

BEFORE THE  
PHILADELPHIA WATER, SEWER AND STORMWATER RATE BOARD

Re Application of the Philadelphia Water Department for Increased Rates and Related Charges	Fiscal Years 2017-2018
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**DIRECT TESTIMONY OF STEPHEN J. FURTEK**

- Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS FOR THE RECORD.**
- A.** My name is Stephen J. Furtek. My business address is 1101 Market Street, Fifth Floor, Philadelphia, Pennsylvania.
- Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**
- A.** I am employed by the City of Philadelphia and serve as the Water Department's ("Department" or "PWD") General Manager of Engineering.
- Q. WHAT ARE YOUR JOB RESPONSIBILITIES?**
- A.** My responsibilities include implementation of the Department's capital program including design engineering, projects control, and construction management services. The capital program consists primarily of improvements to water and wastewater facilities, water main relay, sewer reconstruction, flood relief projects, and combined sewer overflow mitigation.
- Q. WHAT IS YOUR EDUCATIONAL BACKGROUND?**
- A.** I hold a Bachelor of Science degree in Civil and Urban Engineering from the University of Pennsylvania. I am a registered Professional Engineer licensed in Pennsylvania. My attached resume provides a more detailed description of my educational background and work experience. See Exhibit SJF-1.
- Q. PLEASE DESCRIBE YOUR RELEVANT WORK EXPERIENCE WITH THE DEPARTMENT.**
- A.** I was appointed as General Manager of Planning and Engineering (now the Engineering Division) in March 2005. I have held a number of positions with increasing responsibility since joining the Department in 1982, including Supervisor of the Water and Sewer Design Section and Manager of the Design Branch. A more detailed overview of my relevant work experience is set forth in my resume which is attached as Exhibit SJF-1.
- Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?**
- A.** The purpose of my testimony is to describe the Department's Capital Improvement Program and costs associated with the financing of this Program which contribute to the need for requested rate relief.
- Q. PLEASE DESCRIBE THE DEPARTMENT'S CAPITAL IMPROVEMENT PROGRAM?**

- A. The major elements of the Capital Improvement Program (FY 2016-2021) are set forth in the following table, as presented to the City Planning Commission for adoption by Philadelphia City Council.

**Capital Improvement Program (FY 2016-2021)**

(Thousands of Dollars)

Engineering, Administration & Material Support	\$ 239,988
Improvements to Treatment Plants	659,292
Water Conveyance System (new and reconstruction)	294,360
Wastewater Collector System/CSO/Flood Relief	<u>590,060</u>
Total	\$1,783,700

The Water Conveyance system consists of both the water transmission system (water mains 16” in diameter and larger) as well as the distribution system (water mains less than 16” in diameter). The Wastewater Collector system consists of sanitary sewers, stormwater conduits, and combined sewers used to transport sewage and/or stormwater.

A significant portion of the costs of the Capital Improvement Program are expected to be funded with the proceeds of debt to be incurred over the above period. The City expects most of such debt to be in the form of new money revenue bonds.

While the vast majority of the Capital Budget and Program is scheduled for the renewal and replacement of existing infrastructure, significant funds must be budgeted to meet the requirements of ever-expanding regulations promulgated by the United States Environmental Protection Agency (“EPA”), the Pennsylvania Department of Environmental Protection (“PaDEP”) and the Delaware River Basin Commission (“DRBC”). Regulatory requirements associated with biosolids treatment and utilization, watershed protection, combined sewer overflow and stormwater management also carry with them substantial costs.

**Q. HOW IS THE CAPITAL IMPROVEMENT PROGRAM DEVELOPED AND APPROVED?**

- A. The Philadelphia Home Rule Charter (“Charter”) requires City Council to adopt a balanced capital budget for the year on or before May 31 of each year. The Mayor’s Capital Budget is developed from proposed budgets submitted by the various departments of the City, including the Water Department. Capital spending by all departments is subject to the approval of the City Planning Commission and the Mayor’s Office and the Capital Budget is included with the City budget and Five Year Financial Plan for approval by City Council.

**Q. PLEASE DESCRIBE SOME OF THE LARGEST INITIATIVES INCLUDED IN THE CAPITAL IMPROVEMENT PROGRAM.**

- A. The Green City, Clean Waters Program (alternatively referred to as the Long Term Control Plan – “LTCP”) is the largest initiative being undertaken by the Department in its capital program. This program will require a significant increase in capital expenditures over the next 25 years. Specifically, the LTCP addresses combined sewer overflows through large scale implementation of green stormwater infrastructure City-wide with only minimal installation of grey infrastructure improvements (storage and plant capacity increases). This approach focuses upon controlling pollution at its source and improving water quality by restoring the natural hydrologic cycle in the urban environment and is consistent with current EPA policy for addressing wet weather impacts. LTCP expenditures represent 17.2% of the Capital Improvement Program for the period FY 2016-2021. This subject is more fully addressed in the Direct Testimony of Joanne Dahme.

