United States Department of Agriculture

Natural Resources Conservation Service

Sealing a Pond with Additives

Alabama Job Sheet No. AL 520

Definition

Ponds with excessive seepage can sometimes be sealed utilizing either bentonite or soil dispersants. Bentonite is a natural clay material that can absorb water and expand to several times its normal volume. Soil dispersants are either polyphosphates or soda ash, which can be used to chemically alter the soil structure of certain types of soil to reduce permeability. Additives in a finely ground form can be mixed and compacted with the soil in the earthen surface of a farm pond or waste impoundment to impede or prevent excessive seepage. Bentonite treatment works best on coarse-grained soils or very silty, fine-grained soils. Soil dispersants work best on clay soils that have high calcium content.

General Information

The area to be treated with additives must be properly prepared. The soil should be free of all vegetation, trash, roots, frozen soil, snow, ice, stones over 2 in., and other objectionable material. The additive must be evenly applied over the surface to be treated. Application is best with either a drop type spreader or by hand. Spreaders that throw the additive into the air should not be used. When placed by hand, bags of additive should be placed in a grid pattern according to the application rate, broken open, and the contents evenly hand raked over the grid area. *(Mask and goggles should be worn when handling additives to protect from dust.)*

The rate of application of additive and the resultant liner thickness to treat farm ponds should be based on laboratory tests or on acceptable procedures according to the soil type being treated and the planned depth of water. NRCS personnel can help determine these values.

Since waste impoundments have a potential to pollute groundwater, the rate of application of additive and the resultant liner thickness must be based on laboratory tests only.

Liners with additives may have to be constructed in several 4 to 6 inch layers to achieve the designed thickness. Water may need to be added and thoroughly mixed to drier soils prior to the introduction of the additive in order to approach the proper water content for compaction. The additive in each layer should then be thoroughly mixed with the soil using roto-tillage or other approved methods. Each layer should be compacted at the proper water content, with the specified equipment, and properly bonded to other layers using appropriate construction techniques.

The minimum thickness of a finished additive treated liner is 6 inches. Water deeper than 6 feet will require a thicker liner.

Experience has proven that additive treated soil liners can be constructed only when soil moisture content and weather conditions are suitable. Construction should be started only when weather forecasts indicate sufficient continuous dry days to complete the job. Additive should be spread, incorporated, and compacted on the same day to eliminate problems due to unsuitable weather.

Operation and Maintenance

The additive treated liner should be protected from drying and cracking, surface erosion, animals, and equipment. A protective soil layer of at least 6 inches should be placed over the liner for general protection. Any damage to the liner should be immediately repaired.

References

NRCS AL Conservation Practice Standards
- Code 378 - Pond
- Code 520 - Pond Sealing or Lining – Compacted Soil Treatment
- Code 313 - Waste Storage Facility
- Code 359 - Waste Treatment Lagoon

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Pond Sealing or Lining – With Additives Worksheet

Land User: _____ **County:** _____ **Date:** _____

Farm No.: _____ **Tract No. :** _____ **Assisted by:** _____

Pond liner material and rate:

✓	Liner Material	Rate
	Soil Dispersant/Soil Mixture	(lbs/ft^2 per lift)
	Sodium Bentonite/Soil Mixture	(lbs/ft^2 per lift)

Number of lifts required in liner: _____

Thickness of each lift: _____ in.

Depth of protective soil cover if required: _____ in.

Provisions for protection from damage during pond drainage or pump out (if needed):

Specific water content and compaction requirements shall be: