

**NATURAL RESOURCES CONSERVATION SERVICE  
CONSERVATION PRACTICE STANDARD**

**AGRICHEMICAL HANDLING FACILITY**

(No.)

**CODE 309**

**DEFINITION**

A facility with an impervious surface to provide an environmentally safe area for the handling of on-farm agrichemicals.

**PURPOSE**

To provide a safe environment on farm and ranch operations for the storage, mixing, loading and cleanup of agrichemicals, retain incidental spillage, retain leakage, and to reduce pollution to surface water, groundwater, air, and/or soil.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies where:

- The handling of agrichemicals creates significant potential for pollution of surface water, groundwater, air or soil and a facility is needed to properly manage and handle the chemical operation;
- An adequate water supply is available for filling application equipment tanks, rinsing application equipment and chemical containers as needed for the operation;
- Soils and topography are suitable for construction.

This standard does not apply to the handling or storage of fuels. This standard does not apply to commercial or multi-landowner agrichemical handling operations.

**CRITERIA**

**General Criteria Applies to All Purposes**

Plan, design and construct agrichemical

handling facilities to meet all federal, tribal, state and local regulations.

The size of the agrichemical storage will be based on the agrichemical use of the farm needed for a single growing season averaged over the last 5 years.

Components of an agrichemical handling facility shall include the following:

1. A sealed concrete pad to collect and retain spills from mixing and filling activities.
2. A collection sump, pump, and safety devices.
3. Adequate water supply for mixing chemicals, rinsing of chemical containers and tanks, and rinsing the chemical mixing and filling pad.
4. Water supply pump, pipeline, and back flow prevention devices.
5. Water hoses or nozzles for filling tanks, rinsing of chemical containers and concrete mixing pad, and emergency washing.
6. Tanks for storage of rinse water for later use as a diluent for agrichemical mixtures.
7. Piping and pump(s) shall be designed to facilitate drainage for winter shutdown.

The pad, hoses, pipes, valves, seals, connectors, filters, tanks, and related plumbing material must be compatible with the chemicals

Conservation practice standards are reviewed periodically and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#) or visit the [electronic Field Office Technical Guide](#).

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being handled and capable of withstanding the intended use. A minimum 10-year life shall be used for design.

Outlet drains are not permitted in the agrichemical collection, storage or handling areas.

Posts, pipes, hoses, discharge valves, or other devices may not pass through the floor, containment storage walls, or the sump.

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

When the agrichemical handling facility is also used for agrichemical storage, provide sufficient space and designate a separate room or area.

#### **Criteria for Permanent Facilities**

**Location.** Locate the agrichemical handling facility as follows:

- Adjacent to or as near the chemical storage building as practical when chemical storage is not incorporated into the facility;
- As far as practical from streams, ponds, lakes, wetlands, sinkholes, and water wells, with a minimum setback distance of 100 feet;
- Isolated and located downwind from residences and other buildings used to store feed, seed, petroleum products, or livestock with a minimum distance as required by local regulations;
- At sites that have not been used as stationary mixing/loading sites in the past.

The site shall be elevated above the surrounding ground to prevent runoff from entering the facility.

Locate above the 100-year floodplain elevation. However, if site restrictions require location within a floodplain, protect from inundation and damage from the 25-year flood event, or larger if required by laws, rules, and regulations.

**Storage Capacity.** Provide a minimum storage volume on the chemical-handling pad of 250 gallons or 1.25 times the volume of the largest storage or spray tank on the pad, whichever is greater.

For unroofed facilities provide storage on the pad as stated above or the volume of the 25-year, 24-hour storm, whichever is greater. Provide a means of storing or field applying, according to chemical label directions, the full storage volume within the 72-hour period following the storm.

Prevent outside runoff water from entering the facility.

**Rinsate Tanks.** Provide rinsate tanks of adequate number and size as needed for the type of operation, allowing for separation of non-compatible chemicals. The tanks shall be labeled with the type of chemicals and target crops. The material type shall be suitable for the type of chemical to be contained in the tank.

