

NUTRIENT POLLUTION: AN OVERVIEW OF NUTRIENT REDUCTION APPROACHES

UNITED STATES SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON WATER AND WILDLIFE

HON. BENJAMIN L. CARDIN, CHAIRMAN



TESTIMONY OF GEORGE S. HAWKINS, ESQ.
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DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

TUESDAY, OCTOBER 4 AT 2:30 P.M.
DIRKSEN SENATE OFFICE BUILDING, ROOM 406

Good afternoon Chairman Cardin, Ranking Member Sessions and members of the Subcommittee on Water and Wildlife. My name is George Hawkins and I am the General Manager of the District of Columbia Water and Sewer Authority – also known simply as DC Water. I'd like to thank you for inviting me to testify today on the advanced innovative projects that DC Water is implementing right in the backyard of our nation's capitol.

Introduction

First, by way of background, DC Water purchases treated drinking water at wholesale from our federal partner, the Washington Aqueduct, which is a unit of the U.S. Army Corps of Engineers. We then deliver this water through our pumping stations and pipes to our retail customers in the District of Columbia – including this very building. We also operate the world's largest advanced wastewater treatment plant, at Blue Plains, for the benefit of our customers in the District and several suburban jurisdictions. We serve more than two million customers in the metropolitan Washington, D.C., area.

I preside over a 1,000-strong workforce charged with maintaining and upgrading a labyrinthine underground system of pipes and valves. To maintain this network in the face of significant economic pressures, declining consumption, stricter environmental mandates, and a customer base that may be unfamiliar is an awesome, humbling challenge. Yet, DC Water is committed to rise to meet today's challenges and plan for tomorrow. We will continue to aggressively pursue federal investment with our regional congressional delegations and national industry partners as we advocate for shared responsibility for the clean-up of the Bay. In addition, we are currently rolling out three major projects: the Clean Rivers Project, the Enhanced Nutrient Removal Project and the Digester Project. All three projects will reduce nutrients discharged into our local waterways, the Anacostia River, the Potomac River, Rock Creek and ultimately the Chesapeake Bay.

Selected Environmental Projects:

Clean Rivers Project

Along with other cities, the District of Columbia faces the problem of how to fix combined sewer overflows (CSO), which happen when heavy rain events overwhelm a system designed generations ago. The nationally accepted solution and one we have adopted, is to build a huge network of tunnels to hold the combined stormwater and sewage until the storm passes and sends it to our treatment plant. Our agreements with the federal government require the design, construction and implementation of various activities and a Long Term Control Plan to be completed by 2025 at a cost of nearly \$2.6 billion. These mandated activities are designed to substantially decrease the number of overflows into the local waterways that ultimately flow into the Bay. On average there are approximately 82 overflow events per/year. The Clean Rivers Project is designed to reduce these overflows to 2 events per/year capturing 96 percent of the CSO. Further, there will be a reduction of combined-sewer runoff to the Anacostia River by 98 percent. We have already implemented measures such as tide gates, pumping station improvements, inflatable dams, and screens that filter debris-which have reduced combined sewer overflows by 40 percent.

Also, we are promoting the use of green infrastructure (rain gardens, green roofs and bioswales along streets) to reduce CSOs throughout the District but specifically in the Potomac and Rock Creek watersheds. Green infrastructure provides additional community benefits such as cooler temperature streets, increased economic activity,

energy savings and neighborhood revitalization. As evidenced of our commitment, we will undertake a major pilot program of demonstration projects totaling nearly \$30 million to evaluate the opportunities of substituting “gray for green” in the Rock Creek and Potomac watersheds.

The Enhanced Nutrient Removal Project

Wastewater treatment plants represent 19% of the nitrogen going into the Bay. Blue Plains Wastewater Treatment Plant is the single largest point source of nitrogen to the Chesapeake Bay. We account for 9.5% of the 20% attributed to wastewater treatment plants (1.8% of the total Nitrogen going to the Bay).

