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The National Water Research and Development Act

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Mr. Chairman and members of the Committee, my name is Jerry N. Johnson, and I am the General Manager of the District of Columbia Water and Sewer Authority, otherwise known as DCWASA. I appreciate your interest in the federal role in research, development and research coordination in the areas of water supply, water conservation and water management.

I also appreciate this opportunity to testify before the House Committee on Science and Technology Subcommittee on Energy and the Environment, and to comment on a national water research and development effort.

DCWASA's broad mission includes providing reliable and cost-effective water and wastewater services. We are an independent authority of the District of Columbia that serves a multi-jurisdictional service area.

Specifically, we distribute drinking water and collect and treat wastewater for more than 500,000 residential, commercial and governmental customers in the District of Columbia, including this U.S. Capitol complex. We also treat wastewater for 1.6 million customers in Montgomery and Prince George's counties in Maryland and Fairfax and Loudoun counties in Virginia.

In many ways we are unique:

- Unlike almost every other municipal water utility in the country, we were established in both local and federal law;
- We are directly regulated by the federal government, through the U.S. Environmental Protection Agency's (EPA) Region 3.
- The source of our drinking water is the Potomac River - a river that is bounded by several states and the District of Columbia, and although we distribute drinking water, our supplier is the Baltimore District of the United States Army Corps of Engineers Washington Aqueduct.
- Although we treat wastewater for both wholesale and retail customers at a District of Columbia facility that is regulated by the EPA, our wholesale customers operate under separate permits and different pollution limits, and also have different regulatory regimes established under state governments.

These factors do not necessarily impact all of DCWASA's operations on a daily basis, but they do impact how we plan, develop and manage water resources. Even though we are unique we share many of the challenges that confront other municipal and regional water and wastewater agencies. For example:

- The fact that DCWASA is responsible under its NPDES permit for addressing the District's estimated 3 billion gallons of annual combined sewer overflows that reach the Anacostia and Potomac rivers and Rock Creek, while at the same time the District of Columbia Department of the Environment is responsible for managing the District's stormwater flows into these waterways under a separate MS4 permit issued by EPA;
- The fact that the federal government provides drinking water treatment means that the periodic disagreements between jurisdictions that border the Potomac River (and which are mirrored in other regions of the country) have important implications for many area residents, but not for customers whose water is treated by the *federal* US Army Corps of Engineers;

- When local drought conditions require Maryland or Virginia to impose voluntary or even mandatory water restrictions in communities that border the District, we usually escape these limits because we rely on the Potomac which has substantial natural and manmade reserve capacity far upstream;
- Although the Blue Plains Advanced Wastewater Treatment Plant was the first to meet the EPA's Chesapeake Bay Program voluntary limits on nitrogen discharges, and even though we will expend about $1 billion dollars to meet more stringent requirements, EPA and states in the Chesapeake Bay watershed have yet to establish effective means to limit the most serious source of pollutants entering the Chesapeake Bay - run-off from non-point sources;
- The District of Columbia is required to expend approximately $2 billion to address the combined sewer overflows, while most of the pollution in the Anacostia River is caused by legacy pollutants in river bed sediments and other pollutants from upstream beyond the District's borders – another example of the essential need to develop more effective watershed-based approaches to water, wastewater and storm water management.

Mr. Chairman, from our perspective there are a number of factors that complicate efforts to better coordinate the management of water resources, including:

- Geography
- State and local jurisdictional and political boundaries
- The site-specific nature the statutory and regulatory framework within which we all work
- The structure of local and regional water and land use agencies, and
- History – the evolution of development around major waterways that serve as both sources of drinking water and as receiving waters for the discharge of effluent from treatment plants and overland run-off.

A broad framework established for supporting water resources research and development is a pathway to identifying important national priorities while also helping to disseminate information on the range of issues we confront in improving our management of water resources.

However, the opportunity to establish a framework that better coordinates ongoing research will certainly strengthen our research agenda. Providing a stronger brand of national leadership that promotes consensus and identifies priorities will encourage even greater initiative on the part of academic institutions, professional associations and research foundations, local agencies and industry.

