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**NATURAL RESOURCES CONSERVATION SERVICE
INTERIM CONSERVATION PRACTICE STANDARD
AGRICHEMICAL HANDLING FACILITY
(No.)
Code 703**

DEFINITION

An environmentally safe permanent structure used for the filling of agrichemical application tanks and the mixing of chemicals (insecticides, herbicides, fungicides, fertilizer, etc.) for agricultural or similar operations and for the safe storage of agricultural chemicals used in these operations.

PURPOSE

This practice may be applied as part of a conservation management system to support one or more of the following purposes.

- ◆ To provide a safe environment for the mixing and loading of chemicals and to retain incidental spillage for proper handling and disposal.
- ◆ To reduce pollution to surface water.
- ◆ To reduce pollution to groundwater.
- ◆ To reduce pollution to soil.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies where: (1) the lack of adequate facilities for the mixing of chemicals creates significant potential for pollution of surface water, groundwater or soil; (2) a water supply is adequate for filling application equipment tanks, rinsing application equipment and chemical containers; (3) soils and topography are suitable for construction, and (4) the applicator has determined that an impermeable pad is required to properly manage chemical operations.

DESIGN CRITERIA

Each agrichemical handling facility shall be designed to meet the needs of the landuser and in conformance with this standard and all applicable Federal, state, and local laws and regulations. The planning, design and construction shall ensure that the structure is sound and of durable materials commensurate with the anticipated service life, initial and replacement costs, and safety and environmental considerations.

System components.

- ◆ The agrichemical handling facility shall include those components necessary to properly manage the chemical materials and prevent pollution of the environment. Components of a complete agrichemical handling facility shall include but not limited to the following:
- ◆ A roofed building with a concrete pad for mixing and loading chemicals.
- ◆ An impermeable liner installed under the concrete mixing and filling slab.
- ◆ Chemical collection sump and pump.
- ◆ Adequate water supply for mixing chemicals, rinsing chemical containers and tanks, and rinsing the chemical mixing pad.
- ◆ Water supply pipeline, pump, and backflow prevention devices.

- ◆ Water hoses and nozzles for filling tanks, rinsing of chemical containers and chemical mixing pad.
- ◆ Emergency shower/eyewash station.
- ◆ Where needed, tanks for storage of rinse water for later use as a pesticide or diluent.
- ◆ Where needed, a platform for loading chemicals into the chemical applicator (sprayer, etc.).
- ◆ Where needed, a storage space of sufficient size to accommodate short term storage of chemicals commonly used in the landowner's operation.
- ◆ Warning signs, fire extinguisher, first aid kit, protective clothing, and other appropriate safety devices.
- ◆ Electrical components such as lights, fans, outlets, switches, etc.

Location. The agrichemical handling facility shall be located as follows:

- ◆ Adjacent to or as near the chemical storage building as practical.
- ◆ As far as practical from streams, ponds, lakes, wetlands, and wells with a minimum distance of 100 feet.
- ◆ As far as practical from known sinkholes and subsurface anomalies 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.
- ◆ Located above the 100 year floodplain elevation or, where this is not practical, as a minimum above the 25 year floodplain elevation. The facility shall be designed to prevent runoff from adjacent land and structures from entering the facility during a 25 year 24 hour rainfall event.
- ◆ At sites that have not been used as stationary mixing/loading sites in the past.

Foundation preparation. All top soil, organic matter and debris shall be removed from the site. The concrete slab and granular subbase shall be situated on firm, uniform foundation material. The subgrade surface shall be compacted prior to placement of the granular subbase. The granular subbase shall be a minimum of 6 inches in thickness and compacted to at least 95 percent Standard Proctor (ASTM D 698).

Size and capacity. The size of the concrete pad used for chemical mixing shall be as needed to accommodate the length, width, and height of the largest sprayer used at the facility with adequate space for easily maneuvering around the equipment and to accommodate worker access to rinsate tanks, pumps, hoses and other necessary equipment. The minimum pad width shall be 5 feet wider than the widest piece of equipment including retracted booms. Minimum pad length shall be 5 feet longer than the maximum length of the spraying equipment used. The chemical mixing pad shall be sloped to allow for drainage of water and pesticide spills to a collection sump. The chemical mixing pad shall be sloped a minimum of 2% (1/4 inch per foot) toward the sump.

