NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

WASTE FACILITY CLOSURE

(No.)
CODE 360

DEFINITION

The decommissioning of facilities, and/or the rehabilitation of contaminated soil, in an environmentally safe manner, where agricultural waste has been handled, treated, and/or stored and is no longer used for the intended purpose.

PURPOSE

- Protect the quality of surface water and groundwater resources.
- Mitigate air emissions.
- Eliminate a safety hazard for humans and livestock.
- Safeguard the public health.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to agricultural waste facilities or livestock production sites that are no longer needed as a part of a waste management system and are to be permanently closed or converted for another use. These facilities include liquid/dry waste storage facilities, confined animal housing, feedlots, livestock yards, or composting facilities.

This practice applies where impoundments that are to be converted to fresh water storage meet current NRCS standards.

Where structures that include agricultural waste storage, such as confined animal housing, are to be decommissioned, this practice will apply to the removal of the waste and rehabilitation of soil within the facility.

This practice applies to remediation of soil contaminated by agricultural wastes that have been stored on-site.

It does not apply to sites contaminated by materials that require the issuance of a hazardous waste permit, such as fuel or pesticides.

CRITERIA

General Criteria Applicable to All Purposes

The closure shall comply with all Federal, State, and local laws, rules, and regulations including national pollutant discharge elimination system (NPDES) requirements.

Existing waste transfer components that convey to waste facilities or provide drainage from the facility area shall be removed and replaced with compacted earth material or otherwise rendered unable to convey waste.

Remove manure, agricultural waste, and contaminated soil to the maximum extent practicable. All manure and agricultural waste that could negatively impact water and/or air quality or pose a safety hazard shall be removed as deemed practicable. All liquid, slurry, sludge, and solid waste, and soil removed from the facility shall be utilized in accordance with NRCS Conservation Practice Standards,

Nutrient Management, Code 590 and/or Waste Recycling, Code 633.

Precautions (fencing and warning signs) shall be used where necessary to ensure that the facility is not used for purposes incompatible with the facility modification.

Erosion and Pollution Control. All disturbed areas shall be re-vegetated or treated with other suitable measures used to control erosion and restore the aesthetic value of the site. Sites not suitable for re-vegetation through normal cropping practices shall be vegetated in accordance with NRCS Conservation Practice Standard, Critical Area Planting, Code 342.

Liquid and Slurry Waste Removal. Liquid and slurry wastes shall be agitated and pumped to the maximum extent practicable. Water shall be added as necessary to facilitate the agitation and pumping. The wastewater shall be utilized in accordance with NRCS Conservation Practice Standard, Nutrient Management, Code 590 and/or Waste Recycling, Code 633.

Sludge Removal. During sludge removal operations, the integrity of the liner, if one is present, shall be maintained. Sludge shall be removed to the maximum extent practicable and utilized in accordance with NRCS Conservation Practice Standard, Nutrient Management, Code 590 and/or Waste Recycling , Code 633.

Impoundment Closure. Three options are associated with the decommissioning of liquid waste impoundments. One of the following will be used.

1. Embankment Impoundments (those with a depth of water at the design water level of 3 feet or more above natural ground) may be breached so that they no longer impound water. The embankment material can then be graded into the impoundment area, and the area vegetated for another use. Or the embankment may remain if the impoundment area surface has been sufficiently cleaned so that runoff leaving the site would not be considered as contaminated by the wastes.
2. Excavated Impoundments may be backfilled so that these areas may be reclaimed for other uses.
3. Impoundments may be converted to fresh water storage.

Embankment Impoundments. Waste and sludge shall be removed from the impoundment before the embankment is breached. Concrete and flexible membrane liners shall be removed or rendered unable to impound water and properly disposed of. The slopes and bottom of the breach shall be stable for the soil material involved, however the side slopes shall be no steeper than 3 horizontal to 1 vertical (3:1).

Excavated Impoundments. Concrete and flexible membrane liners shall be removed or rendered unable to impound water and properly disposed of. The backfill height shall exceed the height to the design finished grade by a minimum of 5% to allow for settlement. The top 1 foot of the backfill shall be constructed of the most impervious soil material readily available and mounded to shed rainfall runoff. Incorporate available topsoil where feasible to aid establishment of vegetation.

Conversion to Fresh Water Storage. The converted impoundment shall meet the requirements as set forth in the appropriate NRCS practice standard for the intended purpose. Where the original impoundment was not constructed to meet NRCS standards, the investigation for structural integrity shall be in accordance with National Engineering Manual (NEM) 501.23. When it is not practical to remove the sludge from a waste impoundment that is being converted to fresh water storage, the impoundment shall not be used for fish production, swimming, or livestock watering until the water quality is adequate for these purposes.

