Primary storage containers and appurtenances shall be secured to provide reasonable protection from wildlife, vandalism, and unauthorized access at all times by use of fencing, lighting or locks. All storage containers shall have the capability to have the liquid level within the storage container measured readily and safely. All storage containers shall be equipped with a shutoff valve that is located on the storage container or at a distance from the storage container dictated by standard engineering practice. For multiple valves that are located on a single line, the valve closest to its storage container shall be securable.

Walls or dikes shall not be more than 4 feet in height above interior grade unless provision is made for safe access and exiting. For earth embankment dikes, the minimum sum of the inside and outside slopes of the settled embankment shall not be less than five horizontal to one vertical with neither slope steeper than 2:1. Slopes shall be designed to be stable in all cases. The minimum top width for an earthen embankment is 4 feet.

Secondary containment areas protected from rainfall shall contain a minimum of 110 percent of the volume of the largest storage container within the containment area, plus the displacement volume that is occupied by all other tanks within and below the height of the wall or dike. Secondary containment areas not protected from rainfall shall contain a minimum of 125 percent of the volume of the largest storage container within the diked

area, plus the volume that is occupied by all other tanks within and below the height of the dike, plus the volume of a 2yr-24hr rainfall. The floor shall be graded to a low corner or sump to collect concentrated liquids. Allow 2 feet minimum distance for inspection and maintenance between storage containers and between storage containers and the secondary containment wall.

#### **Additional Criteria for Operational Area for Bulk Liquid Fertilizer Storage**

Operational areas shall be utilized for transferring, loading, unloading, and mixing fertilizers at farm storage facilities. The operational area containment shall provide the capacity to hold at least 125 percent of the volume of the largest application equipment tank, or 110 percent if direct rainfall is excluded from the facility. The operational area shall have a minimum width of 10 feet and a minimum length of 20 feet. A portable facility that satisfies the operational area requirements is acceptable.

Except for access, the surface perimeter of the facility floor shall be a minimum of 6 inches above the surrounding ground surface. Access shall be a graveled or a paved ramp with a maximum slope of 15 percent (6:1). If a concrete pad is used it shall be designed as a slab on grade based on methods described in ACI 360R, "Design of Slabs on Grade" or other similar industry guides. The slab shall be designed to minimize cracking. Joints will be designed with appropriate water stops. Ramps, rounded curbing, or other methods will be designed to provide a smooth transition for entrances and exits. The floor of the facility shall slope at least 2 percent (1/4 inch per foot) from all areas to a watertight catch basin or sump.

Loading and unloading operations shall be supervised at all times by an attendant who is familiar and/or trained in the procedures that are used for the control and recovery of discharges. Any fill or unloading point of the mobile container shall be positioned over the containment area during loading or unloading or assure retention of any discharge.

#### **Additional Criteria for Bulk Dry Fertilizer Storage**

A storage facility shall store non-fluid fertilizers in a sound structure that has a cover or roof,

sidewalls, and a base sufficient to prevent contact with precipitation and surface waters. A storage facility shall allow that all loading, unloading, mixing, and handling of dry fertilizer is on an impermeable surface of a size and design that will contain the fertilizer and allow for the collection of spilled material to be recycled and applied at agronomic rates.

Except for access, the surface perimeter of the concrete pad shall be a minimum of 6 inches above the surrounding ground surface. Access shall be a graveled or a paved ramp with a maximum slope of 15 percent (6:1). All other areas around the pad shall be established with vegetation if practical.

#### **CONSIDERATIONS**

Consider the prevailing winds during the season when the agrichemical containment facility will be used and locate the facility downwind and downhill from sensitive areas such as surface waters, wetlands, sensitive upland areas, houses, play areas, gardens, and livestock feedlots.

Consider including measures to reduce the accumulation of sediment, weeds or other debris transported by wind, vehicles, or other means. For roofed facilities, consider providing measures to prevent blown-in precipitation.

Consider sighting the facility to provide the following setbacks:

- Farm buildings 50 ft.
- Residential/business building 200 ft
- Public roads 50 ft.
- Pressurized water lines 25 ft
- Property lines 25 ft.

Consider on-farm traffic patterns and accessibility to chemical storage and application areas, as well as adjacent land uses and visibility when choosing the location of a facility.

Consider the compatibility of architecture and materials with surrounding buildings when the facility components include storage buildings or other roofed structures.

Consider the effects of chemical drift on surrounding areas due to prevailing winds.

Evaluate the need for an emergency area with a faucet and a shower with a pull chain, for the

washing of eyes, face and body in the event of an accidental exposure to chemicals.

### **PLANS AND SPECIFICATIONS**

Plans and specifications shall be prepared in accordance with the criteria of this standard and shall describe the requirements for applying the practice to achieve its intended use.

The following statement shall appear on the cover sheet of construction drawings for each AHF:

*"Management of chemicals is the responsibility of the owner/operator and will be done in accordance with applicable federal, state, and local laws and regulations."*

### **OPERATION AND MAINTENANCE**

An Operation and Maintenance (O&M) plan shall be developed for this practice. The O&M plan shall be consistent with the purposes of the practice, its intended life, safety requirements, and the criteria for the design.

The plan shall address:

- Emptying storage tank(s) to accommodate accidental spills and rinsate prior to mixing and rinsing events.
- Emptying and cleaning the catchment sump and concrete slab after spills or rinsing events.
- Proper disposal/use of rinsate, exterior wash water, accumulated sediment and spillage water in accordance with the chemical's label requirements and federal, state, and local laws and regulations.
- Winterizing facilities.
- Periodic inspection of piping, pump(s), and testing backflow prevention devices.
- Inspection for and repair of cracks in concrete slab and catchment sump.
- Proper precautions to reduce worker exposure in operation of the AHF.
- Emergency response instructions in case of an accidental chemical spill, exposure, fire, or other incident that could adversely affect environmental health.
- Posting of signs that warn that hazardous chemicals are present.

- Posting a condensed version of proper operating procedures for the AHF that is weather proof and easily noticed.

### **REFERENCES**

Colorado Department of Agriculture Rules and Regulations Pertaining to Commercial Fertilizers and Pesticides at Storage Facilities and Mixing and Loading Areas (Title 25 Article 8).

<http://www.ag.state.co.us/DPI/programs/grounderwater.html>

MWPS-37. Designing Facilities for Pesticide and Fertilizer Containment. Midwest Plan Service, Iowa State University, Ames, IA.