

**Virginia Division of Consolidated Laboratory Services**  
**ENVIRONMENTAL LABORATORY CERTIFICATION PROGRAM**  
**(1VAC30-45 and 1VAC30-46)**

**GUIDANCE DOCUMENT**

**1VAC30-45 and 1VAC30-46**  
**Applicability of Geotechnical and Engineering Testing**

**July 15, 2010**

The Division of Consolidated Laboratory Service (DCLS) is issuing the following guidance concerning the applicability of geotechnical and engineering testing under 1VAC30-45 and 1VAC30-46.

Environmental laboratories that perform geotechnical or permeability testing as required by Virginia's solid waste laws and regulations are not applicable under VELAP. 1VAC30-45 and 1VAC30-46 do not include a matrix appropriate to this type of testing.

There is no clear "Field of Certification (Accreditation)" matrix for geotechnical or permeability analysis. Environmental laboratories are certified (accredited) by matrix, technology/method, and analyte. Matrix is defined as "the component or substrate that may contain the analyte of interest." "Analyte" is defined as the "substance or physical property to be determined in samples examined." In the case of permeability testing, the analyte of interest is the physical characteristic of permeability or the ability of a substance to pass through the pores or physical components of another substance.

The VELAP rules offer four matrices for field of certification (accreditation): non-potable water, solid and chemical materials, biological tissue, and air and emissions. "Solid and chemical materials" includes soils, sediments, sludges, products and byproducts of an industrial process that results in a matrix not previously defined. Soils and sludges under the "solid and chemical materials" matrix are analyzed for contaminants such as toxic chemicals.

An appropriate "field of certification (accreditation) matrix" for geotechnical and engineering material testing might be labeled "site characteristics" rather than solid and chemical materials. Geotechnical testing is used to determine whether a physical location is suitable for a landfill. This testing is done to determine whether leachate from landfills would permeate the lining of a landfill and seep into groundwater.

The following are permeability tests provided by DEQ that are required to be performed under Virginia solid waste regulations:

- Atterburg Limits (Provides liquid limit, plastic limit, and plasticity index) - ASTM D4318
- Grain-size Distribution - ASTM D422
- Standard Proctor (Laboratory Moisture-Density Relationship) - ASTM D698 or Modified Proctor (ASTM1557)

- Hydraulic Permeability - ASTM D5084 Flexible Wall Permeameter
- Unified Soil Classification System - ASTM D2487

Clay liner (During Construction):

- Hydraulic Permeability - ASTM D5084 Flexible Wall Permeameter
- Water Content by Microwave Heating - ASTM D4643
- Water Content by Direct Heating ASTM D4959
- Bentonite Clay - Liquid Limit ASTM D4318, ASTM 422, Free Swell (No standard test currently exists for this test), and ASTM 5084
- Composite liner - ASTM D5321 Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by Direct Shear Method

Environmental laboratories that perform these tests are not required to become certified or accredited under 1VAC30-45 or 1VAC30-46 for this category of testing.