NEW AND REFUNDING ISSUE – BOOK-ENTRY ONLY

RATINGS: Fitch: A+ (stable)
Moody's: A1 (stable)
S&P: A+ (stable)
(See "RATINGS" herein)

In the opinion of Co-Bond Counsel, interest on the Tax-Exempt Bonds is excludable from gross income for purposes of federal income tax, assuming continuing compliance with the requirements of the federal tax law. Interest on the Tax-Exempt Bonds is not an item of tax preference for purposes of federal alternative minimum tax. Co-Bond Counsel is of the opinion that interest on the Taxable Bonds is not excludable from gross income for federal income tax purposes. Co-Bond Counsel is also of the opinion that the interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax under the laws of the Commonwealth of Pennsylvania as enacted and construed on the date of initial delivery of the Bonds. See "TAX MATTERS" herein.

$296,555,000
CITY OF PHILADELPHIA, PENNSYLVANIA

$201,530,000
Water and Wastewater Revenue and Revenue Refunding Bonds, Series 2020A

$95,025,000
Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B

Dated: Date of Delivery

Due: November 1, as shown on the inside covers

Defined Terms All capitalized terms that are not otherwise defined on this cover page have the meanings provided to such terms in this Official Statement.

The Bonds The City of Philadelphia, Pennsylvania, a corporation, body politic and city of the first class existing under the laws of the Commonwealth of Pennsylvania (the "City") is issuing its $201,530,000 Water and Wastewater Revenue and Revenue Refunding Bonds, Series 2020A (the "Tax-Exempt Bonds") and its $95,025,000 Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B (the "Taxable Bonds" and together with the Tax-Exempt Bonds, the "Bonds") pursuant to (i) the First Class City Revenue Bond Act, and (ii) the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (as supplemented and amended, collectively referred to as the "General Ordinance").

The Purpose The Bonds are being issued to provide funds which, together with other available funds of the City, will be used to finance (i) capital improvements of the City's Water and Wastewater System, including capitalized interest, (ii) the refunding of all or a portion of the City's outstanding Bonds set forth on Schedule 1 hereto and (iii) the costs of issuance relating to the Bonds. See "PLAN OF FINANCE" and "ESTIMATED SOURCES AND USES OF FUNDS" herein. Capitalized terms used but not otherwise defined in this Official Statement have the meanings ascribed to them in APPENDIX III-A hereof.

The Bonds will be issued only as fully registered bonds and, when issued, will be registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York ("DTC"), which will act as securities depository for the Bonds. Purchasers will not receive certificates representing their ownership interests in the Bonds purchased. Disbursements of principal, interest or redemption payments are the responsibility of DTC.

Payment and Security The Bonds are special obligations of the City, equally and ratably secured, with the City's outstanding Water and Wastewater Revenue Bonds (other than Subordinated Bonds, of which there are none outstanding on the date hereof) in the aggregate principal amount of $3,844,513,802 (as of June 30, 2020) issued under the General Ordinance and all Water and Wastewater Revenue Bonds hereafter issued under the General Ordinance (the "Water and Wastewater Revenue Bonds"). All Water and Wastewater Revenue Bonds are secured by a pledge of and security interest in all Project Revenues derived from the City's Water and Wastewater Systems (the "System") and by monies deposited in the funds and accounts (other than the Rebate Fund) established by the City under the General Ordinance (the "Water and Wastewater Funds"). Project Revenues means: (i) all rents, rates, fees and charges imposed or charged for connection to, or use or product of or services generated by the System to the ultimate users thereof, (ii) all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, (iii) all subsidies or payments payable by federal, state or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on monies borrowed to finance costs chargeable to the System, (iv) all grants, payments and contributions made in aid or on account of the System exclusive of grants and similar payments and contributions solely in aid of construction and (v) all accounts, contract rights and general intangibles representing the foregoing "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS."

THE BONDS ARE PAYABLE SOLELY FROM PROJECT REVENUES AND MONIES DEPOSITED IN THE WATER AND WASTEWATER FUNDS. THE BONDS ARE SPECIAL OBLIGATIONS OF THE CITY AND DO NOT PLEDGE THE FULL FAITH, CREDIT OR TAXING POWER OF THE CITY, OR CREATE ANY DEBT OR CHARGE AGAINST THE TAX OR GENERAL REVENUES OF THE CITY, OR CREATE ANY LIEN OR CHARGE AGAINST ANY PROPERTY OF THE CITY OTHER THAN AGAINST THE PROJECT REVENUES AND AMOUNTS, IF ANY, AT ANY TIME ON DEPOSIT IN THE WATER AND WASTEWATER FUNDS.

Ordinance No. 171110-A, signed by the Mayor on April 24, 2018, includes certain amendments to the General Ordinance (the "Springing Amendments") that will become effective upon the consent of the holders of at least 67% of Water and Wastewater Revenue Bonds outstanding. See "INTRODUCTORY STATEMENT – Recent Amendments to General Ordinance" herein and APPENDIX III-A and APPENDIX III-B hereof. **By virtue of their purchase, holders of the Bonds will be deemed to have consented to the Springing Amendments. The consent of the holders of 67% of Water and Wastewater Bonds outstanding will not be satisfied upon the issuance of the Bonds.**

Interest Payment Date The Bonds will be dated, and will bear interest from, the date of delivery thereof. Interest on Bonds will be payable semiannually on May 1 and November 1 of each year, beginning November 1, 2020.

Redemption The Bonds are subject to optional and mandatory sinking fund redemption prior to maturity as described herein.

Tax Status For information on certain tax matters relating to the Bonds, see the italicized language at the top of this cover page and "TAX MATTERS" herein.

Delivery Date It is expected that the Bonds will be available for delivery to DTC on August 6, 2020.

This cover page contains information for quick reference only. It is not a summary of this issue. Investors must read the entire Official Statement, including the Appendices, which are an integral part hereof, to obtain information essential to making an informed investment decision regarding the Bonds.

The Bonds are offered when, as and if issued and delivered to and received by the Underwriters (defined herein), and subject to the legal opinions of Ballard Spahr LLP and Ahmad Zaffarese LLC, both of Philadelphia, Pennsylvania, Co-Bond Counsel. Certain legal matters will be passed upon for the Underwriters by Dilworth Paxson LLP, Philadelphia, Pennsylvania. Certain other legal matters respecting the Bonds will be passed upon for the City by Greenberg Traurig, LLP and Turner Law, P.C., both of Philadelphia, Pennsylvania, Co-Disclosure Counsel. Certain legal matters will be passed upon for the City by the City Solicitor.

Citigroup **Loop Capital Markets**

Janney Montgomery Scott **Stifel, Nicolaus & Company Incorporated**

The date of this Official Statement is July 22, 2020.

$201,530,000
CITY OF PHILADELPHIA, PENNSYLVANIA
Water and Wastewater Revenue Bonds and Revenue Refunding Bonds,
Series 2020A

MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, PRICES, YIELDS, CUSIPS

Maturity Date (November 1)	Principal Amounts	Interest Rate	Price	Yield	CUSIP* (717893)
2022	$ 650,000	5.000%	110.537	0.270%	N80
2023	4,760,000	5.000%	115.194	0.280%	N98
2024	5,655,000	5.000%	119.395	0.380%	P21
2025	6,155,000	5.000%	123.052	0.530%	P39
2026	6,580,000	5.000%	126.331	0.680%	P47
2027	7,125,000	5.000%	129.470	0.800%	P54
2035	1,665,000	5.000%	132.648†	1.540%	P62
2036	6,200,000	5.000%	132.203†	1.580%	P70
2037	6,525,000	5.000%	131.650†	1.630%	P88
2038	6,855,000	5.000%	130.990†	1.690%	P96
2039	7,200,000	5.000%	130.552†	1.730%	Q20
2040	18,235,000	5.000%	130.225†	1.760%	Q38

$73,100,000, 5.000% Term Bonds due November 1, 2045, Price 128.710†, Yield: 1.900%, CUSIP* 717893Q46

$50,825,000, 5.000% Term Bonds due November 1, 2050, Price 128.174†, Yield: 1.950%, CUSIP* 717893Q53

* The above CUSIP (Committee on Uniform Securities Identification Procedures) numbers have been assigned by an organization not affiliated with the City or the Underwriters, and such parties are not responsible for the selection or use of the CUSIP numbers. The CUSIP numbers are included solely for the convenience of bondholders and no representation is made as to the correctness of such CUSIP numbers. CUSIP numbers assigned to securities may be changed during the term of such securities based on a number of factors including, but not limited to, the refunding or defeasance of such issue or the use of secondary market financial products. Neither the City nor the Underwriters have agreed to, and there is no duty or obligation to, update this Official Statement to reflect any change or correction in the CUSIP numbers set forth above. CUSIP is a registered trademark of the American Bankers Association ("ABA"). CUSIP data is provided by CUSIP Global Services, which is managed on behalf of the ABA by S&P Global Market Intelligence, a part of S&P Global, Inc.

