

UNITED STATES DEPARTMENT OF AGRICULTURE  
NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

**CLOSURE OF WASTE IMPOUNDMENTS**

(No.)

**CODE 360**

**DEFINITION**

The closure of waste impoundments (treatment lagoons and waste storage ponds), that are no longer used for their intended purpose, in an environmentally safe manner.

**PURPOSE**

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

- To protect the quality of surface water and groundwater resources.
- To eliminate a safety hazard for humans and livestock.
- To safeguard the public health.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies to agricultural waste treatment lagoons and waste storage ponds that are no longer needed as a part of a waste management system and are to be permanently closed or converted.

Where these impoundments are to be converted to fresh water storage and the original impoundment was not constructed to NRCS standards, this practice will only apply where the investigation, as required by the National Engineering Manual (NEM) 501.23, shows structural integrity.

**CRITERIA**

**General criteria applicable to all purposes.**

All planned work shall comply with all Federal, state, and local laws and regulations.

All structures used to convey waste to lagoons or waste storage ponds shall be replaced with compacted earth material or otherwise rendered unable to convey waste.

Liquid and slurry wastes shall be agitated and pumped to the extent conventional pumping will allow. Clean water shall be added as necessary to facilitate the agitation and pumping. The wastewater shall be utilized in accordance with NRCS Conservation Practice Standards, Waste Utilization - Code 633; and/or Nutrient Management - Code 590. The sludge remaining on bottom and sides of the waste treatment lagoons or waste storage ponds may remain in place if it will not pose a threat to the environment. This can be determined if the following conditions can be met:

- the earth liner under the sludge can be reasonably assumed to have a specific discharge of 0.028 feet per day or less,
- measures are taken to remove as much of the sludge as practical that can be properly land applied, and
- the remaining sludge layer is no more than 1 ft. thick.

If leaving the sludge in place would pose a threat, it shall be removed to the fullest extent practical and utilized in accordance with NRCS Conservation Practice Standards, Waste Utilization - Code 633; and/or Nutrient Management - Code 590.

**Land reclamation.** Impoundments with embankments may be breached and excavated impoundments may be backfilled so that they will no longer impound water and these areas may be reclaimed for other uses. Waste impoundments that have water impounded against the embankment are considered embankment structures if the depth of water is three (3) feet or more above natural ground.

- (1) Embankment Impoundments. Waste and sludge shall be removed from the site before the embankment is breached. The slopes and bottom of the breach shall be stable for the soil material involved, however, the side slopes shall be no steeper than three horizontal to one vertical (3:1).
- (2) Excavated Impoundments. The backfill height shall exceed the design finished grade by 5 percent to allow for settlement. The finished surface shall be constructed of at least 12 inches of the most clayey material available and mounded to shed rainfall runoff. Incorporate available topsoil where feasible to aid establishment of vegetation. Any upslope rainfall runoff will be diverted away from the closure.

**Conversion to fresh water storage.** The converted impoundment shall meet the requirements of the appropriate NRCS conservation practice standard for the intended purpose (e.g. Pond - Code 378; Irrigation Pit or Regulating Reservoir - Code 552; or Irrigation Storage Reservoir - Code 436). This will require an investigation or the structural integrity of the impoundment, according to NEM 501.23, if not originally constructed with NRCS technical assistance.

**Safety.** When sludge is not removed from a waste impoundment, precautions (fencing and warning signs) will be used to ensure that the impoundment is not used for incompatible purposes (such as swimming, livestock watering, fish production, etc.) until water quality is adequate for the intended purpose. Water quality sampling and analysis shall be used to determine when the impoundment is safe for these uses.

**Protection.** All disturbed areas not returned to crop production shall be vegetated in accordance with NRCS conservation practice standard, Critical Area Planting - Code 342.

Measures shall be taken during closure to minimize erosion and pollution of downstream water resources. This may include details and specifications for such items as silt fences, hay bale barriers, temporary vegetation, mulching, etc.

## CONSIDERATIONS

If the surface of the waste impoundment is covered with a floating mat and a dense stand of vegetation, it may be necessary to apply a herbicide to the vegetation and then burn the residue if the material is to be removed by pumping. Appropriate burning permits should be obtained.

Sludge from poultry lagoons can contain large quantities of ground oyster shells. Other waste impoundments receiving runoff from cattle washing areas and open lots can contain excessive amounts of soil and other debris. These types of sludge will be difficult to remove by agitation and pumping.

When converting waste treatment lagoons and waste storage ponds to fresh water ponds, the effects on the water budget should be considered. A pond will reduce surface runoff, trap sediment, and reduce nutrients and pesticides leaving the land.