As you know, water is rarely a localized resource; it raises inter-jurisdictional challenges across cities, counties and states. The federal role in coordination is crucial.
A number of federal agencies ranging from the EPA, to the US Department of Agriculture and the Centers for Disease Control, just to name a few, are making important contributions to research, and many national professional and industry associations have established over the years very important research efforts that are based on collaboration across professions, academia, government and water agencies.

For example, the mission of American Water Works Association Research Foundation (AwwaRF) is to advance the science of water to improve the quality of life by focusing on drinking water research. To date, AwwaRF has sponsored 635 completed research projects, and more than 300 studies are currently under way. In excess of 500 researchers and 30 partner research organizations have been involved in research efforts, which are guided by stakeholders in the water industry and supported by nearly 1,000 member organizations in nine countries worldwide.

Another example is the Water Environment Research Foundation (WERF), formed in 1989, is a leading independent scientific research organization dedicated to wastewater and stormwater issues. As a member of the WERF Board of Directors, I am proud of the fact that we have managed nearly 400 research projects, valued at more than $85 million.

This nonprofit organization operates with funding from subscribers (wastewater treatment plants, stormwater utilities, and regulatory agencies and the federal government, industry and equipment companies, engineers and environmental consultants. And the approach to research stresses collaboration among teams of subscribers.

Similarly, academic institutions participate in important research that contributes to our understanding of our interactions with the environment. These efforts also enhance our ability to manage water resources and reduce potentially negative effects of human activity. Less well known are the research efforts of local agencies like DCWASA.

Scientists who are employed in our wastewater treatment and our drinking water quality units are participating, and some instances leading, important research efforts in, for example, the use of biosolids, a byproduct of wastewater treatment. We are also conducting research and providing important data to EPA and other agencies in the area of corrosion control in the treatment and distribution of drinking water.

This work is being undertaken in many instances in collaboration with academic institutions like Virginia Tech, Howard University, the University of Washington and Cincinnati University, as well as with organizations like AWWARF.

Yes, this work is important. Yes, we are establishing important and valuable affiliations. Yes, this applied research will improve our ability to operate more efficiently and at lower cost, or alternatively to improve our ability to comply with increasingly stringent regulatory standards.

However, given the nature of our mission, our research agenda can sometimes be driven by relatively shorter term objectives. I genuinely believe that the nation will benefit from a stronger, better coordinated approach to research that supports better management of this increasingly scarce resource.

We are strongly supportive of an initiative that creates a more centralized opportunity to review, discuss and build a consensus on how we should approach some of these many challenges. DCWASA has been an advocate for strengthening the national research effort on a range of issues that relate to both wastewater treatment and drinking water treatment and distribution. For example:

Simultaneous Compliance

More research and coordination should be encouraged in the area of simultaneous compliance with all federal regulations under the federal Safe Drinking Water Act. Changes in one regulation may require a drinking water treatment change that has a negative impact on compliance with another regulation.

As current research is showing, for example, the pipe scales that form on the interior of pipes and which protect the pipes from the corrosive effects of water are very sensitive to chemical changes. These chemical changes may cause extensive metal release (including lead) into the water. Drinking water distribution systems are dynamic and sensitive systems and treatment changes required by regulations can have unforeseen and far reaching consequences. Research in the area of simultaneous compliance requires a much more aggressive and coordinated response.

When is Water Safe to Drink?

Almost every day, a water utility is faced with demonstrating that the water it delivers is, in fact, clean and safe to drink. A recent example is the water main break in Montgomery County Maryland where there was a potential microbial contamination after a major water main break. When a system loses complete water pressure in a large area, the distribution system becomes vulnerable to contamination. Current practice is to issue a boil advisory for at least 48 hours because it takes 24 hours to analyze bacteria samples that are collected immediately after the outage occurs.