† Priced to first optional call date of November 1, 2030.

$95,025,000
CITY OF PHILADELPHIA, PENNSYLVANIA
Water and Wastewater Revenue Refunding Bonds (Federally Taxable),
Series 2020B

MATURITIES, PRINCIPAL AMOUNTS, INTEREST RATES, PRICES, YIELDS, CUSIPS

Maturity Date (November 1)	Principal Amounts	Interest Rate	Price	Yield	CUSIP* (717893)
2021	$ 3,140,000	0.693%	100.000	0.693%	Q61
2022	7,280,000	0.743%	100.000	0.743%	Q79
2023	4,250,000	0.864%	100.000	0.864%	Q87
2024	3,770,000	1.011%	100.000	1.011%	Q95
2025	3,815,000	1.261%	100.000	1.261%	R29
2026	3,860,000	1.486%	100.000	1.486%	R37
2027	3,920,000	1.586%	100.000	1.586%	R45
2028	35,325,000	1.734%	100.000	1.734%	R52
2029	4,175,000	1.884%	100.000	1.884%	R60
2030	4,255,000	1.934%	100.000	1.934%	R78
2031	4,340,000	2.034%	100.000	2.034%	R86
2032	3,010,000	2.134%	100.000	2.134%	R94
2033	4,875,000	2.234%	100.000	2.234%	S28
2034	5,455,000	2.334%	100.000	2.334%	S36
2035	3,555,000	2.434%	100.000	2.434%	S44

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CITY OF PHILADELPHIA, PENNSYLVANIA

MAYOR
Honorable James F. Kenney

MAYOR'S CHIEF OF STAFF
James Engler

MAYOR'S CABINET

Brian Abernathy*	Managing Director
Rob Dubow	Director of Finance
Marcel S. Pratt	City Solicitor
Nefertiri Sickout	Acting Chief Diversity, Equity & Inclusion Officer
Stephanie Tipton	Chief Administrative Officer
Sylvie Gallier Howard	Acting Director of Commerce
Anne Fadullon	Director of Planning & Development
Otis Hackney	Chief Education Officer
Sheila Hess	City Representative
Sarah E. Stevenson	Chief Integrity Officer
Alexander F. DeSantis	Inspector General
Richard Lazer	Deputy Mayor for Labor Relations
Cynthia Figueroa	Deputy Mayor for Children and Families
Deborah Mahler	Deputy Mayor for Intergovernmental Affairs

CITY TREASURER
Christian Dunbar

CITY CONTROLLER
Rebecca Rhynhart

PHILADELPHIA WATER DEPARTMENT
Jefferson Center
1101 Market Street
Philadelphia, Pennsylvania 19107

Randy E. Hayman, Water Commissioner
Michelle L. Bethel, Deputy Revenue Commissioner
Marc Cammarata, Deputy Water Commissioner
Glen Abrams, Deputy Commissioner, Public Affairs
Stephen J. Furtek, General Manager, Engineering and Construction
Melissa LaBuda, Deputy Water Commissioner
Gerald D. Leatherman, Deputy Water Commissioner
Jaclyn Rogers, Assistant Deputy Water Commissioner
Donna Schwartz, Deputy Water Commissioner
Scott J. Schwarz, General Counsel to the Water Department
Alicia Robertson, Assistant Deputy Water Commissioner

Consulting Engineer
Arcadis U.S., Inc.

Financial Advisors
Acacia Financial Group, Inc. and
PFM Financial Advisors LLC

*On July 14, 2020, the City announced that Mr. Abernathy will resign from his position as Managing Director effective September 4, 2020. No successor has yet been appointed.

No dealer, broker, salesperson or other person has been authorized by the City or the Underwriters (defined herein) to give any information or to make any representations with respect to the Bonds other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy, nor shall there be any sale of the Bonds by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale.

This Official Statement is not to be construed as a contract with the purchasers of the Bonds. The information set forth herein has been obtained from the City and other sources believed to be reliable and has been reviewed by the Underwriters in accordance with and as part of their responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction but is not guaranteed as to accuracy or completeness by the Underwriters who provided this sentence for inclusion here. This information and expressions of opinions herein are subject to change without notice, and neither delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the City or the Water Department since the date hereof.

Statements contained in this Official Statement, including the Appendices hereto, which involve estimates, forecasts or other matters of opinion, whether or not expressly so described herein, are intended solely as such and are not to be construed as representations of fact. If and when included in this Official Statement, the words "expects," "forecasts," "projects," "intends," "anticipates," "estimates," "assumes" and analogous expressions are intended to identify forward-looking statements and any such statements inherently are subject to a variety of risks and uncertainties that could cause actual results to differ materially from those that have been projected. Such risks and uncertainties which could affect the amount of revenue collected by the City or the Water Department include, among others, changes in economic conditions and various other events, conditions and circumstances, many of which are beyond the control of the City and the Water Department. Such forward-looking statements speak only as of the date of this Official Statement. The City disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statement contained herein to reflect any changes in the City's expectations with regard thereto or any change in events, conditions or circumstances on which any such statement is based.

Upon their issuance, the Bonds will not be registered under the Securities Act of 1933, as amended, will not be listed on any stock or other securities exchange and neither the Securities and Exchange Commission nor any other federal, state, municipal or other governmental entity, other than the City (subject to the limitations set forth herein), will have passed upon the accuracy or adequacy of this Official Statement.

This Official Statement is submitted in connection with the sale of the securities referred to herein and may not be reproduced or used, in whole or in part, for any other purpose.

The order and placement of materials in this Official Statement, including the Appendices hereto, are not to be deemed to be a determination of relevance, materiality or importance, and this Official Statement, including the Appendices, must be considered in its entirety.

IN MAKING AN INVESTMENT DECISION, INVESTORS MUST RELY ON THEIR OWN EXAMINATION OF THE CITY, THE WATER DEPARTMENT AND THE TERMS OF THE OFFERING, INCLUDING THE MERITS AND RISKS INVOLVED. THESE SECURITIES HAVE NOT BEEN RECOMMENDED BY ANY FEDERAL OR STATE SECURITIES COMMISSION OR REGULATORY AUTHORITY. FURTHERMORE, THE FOREGOING AUTHORITIES HAVE NOT CONFIRMED THE ACCURACY OR DETERMINED THE ADEQUACY OF THIS DOCUMENT. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

IN CONNECTION WITH THE OFFERING OF THE BONDS, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME WITHOUT PRIOR NOTICE.

This Official Statement speaks only as of the date printed on the cover page hereof. This Official Statement, and any supplement or amendment thereto, will be delivered to the Municipal Securities Rulemaking Board through the Electronic Municipal Market Access System.

NOTICE TO INVESTORS IN THE EUROPEAN ECONOMIC AREA ("EEA")

THIS OFFICIAL STATEMENT IS NOT A PROSPECTUS FOR THE PURPOSES OF EUROPEAN COMMISSION REGULATION 809/2004 OR EUROPEAN COMMISSION DIRECTIVE 2003/71/EC (AS AMENDED, INCLUDING BY EUROPEAN COMMISSION DIRECTIVE 2010/73/EU, AS APPLICABLE) (THE "PROSPECTUS DIRECTIVE"). IT HAS BEEN PREPARED ON THE BASIS THAT ALL OFFERS OF THE BONDS WILL BE MADE PURSUANT TO AN EXEMPTION UNDER ARTICLE 3 OF THE PROSPECTUS DIRECTIVE, AS IMPLEMENTED IN MEMBER STATES OF THE EEA, FROM THE REQUIREMENT TO PRODUCE A PROSPECTUS FOR SUCH OFFERS. THIS OFFICIAL STATEMENT IS ONLY ADDRESSED TO AND DIRECTED AT PERSONS IN MEMBER STATES OF THE EEA WHO ARE "QUALIFIED INVESTORS" WITHIN THE MEANING OF ARTICLE 2(1)(E) OF THE PROSPECTUS DIRECTIVE AND ANY RELEVANT IMPLEMENTING MEASURE IN EACH MEMBER STATE OF THE EEA ("QUALIFIED INVESTORS"). THIS OFFICIAL STATEMENT MUST NOT BE ACTED ON OR RELIED ON IN ANY SUCH MEMBER STATE OF THE EEA BY PERSONS WHO ARE NOT QUALIFIED INVESTORS. ANY INVESTMENT OR INVESTMENT ACTIVITY TO WHICH THIS OFFICIAL STATEMENT RELATES IS AVAILABLE ONLY TO QUALIFIED INVESTORS IN ANY MEMBER STATE OF THE EEA AND WILL NOT BE ENGAGED IN WITH ANY OTHER PERSONS.