The chemical mixing pad shall have a curb of sufficient height to prevent outside runoff water from entering and for providing storage of chemical spills. The chemical mixing pad, including the sump, shall have a minimum storage capacity of 250 gallons or a capacity equal to 1.25 times the largest storage or spray tank brought onto the pad, whichever is greater. The lowest component of the facility (sump, footer, etc.) should be a minimum of 12 inches above the high water table.

Entrance. 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 chemical mixing pad. Minimum width of entrance shall be 4 feet wider than the widest piece of equipment used at the facility. The length of the entrance shall be a minimum of 1.5 times the largest wheel circumference of the equipment used at the facility.

Roofed building. The agrichemical handling facility shall be roofed to prevent rainfall from entering the system. Roof supports shall not penetrate into or through the concrete pad area. Ceiling clearance height (the distance from the containment pad to the ceiling joist) should not be greater than what is absolutely necessary for equipment clearance plus the fill pipe's air gap distances. On open buildings, to prevent rain from blowing in on the chemical mixing pad, the roof shall extend a minimum of 30 degrees (45 degrees recommended) from vertical from the edge of the concrete pad in all directions or 2 feet, whichever is greater. Side walls may be constructed on one or more sides to reduce the distance the roof must extend.

Fully enclosed buildings shall be adequately ventilated by natural or mechanical means at all times. Occupied areas shall be vented in accordance with recommendations contained in National Fire Protection Association (NFPA) 30.

Water supply, pump, and pipe. A permanent water supply shall be provided for filling the sprayers, rinsing the chemical containers, spray tanks, and chemical mixing pad, and for emergency washing. A pipeline shall be installed for conveyance of water from the water supply to the agrichemical handling facility. The water supply system shall be equipped with an air gap or other type of backflow prevention device as specified in Rule 62-555.360(4), Florida Administrative Code (F.A.C.) or an antisiphon device assembly as specified in Rule 5E-2.360(4), F.A.C. If a pump and well are installed, it shall be located outside of the chemical mixing pad and meet the distance requirements listed under "Location".

Plumbing. All parts of the plumbing system shall be corrosion resistant. No appurtenances, discharge outlets, drains or other piping shall be installed through the concrete pad, curb, or sump. All plumbing shall be designed to allow for easy drainage to prevent freezing.

Electrical components. Electrical systems (lights, switches, receptacles, circuit breakers, fans, pumps, etc.) shall meet the requirements of the National Electrical Code (NEC) for the hazard classification of the area in which they are installed.

Sump. The sump may be constructed of concrete or stainless steel and shall be water tight. The sump size shall be as small as practical but of sufficient size that it will easily accommodate the pump and provide easy access for the removal of accumulated sediment. The maximum size of the sump should be limited to a capacity of 50 gallons and covered with a corrosion resistant grate for safety. The grate shall be designed to support the anticipated loads.

The sump should be designed with a conical or sloped bottom to facilitate emptying.

Pump. The pump may be permanent or where appropriate a portable pump may be used to empty the sump. The pump shall be resistant to the chemicals used and while operating should create a minimum of turbulence within the sump. A filter shall be installed between the pump and sprayer or rinsate tanks. The pump shall be operated by a manual switch.

Emergency washing area. The emergency wash area shall include an emergency overhead shower/eyewash and wash basin for washing when the applicator's skin is exposed to chemicals. The emergency washing area shall be conveniently located on the pad and easily accessible to the applicator. The plumbing connections for these devices should enter the clean water line between the main line reduced pressure zone (RPZ) valve and any other one-way check valves installed for backflow prevention.

Loading platform. A loading platform shall be constructed where needed to facilitate the filling of the spray equipment. The platform shall be of sufficient height and size with appropriate safety features so as to provide a safe working area.

