



COMMONWEALTH of VIRGINIA

C.M.G. BUTTERY, M.D.
COMMISSIONER

Department of Health
Richmond, Virginia 23219

April 5, 1988

MEMORANDUM

TO: Regional Directors
District Directors
Regional Sanitarians
District Sanitarians

THROUGH: Robert B. Stroube, M.D., M.P.H. *RBS*
Deputy Commissioner for
Community Health Services

FROM: Robert W. Hicks *RWH / by JSA*
Director
Division of Sanitarian Services

SUBJECT: Nitrate Loading and Water Mounding in Mass Drainfields

The Division of Sanitarian Services recently has received several inquiries from field staff regarding the Department's procedure for evaluating mass drainfield proposals. Attached for your reference is a copy of the September 10, 1984 memo from H. W. Oglesby stating those items which must be addressed by the applicant.

When someone proposes a mass drainfield (as defined in the September, 1984 memo) their proposal must address water mounding beneath the drainfield area, nitrate loading contamination, and the operational reliability of the system.

When a large volume of liquid waste is applied to a small area of land the potential exists for significantly raising the watertable. If the watertable rose to the level of the absorption trench, or higher, renovation of sewage effluent would not be possible because of anaerobic conditions that would occur in the saturated soil. In addition, the migration of bacteria and viruses would be aided by saturated anaerobic soil conditions. The possibility of the system failing, either overtly or covertly, is much greater than that of it working properly.

The failure of a sewage disposal system may result in partially treated human waste being exposed on the ground's surface or moving to ditches or streams. The exposure of humans to this partially treated waste greatly increases the potential for contracting any of several diseases including, but not limited to, salmonellosis, shigellosis, viral hepatitis A, and amebiasis (See Dr. Buttery's memo to district and regional directors dated August 1, 1986).

Nitrate, although a naturally occurring form of nitrogen, is of particular concern in drinking water. High nitrate levels in drinking water can cause methemoglobinemia (infant cyanosis or "blue baby" disorder) which interferes with the capacity of an infant's blood to carry oxygen. The federal drinking water standard for nitrate is 10 mg/l (as expressed as nitrogen). The level is also 10 mg/l in the Virginia Waterworks Regulations. For this reason, the Department has adopted the drinking water standard as the maximum level for groundwater at the perimeter of a mass drainfield. In addition, the Virginia State Water Control Board has a groundwater anti-degradation policy which limits the nitrate level in groundwater to 5 mg/l.

Section 3.17.01 of the Sewage Handling and Disposal Regulations states (emphasis added);

3.17.01 If it is determined that the proposed design is inadequate or that soil, geological or other conditions are such to preclude safe and proper operation of a proposed sewage disposal system or that the installation of the system would create an actual or potential health hazard or nuisance, the permit shall be denied and the owner shall be notified in writing of the basis for the denial. The notification shall also state that the owner has the right to appeal the denial.

As stated above, the mounding of the watertable beneath the absorption site can lead to failure of the system which may result in the transmission of disease. Also, the presence of nitrates in drinking water poses a threat to the lives of infants. By requiring the applicant to address these issues during the plan review stage the potential for installing a system which creates a health hazard or nuisance is reduced.

In order to assist you in the future, all plans for mass drainfields and documents pertaining to § 3.13.05 must be submitted to this office for review and approval before any permit is issued by the Department. Local health department staff must be cautioned not to make any kind of commitment, verbal or written, for the approval of a permit to construct a mass drainfield without the approval of the Bureau of Sewage and Water.

Should you have any questions please call Gary Hagy at 786-1750.