NOTICE TO PROSPECTIVE INVESTORS IN THE UNITED KINGDOM

THIS OFFICIAL STATEMENT HAS NOT BEEN APPROVED FOR THE PURPOSES OF SECTION 21 OF THE FINANCIAL SERVICES AND MARKETS ACT 2000 ("FSMA") AND DOES NOT CONSTITUTE AN OFFER TO THE PUBLIC IN ACCORDANCE WITH THE PROVISIONS OF SECTION 85 OF THE FSMA. THIS OFFICIAL STATEMENT IS FOR DISTRIBUTION ONLY TO, AND IS DIRECTED SOLELY AT, PERSONS IN THE UNITED KINGDOM THAT ARE QUALIFIED INVESTORS WITHIN THE MEANING OF ARTICLE 2(1)(E) OF THE PROSPECTUS DIRECTIVE WHO ARE ALSO (I) INVESTMENT PROFESSIONALS, AS SUCH TERM IS DEFINED IN ARTICLE 19(5) OF THE FINANCIAL SERVICES AND MARKETS ACT 2000 (FINANCIAL PROMOTION) ORDER 2005, AS AMENDED (THE "FINANCIAL PROMOTION ORDER") OR (I) HIGH NET WORTH ENTITIES, AND OTHER PERSONS TO WHOM IT MAY LAWFULLY BE COMMUNICATED, FALLING WITHIN ARTICLE 49(2)(A) TO (D) OF THE FINANCIAL PROMOTION ORDER (ALL SUCH PERSONS TOGETHER BEING REFERRED TO AS "RELEVANT PERSONS"). THIS OFFICIAL STATEMENT IS DIRECTED ONLY AT RELEVANT PERSONS AND MUST NOT BE ACTED ON OR RELIED ON BY PERSONS WHO ARE NOT RELEVANT PERSONS, INCLUDING IN CIRCUMSTANCES IN WHICH SECTION 21(1) OF THE FSMA APPLIES TO THE ISSUER. THIS OFFICIAL STATEMENT AND ITS CONTENTS ARE CONFIDENTIAL AND SHOULD NOT BE DISTRIBUTED, PUBLISHED OR REPRODUCED (IN WHOLE OR IN PART) OR DISCLOSED BY RECIPIENTS TO ANY OTHER PERSONS IN THE UNITED KINGDOM. IN THE UNITED KINGDOM, ANY INVESTMENT OR INVESTMENT ACTIVITY TO WHICH THIS OFFICIAL STATEMENT RELATES IS AVAILABLE ONLY TO RELEVANT PERSONS AND WILL BE ENGAGED IN ONLY WITH RELEVANT PERSONS. ANY PERSON WHO IS NOT A RELEVANT PERSON SHOULD NOT ACT OR RELY ON THIS OFFICIAL STATEMENT OR ANY OF ITS CONTENTS.

NOTICE TO PROSPECTIVE INVESTORS IN HONG KONG

THE BONDS (EXCEPT FOR BONDS WHICH ARE A "STRUCTURED PRODUCT" AS DEFINED IN THE SECURITIES AND FUTURES ORDINANCE (CAP. 571 OF THE LAWS OF HONG KONG) ("SECURITIES AND FUTURES ORDINANCE")) MAY NOT BE OFFERED OR SOLD IN HONG KONG BY MEANS OF ANY DOCUMENT OTHER THAN (I) IN CIRCUMSTANCES WHICH DO NOT CONSTITUTE AN OFFER TO THE PUBLIC WITHIN THE MEANING OF THE COMPANIES (WINDING UP AND MISCELLANEOUS PROVISIONS) ORDINANCE (CAP. 32 OF THE LAWS OF HONG KONG) ("COMPANIES (WINDING UP AND MISCELLANEOUS PROVISIONS) ORDINANCE") OR (II) TO "PROFESSIONAL INVESTORS" AS DEFINED IN THE SECURITIES AND FUTURES ORDINANCE AND ANY RULES MADE THEREUNDER, OR (III) IN OTHER CIRCUMSTANCES WHICH DO NOT RESULT IN THE DOCUMENT BEING A "PROSPECTUS" AS DEFINED IN THE COMPANIES (WINDING UP AND MISCELLANEOUS PROVISIONS) ORDINANCE, AND NO ADVERTISEMENT, INVITATION OR DOCUMENT RELATING TO THE BONDS MAY BE ISSUED OR MAY BE IN THE POSSESSION OF ANY PERSON FOR THE PURPOSE OF ISSUE (IN EACH CASE WHETHER IN HONG KONG OR ELSEWHERE), WHICH IS DIRECTED AT, OR THE CONTENTS OF WHICH ARE LIKELY TO BE ACCESSED OR READ BY, THE PUBLIC OF HONG KONG (EXCEPT IF PERMITTED TO DO SO UNDER THE SECURITIES LAWS OF HONG KONG) OTHER THAN WITH RESPECT TO BONDS WHICH ARE OR ARE INTENDED TO BE DISPOSED OF ONLY TO PERSONS OUTSIDE HONG KONG OR ONLY TO "PROFESSIONAL INVESTORS" AS DEFINED IN THE SECURITIES AND FUTURES ORDINANCE AND ANY RULES MADE THEREUNDER.

NOTICE TO INVESTORS IN SWITZERLAND

THE BONDS MAY NOT BE PUBLICLY OFFERED IN SWITZERLAND AND WILL NOT BE LISTED ON THE SIX SWISS EXCHANGE ("SIX") OR ON ANY OTHER STOCK EXCHANGE OR REGULATED TRADING FACILITY IN SWITZERLAND. THIS OFFICIAL STATEMENT HAS BEEN PREPARED WITHOUT REGARD TO THE DISCLOSURE STANDARDS FOR ISSUANCE PROSPECTUSES UNDER ART. 652A OR ART. 1156 OF THE SWISS CODE OF OBLIGATIONS OR THE DISCLOSURE STANDARDS FOR LISTING PROSPECTUSES UNDER ART. 27 FF. OF THE SIX LISTING RULES OR THE LISTING RULES OF ANY OTHER STOCK EXCHANGE OR REGULATED TRADING FACILITY IN SWITZERLAND. NEITHER THIS OFFICIAL STATEMENT NOR ANY OTHER OFFERING OR MARKETING MATERIAL RELATING TO THE BONDS OR THE OFFERING MAY BE PUBLICLY DISTRIBUTED OR OTHERWISE MADE PUBLICLY AVAILABLE IN SWITZERLAND.

NONE OF THIS OFFICIAL STATEMENT OR ANY OTHER OFFERING OR MARKETING MATERIAL RELATING TO THE OFFERING, THE ISSUER OR THE BONDS HAVE BEEN OR WILL BE FILED WITH OR APPROVED BY ANY SWISS REGULATORY AUTHORITY. IN PARTICULAR, THIS OFFICIAL STATEMENT WILL NOT BE FILED WITH, AND THE OFFER OF THE BONDS WILL NOT BE SUPERVISED BY, THE SWISS FINANCIAL MARKET SUPERVISORY AUTHORITY ("FINMA"), AND THE OFFER OF BONDS HAS NOT BEEN AND WILL NOT BE AUTHORIZED UNDER THE SWISS FEDERAL ACT ON COLLECTIVE INVESTMENT SCHEMES ("CISA"). ACCORDINGLY, INVESTORS DO NOT HAVE THE BENEFIT OF THE SPECIFIC INVESTOR PROTECTION PROVIDED UNDER THE CISA.

