

Testimony
Pennsylvania Association of Professional Soil Scientists

Hearing on House Bill 997
May 7, 2014
Professional Licensure Committee
PA House of Representatives

Michael E. Lane
Immediate Past President
Pennsylvania Association of Professional Soil Scientists
Senior Soil Scientist
Brickhouse Environmental
515 South Franklin
West Chester, PA 19380
610/692-5770
mlane@brickhouse-environmental.com

Thank you for scheduling this hearing for House Bill 997 and for taking the time to learn more about soils and soil science.

My name is Michael E. Lane. I am a Certified Professional Soil Scientist and past-President and current Board Member of PAPSS, the Pennsylvania Association of Professional Soil Scientists. PAPSS is a nonprofit, statewide organization of professional soil scientists and associate members formed in 1975. PAPSS is dedicated to fostering the profession of soil classification, mapping, and interpretations, and to increasing and furthering the dissemination of information concerning soil science as it contributes to the protection of the environment and general human welfare. PAPSS also provides a forum for soil science information, encourages and enhances communication with other technical disciplines, serves as a body of opinion on matters relating to soil classification and interpretations, and maintains professional standards in the application of soil science in Pennsylvania.

I am employed as a consulting soil scientist with Brickhouse Environmental, an environmental consulting company located in Chester County that also employs engineers and geologists.

House Bill 997 proposes to license professional soil scientists by amending the existing Engineer, Land Surveyor and Geologist Registration Law, adding Soil Scientists to the list of professions for which practicing persons must be licensed and registered. The proposal adds soil science members to an existing professional oversight board and outlines requirements for licensing of a professional soil scientist; **the legislation does not create a new board or entity.**

What my colleagues and I would like to do this morning is to provide you with background on soils and the practice of soil science, and to provide sound reasons for moving this legislation to the House floor.

Background: A Soil Primer

First, what is soil? Soil is not dirt. To a professional soil scientist, soil is a multi-dimensional, dynamic body of minerals, animals, plants, air, and water. Soil is formed when climate, animals and plants, and landscape position act on a parent material over time. Given sufficient time, a soil will evolve into a series of layers, or horizons, that differ in one or more properties such as in their texture, structure, density, porosity, consistency, temperature, color, and reactivity. Soil profile development is dependent on the processes that form soils from their parent materials, the type of parent material, and the factors that control soil formation.

- Soil acts as a building base, a habitat for animals, a recycling system for organic wastes, a regulator of water quality, and a medium for plant growth. The water-holding capacity of soils is vital for plant survival.
- Soils filter wastewaters, neutralize bacteria and viruses, and degrade contaminants. Soils provide readily available nutrients to plants and animals by converting dead organic matter into usable plant nutrients.
- Soil is not indestructible. It takes over 200 years to form one inch of soil. One inch or more of soil can be lost in a day from uncontrolled erosion of bare ground. One pass of heavy equipment can compact a soil, reducing pore space and water holding capacity. One spill of a hazardous substance can limit a soil's use for decades.

Soil is a resource, and as a resource it needs to be used and managed carefully. That is where the soil scientist comes in.

A person professing to be a professional soil scientist should meet state requirements. House Bill 997 requires minimum standards for a practicing soil scientist, including a bachelor's degree from an accredited university with fifteen credit hours in soil science courses, and five years of post-academic experience.

A professional soil scientist must identify, describe, and delineate soil types for a multitude of purposes, including:

- Soil mapping and classification
- Erosion and sedimentation control
- Stormwater management
- Individual onlot sewage disposal
- Large-volume sewage disposal
- Spray and drip irrigation
- Beneficial reuse of biosolids
- Solid waste disposal at landfills
- Land reclamation/remediation
- Wetland identification/mitigation
- Archaeological investigations
- Nutrient management

Why licensure? The goal of all licensure is to protect the health and welfare of residents of Pennsylvania and to protect consumers when hiring a professional. Soil science licensure is no different.

How does soil licensure protect the health and welfare of Pennsylvanians?

Over one-third of Pennsylvania's residents rely on individual on-site water supply wells. The groundwater for each of these wells ultimately comes from rainwater filtering through soil. Sewage disposal systems, stormwater management structures, solid waste disposal, biosolids reuse, and agricultural fertilizer applications all have the potential to pollute water supplies. Limiting the potential for groundwater contamination relies on proper site characterization beginning with site-specific soil mapping and characterization.

Over 40-percent of Pennsylvania's residents rely on the soil for treatment and disposal in their individual on-lot septic systems according to the PA Septage Management Association. Until recently, there were fewer than 10 options for septic systems, most of which relied on four feet of suitable material to filter wastewater.

Now, there are well over 100 combinations of treatment and distribution technologies, some of which rely on only 10 inches of suitable soil. The margin for error does not exist and these systems rely on accurate descriptions of soil properties and the experience of a trained soil scientist.

Licensure provides a mechanism of enforcement currently absent in Pennsylvania. In Pennsylvania, there is no statutory or regulatory definition of soil science or soil scientist. In Pennsylvania, anyone can claim to be a soil scientist or offer soil science services, even when they have no education or experience.