In addition to this new initiative, the Department continues to invest in its water distribution and wastewater collection systems as well as treatment, storage and pumping facilities to insure reliability of

service. PWD is also implementing flood relief projects in flood prone neighborhoods. The table below presents the Department's top ten Capital Improvement Program projects in terms of estimated costs.

**Philadelphia Water Department  
Top Ten Capital Projects by Estimated Cost**

<u>Project Title</u>	<u>Status</u>	<u>Estimated Cost</u>	<u>FY Construction Commencement</u>
Two 30 Million Gallon Storage Tanks at East Park	Under construction	\$75,500,000	2016*
New 10 Million Gallon Clear Water Basin at Baxter Water Treatment Plant	Design 90% complete	\$73,500,000	2016*
New Preliminary Treatment Building at NE WPCP	Design 70% complete	\$65,000,000	2018*
New Gravity Thickeners at NE WPCP	Under construction	\$36,519,100	2015
East/West Raw Water Basin at Belmont Water Treatment Plant	Under construction	\$27,448,250	2013
Northern Liberties Flood Relief	Under construction	20,339,684	2014
By-Pass Conduit from Primary Sedimentation Tanks Set 1 to Chlorine Contact Tanks at NE WPCP	Under construction	15,894,000	2014
Construction of Sewer Maintenance Yard in West Philadelphia	Pre-Bid Phase	14,848,000	2016*
Flood Relief in Master St. and Germantown Avenue	Design 70% complete	10,500,000	2017*
Cobbs Creek Stream Rehabilitation (Reaches 1 to 3)	Design started	10,400,000	2017*
<b>TOTAL</b>		<b>\$349,949,034</b>	

\* Reflects current projection for start of construction.

**Q. DOES THE DEPARTMENT ALSO HAVE ASSET MANAGEMENT RESPONSIBILITIES THAT ARE FUNDED THROUGH THE CAPITAL IMPROVEMENT PROGRAM?**

**A.** Yes. The Department's Operations, Planning and Environmental Services, and Engineering Divisions develop capital programs to better anticipate future needs for infrastructure maintenance and upgrades and to manage long-term capital expenditures. Included in these efforts are a sewer assessment program, a geographic information system based record view, a capital facilities assessment program, and a standardized planning process for all large capital projects.

The Department has enhanced its planning process for capital projects that have an initial estimated design and construction cost of \$2.0 million or more. As part of such initiative, the Department will focus on and document the following three project planning steps: Project Need Identification, Project Alternatives Identification and Project Alternatives Evaluation. A prioritization system is utilized to capture the primary driving factors associated with a wide range of project types. The desired timing of capital projects also is documented through this process. The improved planning process also will help

inform PWD's future critical strategic planning efforts, in addition to improving communication and coordination among units within the Department. One pivotal program among the capital planning initiatives being undertaken during FY 2017-2018 ("Rate Period") and succeeding years is the Water Main Replacement Program, as described below.

**Q. PLEASE DESCRIBE THE DEPARTMENT'S HISTORIC WATER MAIN REPLACEMENT PROGRAM.**

**A.** PWD has undertaken an accelerated Water Main Replacement program to reduce main breaks utilizing innovative planning, analysis and technology – building upon the current program. This is a part of an overall program to renew the Water System over the next 25 years requiring the prioritization of some \$1.1 billion in capital expenditures. The goals associated with the new accelerated program are to achieve (i) reduction of water main breaks by half (average 12 breaks/100 miles) by 2040, (ii) renewal and replacement of the water transmission system using trenchless technologies, (iii) improvement of risk profile for entire distribution and transmission pipe inventory, and (iv) minimization of customer impacts due to pipeline failures (e.g., water main breaks, repeated leakage events).

Historically, the Department has experienced a five-year average break rate of 24.4 per 100 miles/year. While this is better than the national average of 27.0 breaks per 100 miles/year, PWD has established a goal of cutting this break rate by half by 2040. The Department plans to achieve this goal by undertaking the following activities:

- replace 1% of the Water System annually or 28 miles of pipe;
- replace over 643 miles of cast iron distribution system pipe with ductile iron pipe by 2040;
- remove all 101 miles of leadite pipe from the distribution system by 2030;
- renew all first generation piping (installed before 1965) by 2065; and
- renew 90 miles of large diameter water transmission pipelines using innovative structural rehabilitation technologies.