**Manufactured Components.** Manufactured tanks and components shall be structurally sound, capable of withstanding all anticipated loads, and constructed of fiberglass, polyethylene, or other durable materials suitable for their intended use. The rinsate tanks shall be located on the mixing pad. Tanks will be sized based on a single farm owner or operator agrichemical need.

**Chemical Handling Pad.** Size the pad to accommodate the largest spraying equipment. Equipment access is allowed from more than one direction. Provide adequate space for maneuvering around equipment, a minimum of 2 feet for open facilities and 4 feet for enclosed facilities. When practical base the minimum width of the mixing pad on the width of the spray equipment with the booms retracted.

Slope the pad to allow for drainage to a collection area or sump. The pad shall be sloped a minimum of 2% (1/4 inch per foot) toward the sump.

The entrance to the chemical mixing pad shall be graveled, paved, or otherwise treated to provide a suitable entrance for the equipment and to prevent erosion and the tracking of sediment onto the pad.

**Flexible Membrane Liners.** All flexible membranes shall be certified by the manufacturer to be suitable for the intended use.

Design of the flexible membrane shall be in accordance with manufacturer recommendations. All flexible membrane installations shall meet the material and installation requirements of the plans and specifications provided for each installation and shall be certified by the installer.

Minimum Thickness for Membranes	
Type	Minimum Thickness
HDPE	40 mil thickness
LLDPE	40 mil thickness
PVC	30 mil thickness
RPR	45 mil thickness
EPDM	45 mil thickness

**Concrete Surfaces.** To protect the surfaces of concrete, that are exposed to agrichemicals, from penetration and contamination all concrete must have an admixture for concrete meeting the requirements of ASTM C1240 (micro silica), ASTM C618 (fly ash) or ASTM C989 (ground blast furnace slag), be sealed with a chemically resistant non-vapor barrier forming coating, or take measures to prevent vapor formation under the concrete sealed with a chemically resistant coating. Coatings must be compatible with the agrichemicals used at the facility and installed in accordance with the manufacturer's recommendations.

**Agrichemical Collection – Sump.** The sump shall be a minimum of 3 feet by 3 feet by 2 feet deep, covered with a metal grate. The sump should be thoroughly cleaned between mixing of different chemicals at the facility. The resulting rinsate can be applied as a dilute pesticide to a labeled site or used as make-up water for subsequent batches of pesticides that are labeled for the same crop. Sediment from the sump shall be removed with proper precautions taken to reduce exposure of the worker to any potential contaminants in the sediment. This sediment should be land applied to a target crop in a safe manner. The sediment shall be

removed and the sump pumped dry at the end of each day of operation.

**Sump Pump.** The sump pump shall be a chemical resistant submersible pump and should create a minimum turbulence within the sump. A filter shall be installed between the sump pump and sprayer or rinsate tanks. All electrical components shall be waterproof and explosive proof. The pump shall be manually activated.

**Structural Design.** For the structural design, address all items that will influence the performance of the structure, including loading assumptions, storage tanks, material properties, and construction quality. Indicate design assumptions and construction requirements on the plans. Minimum requirements for agrichemical mixing facilities are specified as follows:

1. A watertight concrete design shall be used to avoid leakage from the sump and chemical mixing pad. A minimum of 6 inches of well compacted granular sub-base shall be placed prior to concrete placement. The minimum concrete thickness of slabs and sump shall be 6 inches and 8 inches respectively. The minimum reinforcement for slabs shall be equal to two layers of 6 by 6 gage, 6 inches by 6 inches welded wire fabric. Final pad and sump thickness and reinforcement shall be designed based on anticipated loading. The slab and sump shall be poured in one pour without expansion joints or openings. Portland cement Type I or II shall be used. The maximum size aggregate used shall be 1 inch. The concrete slab shall have a minimum 28-day strength of 4000 psi. The slab shall be coated with an impervious sealant for protection from chemicals.

