UNITED STATES SENATE

COMMITTEE ON ENERGY AND NATURAL RESOURCES

SUBCOMMITTEE ON WATER AND POWER

TESTIMONY OF CHARLES KIELY

ASSISTANT GENERAL MANAGER

DISTRICT OF COLUMBIA WATER AND SEWER AUTHORITY

THURSDAY JULY 25, 2013 AT 2:30 P.M.

DIRKSEN SENATE OFFICE BUILDING, ROOM 366

Good afternoon Chairman Schatz, Ranking Member Lee and members of the Senate Committee on Energy and Natural Resources Subcommittee on Water and Power. My name is Charles Kiely and I am the Assistant General Manager of Customer Care and Operations at the District of Columbia Water and Sewer Authority, known as DC Water. I am grateful for the opportunity to provide testimony today on the very important subject of aging water and sewer infrastructure.

DC Water serves the more than 17 million people who live, work, and visit the District of Columbia every year. We maintain and operate 1,350 miles of water pipes; over 37,000 valves; four pumping stations; five reservoirs; three elevated water tanks; and more than 9,300 public fire hydrants to deliver water across Washington, DC. The median age of the water system is over 78 years old with some pipes in service today that were installed before the American Civil War. Once that water is used, it is returned to our sewer system that is older than the water system with a median age of 85 years old. The sewer system has 1,800 miles of separated and combined sewer and storm water lines, nine wastewater pumping stations and 16 stormwater pumping stations, 12 inflatable dams and a swirl facility. The existing sanitary sewer system in the District of Columbia dates back to 1810, and includes a variety of materials such as brick and concrete, vitrified clay, reinforced concrete, ductile iron, plastic, steel, brick, cast iron, cast in place concrete, and even fiberglass. A significant number of the sewers in the DC Water system were constructed more than one hundred years ago and are still in operation today. An image of this type of structure is included in my written testimony along with a chart depicting the age of our water and sewer system.

The aging infrastructure that delivers water and sewer services is a vital resource to every home, business and facility in the District, including the U.S. Capitol. Our work also plays a critical role in ensuring the health of the environment. Balancing the delivery of service, improvements in treatment, and the cost to ratepayers is one of the largest challenges facing DC Water. Over the next ten years, DC Water plans to spend over $3.8 billion on capital improvements with $1.7 billion dollars allocated to meet federally-mandated environmental projects. Another $1.2 billion in the 10-year plan will be used to improve our aging water and sewer infrastructure. We are ramping up to replace one percent of our aging infrastructure per year, three times the rate of replacement in previous years, but still a 100-year replacement cycle.

As you know, direct federal investment in water and sewer infrastructure has severely declined. In Fiscal Year 2012, the District of Columbia received just $6.9 million from the Clean Water State Revolving Fund and $8.9 from the Drinking Water State Revolving Fund. Although we are grateful for these funds, the overwhelming majority of this work is financed by our ratepayers. The scale of the work needed means that our ratepayers will have to shoulder rate increases each year well into the foreseeable future unless other funding sources become available.

I have with me an actual section of tuberculated unlined cast iron main that we frequently encounter in our drinking water system to show what is deep below the ground in many areas across the country. Tuberculation is the deposit of corrosion materials inside the pipe that accumulate over time. As these deposits grow, they restrict the flow of water for everyday use

and fire suppression. The tuberculated deposits can also impact the quality of water because they can promote microbiological activity, cause discolored water, and impact disinfection Limited resources force DC Water to make strategic investments in our water and sewer infrastructure by prioritizing replacement projects based on the age and material of the asset, customer feedback, water quality testing, and camera inspections. Given that our infrastructure is located beneath roadways, DC Water works closely with the District Department of Transportation to coincide water and sewer infrastructure upgrades with transportation projects in public space whenever possible.

