

**COMMONWEALTH OF VIRGINIA**  
**DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**DIVISION OF WATER QUALITY PROGRAMS**  
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**SUBJECT:** Guidance Memorandum No. 05-2005  
Procedures – Closure or Abandonment of Lagoon/STW

**TO:** Regional Directors

**FROM:** Ellen Gilinsky, Ph.D., Director



**DATE:** April 14, 2005

**COPIES:** Deputy Regional Directors, Regional Water Permit Managers, Regional Compliance Managers, Cindy Berndt, Asif K. Malik, OWE Engineers

**Summary:**

The purpose of this memorandum is to provide procedures and guidance to the Office of Wastewater Engineering (OWE) Area Engineers to process the submittal of Lagoon or Sewage Treatment Works (STW) Closure Plans as per section: 9VAC 25-790-450 of Sewage Collection and Treatment (SCAT) Regulations.

**Electronic Copy:**

An electronic copy of the this guidance in PDF format is available for staff internally on DEQNET, and for the public on DEQ's website at <http://www.deq.virginia.gov/water>.

**Contact Information:**

Please contact Asif K. Malik, P.E., Office of Wastewater Engineering, (804) 698-4476 or [akmalik@deq.virginia.gov](mailto:akmalik@deq.virginia.gov) if you have any questions about this guidance.

**Disclaimer:**

**This document is provided as guidance and, as such, sets forth standard operating procedures for the agency. However, it does not mandate any particular method nor does it prohibit any particular method for the analysis of data, establishment of a wasteload allocation, or establishment of a permit limit. If alternative proposals are made, such proposals should be reviewed and accepted or denied based on their technical and compliance with appropriate laws and regulations.**

## **Purpose**

The purpose of this memorandum is to provide procedures and guidance to the Office of Wastewater Engineering (OWE) Area Engineers to process the submittal of Lagoon or Sewage Treatment Works (STW) Closure Plans as per section: 9VAC 25-790-450 of Sewage Collection and Treatment (SCAT) Regulations.

Whenever a lagoon/STW closure or abandonment is proposed by the owner because of the need to build another treatment facility to meet stringent effluent limits or because of the need to convey the sewage to a Regional treatment facility, a complete lagoon/STW closure plan should include the following activities as part of the closure process.

### **Lagoon Drainage:**

Liquid from the lagoon should be removed (decanted) at a controlled rate so that effluent limits specified in the VPDES permit for the facility are not violated. The lagoon discharge should be disinfected unless testing of the lagoon contents verifies that the liquid contains an acceptable level of pathogenic organisms as indicated by a geometric mean value of 126 E coli per 100 milliliters, or less. In some cases, when a treatment facility with adequate capacity is available nearby, it may be possible to pump the lagoon liquid contents to this sewage treatment facility for further treatment.

### **Residuals Stabilization:**

The lagoon residual mixture left after decanting should be allowed to air dry until it can be worked with construction equipment. Lime can be spread over the residual mixture (1.0 to 2.0 pounds per 100 square feet) for disinfection and odor control. It is acceptable to bury stabilized solids in place for VPDES permitted facilities receiving only domestic sewage (verified by a letter from the owner.) Otherwise, representative samples of the residual mixture must be tested to verify that no hazardous pollutants are present. Additives such as soil, sand, lime and cement have been used to draw moisture out of liquid sludge mixtures to facilitate burial or handling as dewatered sludge. In some situations, burial of residuals in place may not be appropriate because of high ground water level.

### **Piping and Appurtenances Removal:**

Influent/effluent lines should be removed and/or plugged. Any demolition waste should be reduced in size if left to be buried in the lagoon. The fence should not be removed or left open until after grading of the site commences.

### **Liner:**

Properly constructed lagoons generally use compacted clayey soils as a liner for the bottom and side walls. This material should be scarified thoroughly to avoid creating a perched water basin. The liner soil can also be salvaged for later use as a semi-permeable capping material. Synthetic liners should be completely removed.

**Grading:**

The lagoon should be filled with compacted layers of clean fill material free of brush, tree roots, and debris (no more than twelve inches deep per layer). Berm walls may be utilized as fill and can be pushed into the fill area. The finished surface of the graded area should be approximately level with surrounding topography, although the center of the graded area should be somewhat elevated to facilitate drainage (one percent or more slope from the elevated portion outward). If significant residual sediment is left behind in the lagoon, the graded area should be capped with at least three inches of slowly permeable soil (clayey texture classification, or hydraulic conductivity of  $10^{-5}$  cm/sec or less) and the lagoon bottom should be covered by at least two feet of fill material.

**Seeding and Cover Vegetation:**

The graded and all disturbed areas should be properly seeded to produce an erosion resistant vegetative cover. A mixture of rye and fescue grass is often utilized at a rate of approximately 150 pounds per acre. The local agricultural extension agent should be consulted to provide a more precise recommendation. Commercial fertilizer, Class A sewage sludge products, lime, mulch, etc., may have to be applied to help establish an adequate cover. The seeding procedure may have to be repeated until adequate and resistant vegetative cover is established.

**Erosion Control:**

The closure operation must comply with standard erosion and sediment control procedures typically regulated locally, or through the Department of Conservation and Recreation (DCR).

**Deed:**

The deed must be amended to indicate that a closed sewage lagoon exists on the property, and should include pertinent information, such as type of wastewater treated, and results of tests performed if any on residue samples. The deed should be registered with the Clerk of the Circuit Court, and a copy of the amended deed will be sent to the area engineer.

**Sewage Treatment Works (STW's)**

The STW closure procedures should follow the same common sense guidelines as listed above. Steel package plants should be either removed intact or cut into manageable-sized pieces and sold for salvage. The salvaged material should be disinfected before it is sold. Concrete structures should be broken up 2 to 3 feet below grade. Tank bottom should be broken, punctured, or have relief plugs removed. Tanks can be filled with select, clean construction rubble and either crusher run or #57 gravel. The final 2 to 3 feet of cover should be soil.