NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
RHODE ISLAND

AGRICHEMICAL HANDLING FACILITY

(No.)

CODE 312

DEFINITION

An impervious surface to provide an environmentally safe area for the handling of on-farm agrichemicals, such as pesticides, herbicides and fertilizers.

PURPOSE

- To provide a safe environment for the handling of chemicals and to retain incidental spillage for proper disposal;
- To reduce pollution to surface water, groundwater, and/or soil.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where:

- The lack of adequate facilities for the handling of chemicals creates significant potential for pollution of surface water, groundwater or soil;
- A water supply is available and adequate for filling application equipment tanks, rinsing application equipment and chemical containers;
- Soils and topography are suitable for construction; and,
- An impermeable pad is needed to properly manage chemical operations.

CRITERIA

Laws and Regulations. All Federal, state, and local laws, rules, and regulations, including local inland wetland agency regulations, governing the construction and use of this practice as well as setbacks from wells, surface water and property boundaries shall be followed. Planned work shall comply with all federal, state, and local laws and permit conditions and requirements. **The landowner shall obtain all necessary permits prior to construction activities.**

Criteria for Permanent Structures

An agrichemical handling facility is a permanent structure with an impervious surface that is designed and constructed in accordance with all federal, state, and local laws.

Producers are responsible for securing the necessary permits to install the required facilities and for properly managing the facility.

Location. Locate the agrichemical handling facility as follows:

- **Separation Distances.** Separation distances from residences and buildings, property lines, surface water bodies including wetlands, private wells or springs, and/or public wells shall be determined on a case by case basis in consultation with appropriate state or local regulatory agencies.
- Adjacent to or as near the chemical storage building as practical;

- As far as practical from streams, ponds, lakes, wetlands, known sinkholes, subsurface anomalies, and wells, with a minimum distance of 100 feet;
- Isolated and located downwind from residences and other buildings used to store feed, seed, petroleum products, and livestock;
- Locate above the 100-year floodplain elevation. However if site restrictions require location within the flood plain protect from inundation and damage.
- At sites that have not been used as stationary mixing/loading sites in the past.

Components. Include those components necessary to properly handle the chemical mixture and prevent pollution of the environment.

Outlet drains are not permitted in the chemical collection area or the chemical-mixing and loading pad. Components of a complete facility include, but are not limited to, the following:

Required Items:

- A sealed concrete pad for chemical handling and loading;
- A chemical collection sump, sump pump, and safety devices;
- Adequate water supply for mixing chemicals, rinsing tanks and containers, and for emergency health and safety needs;
- Water supply pump, pipeline, hoses, backflow prevention devices, and other hardware needed for water control;
- Emergency washing area;
- Tanks for storage of rinsate;
- Warning signs, fire extinguisher, first aid kit, protective clothing, and other appropriate safety devices;
- Agreed to Operation, Maintenance, and Safety Plan.

If applicable

- Electrical components such as lights, fans, outlets, switches, etc.;
- Where needed, storage space of sufficient size to accommodate short-term storage of chemicals.

Although optional, it is highly recommended that the facility be roofed, and that a mixing platform be available when filling chemical sprayer. It is preferable to have a separate building or room for chemical storage.

Pad. The size of the concrete pad used for the chemical handling operation shall be large enough to accommodate the largest spraying equipment and may allow for access from more than one direction. Provide adequate space for easily maneuvering around the equipment and to accommodate the worker. A minimum of 5 feet on each side of the sprayer is suggested. Where possible base the minimum width of the mixing pad with the booms of the spray equipment retracted.

To prevent the surface from penetration and contamination from chemicals, all concrete exposed to chemicals 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), or be sealed with a chemically resistant non-vapor forming coating compatible with the chemicals used at the facility.

Slope the chemical-handling pad to allow for drainage of water and pesticide spills to a collection sump.

Prevent outside runoff water from entering the facility. Provide a minimum storage capacity on the chemical-handling pad, including the sump, of 250 gallons or equal to 1.25 times the largest storage or spray tank brought onto the pad, whichever is greater.

For an unroofed mixing/loading pad, 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.

Chemical Collection Sump. Provide a watertight concrete sump, under the pad, with adequate dimensions for sediment removal and pump operation. Cover with a metal grate. Design the sump for all anticipated loads. The

minimum concrete thickness of the sump walls and bottom is 8 inches.

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

Structural Design. For the structural design, address all items that will influence the performance of the structure, including loading assumptions, material properties, and construction quality. Indicate design assumptions and construction requirements on the plans.

The use of a roof/building to cover the pad is strongly encouraged. Use minimum snow and wind loads as specified in ASCE 7, Minimum Design Loads for Buildings and Other Structures. Meet all local and state codes.

Provide adequate ventilation at all times for enclosed buildings using natural or mechanical means.

Locate footings below the anticipated frost depth unless measures are designed to accommodate frost/freeze conditions.

Minimum design requirements are as follows:

- Timber - *National Design Specifications for Wood Construction*, American Forest and Paper Association;
- Concrete - *Building Code Requirements for Reinforced* Concrete*, ACI 318*, American Concrete Institute;
- Masonry - *Building Code Requirements for Masonry Structures, ACI 530*, American Concrete Institute;
- Slabs – Use a six (6) inch minimum concrete slab. Base the required area of reinforcing steel on the subgrade drag theory in accordance with American Concrete Institute, ACI 360, *Design of Slabs-on-Grade.* When heavy equipment loads are to be resisted and/or where a non-uniform foundation cannot be avoided, use an appropriate design procedure incorporating a subgrade resistance parameter(s) such as ACI 360.
- Concrete - Use type I or II cement, with minimum 28-day compressive strength of 4000 psi, 5% to 7.5% air entrainment with a slump of 1.5 inches to 3 inches. A concrete super plasticizer admixture may be used.