NOTICE TO INVESTORS IN SINGAPORE

THIS OFFICIAL STATEMENT HAS NOT BEEN AND WILL NOT BE REGISTERED AS A PROSPECTUS WITH THE MONETARY AUTHORITY OF SINGAPORE. ACCORDINGLY, THIS OFFICIAL STATEMENT AND ANY OTHER DOCUMENT OR MATERIAL USED IN CONNECTION WITH THE OFFER OR SALE, OR INVITATION FOR SUBSCRIPTION OR PURCHASE, OF THE BONDS MAY NOT BE CIRCULATED OR DISTRIBUTED, NOR MAY THE BONDS BE OFFERED OR SOLD, OR BE MADE THE SUBJECT OF AN INVITATION FOR SUBSCRIPTION OR PURCHASE, WHETHER DIRECTLY OR INDIRECTLY, TO PERSONS IN SINGAPORE OTHER THAN (I) TO AN INSTITUTIONAL INVESTOR AS DEFINED IN SECTION 4A OF THE SECURITIES AND FUTURES ACT (CHAPTER 289) OF SINGAPORE, AS MODIFIED OR AMENDED FROM TIME TO TIME (THE "SFA") PURSUANT TO SECTION 274 OF THE SFA, (II) TO A RELEVANT PERSON PURSUANT (AS DEFINED IN SECTION 275(2) OF THE SFA) TO SECTION 275(1), OR ANY PERSON PURSUANT TO SECTION 275(1A), AND IN ACCORDANCE WITH THE CONDITIONS SPECIFIED IN SECTION 275, OF THE SFA; OR (III) OTHERWISE PURSUANT TO, AND IN ACCORDANCE WITH THE CONDITIONS OF, ANY OTHER APPLICABLE PROVISION OF THE SFA. WHERE THE BONDS ARE SUBSCRIBED OR PURCHASED UNDER SECTION 275 OF THE SFA BY A RELEVANT PERSON THAT IS: (A) A CORPORATION (WHICH IS NOT AN ACCREDITED INVESTOR (AS DEFINED IN SECTION 4A OF THE SFA)) THE SOLE BUSINESS OF WHICH IS TO HOLD INVESTMENTS AND THE ENTIRE SHARE CAPITAL OF WHICH IS OWNED BY ONE OR MORE INDIVIDUALS, EACH OF WHOM IS AN ACCREDITED INVESTOR; OR (B) A TRUST (WHERE THE TRUSTEE IS NOT AN ACCREDITED INVESTOR) WHOSE SOLE PURPOSE IS TO HOLD INVESTMENTS AND EACH BENEFICIARY OF THE TRUST IS AN INDIVIDUAL WHO IS AN ACCREDITED INVESTOR, SECURITIES OR SECURITIES-BASED DERIVATIVES CONTRACTS (EACH AS DEFINED IN SECTION 2(1) OF THE SFA) OF THAT CORPORATION OR THE BENEFICIARIES' RIGHTS AND INTEREST (HOWSOEVER DESCRIBED) IN THAT TRUST SHALL NOT BE TRANSFERRED WITHIN 6 MONTHS AFTER THAT CORPORATION OR THAT TRUST HAS ACQUIRED THE BONDS PURSUANT TO AN OFFER MADE UNDER SECTION 275 OF THE SFA EXCEPT: (I) TO AN INSTITUTIONAL INVESTOR OR TO A RELEVANT PERSON, OR TO ANY PERSON ARISING FROM AN OFFER REFERRED TO IN SECTION 275(1A) OR SECTION 276(4)(I)(B) OF THE SFA; (II) WHERE NO CONSIDERATION IS OR WILL BE GIVEN FOR THE TRANSFER; (III) WHERE THE TRANSFER IS BY OPERATION OF LAW; (IV) AS SPECIFIED IN SECTION 276(7) OF THE SFA; OR (V) AS SPECIFIED IN REGULATION 37A OF THE SECURITIES AND FUTURES (OFFERS OF INVESTMENTS) (SECURITIES AND SECURITIES-BASED DERIVATIVE CONTRACTS) REGULATIONS 2018 OF SINGAPORE.

NOTIFICATION UNDER SECTION 309B(1)(C) OF THE SFA

IN CONNECTION WITH SECTION 309B OF THE SFA AND THE SECURITIES AND FUTURES (CAPITAL MARKETS PRODUCTS) REGULATIONS 2018 OF SINGAPORE (THE "CMP REGULATIONS 2018"), THE ISSUER HAS DETERMINED, AND HEREBY NOTIFIES ALL RELEVANT PERSONS (AS DEFINED IN SECTION 309A(1) OF THE SFA), THAT THE BONDS ARE 'PRESCRIBED CAPITAL MARKETS PRODUCTS'(AS DEFINED IN THE CMP REGULATIONS 2018) AND ARE EXCLUDED INVESTMENT PRODUCTS (AS DEFINED IN MAS NOTICE SFA 04-N12: NOTICE ON THE SALE OF INVESTMENT PRODUCTS AND MAS NOTICE FAA-N16: NOTICE ON RECOMMENDATIONS ON INVESTMENT PRODUCTS).

NOTICE TO PROSPECTIVE INVESTORS IN TAIWAN

THE OFFER OF THE BONDS HAS NOT BEEN AND WILL NOT BE REGISTERED OR FILED WITH, OR APPROVED BY, THE FINANCIAL SUPERVISORY COMMISSION OF TAIWAN AND/OR OTHER REGULATORY AUTHORITY OF TAIWAN PURSUANT TO RELEVANT SECURITIES LAWS AND REGULATIONS, AND THE BONDS MAY NOT BE OFFERED, ISSUED OR SOLD IN TAIWAN THROUGH A PUBLIC OFFERING OR IN CIRCUMSTANCES WHICH CONSTITUTE AN OFFER WITHIN THE MEANING OF THE SECURITIES AND EXCHANGE ACT OF TAIWAN THAT REQUIRES THE REGISTRATION OR FILING WITH OR APPROVAL OF THE FINANCIAL SUPERVISORY COMMISSION OF TAIWAN. THE BONDS MAY BE MADE AVAILABLE OUTSIDE TAIWAN FOR PURCHASE BY INVESTORS RESIDING IN TAIWAN (EITHER DIRECTLY OR THROUGH PROPERLY LICENSED TAIWAN INTERMEDIARIES), BUT MAY NOT BE OFFERED OR SOLD IN TAIWAN EXCEPT TO QUALIFIED INVESTORS VIA A TAIWAN LICENSED INTERMEDIARY. ANY SUBSCRIPTIONS OF BONDS SHALL ONLY BECOME EFFECTIVE UPON ACCEPTANCE BY THE ISSUER OR THE RELEVANT DEALER OUTSIDE TAIWAN AND SHALL BE DEEMED A CONTRACT ENTERED INTO IN THE JURISDICTION OF INCORPORATION OF THE ISSUER OR RELEVANT DEALER, AS THE CASE MAY BE, UNLESS OTHERWISE SPECIFIED IN THE SUBSCRIPTION DOCUMENTS RELATING TO THE BONDS SIGNED BY THE INVESTORS.

NOTICE TO INVESTORS JAPAN

THE BONDS HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER THE FINANCIAL INSTRUMENTS AND EXCHANGE ACT OF JAPAN (NO. 25 OF 1948, AS AMENDED, THE “FIEA”). NEITHER THE BONDS NOR ANY INTEREST THEREIN MAY BE OFFERED OR SOLD, DIRECTLY OR INDIRECTLY, IN JAPAN OR TO, OR FOR THE BENEFIT OF, ANY “RESIDENT” OF JAPAN (AS DEFINED UNDER ITEM 5, PARAGRAPH 1, ARTICLE G OF THE FOREIGN EXCHANGE AND FOREIGN TRADE ACT (ACT NO. 228 OF 1949, AS AMENDED)), OR TO OTHERS FOR RE-OFFERING OR RESALE, DIRECTLY OR INDIRECTLY, IN JAPAN OR TO, OR FOR THE BENEFIT OF, ANY RESIDENT OF JAPAN, EXCEPT PURSUANT TO AN EXEMPTION FROM THE REGISTRATION REQUIREMENTS OF, AND OTHERWISE IN COMPLIANCE WITH, THE FIEA AND ANY OTHER APPLICABLE LAWS, REGULATIONS AND MINISTERIAL GUIDELINES OF JAPAN.

THE PRIMARY OFFERING OF THE BONDS AND THE SOLICITATION OF AN OFFER FOR ACQUISITION THEREOF HAVE NOT BEEN AND WILL NOT BE REGISTERED UNDER PARAGRAPH 1, ARTICLE 4 OF THE FIEA. AS IT IS A PRIMARY OFFERING, IN JAPAN, THE BONDS MAY ONLY BE OFFERED, SOLD, RESOLD OR OTHERWISE TRANSFERRED, DIRECTLY OR INDIRECTLY TO, OR FOR THE BENEFIT OF CERTAIN QUALIFIED INSTITUTIONAL INVESTORS AS DEFINED IN THE FIEA (“QIIS”). A QII WHO PURCHASED OR OTHERWISE OBTAINED THE BONDS CANNOT RESELL OR OTHERWISE TRANSFER THE BONDS IN JAPAN TO ANY PERSON EXCEPT ANOTHER QII.

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OFFICIAL STATEMENT SUMMARY

This summary is furnished to provide limited introductory information regarding the terms of the Bonds and is qualified by the more detailed descriptions appearing in this Official Statement and the appendices hereto. The offering of the Bonds is made only by means of this entire Official Statement, and no person is authorized to make offers to sell or solicit offers to buy the Bonds unless the entire Official Statement is delivered. Certain terms used in this summary are defined elsewhere in this Official Statement.