It should be noted that, historically, PWD has closely monitored water main conditions to determine that adequate capital investment is made to ensure the integrity of the Water System. Beginning in FY 2014, the Department expanded the level of assessment of water main failures (using state of the art technologies) by evaluating both the likelihood and consequences of failure of individual pipe segments. PWD continues to use this information to predict long-term water main replacement needs and refine the decision criteria for replacement selection. During FY 2014, these efforts were organized under the heading of the Linear Asset Management Program ("LAMP") which is leveraging emerging technologies in asset management to assess the water distribution and collection systems. Over the last 20 years, the Department has replaced on average 18.2 miles of water mains per year. In FY 2016 the water main replacement budget was increased from \$34M to \$44M per year in order to target 28 miles of water distribution system annually.

**Q. PLEASE DESCRIBE THE DEPARTMENT'S ACCELERATED MAIN REPLACEMENT PROGRAM.**

**A.** In 2011, the Department launched a renewed effort to accelerate the long-term Water Pipeline Renewal Program as well as expand the scope of water pipeline renewal in Philadelphia. The effort is being managed under the Water Linear Asset Management Program. The long-term goal of the accelerated main replacement initiative is to completely replace the first generation of piping (installed prior to

1965) by 2065. This will require the replacement of some 2,092 miles of piping with higher quality materials together with improved design and construction methods. In short, the Department will elevate the resilience and reliability of its piping infrastructure to provide more reliable service to minimize pipeline failures and related disruptions in service. As alluded to above, this will be accomplished over a fifty year interval comprised of two 25 year financial planning periods (FY 2016-2040 and FY 2040-2065).

During the first 25-year period, planned annual expenditures are projected at \$44 million through 2040. Planned expenditures during the FY 2016-2040 period tallies to \$1.1 billion which is sufficient to renew 643 miles of pipeline. During the second 25-year period, PWD will renew an additional 1,452 miles of pipeline at an estimated cost of \$2.03 billion. As presently structured, the FY 2040-2065 period will require considerably more resources and activity than the initial period (FY 2016-2040). However, it is likely that the financial plan for FY 2016-2040 will be re-evaluated and revised during the next several years, presenting an opportunity to expand the funding level in the first 25 years to lessen some of the financial burden during the latter period.

**Q. PLEASE HIGHLIGHT THE KEY OBJECTIVES OF THE ACCELERATED MAIN REPLACEMENT PROGRAM.**

**A.** Highlights of the program are stated below:

- PWD will spend \$1.1 billion over the next 25 years and a total of \$3.13 billion over the next 50 years to renew all first generation water piping installed prior to 1965;
- Funding levels for water main replacement increased by 30% in FY 2016 up to \$44 million/year with additional funding increases starting in 2041;
- 643 miles of pipeline will be renewed by 2040 – representing 22% of all water pipeline in the City;
- Pipelines being prioritized for renewal based upon their evaluated level of risk failure and potential for disruption and damage to property; and
- Customers will see improved service reliability and an upgraded system ready for future growth.

**Q. PLEASE DESCRIBE ADDITIONAL CAPITAL PLANNING INITIATIVES RELATED TO THE DEPARTMENT'S ASSET MANAGEMENT RESPONSIBILITIES.**

**A.** The following three programs are additional capital planning initiatives which impact planned spending for the Capital Improvement Program.

Distribution System Reservoir Planning Initiative

The Reservoir Team was created to better manage the strategic planning, capital program projects and operations and maintenance functions of the Water Department's distribution system finished water storage reservoirs. In its initial work, the team updated all standard operating procedures and improved as-built facility documentation. The Reservoir Team has strategically focused on the long-term options for the East Park and Oak Lane Reservoirs where the floating covers are into the second half of their useful lives. The Team's Strategic Planning Group obtained the services of the consulting group CH2M Hill who conducted hydraulic analysis and a life-cycle cost evaluation comparing replacement of floating covers and construction of pre-stressed wire-wound concrete tanks at East Park Reservoir. Based upon the consultant's findings, the team recommended, and the Water Department administration

approved, a plan to construct concrete tanks at the East Park site. Concrete tanks are known to provide superior protection of water quality and have become common in the use of ground level reservoirs throughout the United States. CH2M Hill was selected in a competitive process to develop detailed design plans and specifications, and the design work was completed. The project to build 2 new tanks was recently bid. The low bid was \$75.5 million.