Rinsate storage tanks. Rinsate storage tanks shall be provided to temporarily hold rinsates resulting from cleaning of the chemical mixing pad or sprayer if the operator intends to store or accumulate rinsewater prior to use as a pesticide or as a diluent. The tanks shall be clearly

labeled to identify its contents and target crops. Tanks shall be fiberglass, polyethylene, or other material resistant to the chemicals being used and have the capacity to meet the requirements of the operation plan. The rinsate tanks shall be located on the chemical mixing pad and near the sump.

On-site chemical storage. Storage of chemicals on the agrichemical handling facility pad can provide additional protection of surface and ground water. The pesticide storage area shall only be used for storage of chemicals used in the landowner's spraying operation. The storage facility shall be located so that it will be accessible to the emergency washing area.

Structural design. The structural design shall consider all items that will influence performance, such as design analyses, methods, and assumptions; construction methods and quality control; and operational exposure, use, maintenance, and repair.

Minimum structural requirements for agrichemical handling facilities are specified as follows: Steel construction shall conform to AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings.

- ◆ Structural timber components shall conform to National Forest Products association (NFPA) National Design Specifications for Wood Construction.
- ◆ Reinforcing steel shall conform to ASTM A 615, Grade 60.
- ◆ Buildings shall be designed for applicable wind and dead loads in conformance with local building codes. Where no local building code governs, the loadings shall be as specified in ASAE EP288.5.
- ◆ A watertight concrete design shall be used to avoid leakage from the sump and chemical mixing pad. The granular subbase shall be placed and compacted 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 that of # 4 bars, 12 inches on centers. Final pad and sump thickness and reinforcement shall be designed based on the wheel loads of existing or anticipated equipment when loaded, the loads anticipated by storage tanks and other equipment, or temperature and shrinkage reinforcement whichever is greater. Concrete design shall meet the following minimum requirements:
 - ◆ A minimum design 28 day compressive strength of 4000 psi and a maximum water/cement ratio of 0.40 to 0.45.
 - ◆ Portland cement Type I or II.
 - ◆ A slump of 1.5 inches to 3 inches. A concrete super plasticizer admixture shall be used during placement to improve workability and reduce voids and honeycombs.
 - ◆ Minimum cement content of 564 pounds (6 bags) per cubic yard.
 - ◆ A maximum size aggregate of 1 inch.
 - ◆ Air entrainment of 5% to 7.5% by volume.
 - ◆ Wet curing shall be for a minimum of 7 days (14 days when pozzolan is used) or the application of a liquid membrane forming curing compound (ASTM C 309).
 - ◆ The concrete slab and sump shall be poured in one continuous placement without construction joints or openings. Where construction joints are unavoidable a PVC waterstop shall be installed.
 - ◆ Control joints should be used to control cracking and shall not exceed a maximum spacing of 30 feet. All control joints shall be filled with a flexible sealant (elastomeric sealers) to prevent leakage.

The concrete slab shall be protected by a surface applied impervious epoxy coating that is resistant to deterioration from the chemicals used at the facility. The coating material selected

shall remain flexible after curing, aging, cold weather, and exposure to the pesticides, loads and traffic. The dry coating thickness of the epoxy coating and method of application shall be as recommended by the manufacturer.

Impermeable liner. An impermeable liner shall be installed beneath the concrete slab for additional protection to soil and water resources. The liner shall be installed with a minimum of 3 inches of granular material between the liner and the concrete to provide adequate drainage during construction. The impermeable membrane shall be resistant from deterioration from the chemicals used at the facility and shall be a minimum of 30 mils thick.

Safety. Highly visible waterproof warning signs, such as "CAUTION, CHEMICAL STORAGE AREA", or similar signs shall be posted at all entrances to the facility. "NO SMOKING" signs shall be placed both outside and inside the facility. Signs should be bilingual. Signs (size, location, color, etc.) shall meet the requirements of Occupational Safety and Health Administration (OSHA) 29 CFR 1910.144 and 29 CFR 1910.144; American National Standards Institute (ANSI) Z35.1-1979, Z35.4-1973, Z525.1-1991, and Z535.2-1991; and any applicable Federal, state, or local laws and regulations.