The City	The City of Philadelphia, Pennsylvania (the "City") is a corporation, body politic and city of the first class of the Commonwealth of Pennsylvania.
The Bonds	$201,530,000 City of Philadelphia, Pennsylvania Water and Wastewater Revenue Bonds and Revenue Refunding Bonds, Series 2020A (the "Tax-Exempt Bonds") and $95,025,000 City of Philadelphia, Pennsylvania Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B (the "Taxable Bonds" and together with the Tax-Exempt Bonds, the "Bonds"), as shown on the inside front cover page of this Official Statement.
Use of Proceeds	The Bonds are being issued to provide funds which, together with other available funds of the City, will be used to finance (i) capital improvements of the City's Water and Wastewater System, including capitalized interest, (ii) the refunding of all or a portion of the City's outstanding Bonds set forth on Schedule 1 hereto and (iii) the costs of issuance relating to the Bonds. See "PLAN OF FINANCE" and "ESTIMATED SOURCES AND USES OF FUNDS" contained herein.
Maturity	The Bonds mature on the dates in the principal amounts set forth in the inside cover page hereof.
Interest	Interest on the Bonds accrues from their date of delivery and is payable on May 1 and November 1, commencing November 1, 2020, until maturity or earlier redemption.
Redemption	The Bonds are subject to optional and mandatory sinking fund redemption prior to maturity as described herein. See "THE BONDS – Redemption Provisions" contained herein.
Ratings	Fitch Ratings, Inc. ("Fitch"), Moody's Investors Service, Inc. ("Moody's") and S&P Global Ratings ("S&P") have assigned credit ratings of "A+", "A1" and "A+", respectively, to the Bonds. See "RATINGS" contained herein.
Security for the Bonds	The Bonds, together with other Water and Wastewater Revenue Bonds currently outstanding or hereafter issued under the General Ordinance, are revenue bonds secured by and payable from (i) all rents, rates, fees and charges imposed or charged for connection to, or use or product of or services generated by the System to the ultimate users thereof, (ii) all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, (iii) all subsidies or payments payable by federal, state or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on monies borrowed to finance costs chargeable to the System, (iv) all grants, payments and contributions made in aid or on account of the System exclusive of grants and similar payments and contributions solely in aid of construction and (v) all accounts, contract rights and general intangibles representing the foregoing (collectively referred to as, the "Project Revenues").

The City pledges, assigns and grants to the Fiscal Agent, in trust for the security and payment of all Water and Wastewater Revenue Bonds, a lien on and security interest in all Project Revenues and all amounts on deposit in or standing to the credit of the Water and Wastewater Funds (other than the Rebate Fund), for the equal and ratable benefit of all present and future holders of Water and Wastewater Revenue Bonds (other than Subordinated Bonds) issued under the General Ordinance. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS" contained herein.

Debt Reserve Account	On the date of issuance of the Bonds, the City will deposit a portion of the proceeds of the Bonds in the Debt Reserve Account in an amount sufficient to the Debt Reserve Requirement for all Water and Wastewater Revenue Bonds outstanding after the issuance of the Bonds. If at any time and for any reason, the monies in the Debt Service Account of the Sinking Fund are insufficient to pay as and when due, the principal of (and premium, if any) or interest on any Water and Wastewater Revenue Bond, the Fiscal Agent is authorized and directed to withdraw from the Debt Reserve Account and pay over the amount of such deficiency for deposit in the Debt Service Account. As of June 30, 2020, the balance of cash and investments in the Debt Reserve Account was $212,188,343.11, which was in excess of the Debt Reserve Requirement on such date. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Debt Reserve Account." See also "INTRODUCTORY STATEMENT – Amendments to General Ordinance."
Parity Bonds	All Water and Wastewater Revenue Bonds are equally and ratably secured under the General Ordinance.
Rate Covenant	The City covenants to Bondholders that it will establish rents, rates, fees and charges for the use of the System sufficient to yield Net Revenues in each Fiscal Year at least equal to 1.20 times the Debt Service Requirements for such Fiscal Year. In addition, the City covenants with Bondholders that Net Revenues, in each Fiscal Year, will be at least equal to (A) 90% of the Debt Service Requirements for each Fiscal Year (recalculated to exclude principal and interest payments in respect of Subordinated Bonds and transfers from the Rate Stabilization Fund), and (B) 1.00 times the following, referred to as "total debt service" for such Fiscal Year: (i) the Debt Service Requirements; (ii) amounts required to be deposited into the Debt Reserve Account; (iii) debt service payable on General Obligation Bonds issued for the System; (iv) debt service due on Interim Debt; and (v) the Capital Account Deposit Amount, less any amounts transferred from the Residual Fund to the Capital Account. As of the date hereof, no General Obligation Bonds issued for the System are outstanding, no Interim Debt is outstanding and no Subordinated Bonds are outstanding. See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Rate Covenant" contained herein.
Springing Amendments	Ordinance No. 171110-A, signed by the Mayor on April 24, 2018, includes certain amendments to the General Ordinance (the "Springing Amendments") that will become effective upon the consent of the holders of at least 67% of Water and Wastewater Revenue Bonds outstanding. See "INTRODUCTORY STATEMENT – Amendments to General Ordinance" herein and APPENDIX III-A and APPENDIX III-B hereof. **By virtue of their purchase, holders of the Bonds will be deemed to have consented to the Springing Amendments. The consent of the holders of 67% of Water and Wastewater Bonds outstanding will <u>not</u> be satisfied upon the issuance of the Bonds.** As of June 30, 2020, the consent of 27% of the holders of Water and Wastewater Revenue Bonds has been obtained.

Consulting Engineer's Report	Arcadis U.S., Inc. ("Arcadis") has performed engineering evaluations of the current condition and financial operations of the System providing the basis for the required findings that Net Revenues are sufficient to comply with the Rate Covenant and that the System is in good operating condition. See "INTRODUCTORY STATEMENT – Consulting Engineer's Report" and APPENDIX II for a copy of the Engineering Report.
Book-Entry Only System	The Bonds are initially issuable only to Cede & Co., the nominee of The Depository Trust Company, New York, New York ("DTC"), pursuant to a book-entry only system. No physical delivery of the Bonds will be made to the beneficial owners of the Bonds. Principal of and interest on the Bonds will be paid to Cede & Co., which will distribute such payments to the participating members of DTC for remittance to the beneficial owners of the Bonds. See APPENDIX VIII herein.
No Payment Defaults	The City has never failed to make a payment of principal of or interest on its Water and Wastewater Revenue Bonds.
Fiscal Agent/Registrar	The Fiscal Agent and registrar for the Bonds is U.S. Bank National Association, Philadelphia, Pennsylvania.
Tax Matters	In the opinion of Co-Bond Counsel, interest on the Tax-Exempt Bonds is excludable from gross income for purposes of federal income tax, assuming continuing compliance with the requirements of the federal tax law. Interest on the Tax-Exempt Bonds is not an item of tax preference for purposes of federal alternative minimum tax. Co-Bond Counsel is of the opinion that interest on the Taxable Bonds is not excludable from gross income for federal income tax purposes. Co-Bond Counsel is also of the opinion that the interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax under the laws of the Commonwealth of Pennsylvania as enacted and construed on the date of initial delivery of the Bonds. See "TAX MATTERS" herein.
Investment Considerations	For certain investment considerations relating to the decision to purchase the Bonds, see "CERTAIN INVESTMENT CONSIDERATIONS."

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OFFICIAL STATEMENT
relating to

$296,555,000
CITY OF PHILADELPHIA, PENNSYLVANIA

$201,530,000 Water and Wastewater Revenue Bonds and Revenue Refunding Bonds, Series 2020A	$95,025,000 Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B

INTRODUCTORY STATEMENT

General

This Official Statement, including the cover page, inside front cover page and appendices attached hereto, sets forth certain information in connection with the issuance by the City of Philadelphia, Pennsylvania, a corporation, body politic and city of the first class existing under the laws of the Commonwealth of Pennsylvania (the "City") of its Bonds. Capitalized terms used but not otherwise defined in this Official Statement have the meanings ascribed to them in APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Certain Definitions."

The Bonds are being issued to provide funds which, together with other available funds of the City, will be used to finance (i) capital improvements of the City's Water and Wastewater System, including capitalized interest, (ii) the refunding of all or a portion of the City's outstanding Bonds set forth on Schedule 1 hereto and (iii) the costs of issuance relating to the Bonds. See "PLAN OF FINANCE" and "ESTIMATED SOURCES AND USES OF FUNDS" herein.