Criteria for Portable Mixing Stations

The chemical mixing station is a portable device that can be easily moved from field to field, will meet the needs of the user and comply with all required federal, state, and local regulations.

Components. The portable mixing station includes those components necessary to properly manage the chemical materials and prevent accidental release to the environment, which include but are not limited to the following:

- A portable impermeable pad for mixing of chemicals and rinsing chemical containers.
- A system of hoses, nozzles, valves, pumps, etc., designed to: (a) safely transfer chemicals from the chemical containers to equipment spray tanks, (b) thoroughly rinse chemical containers, and (c) clean up and recover any liquid spilled onto the pad.
- Adequate water supply for mixing chemicals, rinsing chemical containers and tanks, and rinsing the containment pad. Water is normally supplied from the nurse tank.

Pad. The pad shall be structurally sound, be constructed of durable impermeable material that is chemically resistant and configured to securely position the chemical containers to avoid tipping and chemical spillage. The minimum containment capacity of the pad is 1.25 times the volume of the largest individual chemical container to be used. Include a sump or other provisions for easy recovery of spilled liquid.

The pad, hoses, pipes, valves, seals, connectors, filters, tanks, and related plumbing material must be compatible with the chemicals being handled and capable of with standing the intended use.

Rinsing Devices. Design rinse devices so that residual contents of chemical containers can be adequately rinsed directly from the container to the spray tank. Design the rinse system to operate from the nurse tank discharge pump or a separate pump that provides adequate pressure.

CONSIDERATIONS

For permanent facilities, the agrichemical handling facility will cause an increase in water use at the site from the mixing of chemicals and rinsing of chemical sprayers, containers and chemical-handling pad. The quantity of runoff will increase due to the area roofed at the facility.

For portable stations verify with the manufacturer of the mixing station that any pump to be used in pressure rising is compatible with the rinse device. Generally, positive displacement pumps should not be used. 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 shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. Plans and specifications shall include construction plans, drawings, job sheets or other similar documents. These documents shall as a minimum, specify the requirements for installing the practice and include the kind, quantity and quality of materials to be used.

To the extent practical, specifications shall conform to NRCS National Engineering Handbook Parts 642 and 643 (Section 20).

Portable mixing stations are manufactured items. Review plans and specifications submitted by the manufacturer to insure that the proposed mixing station meets the requirements of this standard.

AS BUILT DRAWINGS

As built drawings shall be prepared which show all pertinent elements and elevations as actually installed. A copy shall be provided to the owner / operator upon construction completion.

OPERATION AND MAINTENANCE

An Operation and Maintenance (O&M) plan shall be prepared for, reviewed and signed by the landowner or operator. The plan shall specify that the treated areas and associated practices are inspected annually and after significant storm events to identify repair and maintenance needs.

The O&M plan shall detail the level of repairs needed to maintain the effectiveness and useful life of the practice.

Include in the operation and maintenance (O&M) plan an inventory of chemicals used at the facility and the methods proposed for handling of sediment, rinsate, potential spills, and an emergency response plan with the emergency spill and poison center telephone numbers. Include with the O&M plan Material Safety Data Sheets (MSDS) for all chemicals used. Post a copy of the O&M plan at the agrichemical handling facility.

The agrichemical handling facility shall be kept free of items not necessary for the storing, mixing, loading, and cleanup operations. The facility shall not be used for purposes other than the storing, mixing, loading, cleaning and maintenance of materials and equipment used for chemical application.

Perform normal winterization procedures to prevent damage to the facility and to chemical containers when weather conditions dictate.

Do not drain rinse water or rinsate from the sprayer onto the pad as a standard practice due to the probability of contamination by soil, trash and other pesticides.

Thoroughly clean the pad and sump between the mixing and loading of different chemicals. The resulting rinsate can be applied as a dilute pesticide to a labeled site or used as dilution water for subsequent batches of the pesticides that are labeled for the same crop. Empty the sump at the end of each day of operation.

Remove sediment from the sump using proper precautions to reduce exposure of the worker to any potential contaminants in the sediment. Sediment from a pesticide is considered the same weight active ingredient as the formulated chemical being mixed. If this sediment is land applied, apply it to the target crop field at a rate below the label recommendation. Remove the sediment from the sump prior to switching from one chemical to another chemical.

All material removed from the chemical-handling pad and sump must be properly utilized or disposed of. Appropriate uses and disposal methods are:

1. Application to the target crop as pesticide;

2. Use as dilution water in mixing to be applied to the target crop; or,

3. Disposal, as a waste product, in conformance with all local, state, and federal regulations.

Empty rinsate tanks, used as holding tanks for sump discharge, as soon as possible. Rinsate tanks shall not be used to store sump discharges of different chemicals. The rinsate may be applied as a dilute pesticide or used as dilution water for subsequent batches of pesticides that are labeled for the same crop.

Inspect the agrichemical handling facility periodically to ensure proper operation. The inspection shall include, but is not limited to the following:

- Concrete pad;
- Condition of protective coating, when used;
- Operation of back flow prevention devices;
- Hoses, pipes, valves, connectors, filters, tanks, and related plumbing material;
- Sump and sump pump;
- Safety equipment, including emergency washing area;
- Electrical systems and controls;
- Roof and structural integrity of facility;
- Access roads and ramps;
- Drainage around building;
- Labeling of rinsate storage tanks that will ensure proper methods for applying rinsate back to the land;
- Chemical inventory.

REFERENCES

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

American Society for Testing and Materials. *ASTM Standards*. Philadelphia, Pennsylvania.

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

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

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

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.