2. ASTM A-615, Grade 60. (Welded Wire Fabric ASTM A-185)

**Water Supply.** A permanent water supply shall be provided for filling the sprayers and rinsing the chemical containers, spray tanks, and chemical mixing pad. A pump and pipeline shall be installed for conveyance of water from the water supply to the chemical mixing facility. Back flow preventers, anti-siphon devices or a minimum 2-inch gap shall be installed on all

water supply lines for mixing and loading operations from a well or other water source. The pump and well shall be located a minimum of 100 feet away from the chemical mixing pad.

Portable water nurse tanks may be used in the field to refill sprayer tanks. No chemicals shall be placed in the nurse tank and a 2-inch air gap shall be maintained between it and the sprayer tank.

**Safety.** Design shall include appropriate safety features to minimize the hazards of the facility. Provide warning signs, emergency eyewash station and other devices as appropriate, to ensure the safety of humans. A double bib faucet shall be installed at the agrichemical mixing facility in the water supply line. One shall be kept available and without a hose attached. Convenient access to it shall be provided for emergency washing when the applicator's skin is exposed to chemicals. Provide adequate ventilation at all times for enclosed buildings using natural or mechanical means.

**Vegetation.** Stabilize disturbed areas, as necessary, to prevent erosion, in accordance with the conservation practice standard for Critical Area Planting, Code 342.

## CONSIDERATIONS

For permanent facilities, the agrichemical handling facility may cause an increase in water use at the site from the mixing of agrichemicals and rinsing of agrichemical sprayers, containers and agrichemical-handling pad.

Consider installing an apron at the facility entrance to minimize sediment transport onto the pad.

Consider providing a mixing platform for filling agrichemical sprayers.

For portable handling facilities consider using a top/bottom-loading valve with built-in check valve in the hose from the nurse tank to the spray tank. This will enable the operator to remain on the ground while filling the sprayer.

## PLANS AND SPECIFICATIONS

Plans and specifications for constructing agrichemical mixing facilities shall be in accordance with the criteria contained in this

standard and shall describe the requirements for applying the practice to achieve its intended purpose.

## OPERATION AND MAINTENANCE

An operation and maintenance (O&M) plan (attached) shall be developed that is consistent with the purpose of the practice. The O&M Plan will include an inventory of chemicals used at the facility and the methods proposed for handling of sediment, rinsate, and potential spills. An emergency response plan shall be a part of the O&M plan. A copy of the O&M plan shall be located at the agrichemical mixing facility and include the Emergency Management Agency contact number: (601) 352-9100 and the Mississippi Regional Poison Control Center contact number, (601) 354-7660. These telephone numbers shall be posted at an easily visible location near the mixing facility and next to the nearest telephone.

Operation and maintenance shall be in accordance with the requirements of this standard and in conformance with all local, state, and federal laws and regulations. Required records for chemicals, locations and dates applied shall be kept.

## REFERENCES

American Concrete Institute, *ACI codes*, Detroit, MI.

American Institute of Steel Construction, *AISC, Manual of Steel Construction*, Chicago, IL.

American Society of Agricultural Engineers, ASAE EP514, *Design of Concrete Structures for Secondary Containment of Liquid Pesticides and Fertilizers*, St. Joseph, MI.

Daum, D. R., and D. J. Meyer. *Pesticide Storage Building*. Pennsylvania State University, Agricultural Engineering Department.

Doane's Agricultural Report. *Chemical Containment Facilities*. Vol. 53, No 36-5.

Midwest Plan Service, 1995. *Designing Facilities for Pesticide and Fertilizer Containment MWPS-37*, Ames, IA.

Kammel, D. W., 1988. *Protective Treatment for Concrete*. Agricultural Engineering Department, University of Wisconsin.

