

Renovation/ Closure of Waste Impoundments

Alabama Guide Sheet No. AL 360



Definition

The process of removing the long-term accumulation of sludge, floating matter, and wastewater from waste impoundments (animal waste lagoons or storage ponds) in an environmentally safe manner.

General Information

Waste impoundments (lagoons and storage ponds) for animal feeding operations often need renovation to restore design volumes and/or waste treatment function. If an animal feeding operation closes, the waste impoundment will also need to be properly closed or decommissioned.

The renovation/closure of waste impoundments includes:

- agitating and pumping the mixed contents of the waste impoundment to the land as fertilizer with either irrigation equipment or liquid manure spreaders;
- dredging, stockpiling, draining, and spreading the dried material as fertilizer; or
- a combination of pumping the liquid and dredging the solids.

The process of agitation and pumping can remove most of the waste impoundment contents. However, there will be a thick layer of nutrient rich sludge left in the bottom of the waste impoundment that is unpumpable. Ideally, this layer can be tested for nutrient content, scraped from the bottom and sides of

the waste impoundment, and applied to the land according to the nutrient management plan. In the event that sufficient land is not available in close proximity to the waste impoundment, the excess sludge can be left in place and covered with suitable material provided the following conditions can be met:

- measures are taken to remove as much of the sludge as practical that can be properly land applied,
- the earth liner under the sludge can be reasonably assumed to have a specific discharge of 0.028 feet per day or less,
- the remaining sludge layer is no more than 1 ft. thick,
- the finished surface will be mounded to provide positive surface drainage,
- the final compacted layer on the finished surface will be constructed of clayey material and 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, and
- any upslope rainfall runoff will be diverted from the closure.

All waste products removed from the waste impoundment during renovation/closure should be land applied with adequate buffers and according to a nutrient management plan.

Renovation Of Waste Impoundments

Agitation and Pumping

Agitation of the contents of a waste impoundment involves utilizing specially designed equipment to thoroughly mix the solid and liquid wastes together into a slurry. Agitation must begin long before the pumping begins and must continue during pump out. Large waste impoundments may require more than one agitator or agitation at multiple locations to effectively mix the solid and liquid wastes.

The agitated mixture is most often pumped through specially designed irrigation equipment to deliver the slurry to the land application area according to the nutrient management plan. The mixed contents of some small waste impoundments may be pumped into liquid manure spreaders for application in the fields.

Dredging

The unpumpable sludge in the bottom of the waste impoundment will normally have to be moved toward the dredging operation with earth moving equipment operating in the bottom of the waste impoundment.

If the sludge is too wet for immediate land application, it must be stockpiled near the waste impoundment to dry. Seepage from the sludge must be controlled so that pollution of surface or groundwater does not occur. This may require a compacted clay pad, sump pump, grass filter, or other methods. After the sludge has dried, the material is land applied according to the nutrient management plan.

After completion of agitation, pumping, and dredging, the waste impoundment should be considered renovated if the original design volumes and/or waste treatment function is restored. The waste impoundment may need to be enlarged prior to reuse if the livestock operation has increased in size since the original design. Lagoons that are renovated should be filled with fresh water to 60% of the minimum treatment volume before new wastes are introduced to the system.

Land Application

Wastes removed from a waste impoundment should be land applied according to the following guidelines:

1. Apply wastes according to the NRCS Conservation Practice Standard, Code 590 - Nutrient Management.

2. When waste is applied to hayland or pastureland, apply when vegetation at the site is actively growing. For hayland, apply prior to the last cutting of hay expected during the current growing season. For pastureland, apply 45 days prior to the end of the current grazing season.
3. When waste is applied to cropland, apply approximately three weeks prior to planting and/or during the vegetative growth stage of the crop. When applied prior to planting, if possible, incorporate the wastes to conserve nitrogen and reduce odor. (NOTE: Waste with high ammonia concentrations can adversely affect germination of corn if applied too close to the planting date.)
4. Buffers shall be used between the application site and:
 - wells
 - perennial and intermittent streams
 - lakes and ponds
 - wetlands
 - sinkholes
 - public roads
 - residences other than producer
 - public use areas.
5. Waste shall not be spread between November 15 and February 15 in north Alabama.
6. Spreading wastes under the following conditions will be avoided:
 - On any slope or at a rate which produces runoff.
 - Within 3 days of a predicted storm event with a probability of occurrence of 49 percent or more from the National Weather Service.
 - When the soils are water saturated, frozen, or too near field capacity to contain the wastes.
 - When wind direction and velocity would cause drift toward residences, public areas or roads.
 - In the fall on land that will be fallow through winter.

Closure Of Waste Impoundments

Waste impoundments scheduled for closure can be either eliminated with earthfill or converted into farm ponds.

Waste impoundments scheduled for elimination should first have the waste properly removed and land applied. Earthfill should then be added in 12 inch lifts and each lift compacted with at least 2 passes of heavy equipment. The earthfill process should continue until the area is overfilled at least 5 percent and mounded so that rainfall does not accumulate. The final 12 inches of compacted earthfill should be made with the most clayey material available on site. Any potential upslope runoff should be diverted from the closure. The surface of the closure should be covered with at least 4 inches of topsoil and then properly vegetated according to the closure plan.

Waste impoundments scheduled for conversion to a farm pond should first have the waste totally removed and properly land applied. An NRCS technician can determine if the converted waste impoundment needs pipes and an emergency spillway constructed to

properly convert the impoundment into a farm pond. The impoundment should then be refilled with fresh water and monitored to see if 3 mg/l of dissolved oxygen can be maintained. If so, the impoundment can be used as a farm pond. If not, the impoundment should be pumped and refilled until the water quality is suitable.

References

NRCS AL Conservation Practice Standards:

Code 360 - Closure of Waste Impoundments

Code 590 - Nutrient Management

Code 378 - Pond

AL NRCS Guide Sheets

AL 590 - Application Distances for Applying Animal Manure and Organic By-Products

AL 634 - Wastewater Irrigation

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