Soil science services are frequently sought by engineers, surveyors, geologists, and land owners for projects including sewage facility planning and soil permeability studies, land application of biosolids, site characterization for planning stormwater facilities and measuring soil infiltration, high-intensity soil surveys (alluvial, colluvial, hydric, and highly erosive soils, seasonal high water tables, prime agricultural soils), expert testimony, locating source materials such as for clay liners, soil nutrient management, pond site evaluations, wetland mitigation, and site suitability for landscaping and stabilization plantings. Licensure provides a means to find a qualified soil scientist.

House Bill 997 is intended to provide consumer protection for soil science services and is not intended to infringe on the professional practices of engineers, land surveyors, geologists, wetland delineators, or sewage enforcement officers.

A Myriad of Rules but No Common Definition

I'd like to list a few examples of existing ordinances, regulations, and policies that relate directly to soil science and its practice. These rules were written by the PADEP and by local governments to fulfill their shared mission to provide for the health and safety of Pennsylvania's citizens. The examples are intended to illustrate that agencies charged with protecting health and welfare have already recognized the value of professional soil scientists. It is time to provide the consumer protection commensurate with these rules.

- **Municipal Waste Management Title 25 271.122(d)** The soils, geology and groundwater sections of a permit application shall be completed by *experts in the fields of soil science*, soil engineering, geology and groundwater.
- **Municipal Waste Management Title 25 271.915(c)(7)** Sewage sludge may not be applied to agricultural land, forest or a reclamation site that is: Within 11 inches (or 28 centimeters) of the seasonal high water table, nor within 3.3 feet (or 1 meter) of the regional groundwater table. For purposes of this section, the depths to seasonal high water table and to regional groundwater table shall be based on the most recent soil mapping as published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service, or more detailed mapping data as mapped by *an expert in soil science* using standard and acceptable mapping procedures as developed by the USDA Natural Resources Conservation Service.
- **Municipal Waste Landfills Title 25 273.117. Soil description.**
An application shall contain:
 - The depth to the seasonal high water table within the proposed permit area and adjacent area to demonstrate that seasonal high water table will not contact the liner system.
- **Land Application of Sewage Sludge Title 25 275.312** Site characteristics. No person or municipality may apply sewage sludge to a site unless the site complies with the following:
 - The site has soils that fall within the United States Department of Agriculture textural classes of sandy loam, loam, sandy clay loam, silty clay loam or silt loam, unless otherwise approved by the Department in the permit.
 - The soils have a minimum depth from surface to bedrock of 20 inches.
 - The site has a minimum depth from surface to seasonal high water table of 20 inches.
 - The operator may establish this minimum depth through the use of a tile drain system, if approved by the Department in the permit.
- **Residual Waste Management Title 25 287.122(d)** The soils, geology and groundwater sections of a permit application shall be completed by *experts in the fields of soil science*, soil engineering, geology and groundwater.
- **Land Application of Residual Waste Title 25 291.104(e)** The information required by this section shall be prepared by *experts in soil science*.

- **Erosion and Sediment Control Title 25 102.8(f)** PCSM Plan contents. The PCSM Plan *shall be designed to minimize the threat to human health, safety and the environment* to the greatest extent practicable. PCSM Plans must contain at a minimum the following: The types, depth, slope, locations and *limitations of the soils* and geologic formations. An identification of naturally occurring geologic formations or *soil conditions that may have the potential to cause pollution* after earth disturbance activities are completed and PCSM BMPs are operational and development of a management plan to avoid or minimize potential pollution and its impacts.
- **Erosion and Sediment Control Title 25 102.8(g)** PCSM Plan stormwater analysis. Predevelopment *site characterization and assessment of soil* and geology including appropriate infiltration and geotechnical studies that identify location and depths of test sites and methods used.
- **PA Stormwater BMP Manual Appendix C. Who Should Conduct Testing** Qualified professionals who can substantiate by qualifications/experience their ability carry out the evaluation should conduct test pit soil evaluations. *A professional, experienced in observing and evaluating soils conditions* is necessary to ascertain conditions that might affect BMP performance, which can not be thoroughly assessed with the testing procedures. These evaluations *must* be conducted by the above professionals in risk areas or areas indicated in the guidance as non-preferred locations for testing or BMP implementation.
- **By PADEP policy, soil scientists:**
 - perform *soil profile analysis* and hydraulic conductivity testing for all large-volume sewage disposal systems.
 - perform *soil profile analysis* and hydraulic conductivity testing for PADEP Part II-permitted land application systems.
 - perform *soil profile analysis* to determine infiltration loading rate for drip irrigation systems.
 - perform *soil profile analysis* to determine infiltration loading rate and hydraulic linear loading rate for shallow soil onlot systems sited with soil morphology.
 - must be employed by a delegated or multi-municipal local agency to provide oversight of soils work performed by local officials, to provide soils training to local officials, and to provide expert testimony at hearings and trials.
- **West Bradford Township, Chester County Ordinance 96-05** The party disputing the boundaries of the Flood Hazard District as established in Section 703 A of this Article

shall submit to the Zoning Administrative Officer four (4) copies of a detailed on-site survey of the land in question, made by a professional geologist or *soil scientist*, showing in detail those specifics which the applicant alleges accurately reflect the condition of the land or those changes alleged to have occurred, which remove the land or any portion thereof from the Flood Hazard District as designated in Section 703 A.