Another set of samples is analyzed 24 hours later, placing a burden on local businesses, hospitals, and the entire community. Improving the speed of bacteriological analysis from days to hours or minutes in a manner that meets nationally accepted standards to ensure can help ensure the integrity of our water systems as well as consumer confidence.

I believe that this ought to be a higher priority. That is of course only an opinion, but this initiative may provide a better opportunity for all interested parties to create a consensus on this and many other issues.

Pharmaceuticals and Nanotechnology

Better coordination between federal agencies like the National Institute of Health, USDA and EPA, on pollutants that are discharged to our waterways, especially in the emerging areas of pharmaceuticals and nanotechnology is critical.

Water and wastewater utilities end up holding the bag because we are a regulated point source, but we must do a vastly better job assessing the environmental impact in the product development phase of many of these current and future potential contaminants. There have been concerns about pollutants such as estrogens in the Potomac, but there has been too little effort to evaluate source reduction strategies to regulate these chemicals, leaving the onus on end-of-pipe technologies that are very difficult and/or expensive to implement.

The variety of pollutants are also expanding to include nanotechnology constituents that may potentially harm the environment or human health, but there is, again, too little work evaluating the fate of these constituents once they reach the environment.

Biosolids

Better federal stewardship of biosolids management is another example of the need for greater attention in the area of wastewater and wastewater treatment by-product re-use. DCWASA staff members are involved in WERF and self-funded projects that are intended to ensure that the application of biosolids to land as a fertilizer is practiced in a safe and sustainable manner and in accordance with EPA guidelines.

- We are involved in WERF work to produce a protocol for rapid response to biosolids safety related issues.
- We are also evaluating sustainability measures for biosolids reuse. Our determination is that biosolids recycling can significantly reduce our greenhouse gas footprint through carbon sequestration and by off-setting the energy needs and greenhouse gases produced from manufacturing commercial fertilizer.
- DCWASA is also involved in a WERF project verifying reliable destruction of pathogens in digested biosolids.

Even better efforts to coordinate biosolids research could help address local concerns around the nation regarding perceived risks associated with biosolids, while also assessing the current and potential future value of biosolids as a safe and sustainable resource.

Non-Point Source Controls

Better coordination on non-point source control may be one of the most critical challenges in improving water quality in the nations receiving waters. Point sources are subject to regulation, but often non-point sources are major sources of pollution and the clean-up of water bodies will not be realized until non-point sources are addressed.

An example is the mitigation of nutrient related pollution in the Chesapeake Bay, where the Bay clean-up will not be realized without participation of non-point sources. Non-point source pollution is the main cause of nutrient pollution in the Bay. Point sources make up less than a quarter of nutrient related pollution. Yet DCWASA ratepayers are being asked to spend $1 billion to build facilities under stringent standards and deadlines with absolutely no guarantee to these ratepayers that the Chesapeake Bay will be remediated, because much of the non-point source related nutrient pollution remains unabated. It is critically important that we work more diligently to develop watershed-wide and non-point source strategies for managing and improving water quality in receiving waters.

Mr. Chairman, I once again wish to express my appreciation to you and the Committee for your interest in these critical issues. We most often come to Capitol Hill seeking support for massive infrastructure improvements that water agencies must undertake to both ensure reliable service and to protect the environment.

There are, however, initiatives that the federal government can undertake that are at least as important as appropriations bills. A national initiative to build a better coordinated and stronger foundation for developing priorities, enhancing the overall national research agenda and providing the information we need to improve our management of our water resources is just such an initiative.

I believe that you can be confident that a successful effort will result in not only more cost-effective research initiatives, but also a positive impact on water resource development and management through better planning, lower costs, and improved efficiency,

In closing, Mr. Chairman, many of the issues I've noted in my testimony are not new to the research community, or the industry. Climate change, however, is a substantially different kind of challenge. Although the debate regarding global warming continues in some quarters, there is no doubt that water resources can and are dramatically affected by local and regional changes in climate.

Strengthening the national research agenda through better coordination could help develop important new tools that provide a crucial advantage in successfully addressing this new challenge.

I would be pleased to respond to any questions.