Noyes, R. I., 1989. *Modular Farm Sized Concrete Agricultural Chemical Handling Pads*. Oklahoma State University, Agricultural Engineering Department.

Noyes, R. T., and D. W. Kammel, 1989. *A Modular Containment, Mixing/Loading Pad*. ASAE Paper No 891613, American Society of Agricultural Engineers, Winter Meeting, New Orleans, LA.

USDA, Natural Resources Conservation Service, *Critical Area Planting*, Code 342, Conservation Practice Standards.

#### A. MIXING AND APPLICATION

1) Mix only the amount of chemical needed for the planned treatment. Mixing operations shall be under the supervision of a person holding a current applicator's license.

2) Apply all chemicals at the specified label rates. Small amounts of excess chemical in the spray tank may be disposed of by applying in the same manner on designated areas in the target field. Larger quantities are to be brought back to the mixing center and transferred from the spray tank to the designated rinsate storage tank for reuse. Rinsate storage tanks will be identified as to the contents.

3) Always wear protective clothing including skin, eye and lung protection when mixing chemicals.

4) A record of chemical use will be kept and will include the chemical name, rate, date, and locations of applications.

#### B. CLEAN UP OF SPRAY EQUIPMENT AND CONTAINERS

1) Triple rinse all empty containers. Add all rinsate from containers into the spray tank and apply on the target field. Store cleaned containers until properly disposed.

2) Rinse spray tank with clean water. Small amounts of the rinsate may be applied to designated areas in the same manner as application on target field. For larger amounts of rinsate, flush tanks and lines with sprayer over herbicide mixing pad. Close sump valve and catch rinsate. Transfer rinsate from sump to proper rinsate tank for future reuse.

3) Wash down the mixing pad before changing to a different chemical or at the end of the day.

#### C. STORAGE TANKS

1) Rinsate storage tanks will be labeled with the type of chemical and target crops. Rinsate tanks will be kept on the chemical mixing pad.

#### D. SUMP SEDIMENT

1) Sediments consisting of dirt, gravel and dust accumulate on the pad and get washed into the sump. Sediment from the sump is considered to be contaminated if any spills occurred on the pad. The amount of sediment in the sump should be controlled to reduce a large buildup. The sediment should be removed periodically with proper precautions taken to reduce exposure of the worker to any potential contaminants in the sediment. This sediment should be land applied to the target field at a rate below the label recommendation. The sediment should be removed when changing spray material from one crop to another (i.e., from corn to soybeans).

#### E. TRACKING OF MUD AND CHEMICALS OFF PAD

1) Tracking of chemical from the pad by wheel traffic onto surrounding area will be prevented by properly washing down the equipment and pad if a spill occurs and transferring the rinsate to the storage tank.

#### F. CLEANUP OF SPILLS

1) The Private Applicators Training Manual will be consulted to determine the best method for cleaning up a spill and to determine if the spill needs to be reported.

#### G. EMERGENCY WASH AREA

1) One faucet will be designated and available (with no hose attached) for emergency washing in case the applicator's skin is exposed to chemicals.

2) Keep access to the emergency faucet open.

#### H. INSPECTION

1) The facility shall be inspected periodically to insure that the back flow prevention devices are operating satisfactorily.

2) Check chemical mixing pad and sump weekly for leaks and cracks and repair as soon as possible with materials approved by the Mississippi Department of Environmental Quality.

3) Check rinsate storage tank to insure that they are properly labeled.

I. END OF SEASON CLEANUP

1) End of season cleanup and decontamination can be done by pressure washer and detergent to wash off the pad. Rinsate should be loaded onto the sprayer and applied to appropriate crop area designated by chemical area.

A copy of this Operation and Maintenance Plan will be kept at the agrichemical mixing center. The Emergency Management Agency contact : 601-352-9100 and the Poison Control Center contact number: (601) 354-7660 will be posted at an easily visible location near the mixing facility and next to nearest phone.