Fabricated Liquid Waste Facilities. If fabricated structures are to be demolished, disassembled or otherwise altered, it shall be done to such an extent that no water can be impounded. Disassembled materials such as pieces of metal shall be temporarily stored in such a manner that they do not pose a hazard to animals or humans until their final disposition.

Demolished materials shall be buried on-site or moved off-site to locations designated by state or local officials. If buried on-site, the materials are to be covered with soil to a settled depth of at least 1 foot. The backfill height shall exceed the height to the design finished grade by a minimum of 5% to allow for settlement, and the backfill be sufficiently mounded such that runoff will be diverted from the site after the backfill settles.

Dry Waste Storage or Treatment Facilities. The soil at dry waste facilities such as confined animal housing, feedlots, livestock yards, or composting facilities with earthen floors must be evaluated.

The evaluation shall include laboratory analyses of the soil profile for any nutrients for which specific information is needed to determine the required depth of rehabilitation. Soil samples shall be taken at multiple locations and depths within the facility. One sample per depth interval per acre of the area being decommissioned with a minimum of 3 samples per depth interval shall be taken. Samples taken for each specified sampling depth interval may be consolidated into a single set (e.g., 3 samples taken at the 0- to 6-inch depth interval may be consolidated into a single sample for testing). The samples shall be collected, prepared, and tested in accordance with NRCS Conservation Practice Standard, Nutrient Management, Code 590.

The results of the soil analysis will be used to prepare a plan to recover the site for its intended use. The following site appropriate options shall be utilized, if needed:

- Adjust pH to restore desired crop growing conditions.
- Plant salt tolerant plants to restore the site to desired crop conditions. The harvested vegetation quality should be monitored for N, P, and K removal.
- Select plants and erosion control practices to minimize phosphorus transport from the site and facilitate remediation of excessively high phosphorus levels.

Although in-situ processes are the preferred method for adjusting the soil conditions, removal of a portion of the

soil may be necessary. The removed soil shall be land applied in accordance with NRCS Conservation Practice Standard, Nutrient Management, Code 590 and/or Waste Recycling, Code 633. Excavated areas shall be graded and or backfilled to shed rainfall and prevent ponding of runoff. Where feasible, available topsoil should be used to aid the establishment of permanent vegetation.

CLOSURE PLAN

All animal waste systems shall include a closure plan including an estimated cost for closure of the waste disposal system.

Closure plans shall be in compliance with Arkansas Department of Environmental Quality (ADEQ) Regulations, which includes The Arkansas Pollution Control and Ecology (ADPC&E) Commission Regulation 5.

A closure plan shall be prepared prior to any removal, closure or abandonment of any waste storage or treatment facility containing waste or residuals from confined animals facilities, processing plants or other specified wastes.

NRCS will provide certification to the landowner after all closure activities are complete and that potential environmental hazard has been eliminated. Permittee will be responsible for submitting closure certification to ADEQ.

All structures used to convey waste to waste impoundments or to provide drainage from the impoundment area shall be removed and replaced with compacted earth material or otherwise rendered unable to convey waste.
The sludge remaining on the bottom and sides of the waste treatment lagoon or waste storage facility may remain in place if it will not pose a threat to the environment. If leaving the sludge in place poses a threat to the environment, it shall be removed to the fullest extent practical. All waste must be utilized in accordance with NRCS Conservation Practice Standard, Nutrient Management, Code 590 and/or Waste Recycling, Code 633.

WASTE REMOVAL

The basic methods for preparing waste impoundments for closure include removing the wastes by: (1) agitating and transferring to the land with irrigation equipment or with liquid manure spreaders; (2) dredging, stockpiling, draining, and spreading; or (3) a combination of pumping and/or agitating then dredging. The process of agitation and pumping can remove most of the waste impoundment contents. However, there may be a thick layer of nutrient rich sludge left in the bottom of the waste impoundment that is not pumpable. Sludge can be left in place and covered with suitable material, provided the following conditions can be met:

- If removal of sludge would compromise the integrity of earthen liner.
- The earth liner under the sludge can be reasonably assumed to have a specific discharge of 10-6 cm/sec or less.
- The finishing surface will be mounded to provide positive surface drainage.
- The final compacted layer on the

finished surface will be constructed of clayey (SC, CL, or CH) material and will have a compacted thickness of at least 12 inches.
- At least 4 inches of topsoil will be added to the surface to facilitate vegetation establishment.
- Any upslope rainfall runoff will be diverted away from the closure.
- Sludge that is removed with sludge pumps or excavation equipment may be directly land applied per the nutrient management plan or temporarily stockpiled for drying near the waste impoundment if the embankment and liner is left intact. The stockpile area should drain to the waste impoundment. A drainage fence or filtering device may be necessary to prevent solids from re-entering the waste impoundment. If positive drainage toward the waste impoundment cannot be obtained, a sump pump system may be required to return the liquid drainage to the waste impoundment. If the existing soils at the stockpile location are not adequate to prevent seepage from entering the groundwater, a 6-inch compacted clay pad or other approved impermeable barrier is required beneath the stockpile. The perimeter of the stockpiled material shall be protected as needed with an earthen berm or other approved structure to exclude uncontaminated runoff and to ensure drainage from the dredged material returns to either the waste impoundment or a sump pump. The stockpiled material should be allowed to dry, tested for nutrient content, and then land applied at recommended rates. After land application of the dried material, the temporary stockpile area shall be smoothed and vegetated according to the vegetation plan.