Consideration of climatic factors such as humidity, wind speed, and wind direction should be considered to determine the timing and method of applying the wastewater and sludge from the lagoon or waste storage pond.

If livestock will have access to a closed waste impoundment converted to a fresh water pond, consideration should be given to fencing or installation of a watering ramp where needed for safety.

If the closed or abandoned waste impoundment is to be filled with fresh water and used for fish production, consideration should be given to the removal of the sludge since it will be a source of biological oxygen demand (BOD).

Sludge which is allowed to dry will begin to decompose aerobically. This will result in a release of nutrients from the sludge, which can last years depending upon the depth of sludge. For this reason, sludge which is left in place should be kept flooded to prevent this from occurring, or other measures taken to prevent

this release of nutrients from becoming a source of surface or ground water contamination.

### **PLANS AND SPECIFICATIONS**

Plans and specifications for closure of abandoned waste treatment lagoons and waste storage ponds shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. If the waste treatment lagoon or waste storage pond is converted to a fresh water pond, the pond shall be required to meet the NRCS conservation practice standard for the intended purpose. The plans and specifications will also be in keeping with the requirements of that standard.

### **OPERATION AND MAINTENANCE**

The proper closure of a waste treatment lagoon or waste storage pond should require little or no

operation and maintenance; however, if it has been converted to another use, such as a fresh water pond, operation and maintenance will be in accordance with the needs as set forth in the NRCS conservation practice standard applicable to the intended purpose.

### **REFERENCES**

NRCS Conservation Practice Standards:

Critical Area Planting - Code 342  
Irrigation Pit or Regulating Reservoir -  
Code 552  
Irrigation Storage Reservoir - Code 436  
Nutrient Management - Code 590  
Pond - Code 378  
Waste Utilization - Code 633

AL NRCS Guide Sheet  
Renovation/Closure of Waste Impoundments,  
AL 360



## CONSTRUCTION SPECIFICATION

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#### SCOPE

This item shall consist of the measures necessary to properly remove the contents of a waste impoundment by agitating and pumping, dredging, or a combination of both. Also included are measures necessary to close out a waste impoundment that is no longer in service. Construction operations are to be carried out in such a manner that erosion, air, water, and noise pollution will be minimized and held within legal limits established by state regulations.

#### WASTE REMOVAL

##### Agitation and Pumping

Removal of the contents of a waste impoundment by agitation and pumping is often done with rental type equipment and generally does not require construction measures. However, some operators may elect to install permanent pump and pipeline locations. If pump or pipeline are installed through or into the waste impoundment embankment, the construction techniques and methods should be approved by the Natural Resources Conservation Service engineer.

Wastewater should be applied according to guidelines in the Conservation Plan.

##### Dredging

Sludge that is removed with a dragline or other similar equipment may be temporarily stockpiled near the waste impoundment. If at all possible, the stockpile area shall slope slightly toward the waste impoundment. A drainage fence or filtering device may be necessary to prevent solids from reentering the waste impoundment. In topographical locations in which 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 sludge has minimum drainage associated with the dredged material, a grass filter can be designed to treat the liquid in lieu of the sump pump system.

If the existing soils at the stockpile location are not adequate to prevent seepage from entering the groundwater, a 6-inch, compacted clay pad

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 of the dredged material returns to either the waste impoundment, a sump pump, or an appropriate grass filter.

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. Uncontaminated runoff water from the area shall be diverted from the waste impoundment.

#### WASTE IMPOUNDMENT CLOSURE

Agitate and pump the waste impoundment content as outlined in the Conservation Plan. Remove the unpumpable material in the bottom of the waste impoundment according to the closure plan.

If the waste impoundment is to be closed by filling the soil, the soil shall be placed in maximum 12-inch lifts with each layer being compacted using two passes of heavy equipment. Soil moisture content shall be maintained to ensure adequate compaction of the material. The filling process shall continue until the waste impoundment is overfilled 5 percent to allow for settlement. The final compacted layer shall have at least a 12-inch compacted thickness and be made with the most clayey material on site. The final surface shall be mounded so that any surface water will not collect. Potential rainfall runoff water upslope from the closed waste impoundment shall be diverted from the closure. Apply at least 4 inches of topsoil material, smooth, and vegetate the area according to the vegetation plan.

#### POLLUTION CONTROL

Waste removal, land application of the dry waste or wastewater, and all construction activities are to be conducted in such a manner that all pollution is minimized. Best Management Practices (BMPs) shall be utilized whenever possible.