#### Sewer Replacement and Renewal Program

Over the last 20 years, the Department has reconstructed and/or rehabilitated, on average, approximately 8 miles of sewer annually. The Department's Capital Renewal Program currently reconstructs or relines from six to ten miles of sewers per year based upon results of the Sewer Infrastructure Assessment Program and other condition reports. Some sewers are scheduled for reconstruction as a result of programmed water main replacement and the need to update infrastructure concurrently. LAMP initially is focused on the water distribution system but is expected to assess the sewer collector system starting in Fiscal Year 2016. As infrastructure is studied further, it is likely that annual sewer renewal will increase. The current annual budget for sewer replacement and/or rehabilitation is \$30 million per year, which generally yields 6 to 10 miles of sewers per year depending on their size and location.

#### Sewer Infrastructure Assessment Program

A pilot sewer assessment program completed in FY 2005 evaluated the condition of sewer system infrastructure using video technology to inspect over 215 miles of sewers. PWD used the information gathered to build a database and ranking system to prioritize needed improvements. Upon completion of the pilot program, the Department has incorporated the sewer assessment program into its operation as a means of evaluating the condition of its sewer system. Trained PWD personnel continue to prepare surveys using data collected through the sewer assessment program to reflect necessary repairs in the capital and operating budgets. This program has helped to identify sewers that were in immediate need of repair, and it is anticipated that over time this effort will result in a reduction of costly and disruptive emergency sewer repairs. In FY 2014, the Department continued video inspections and performed additional excavations and repairs. A total of 512.5 miles of sewer have been inspected from July 1, 2004 to June 30, 2014. In addition to informing the sewer maintenance unit of locations in need of repair, the sewer assessment program is used to schedule repairs for sewers that have reached the end of their useful life, to be reconstructed as part of the Capital Improvement Program.

**Q. IS THE PROPOSED INCREASE NECESSARY TO SUPPORT THE DEPARTMENT'S CAPITAL PROGRAM INITIATIVES?**

A. Yes. The Department expects to finance its Capital Improvement Program using revenue bonds, pay-as-you-go financing, and possibly alternate sources of funding, including loans or grants. A significant portion of the costs of the Capital Improvement Program are expected to be funded with the proceeds of debt to be incurred during FY 2016 through 2021. The City expects most of such debt to be in the form of new money revenue bonds issued in several transactions, as necessary. To be sure, debt service requirements and cash reserves for pay-as-you-go financing are integral components of the revenue requirement for FY 2017-2018. The plan of finance for the Capital Improvement Program is described in the testimony of Melissa LaBuda.

**Q. DOES THIS CONCLUDE YOUR PREPARED TESTIMONY?**

A. Yes, it does.

**Stephen J. Furtek, P.E.**

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**Education:**            **B.S. degree, Civil & Urban Engineering, University of Pennsylvania (1978-82)**

**Experience:**    **Philadelphia Water Department (August 1982 – present)**

- 3/2005 to Present**        **General Manager of the Engineering Division**  
Responsible for the administration and management of the Engineering & Construction Division of the Water Department. The Engineering & Construction Division is responsible for the implementation of the Department's capital program. The division is comprised of the following units:
- **Design Branch** – Responsible for providing in-house design services, as well as managing outsourced design services, for the capital program. In addition, Design provides technical support to the Department at large regarding water and wastewater issues.
  - **Construction Branch:** - Construction Branch is responsible for administration and construction inspection of all capital program projects, including surveying and generation of as-built drawings.
  - **Projects Control Section** – The Projects Control Section is responsible for developing, maintaining, and tracking the capital improvement program. This section is charged with maintaining the Department's as-built drawings & system maps as well as developing, implementing, and maintaining the Department's Geographic Information System (GIS). This Section is also home to the One-Call Unit, which is responsible for implementing the State's requirement that buried infrastructure, be field marked prior to excavation.
- 10/1996 to 2/2005**        **Manager of Design Branch**  
Responsible for managing a multidiscipline design-engineering unit for the Water Department consisting of architectural, civil, structural, electrical, and mechanical personnel. This unit is responsible for the design of the Water Department's capital program, including the generation of biddable plans and specifications. In addition, this unit is responsible for managing numerous professional engineering services contracts. These firms provide engineering services to supplement the Water Department's in-house staff in designing the annual capital program.
- 1/1988 to 10/1996**        **Engineering Supervisor, Water & Sewer Section, Design Branch**  
Supervised a group of design engineers and drafting technicians. Responsible for the oversight of the preparation of contract plans and specifications for the Water Department's water main relay and sewer reconstruction capital program, using both in-house staff and engineering consulting firms.
- 8/1982 to 1/1988**        **Civil Engineer, Structural Section, Design Branch**  
Prepared contract plans and specifications and performed structural design as required to support various construction and/or rehabilitation projects of Water Department facilities.
- Licensure:**            **Registered Professional Engineer in the Commonwealth of Pennsylvania.**