We have long been committed to reducing our effluent nitrogen load. Blue Plains was the first wastewater treatment plant in the Chesapeake Bay watershed to meet its program goals and has met or exceeded them since 2000. The first major step was a voluntary goal program to reduce nitrogen from the plant from 14.1 million pounds/year, a 40 percent reduction from 1985 levels, at a capital cost of over 16 million dollars. The ‘best efforts’ 8.5 million pound voluntary goal was eventually formalized in the NPDES Permit. By 2010, continuing under a voluntary program beyond any commitments made external to the District of Columbia, DC Water had further reduced effluent nitrogen to about 5 million pounds/year at an additional \$100 million capital cost. Thus, for a capital cost of approximately \$16 million, DC Water under a voluntary program was able to reduce effluent nitrogen by more than 9 million pounds/year.

In 2009, the USEPA issued an NPDES Permit to DC Water for Blue Plains AWTP requiring a further reduction in effluent nitrogen to 4.4 million pounds/year. The design of the next generation of nitrogen removal the Enhanced Nutrient Removal Program (ENR) is complete and construction started. We broke ground in early 2010. This project will allow Blue Plains to meet the NPDES Permit requirements that will go into effect in January 2015 for nitrogen, as it already does for phosphorus. This reduction of approximately 600,000 pounds of nitrogen, a 2% reduction in the WWTP nitrogen load to the Bay (0.4% reduction of total N), and conversion from a 'best efforts' voluntary goal to a permit requirement will incur a capital cost of \$900 million to rate payers. The project is slated for completion in July 2014 and will operate in conjunction with the Clean Rivers Project.

The Digester Project

DC Water will soon be the first utility in North America to use thermal hydrolysis for wastewater treatment, and when completed, Blue Plains will be the largest thermal hydrolysis plant in the world. The carbon and nitrogen collected during the ENR project will be used to produce green energy and a high quality soil product. The thermal hydrolysis and digestion processes convert a portion of the organic matter into electric energy while producing with the remainder a valuable, nutrient rich soil amendment. Using thermal hydrolysis and anaerobic digestion together will generate power to operate half the needs of the plant. Analysts estimate the power generation at approximately 13 megawatts, enough to continuously supply 8,000 homes with

electricity. This represents an enormous cost savings to the plant- \$10 million annually, which is as much as one third of our electricity costs on an operation that runs every day of the year for 24 hours a day.

In addition to the production of clean, green renewable power, the new process reduces the amount of the remaining solid material to be recycled by more than 30 fewer trucks each day, or nearly 2,000,000 truck miles per year, and reduces truck emissions and gasoline costs. Together with the green energy, these benefits will dramatically decrease the Blue Plains carbon footprint by approximately 50,000 tons per/year. Since Blue Plains is the largest consumer of electricity in the District, this project will in turn have a dramatic effect on the carbon footprint of Washington DC. DC Water will use the high quality soil amendment produced from the digesters for tree planting, landscaping, green roofs and LID projects, greening the city, sequestering carbon, and helping to reduce runoff to the Bay.

The price tag of the complete project is about \$400 million, with annual savings of approximately \$25 million. The project is scheduled to begin operations in early 2015. Once underway, we will have options to run our city buses with biogas, cut the plant's electric bill by 1/3 saving ratepayers substantial increases per year, trade green credits on the open market and sell the Class A biosolids at any home retail stores. All of this from carbon and nutrients generated by all of us in the DC Water service area, and collected in an effort to restore the Chesapeake Bay. Many eyes will be watching, as leaders in the U.S. water sector eagerly await the results of DC Water's undertaking.

This energy recovery model can be replicated in many states and municipalities across the country.

Summary

In summary, we have three enormous initiatives underway designed to help restore the Chesapeake Bay and push our profession toward sustainability. The Clean Rivers (\$2.6B) and the Enhanced Nutrient Removal (\$900M) projects are mandated by consent decree and permit, while the Green Energy Digestion Project (\$400M) is discretionary. These projects demonstrate DC Water's commitment to the goal we all strive toward - a healthy Chesapeake Bay.

Chairman Cardin, members of the Subcommittee, this concludes my prepared remarks. Thank you again for the opportunity to testify, and I look forward to answering any questions you may have.