The Bonds are being issued under (i) The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972 (the "Act") and (ii) the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989, approved by the Mayor June 24, 1993 (the "Restated General Ordinance"), as supplemented and amended from time to time, including by the Eighteenth Supplemental Ordinance approved by the Mayor on December 8, 2015 (the "Eighteenth Supplemental Ordinance"), and the Twentieth Supplemental Ordinance approved by the Mayor on April 18, 2018 (the "Twentieth Supplemental Ordinance"), which provide specific authority for the issuance of the Bonds. The Restated General Ordinance, as supplemented or amended from time to time, is referred to as the "General Ordinance." All bonds issued under the General Ordinance (whether prior to or following the date hereof) are referred to herein as "Water and Wastewater Revenue Bonds." U.S. Bank National Association, Philadelphia, Pennsylvania, is acting as Fiscal Agent (the "Fiscal Agent") for the Water and Wastewater Revenue Bonds.

The Water Department

Pursuant to the Philadelphia Home Rule Charter (the "Charter"), the City's Water Department (the "Water Department") has the power and duty to operate, maintain, repair and improve the City's water system (the "Water System") and the City's wastewater system (the "Wastewater System" and together with the Water System, the "Water and Wastewater Systems" or the "System"). The Water Department, which began water service in the 1800's, supplies water and wastewater services to customers within the City and has one wholesale water contract and ten wholesale wastewater contracts with entities outside the City. Under the General Ordinance, the Water and Wastewater Systems are treated as one combined utility for the purpose of revenue bond financing. See "THE WATER DEPARTMENT" herein.

Rate Covenant Under the General Ordinance

Under the General Ordinance, the City must set rates and charges at levels that provide sufficient revenue to meet Operating Expenses (defined herein) of the System, including Interfund Charges (defined herein) for services provided to the Water Department, and Debt Service Requirements on all obligations issued for the Water Department, as well as to meet other specific covenants contained in the General Ordinance. For a more detailed discussion, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Rate Covenant" and "RATES" contained herein.

Recent Amendments to General Ordinance

Ordinance No. 171110-A, signed by the Mayor on April 24, 2018 (the "Twenty-First Supplemental Ordinance") includes amendments to the General Ordinance. Certain amendments became effective when the Mayor signed the Twenty-First Supplemental Ordinance, which are summarized in APPENDIX III-A – SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS. This includes the addition of a covenant that the City will, at a minimum, impose, charge and collect in each Fiscal Year such water and wastewater rents, rates, fees and charges as shall yield Net Revenues (defined herein but, for purposes of this covenant particularly, calculated to exclude any amounts transferred from the Rate Stabilization Fund to the Revenue Fund in, or as of the end of, such Fiscal Year) which will be equal to at least 0.90 times Debt Service Requirements for such Fiscal Year (excluding principal and interest payments in respect of Subordinated Bonds and transfers from the Rate Stabilization Fund). This also includes a clarification of the definition of "Debt Reserve Requirement" to remove some ambiguity concerning the method of calculation.

Certain other amendments (the "Springing Amendments") will become effective upon the consent of the holders of at least 67% of Water and Wastewater Revenue Bonds outstanding (the "67% Effective Date"), and are described below. See APPENDIX III-B – TWENTY-FIRST SUPPLEMENTAL ORDINANCE.

By virtue of their purchase, holders of the Bonds will be deemed to have consented to the Springing Amendments. The consent of the holders of 67% of Water and Wastewater Revenue Bonds outstanding will <u>not</u> be satisfied upon the issuance of the Bonds.

On the 67% Effective Date, the Springing Amendments contained in the Twenty-First Supplemental Ordinance will amend the General Ordinance as follows.

1. In Section 2.01, amend the definitions of "Credit Facility" and "Substitute Credit Facility" to remove the minimum rating threshold for a Credit Facility and a Substitute Credit Facility provider.

2. In Section 2.01, amend the definition of "Rating Agency" to include any rating service that has a rating in effect for the Water and Wastewater Revenue Bonds at the subject time.

3. Amend Section 4.09 to allow the City, pursuant to the Supplemental Ordinance authorizing the issuance of a Series of Water and Wastewater Revenue Bonds, to establish a separate debt reserve subaccount in the Debt Reserve Account to secure such Series of Water and Wastewater Revenue Bonds (and only such Series) in lieu of a deposit to the Debt Reserve Account in respect of such Series of Water and Wastewater Revenue Bonds, upon receipt of a rating confirmation from any one Rating Agency then rating the Water and Wastewater Revenue Bonds that such action, in and of itself, will not result in a downgrade, suspension or withdrawal of the credit rating on any Water and Wastewater Revenue Bonds Outstanding.

4. Further amend Section 4.09 to allow the City, pursuant to the Supplemental Ordinance authorizing the issuance of a Series of Water and Wastewater Revenue Bonds, to provide for no deposit to the Debt Reserve Account and no establishment of a Series-specific debt reserve subaccount in respect of a Series of Water and Wastewater Revenue Bonds, upon receipt of a rating confirmation from

any one Rating Agency then rating the Water and Wastewater Revenue Bonds that such action, in and of itself, will not result in a downgrade, suspension or withdrawal of the credit rating on any Water and Wastewater Revenue Bonds Outstanding.

5. In connection with #3 and #4 above, add the definitions "Series Debt Reserve Requirement" and "Series Debt Reserve Subaccount" to Section 2.01.

6. Further amend Section 4.09 to permit the City to transfer any excess in the Debt Reserve Account or subaccount thereof directly to (i) the Sinking Fund or a refunding escrow to pay the Debt Service Requirements or redemption price, as applicable, on Water and Wastewater Revenue Bonds secured by such account or subaccount, or (ii) if such moneys do not constitute tax-exempt bond proceeds, the Residual Fund for the purposes thereof.

7. Further amend Section 4.09 to permit the City, in connection with the issuance of refunding bonds pursuant to Section 5.04(g) of the General Ordinance, to transfer amounts from the Debt Reserve Account or a subaccount held by the Fiscal Agent in respect of the Water and Wastewater Revenue Bonds being refunded to the Debt Reserve Account or a subaccount to satisfy any debt reserve requirements in respect of such refunding bonds.

8. Amend the provisions of Section 4.09 relating to the City's right to deposit into the Debt Reserve Account, to meet the Debt Reserve Requirement, a surety bond, irrevocable letter of credit or insurance policy (a "Debt Reserve Facility"), to qualify a Debt Reserve Facility whose provider has a current long-term rating in at least the "A" category from one Rating Agency at the time the Debt Reserve Facility is obtained by the City. In the event that after the City has deposited cash into the Debt Reserve Account as required in connection with a Debt Reserve Facility rating reduction or suspension, but prior to any cancellation thereof, such Debt Reserve Facility meets the rating criteria described above, no excess of the Debt Reserve Requirement will result for purposes of calculating the Debt Reserve Requirement.

9. Amend Section 5.01 of the General Ordinance concerning the determination of Debt Service Requirements relating to Variable Rate Bonds for the purposes of meeting the Rate Covenant and the requirements for issuing additional Water and Wastewater Revenue Bonds, and concerning the determination of the Debt Reserve Requirement relating to variable rate bonds.

10. In connection with #9 above, (i) amend the definition of "Debt Service Requirements" in, and (ii) add a definition of "Balloon Bonds" to, Section 2.01.

As of June 30, 2020, the consent of 27% of the holders of Water and Wastewater Revenue Bonds has been obtained. As stated above, the consent of 67% of such holders is required for the Springing Amendments to become effective.

See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Debt Reserve Account – *Springing Amendments*" herein and APPENDIX III-A and APPENDIX III-B of this Official Statement for additional description of the Springing Amendments and other amendments; and see APPENDIX III-B of this Official Statement for a copy of the Twenty-First Supplemental Ordinance.

Rate Ordinance and Ratemaking Board

Ordinance No. 130251-A (the "Rate Ordinance") amended the Philadelphia Code to establish an independent rate-making body known as the Philadelphia Water, Sewer, and Stormwater Rate Board (the "Rate Board") responsible for fixing and regulating rates and charges for supplying water, sewer and stormwater services. For a further discussion of the Rate Ordinance, see "RATES – Charter Amendment and Rate Ordinance."

Security and Sources of Payment for the Bonds

The Bonds, equally and ratably with all Water and Wastewater Revenue Bonds (other than Subordinated Bonds), are payable from and secured by a pledge of all Project Revenues and amounts on deposit in the Water and Wastewater Funds (other than the Rebate Fund). See "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS" herein and APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance."

Under the General Ordinance, a Debt Reserve Account of the Sinking Fund has been established to secure the Water and Wastewater Revenue Bonds, other than Subordinated Bonds (of which none currently are outstanding). On the date of issuance of the Bonds, the City will deposit a portion of the proceeds of the Bonds in the Debt Reserve Account in an amount sufficient to meet the Debt Reserve Requirement for all Water and Wastewater Revenue Bonds outstanding after the issuance of the Bonds. For a discussion of the Debt Reserve Account, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Debt Reserve Account" herein.