- **Kennett Township, Chester County Ordinance 129** Where the Applicant seeks reclassification of hydric soils and their location, such reclassification shall be undertaken by a *Certified Soil Scientist or other similarly qualified professional*.

- **Lower Windsor Township, York County Stormwater Management Ordinance** A detailed soils evaluation of the project site shall be performed to determine the suitability of recharge facilities. The evaluation shall be performed by a *soil scientist or qualified professional*, and at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability.

- **West Donegal Township, Lancaster County Subdivision and Land Development Ordinance 2003**

Alluvial Soil - Soils formed from material such as gravel, sand, or silt deposited by a stream of water and showing little or no modification of the original materials by the soil forming process. These soils are further identified by the Soil Survey or by an on-site assessment by a *soil scientist*.

- **Doylestown Township, Bucks Co. Ordinance No. 359, March 15, 2011**

The SHWT [Seasonal High Water Table] and/or permanent groundwater elevation shall be determined for each dwelling unit or building by on-site testing completed prior to the Preliminary Plan submission. The test results shall be certified by a qualified Geologist or *Soil Scientist*.

- **Jackson Township, Cambria Co. Ordinance 62, amended July 29, 1994**

5. A soils and geologic report indicating the physical characteristics of the site with respect to its suitability for application of sludge...Field tests shall include:

(a) Soil borings by a *soil scientist* to confirm actual soil profile characteristics are consistent with published soil survey data.

- **West Deer Township, Allegheny Co. Ordinance No. 376**

M. If detailed infiltration study is required, the following guidance shall be followed:

Soil evaluations shall be performed to determine the feasibility and extent to which infiltration systems can be used. The evaluation shall be performed by a qualified, licensed geologist, geotechnical/civil engineer or *soil scientist*...

- **Conewago Township, Adams Co. Subdivision and Land Development Ordinance, January 5, 2010**

This information shall include a seepage report containing a test pit soils analysis, prepared by a *soil scientist*, and percolation test results in accordance with PA DEP regulations (Chapter 73, Section 15). The bottom of the test pits shall be no less than thirty inches (30”) below the elevation at which the soil/seepage interface is designed (i.e., the bottom of the trench, pit, etc.).

(13) A liner of impervious material must be provided in all wet ponds. In-lieu-of an impervious liner, the applicant may supply sufficient information to the Township prepared by a *soil scientist*, which includes an analysis of the potential for sinkhole development, and demonstrates to the Township that sinkholes will not develop.

- **East Hanover Township, Dauphin Co. Stormwater Management Ordinance April 1, 2003**

This information shall include a seepage report containing a test pit soils analysis, prepared by a *soil scientist*...

- **Luzerne Co. Mill Creek Watershed Act 167 Plan June 30, 2000**

Section 307. Ground Water Recharge

A. ...A detailed geologic evaluation of the project site shall be performed to determine the suitability of recharge facilities. The evaluation shall be performed by a qualified person (i.e., geologist, geotechnical engineer, and/or *soil scientist*)

- **Frankstown Township, Blair Co. Ordinance No. 100207-B**

402.6.5 Wetland Study. When a wetland is identified on an inventory conducted by a State or Federal agency or the Township suspects the presence of a wetland, a Wetland Study shall be performed by a professional *soil scientist*...

- **Draft PA Oil and Gas regulations, 78.56(iii)(11)**

The bottom of the pit shall be at least 20 inches above the seasonal high groundwater table, unless the operator obtains approval under subsection (b) for a pit that exists only during dry times of the year and is located above groundwater. The operator of an unconventional well shall determine that the pit bottom is at least 20 inches above the seasonal high groundwater table prior to using the pit. *The determination shall be made by a soil scientist* or other similarly trained person using accepted and documented scientific methods. The individual’s determination shall contain a statement certifying that the pit bottom is at least 20 inches above the seasonal high groundwater table according to observed field conditions. The name, qualifications and statement of the

individual making the determination and the basis of the determination shall be provided to the Department upon request.

Construction of a new Township Building was started in Westmoreland County. I am quoting from a news report published at the time,

<<<With a large pool of water sitting where they plan to expand the township building, Derry Township supervisors are once again defending the controversial project.

A handful of residents at a supervisors' meeting Tuesday once again questioned the logic and wisdom of the nearly \$400,000 project to repair, renovate and expand the township building along Route 982, near Bradenville.

[A Township Supervisor] said workers ran into an "unexpected" water problem shortly after work started last month.

"We didn't have a crystal ball," [the Supervisor] said, noting that the plan has been revised to eliminate a basement that was outlined in the schematic. >>>

The Township did not need a crystal ball, they needed a soil scientist, and the water problem would have been recognized long before the start of construction. Thank you.