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

Testimony of Dawn R. Gibas, PhD, PSS, CPSS
Assessment Specialist
Soil Science Society of America/American Society of Agronomy
Madison, WI

Good morning. My name is Dr. Dawn Gibas. I am a Certified Professional Soil Scientist through the Soil Science Society of America and I am a Licensed Soil Scientist in the State of Minnesota. I have a Bachelor's degree in soil science from the University of Wisconsin-Madison and a Masters in soil physics and PhD in forest hydrology from the University of Minnesota-Twin Cities.

During my career I have been employed as an environmental consultant with several firms and have worked all over the U.S., I have served as the Natural Resources Director for Scott County, Minnesota, and have been on the faculty at Susquehanna University in Selinsgrove, Pennsylvania and most recently at The Ohio State University, where I am still an adjunct professor in the School of Environment and Natural Resources.

Since the conclusion of my PhD work in 1991, I have also been involved in credentialing as a volunteer with both the Soil Science Society of America and, for a time, the Society of Wetland Scientists. I am a past president of the Minnesota Association of Professional Soil Scientists and a past chair of the Council of Soil Science Examiners (the group that writes the certification and licensing exams for soil science). I have also served on the Minnesota Board of Licensing as the Soil Science representative.

In my current position I work for the Soil Science Society of America and the American Society of Agronomy as their Assessment Specialist. I am responsible for 37 credentialing exams in soil

science and agronomy. Geographically, these exams cover the U.S., Canada, Australia, Mexico, and India. My job is to ensure that our credentialing exams follow standard practice, are legally defensible, and psychometrically sound.

With respect to soil science, the Soil Science Society of America, through the Council of Soil Science Examiners, provides exams for national certification and current licensing states that utilize our exams for licensure. These states currently include Maine, Minnesota, North Carolina, North Dakota, South Carolina, Tennessee, Texas, Virginia, and Wisconsin. The inception of soil science credentialing exams is more recent than some professions; we began in the mid-1990's with North Carolina being the first state to pass a licensing law, with Minnesota following shortly thereafter. Virginia is the most recent state to pass a licensing law.

I should also note that there are other states that have their own exams and do not participate with a program at a national level; examples are Illinois, Indiana and Delaware. Participation at a national level becomes important in terms of comity or reciprocity between states or the national level certification program for portability of credentials.

Credentialing exams are high stakes exams, and as such, can be difficult to create and maintain due to the complex nature of providing exams that test competency. However there are testing standards and established exam procedures in place and we do follow those. To provide a short overview of the exam process, I will use the Soil Science exams that we produce as an example.

The exams are based on a set of Performance Objectives or POs. The POs really provide a detailed list of items or working knowledge that define the practice of soil science. The first set of POs was written in the early 1990s. This task was accomplished by a group of experienced soil scientists that came together from different geographic regions of the U.S., different sectors of employment (academia, government, industry, and private practice), and varying

levels of education (Bachelor through PhD). The Council of Soil Science Examiners also follows this type of committee make-up to ensure a minimum of bias.

The POs are written in two levels, mirroring the exams required for soil science licensing. Therefore, there is a set of POs for the Fundamentals Exam and another for the Professional Practice Exam. POs are updated every 4 years to ensure that they continue to define the current practice of soil science.

While it is important to establish the POs, it is equally important to include input from the larger population of practicing soil scientists. Before the updated POs documents are published, they are sent out for review in the form of an End User Survey to help make sure that we continue to understand the spectrum of knowledge that is "Need to Know" versus "Nice to Know". We can then incorporate this feedback into how the exam is written and which competency areas are emphasized.

One important key for these exams is that every exam question written must be linked back to a PO. It that link is not made, the exam question is not used. This also provides for ready-made study materials for potential examinees since they have free access to the PO document through our website.

Credentialing exams are used to determine competency of an individual to practice. The Soil Science Society of America contracts and works closely with a psychometrician to monitor exam performance, statistics, and to determine the cut score for each exam administration. We take this responsibility very seriously because we understand that not only are these are high stakes exams for the individual, but once licensed, there is a duty to practice to protect the health, safety, and welfare of the public as well as the environment.

The exams themselves are multiple choice questions written in a format that allows us to use standard psychometric statistics to determine performance. This means questions have four

possible answers, but only one correct answer. No "All of the Above" or "None of the Above" or "A and B", etc.

The Fundamentals Exam focuses on the six basic areas of soil science that an individual with 15 semester hours of soil science coursework and 45 semester hours of supporting core courses should have gained knowledge of within their degree program. The six basic areas are: Soil Chemistry; Soil Fertility; Soil Physics; Soil Genesis, Morphology and Classification; Soil Biology and Ecology, and Land Use.

The Professional Practice Exam encompasses the six areas of the Fundamentals Exam, but adds two sections: Field and Laboratory Techniques, and Ethics. This exam is taken after experience is gained by working and is scenario based. This requires the examinee to solve problems that a soil scientist may face given a scenario and associated data.

Exams determine competency of an individual to be able to practice, but the exam is only a portion of the overall credentialing package. To become licensed as a soil scientist, an individual must show proof of a Bachelor's degree in soil science or closely related field including 15 semester hours of soil science coursework, provide a detailed account of experience in soil science work (including references to verify this experience), pass both exams, and sign a professional ethics statement. Once licensed, continuing education is required to keep the credentials current and also provides a mechanism for the individual to stay current with the practice.

You have heard testimony this morning from several Pennsylvania soil scientists that have explained the importance of passing legislation that would establish licensing for the soil science profession and also facilitate protection for the public and the environment in several ways. Soil science is a complex science comprised of chemistry, biology, and physics as well as understanding how to combine that knowledge with an ability to interpret the landscape, climate, anthropogenic effects and how all these variables affect our soil resources and

ultimately the environment in which we live. Soil scientists will play a critical role in the future in terms of providing food and fiber to a growing population as well as playing a significant role on other closely linked issues such as water resources.

Soil is a living resource that is only renewable over long periods of time. How we use it, conserve it, protect it, and help sustain it is up to all of us – but who better to guide us than those trained and experienced in interpreting the story being told by that vast resource under our feet that we often take for granted?

In closing, the Soil Science Society of America will continue to strongly support licensing of soil scientists in Pennsylvania and we are committed to the support of the licensing programs through the provision of quality exams and continuing education.

Thank you for your time this morning. I would be happy to answer any questions.