Consulting Engineer's Report

In connection with the enactment of the Supplemental Ordinance authorizing the issuance of future series of Water and Wastewater Revenue Bonds, Arcadis U.S., Inc. (the "Consulting Engineer") has delivered to the City its engineering report dated April 1, 2019 (the "Original Report"), as supplemented by the letter dated July 7, 2020 (the "Letter"), which, among other things, describes certain personnel changes and concludes that the financial conclusions in the Original Report remain unchanged. The Original Report and the Letter are referred to as the "Engineering Report" herein. A copy of the Engineering Report is attached hereto and incorporated herein by reference as APPENDIX II. The assessments concerning the condition and current and future financial operations of the System contained in the Engineering Report provide the basis for the following findings: (i) that Project Revenues (including the projected increases in service revenue indicated in the Engineering Report) will be sufficient to meet payment or deposit requirements of the operation, maintenance, repair and replacement of the System, reserve funds, and principal or redemption price of and interest on outstanding Water and Wastewater Revenue Bonds (including the Bonds); (ii) that Net Revenues (including the projected increases in service revenue indicated in the Engineering Report) are currently sufficient to comply with the Rate Covenant and are projected to be sufficient to comply with the Rate Covenant for the two Fiscal Years following Fiscal Year 2020 and Fiscal Year 2021; and (iii) that the System is in good operating condition or that adequate steps are being taken to return it to good operating condition.

Capital Improvement Program

As required by the Charter, the Water Department has adopted a six-year capital improvement program to plan and manage the capital investments necessary to fulfill the Water Department's service missions, comply with regulatory requirements and preserve and upgrade the System (the "Water Capital Improvement Program"). The Water Department updates the Water Capital Improvement Program annually as part of its yearly budget process, based on a detailed project review by engineering staff, external engineering consultants, and senior management. For a more detailed discussion of the Water Capital Improvement Program and the Water Department's capital budgeting process, see "CAPITAL IMPROVEMENT PROGRAM" herein.

Financial Information

The operations of the Water Department are accounted for in the Water Fund, which is an enterprise fund of the City. The Water Fund is an accounting convention established pursuant to the Charter to account for the assets, liabilities, revenues, expenses of, and to measure Rate Covenant compliance for, the Water and Wastewater System.

The City is required by the Charter to issue, within 120 days after the close of each Fiscal Year, a statement as of the end of the Fiscal Year showing the balances in all funds of the City, the amounts of the City's known liabilities, and such other information as is necessary to furnish a true picture of the City's financial condition (the "Annual Financial Report"). The Annual Financial Report, which is released on or about October 28 of each year, is intended to meet these requirements and is unaudited. The Annual Financial Report contains financial statements for all City governmental funds and blended component units presented on the modified accrual basis. The Annual Financial Report also contains a budgetary comparison schedule for the Water Fund in the supplementary information. The City released the Annual Financial Report for Fiscal Year 2019 on or about October 26, 2019.

The City reports its financial performance for each Fiscal Year on a consolidated basis in its audited Comprehensive Annual Financial Report ("CAFR"), which is published not later than February 28 of each year. The City's CAFR for Fiscal Year 2019, which includes audited financials of and other information relating to the Water Fund, was filed on the Electronic Municipal Market Access System of the Municipal Securities Rulemaking Board ("MSRB") on February 25, 2020 and is available at http://www.emma.msrb.org. The City Controller has examined and expressed opinions on the basic financial statements of the City contained in the CAFR for Fiscal Year 2019. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – City Finances and Financial Procedures – Independent Audit and Opinion of the City Controller."

The financial statements of the Water Fund for the Fiscal Year ended June 30, 2019, attached hereto as APPENDIX I, are derived from the CAFR for the Fiscal Year ended June 30, 2019. The financial statements pertaining to the Water Fund are derived from the CAFR in order to present the financial condition of the Water Fund separately from the financial condition of the City and its other funds and units as a whole. The City Controller has neither examined nor expressed an opinion on the financial statements of the Water Fund contained in APPENDIX I to this Official Statement or on any other financial data contained in this Official Statement, except as noted in the preceding paragraph as to the CAFR.

The City Controller has neither participated in the preparation of this Official Statement nor in the preparation of the budget estimates and projections and cash flow statements and forecasts set forth in various tables contained in this Official Statement except as noted regarding the CAFR. The City Controller expresses no opinion with respect to any of the data contained in this Official Statement.

COVID-19 Response

General. On January 31, 2020, the United States Department of Health and Human Services declared a public health emergency for the United States to aid the nation's health care community in responding to the novel strain of coronavirus ("COVID-19"). On March 11, 2020, the World Health Organization declared the COVID-19 outbreak a global pandemic, and on March 13, 2020, the President of the United States declared a national state of emergency.

Due to the increase in the number of COVID-19 cases around the country and internationally, federal, state, and local bodies have enacted legislation, and other administrative orders, directives and guidance to mitigate the impacts of COVID-19 on the general population and the economy. On March 6, 2020, the Governor declared a disaster emergency in the Commonwealth of Pennsylvania followed by an order on March 19, 2020 closing all non-life-sustaining businesses in the Commonwealth. On April 1, 2020, the Governor issued a stay at home order for all counties in the Commonwealth for all activities, except as needed to access, support, or provide life sustaining business, emergency, or government services. Since then, the stay at home order has been lifted, and the Governor has reopened businesses in Pennsylvania using a data-driven, three-phase approach on a county-by-county basis; however, restrictions and operational limitations continue for certain parts of the Commonwealth. The conditions remain fluid and any or all counties in the Commonwealth may return to a stay at home status if conditions warrant, as determined by the Pennsylvania Department of Health and the Governor.

The Mayor and City Council also have taken various emergency measures and other actions to respond to the spread of COVID-19 in the City. On March 22, 2020, the Mayor issued a stay at home order temporarily prohibiting operation of non-essential business and gatherings of people outside a single household. Currently, certain restrictions remain in effect.

The City continues to closely monitor and assess the effects of the COVID-19 pandemic and its impact on the City's financial position and operations. The complete fiscal impact of COVID-19 on the City is likely to change significantly as the situation further develops and cannot be fully quantified at this time. For more information on the City's response to COVID-19 and the related financial impact on the City, see APPENDIX IV – "OVERVIEW – Fiscal Health of the City – COVID-19."

Measures Implemented by the Water Department. On March 25, 2020, the City notified the PADEP of its intent to seek an extension for compliance with its 10-year obligations under the Consent Order and Agreement citing a force majeure event on account of the COVID-19 pandemic. See "THE SYSTEM – Environmental Compliance – Combined Sewer Overflow Program" herein. The City has imposed a moratorium on shut-offs and disconnections during the pendency of the COVID-19 pandemic. Currently, the moratorium is in place until August 31, 2020. As of July 6, 2020, the following accounts are eligible for shut-off but have not been disconnected due to the moratorium: 5,658 commercial accounts, 56,755 residential account and 2,532 TAP accounts, for a total of 64,945 accounts. To control costs during the pandemic, the Water Department has instituted a hiring freeze and has significantly decreased travel and other reimbursable expenses. The Water Department will also be postponing the implementation of certain non-critical capital projects to focus on critical system upgrades and maintenance. See "CAPITAL IMPROVEMENT PROGRAM – Table 6 – Top Fifteen Active Capital Projects by Estimated Cost" and " – Water Main Replacement" and " – Sewer Replacement and Renewal" herein. In addition, the Water Department reduced its Fiscal Year 2021 budget by approximately $25 million upon the City's request for the submittal of revised budgets on the part of all City departments in light of the COVID-19 pandemic. See "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – The Water Department's Budget" herein.

Miscellaneous

Brief descriptions of the Water Department, the Bonds and the security therefor, and certain information about the City are included herein. All references herein to the Act, the Charter, the General Ordinance and the Engineering Report are qualified in all respects by reference to each such document in its entirety. The Annual Financial Report, the CAFR, and the financial statements of the Water Fund are available on the City's Investor Website at http://www.phila.gov/investor (the "City's Investor Website").

The "Terms of Use" statement of the City's Investor Website, which applies to all users of the City's Investor Website, provides, among other things, that the information contained therein is provided for the convenience of the user, that the City is not obligated to update such information, and that the information may not provide all information that may be of interest to investors. The information contained on the City's Investor Website does not constitute an offer to buy or sell securities, nor is it a solicitation therefor. The information contained in the City's Investor Website is not incorporated by reference in this Official Statement and persons considering the purchase of the Bonds should rely only on information contained in this Official Statement or incorporated by reference herein.