We are also exploring alternative technologies to minimize disruption to the public and decrease road restoration costs. In addition to a data-driven and coordinated replacement schedule, DC Water utilizes alternative technologies that are less invasive than the traditional open trench replacements to reduce the cost of improving our infrastructure. For example, DC Water is responsible for maintaining approximately 150,000 sewer laterals in public space and we replace approximately 400 per year. A sewer lateral is the underground pipe, typically four inches in diameter that connects the home or business to the main sewer line. For decades, DC Water employed the conventional open cut construction method for lateral replacements, resulting in significant restoration costs, labor charges, and unavoidable customer inconveniences. DC Water has evaluated and employed trenchless technologies to reduce the life cycle costs by selecting a cured in place pipe (CIPP) solution. Typically, it can be installed in less than one day compared to the four days needed for the conventional. Work is completed with minimal surface excavation, providing a far safer environment for employees and minimizing customer disruption. The CIPP process virtually eliminates road and pavement restorations associated with open trench construction while also reducing the need for traffic control. Time spent on the job site is significantly reduced, and the average cost of installation is about $3,900 – or a $7,300 savings over the conventional open cut method. Quite simply, we are spending 65 percent less to do more by working smarter.

DC Water was also one of the first water utilities to implement an advance meter infrastructure to not only provide customers with accurate bills but also to monitor the consumption from the service line into the customer's home or business to proactively detect leaks from aging infrastructure. DC Water is also piloting various emerging technologies including sonic and ultrasonic leak detection, radar for the geophysical detection of underground voids associated with large diameter pipes, and metallurgical analyses of metal for the strength of pipe components. When defects are discovered, consideration is given to applying various new tools including structural and non structural pipe linings and coatings, and corrosion protection technologies.

Unfortunately, age, corrosion, and weather often force us to address our aging infrastructure in a less proactive manner. Unlike roads and bridges, our extensive assets are buried and problems underground can persist for years without detection. Some may recall the large diameter water main break on Constitution Avenue NW in the fall of 2010. The break resulted in the closure of three blocks of a major arterial roadway, and surrounding buildings like the Smithsonian Museum of Natural History and the U.S. Department of Justice were left without

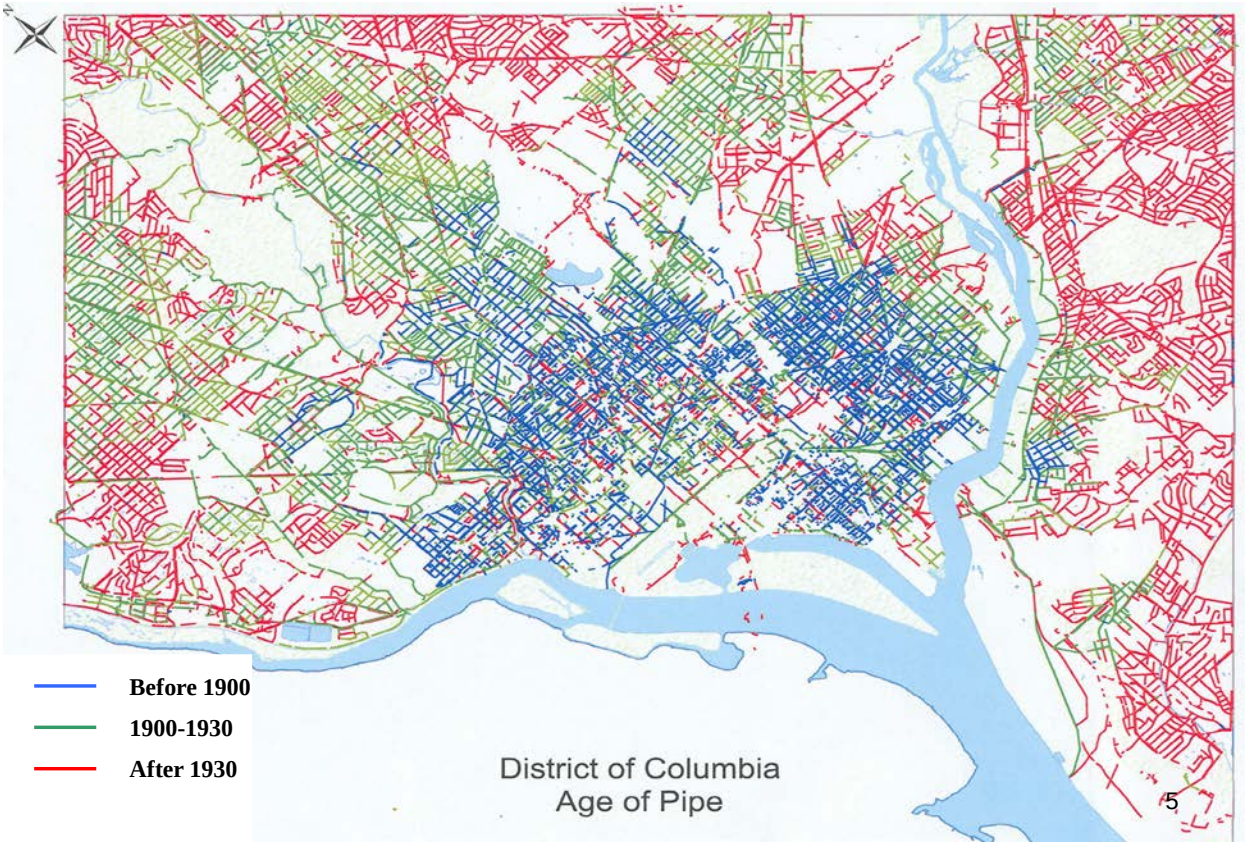
water service until the repairs were completed. Once replacement materials were identified and repairs were made, three blocks of the severely damaged roadway had to be resurfaced. All told, the emergency work took three days to complete and cost $740,000.