Arkansas has used this criteria for several years in developing and implementing closure plans and it has been successful in closing and eliminating the potential environmental hazard associated with waste storage plans.

CONSIDERATIONS

Pre-closure soil and water (surface and subsurface) testing may be helpful in the establishment of base line data surrounding the site at the time of closure. Establishing baseline data can be used in the future to address soil and water issues.

The process of agitation and pumping can remove most of the waste impoundment contents. However, there may be a thick layer of nutrient rich sludge left in the bottom of the waste impoundment that is unpumpable. This layer should be tested for nutrient content, scraped from the bottom and sides of the waste impoundment, and applied to the land according to the comprehensive nutrient management plan.

Where the surface is covered by a dense mat of floating vegetation, pumping effort to empty waste impoundments may be reduced by first applying herbicide to the vegetation and then burning the residue. Appropriate permits must be obtained before burning. When burning is conducted, take necessary actions to ensure that smoke is managed to minimize impacts

to downwind populations.

Alternative methods of sludge removal may be required where the impoundments contain large amounts of bedding, oyster shells, soil, or other debris.

Minimize the impact of odors associated with land applying dry wastes and with agitation, emptying, and land applying wastewater and sludge from a waste impoundment by conducting these operations at a time when the humidity is low, when winds are calm, and when wind direction is away from populated areas. Adding chemical and biological additives to the waste prior to agitation and emptying can reduce odors. Odor impacts from land application can also be mitigated by using an incorporation application method.

Minimize agitation of the wastes to only the amount needed for pumping to reduce the potential for release of air emissions.

Soil to fill excavated areas should not come from important farmlands (prime, statewide, local, and/or unique).

Waste facility closure may improve utilization and aesthetics of the farmstead.

Breached embankments may detract from the overall aesthetics of the operation. Embankments should be removed and the site returned to its original grade, or converted into fresh water impoundments.

Disassembled fabricated structures may be suitable for assembly at another site. Care should be taken during closure to minimize damage to the pieces of the facility, particularly coatings that prevent corrosion of metal pieces.

Measures should be taken during contractor's activities to minimize site erosion and pollution of downstream water resources. This may include such items as silt fences, hay bale barriers, temporary vegetation, and mulching.

To minimize potential impacts to livestock, such as nitrate poisoning, the initiation of a testing and monitoring program of nutrient levels in crop products, particularly livestock feeds, harvested from sites of closed animal confinement facilities, should be considered.

PLANS AND SPECIFICATIONS

Plans and specifications for the decommissioning of abandoned waste facilities and the rehabilitation of contaminated soil shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum, include the following:

1. A plan view showing the location and extent of the practice.
2. Pertinent elevations of the closed facility and excavation limits.
3. Number, capacity, and quality of facility(ies) and estimate of soil volume to be moved.
4. Location of known utilities.
5. Requirements for salvage and disposal of structural materials.
6. Vegetative requirements.
7. Utilization Plan for animal wastes and soil.
8. Odor management or mitigation recommendations.

9. Safety plan requirements. Note: Per Occupational Safety and Health Administration (OSHA) confined space entry protocol, personnel shall not enter confined space of an enclosed waste facility without breathing apparatus or taking other appropriate measures.

OPERATION AND MAINTENANCE

The proper decommissioning and rehabilitation of a waste facility should require little or no operation and maintenance. However, if it is converted to another use, such as a fresh water facility, operation and maintenance shall be in accordance with the needs as set forth in the appropriate NRCS conservation practice standard for the intended purpose.

REFERENCES

Rice, J.M., D.F. Caldwell, and F.J. Humenik. Ed. 2006. Closure of Earthen Manure Structures in Animal Agriculture and the Environment: National Center for Manure and Animal Waste Management White Papers, pp. 263-282. ASABE. Pub. Number 913C0306.

Conservation Practice Standards: 313-Waste Storage Facility, 359-Waste Treatment Lagoon, 590-Nutrient Management, 633-Waste Recycling, 329-Waste Treatment, 378-Pond, 317-Composting Facility

USDA, NRCS. 1992. National engineering Handbook, Part 651, Agricultural Waste Management field handbook. Washington, D.C.