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Statement of:

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Chairman Baird, Ranking Member Inglis, and members of the Committee: good morning and thank you for inviting me to address the Committee and provide the University of Georgia's Savannah River Ecology Laboratory perspective on the Department of Energy's designation of National Environmental Research Parks.

I am Whit Gibbons, Professor Emeritus of Ecology from the University of Georgia and Head of the Environmental Education and Outreach Program of the Savannah River Ecology Laboratory on DOE's Savannah River Site in South Carolina.

Because of my own background and experience I will use the Savannah River Ecology Laboratory (SREL) as an example of how the designation of National Environment Research Parks across the nation will be in the public interest. Please remember that SREL and the SRS are only examples and that any of the DOE sites can serve as excellent examples as well.

SREL was founded in 1951 by the late Dr. Eugene P. Odum of the University of Georgia and throughout its history SREL has been operated by the University of Georgia with collaboration from other academic units regionally and nationally. The laboratory is located on the Department of Energy's (DOE) Savannah River Site near Aiken, SC; it has been recognized internationally by Encyclopedia Britannica as the Outstanding Laboratory of the Year and also was recognized by a Guinness World Record Certificate for the longest running amphibian field research program in the world.

SREL's mission, as defined in its Cooperative Agreement with the Department of Energy, is to provide an independent evaluation of the ecological effects of Savannah River Site operations through a program of ecological research, education, and public outreach.

The program involves basic and applied environmental research, with emphasis upon expanding the understanding of ecological processes and principles, and upon evaluating the impacts of industrial and land use activities on the environment. Dissemination of this knowledge to the scientific community, land managers, government officials, and the general public is a key goal of SREL.

During its 58-year history, SREL has had a significant impact on the Savannah River Site, the scientific community, and the general public by actively contributing to environmental remediation, restoration efforts, and environmental stewardship on the SRS and elsewhere, all within the spirit of a what a system of National Environment Research Parks proposes to be in regard to research, education, and outreach.

1. RESEARCH - The environmental research themes that are currently undertaken and that will be enhanced by the National Environmental Research Park designation are

(1) Environmental characterization,

(2) Ecological risks and effects, and

(3) Remediation and restoration of natural habitats.

SREL contributions to research include the publication of more than 3,000 publications in the peer-reviewed scientific literature and more than 25 books on ecology and the environment.

Environmental Characterization

Characterization is a necessary first step in determining environmental and health risks and in devising appropriate remediation and restoration strategies. Environmental information is also needed to make informed decisions about long-term stewardship and land management, and it is also a critical component of NEPA reports, Records of Decision (ROD), and other regulatory documents. Environmental characterization is more than simply measuring contaminant concentrations in biota or other media, or reporting the presence of organisms at various locations. It includes developing an understanding of the processes that control distributions of contaminants, chemical forms, and their bioavailability. Characterization is also necessary to construct models of how natural and engineered systems function, both in the presence and absence of environmental contamination.

Ecological Risks and Effects

Estimated risks and effects determine the need for remediation and restoration efforts, while perceived risks and effects determine the public's acceptance and support of DOE policies and actions. Estimating ecological risks and effects on the basis of sound science helps to ensure that good decisions are made by reducing uncertainties associated with complex environmental processes. A 1999 report from the National Academy of Sciences stated that *"Ecological risks are better characterized at the Savannah River Site than at any other DOE installation, due in part to the designation of the site as a National Environmental Research Park and the presence of the Savannah River Ecology Laboratory."*

Remediation and Restoration

The SRS National Environmental Research Park coupled with the knowledge and expertise based at SREL are ideally suited to address the remediation and restoration of large land areas contaminated with relatively low levels of metals, organics, and radionuclides. SREL conducts multidisciplinary research designed to assist in the development, evaluation and stakeholder acceptance of remediation and restoration efforts that protect human and ecosystem health. Fundamental to the success of various bioremediation, natural attenuation, and *in situ* remediation applications is an understanding of the underlying scientific principles on which they are based.

The SRS and other National Environmental Research Parks in the DOE complex can also serve as a reference landscape for the patchwork landscape that exists outside of their borders as well as a presenting a landscape with biological communities that can serve as a reference for climate change, without the impact of "normal" economic development. In addition, long-term

ecological studies can be conducted on National Environmental Research Parks that would be impossible to carry out without the protected nature of the DOE sites?

2. EDUCATION - For more than a half century, SREL has provided training for future scientists and engineers, having had more than 600 undergraduate research participants, including representatives from 275 universities and colleges in every state and Puerto Rico. More than 200 of these students have continued careers in science. Graduate students have produced more than 400 Master's theses and doctoral dissertations based on research conducted.

3. OUTREACH - In environmental outreach programs, SREL reaches as many as 50,000 members of the general public each year through talks, tours, exhibits, workshops, and other presentations about SRS activities and environmental stewardship.

Reasons for SREL's success in accomplishing these goals include the facts that the SRS has the largest tract of fenced-off, environmentally protected land east of the Mississippi River and therefore minimally affected by impacts from agricultural, urban, or industrial activities. Paradoxically, because five formerly active nuclear production reactors were guarded and protected for defense security purposes for more than a half century, we now have what is arguably the most biologically diverse suite of regional habitats in the Atlantic and Gulf Coastal Plain. For these reasons, the SRS was proposed as the first National Environmental Research Park. The other DOE complexes have comparable uniqueness for environmental stewardship and ecological research.

Testaments to the biodiversity and abundance of wildlife on the SRS are

1. Upper Three Runs Creek, which travels more than 20 miles across the site to the Savannah River, has the highest documented diversity of aquatic invertebrates, including clams, crawfish, freshwater shrimp, and countless fascinating insects, than any other stream in North America.

2. More ruddy ducks winter on SRS reservoirs each year than in the rest of South Carolina put together,

3. Much of the 10,000-acre river swamp and floodplain have been virtually untouched by onsite human activities for a minimum of 50 years. Recently, one of the cypress trees was aged using tree rings and found to be more than 600 years old.

4. More species of reptiles and amphibians, over 100 species, have been documented from the SRS than have been found on any other public land area in the United States, including the Everglades or Great Smoky Mountains National Park, and more than are found in most of the 50 states. Approximately 1000 species of plants exist on the SRS.

5. Another environmental record is that the SRS has more intact and permanently protected Carolina bay wetlands, the natural wetlands of this region, than the remainder of the state of South Carolina.

These are but a few of the impressive features of this protected land area that speak to the ecological richness and environmental health of the region and to its perpetuation and stability.

The establishment of the SRS and other DOE sites as National Environmental Research Parks will assure a legacy that DOE can be proud of.

Mr. Chairman, I thank you and members of the Committee for the opportunity to provide testimony in support of the National Environmental Research Park concept. The contributions to field research relating to energy technologies that can be accomplished at these DOE sites, which are unsurpassed as outdoor laboratories, are boundless. The opportunities to achieve public trust through transparent presentation of ecological research findings and advancements in ecological stewardship through environmental education and outreach programs are limitless. We have prepared a model at SREL both for ecological research and for environmental education and outreach. We hope to continue our efforts at SREL under the umbrella of the National Environmental Research Park program at the Savannah River Site and hope that the six National Environmental Research Parks located in other major ecological and climatic regions of the United States will be afforded the same opportunities. This concludes my testimony. I will be pleased to answer any questions.