This past May, DC Water was involved in emergency work related to a sinkhole on the heavily trafficked intersection of 14th and F Streets NW. The hole developed when segments of the road fell upon a portion of our sewer that was constructed in 1897. The falling road debris caused the sewer to collapse and triggered the road to cave in. Repairs to sewer infrastructure can be more complicated than water mains since the infrastructure is located 15 feet or more below the roadway. To determine the cause and repair the sewer, DC Water crews had to cut through old trolley tracks and navigated a multitude of gas, electric and telecommunication lines. Fixing our 54-inch brick sewer meant cutting four foot sections of steel pipe and re-welding them together underground inside the broken sewer - essentially lining the existing tunnel to avoid digging a long trench 20 feet below the roadway surface. The steel had to be specially cut so that connections to the existing sewer laterals could be reconnected. All told, the emergency repairs caused most of the intersection to be closed for 11 days. We have not received all of the invoices for this work yet, but we estimate that the repair will cost ratepayers $1 - $2 million.

Disruptions from aging infrastructure are not limited to commercial areas downtown. Recently, an 8-inch water main break on a residential street washed out two manholes that extended 50 feet below the surface to a deep sewer. The restoration work took 31 days and ultimately cost our customers over $600,000. While the repair was taking place, DC Water had to run pumps and generators to bypass the sewer flow. The street was closed for over one month causing a major inconvenience to our customers in the neighborhood.

While DC Water has prioritized maintaining and upgrading our water and sewer delivery system, emergency repairs will be a routine occurrence as our system continues to age. Though it may not sound ambitious, our goal of replacing one percent of our aging infrastructure per year exceeds the replacement average of many of the older cities that we have surveyed. Moreover, DC Water has projected an additional need of $2.3 billion over the 20-year horizon for water and sewer infrastructure improvements. We hope to work with Congress to identify measures to help address the critical issue of aging water and sewer infrastructure. Thank you for the opportunity to provide remarks today and I am happy to answer any questions you may have.

Sewer System Background - Sewer Age



Damaged Sewer – Spring Place NW, December 2009