Where chemicals are stored on-site, the storage facility shall be secured to provide reasonable protection against vandalism or unauthorized access. The chemical storage area shall include appropriate safety devices including ventilation, lighting, fire extinguisher (ABC use rating, dry chemical, minimum 20 pound capacity), and smoke detector with audible alarm. Normal winterization procedures to prevent damage to the facility and to chemical containers shall be performed when weather conditions dictate.

Protection. All areas disturbed during construction shall be seeded or sodded as necessary to prevent erosion. Areas shall be vegetated in accordance with NRCS Florida conservation practice standard for Critical Area Planting, Code 342.

CONSIDERATIONS

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 mixing pad, but will be of minor concern due to the low volumes of water used. The quantity of runoff will increase due to the area roofed at the facility, but will be of minor impact due to the limited size of the structure and its rural locations.

The quality of water runoff and groundwater will be improved due to the capture and treatment of agricultural chemicals during mixing and rinsing operations.

PLANS AND SPECIFICATIONS

Plans and specifications for agrichemical handling facility shall be in keeping with this standard. They shall be site specific and shall describe the requirements for applying this practice to achieve its intended purpose. Plans and specifications shall include construction plans, drawings, job sheets or other similar documents. These documents are to specify the requirements for installing the practice, such as the kind, amount, or quality of materials to be used, or the timing or sequence of installation activities.

OPERATION AND MAINTENANCE

Operation and maintenance shall be in accordance with the requirements of this standard and in keeping in conformance with all local, state, and Federal laws and regulations.

The operation and maintenance (O&M) plan shall include an inventory of chemicals used at the center and the methods proposed for handling of sediment, rinsate, and potential spills. An emergency response plan with the emergency spill and poison center telephone numbers shall

be part of the O&M plan. Material Safety Data Sheets (MSDS) for chemicals used shall be attached to the O&M plan. A copy of the O&M plan shall be located 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 should not be used for purposes other than the storing, mixing, loading, cleaning and maintenance of materials and equipment used for chemical application.

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. The sump should be thoroughly cleaned 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 make-up water for subsequent batches of the pesticides that are labeled for the same crop. The sump shall be pumped dry at the end of each day of operation.

Sediment from the sump shall be removed with proper precautions taken 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. This sediment should be land applied to the target crop at a rate below the label recommendation. The sediment shall be removed from the sump prior to switching from one chemical to another chemical.

All material removed from the chemical mixing pad and sump must be: (a) applied to the target crop as pesticide, (b) used as make-up water in mixing to be applied to the target crop, or (c) disposed of as waste in conformance with all local, state, and Federal regulations. The rinsate tanks used for holding tanks for sump discharge should be emptied as soon as possible. Rinsate tanks shall not be used to store sump discharges of different chemicals. The rinsate can be applied as a dilute pesticide or used as dilution water for subsequent batches of pesticides that are labeled for the same crop.

The agrichemical handling facility should be inspected periodically to ensure proper operation. The inspection should include, but not limited to:

- ◆ concrete pad
- ◆ protective coating on the surfaces of the concrete pad, sump, and sidewalls
- ◆ operation of back flow prevention devices
- ◆ hoses, pipes, valves, connectors, filters, tanks, and related plumbing material
- ◆ sump and sump pump
- ◆ safety equipment
- ◆ 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

ANSI Z35.1-1979, Z35.4-1973, Z525.1-1991, and Z535.2-1991
AISC Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings
ASAE EP288.5
ASTM A 615, Grade 60
ASTM D 698
NFPA 30

NFPA National Design Specifications for Wood Construction
NRCS Florida conservation practice standard for Critical Area Planting, Code 342
OSHA 29 CFR 1910.144 and 29 CFR 1910.144
Rule 5E-2.360(4), F.A.C.
Rule 62-555.360(4), F.A.C.