The foregoing statement as to filing or furnishing of additional information reflects the City's current practices but is not a contractual obligation to the holders of the City's bonds. The foregoing information is furnished solely to provide limited introductory information with respect to the Bonds and does not purport to be comprehensive or definitive. All such information is qualified in its entirety by reference to the more detailed descriptions appearing elsewhere in this Official Statement, inclusive of the Appendices, which should be read in its entirety, and to the complete documents referenced herein. The sale of the Bonds is made only by means of this entire Official Statement.

The financial statements of the Water Fund are attached hereto as APPENDIX I. The Engineering Report is attached hereto as APPENDIX II. Summaries of certain provisions of the Act, the General Ordinance, the Eighteenth Supplemental Ordinance and the Twentieth Supplemental Ordinance (including definitions of certain terms), are attached hereto as APPENDIX III-A. A copy of the Twenty-First Supplemental Ordinance is attached hereto as APPENDIX III - B. A description of the Government and Financial Information of the City is attached hereto as APPENDIX IV. The City of Philadelphia Socioeconomic Information is attached hereto as APPENDIX V. The form of approving opinion of Co-Bond Counsel to be delivered in connection with the issuance and delivery of the Bonds is attached hereto as APPENDIX VI. The form of Continuing Disclosure Agreement relating to the Bonds is attached hereto as APPENDIX VII. Information relating to the Depository Trust Company is attached hereto as APPENDIX VIII.

PLAN OF FINANCE

The City is issuing the Bonds to provide funds, which together with other available funds of the City, will be used to finance (i) capital improvements of the City's Water and Wastewater System, including capitalized interest, (ii) the current refunding of the City's outstanding Water and Wastewater Revenue Bonds, Variable Rate Series 1997B and Water and Wastewater Revenue Bonds, Series 2010C (collectively, the "Current Refunded Bonds"), as set forth on Schedule 1, (iii) the advance refunding of all or a portion of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2011B, Water and Wastewater Revenue Refunding Bonds, Series 2012 and Water and Wastewater Revenue Refunding Bonds, Series 2013A (the "Advance Refunded Bonds" and together with the Current Refunded Bonds, the "Refunded Bonds"), as set forth on Schedule 1, (iv) the costs of issuance relating to the Tax-Exempt Bonds and (v) the costs of issuance relating to the Taxable Bonds.

A portion of the proceeds of the Taxable Bonds will be (i) deposited in an escrow fund established under an Escrow Deposit Agreement dated as of the date of delivery of the Bonds (the "Escrow Agreement"), between the City and U.S. Bank National Association, as escrow agent, and (ii) invested in non-callable United States Treasury securities ("Government Obligations"). The maturing principal of and interest on the Government Obligations, together with cash held under the Escrow Agreement, will be applied to the payment of the interest on the Advance Refunded Bonds until redemption and the redemption price of the Advance Refunded Bonds on the date fixed for the redemption of the Advance Refunded Bonds, as described in the preceding paragraph. See "VERIFICATION" herein.

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ESTIMATED SOURCES AND USES OF FUNDS

The following table sets forth estimated sources and uses of the proceeds of the Bonds.

Sources of Funds	Total
Tax-Exempt Bonds	
Principal Amount	$201,530,000.00
Original Issue Premium	56,887,100.50
Taxable Bonds	
Principal Amount	95,025,000.00
Total Sources of Funds	$353,442,100.50
Uses of Funds	
Tax-Exempt Bonds	
Deposit to Bond Proceeds Account of Construction Fund	$200,000,000.00
Deposit to Debt Service Account of the Sinking Fund for capitalized interest	19,074,586.81
Deposit to respective redemption accounts of the Sinking Fund*	37,848,371.15
Costs of Issuance**	1,494,142.54
Taxable Bonds	
Deposit to escrow fund***	94,343,335.67
Costs of Issuance**	681,664.33
Total Uses of Funds	$353,442,100.50

* Reflects deposit to be used to refund the Current Refunded Bonds.
** Includes Underwriters' discount; legal, printing, rating agency, consultant, Fiscal Agent and financial advisor fees; and other expenses of the issuance and offering of the Bonds.
*** Reflects deposit to be used to refund the Advance Refunded Bonds.

THE BONDS

General

The Bonds will be issued in the aggregate principal amount, will be dated, will bear interest at the rates and will mature on the dates and in the amounts shown on the inside front cover page of this Official Statement. The Bonds will be issued in fully-registered form, registered in the name of Cede & Co., as nominee of The Depository Trust Company ("DTC") pursuant to DTC's Book-Entry Only System. See APPENDIX VIII herein.

The Bonds will be issued in denominations of $5,000 or any integral multiple thereof. Interest on the Bonds, calculated on the basis of a 360-day year comprised of twelve 30-day months, will be payable semiannually on May 1 and November 1 of each year, commencing November 1, 2020 (each, an "Interest Payment Date"). The Record Date for the Bonds will be each April 15 and October 15.

Redemption Provisions

Optional Redemption. The Tax-Exempt Bonds maturing on or after November 1, 2035 are subject to optional redemption prior to maturity on or after November 1, 2030, at the option of the City, as a whole at any time or in part from time to time in the maturities selected by the City and within a maturity and a given interest rate, if applicable, by lot as determined by the Fiscal Agent at the redemption price of 100% of the principal amount of the Tax-Exempt Bonds to be redeemed, plus accrued interest to the redemption date.

The Taxable Bonds maturing on or after November 1, 2031 are subject to optional redemption prior to maturity on or after November 1, 2030, at the option of the City, as a whole at any time or in part from time to time in the maturities selected by the City and within a maturity and a given interest rate, if applicable, by lot as determined by the Fiscal Agent at the redemption price of 100% of the principal amount of the Taxable Bonds to be redeemed, plus accrued interest to the redemption date

Mandatory Sinking Fund Redemption. The Tax-Exempt Bonds maturing on November 1, 2045 and November 1, 2050 are subject to mandatory sinking fund redemption prior to maturity, as drawn by lot by the Fiscal Agent, in the following years at a redemption price equal to 100% of the principal amounts set forth below.

Tax-Exempt Bonds Maturing November 1, 2045

Year	Principal Amount
2041	$23,485,000
2042	24,690,000
2043	7,900,000
2044	8,300,000
2045†	8,725,000

†Final maturity

Tax-Exempt Bonds Maturing November 1, 2050

Year	Principal Amount
2046	$ 9,175,000
2047	9,640,000
2048	10,145,000
2049	10,655,000
2050†	11,210,000

†Final maturity

The principal amount of the Bonds required to be redeemed on each mandatory sinking fund redemption date may be reduced by the principal amount of the Bonds theretofore redeemed (otherwise than by mandatory sinking fund redemption) or delivered to the Fiscal Agent for cancellation, and not theretofore applied as a credit against any mandatory sinking fund redemption obligation. Any such reduction will be applied as a credit against the mandatory sinking fund obligation for the year or years selected by the City.

Notice of Redemption

Notice of the call for any redemption of Bonds prior to maturity shall be given in the name of the City and shall contain the following information: "CUSIP" number; and, in the case of a partial redemption of any Bond, the certificate number and the respective principal amounts of the Bonds to be redeemed; the publication date; the redemption date; the redemption price and the name and address of the redemption agent, and shall further identify the Bonds by date of issue, interest rate and maturity date. Such notice shall be given by the Fiscal Agent by depositing a copy of the notice of redemption in the United States mail, first-class, postage prepaid, at least 20 days and not more than 60 days prior to the date fixed for redemption, to the registered owner of each such Bond to be redeemed at the address shown on the registration books kept by the Fiscal Agent, provided, however, that notice of redemption shall be given by certified mail, return receipt requested, to each owner of at least $1,000,000 aggregate principal amount of Bonds.

Notice having been so given and provisions having been made for redemption from funds on deposit with the Fiscal Agent, all interest on Bonds called for redemption accruing after the date fixed for redemption shall cease, and the holders or registered owners of the Bonds called for redemption shall have no security, benefit or lien under the General Ordinance or any right except to receive payment of the redemption price.

If at the time of mailing notice of redemption the City shall not have deposited with the Fiscal Agent monies sufficient to redeem the Bonds called for redemption, such notice may state that it is conditional in that it is subject to the deposit of the redemption monies with the Fiscal Agent not later than the redemption date, and such notice shall be of no effect unless such monies are so deposited.

Debt Service Requirements

The table on the following page sets forth the Debt Service Requirements for the Bonds and the aggregate Debt Service Requirements for all Outstanding Water and Wastewater Revenue Bonds, adjusted to exclude the Refunded Bonds.

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Table 1
Debt Service Requirements for Fiscal Years Ending June 30
for Water and Wastewater Revenue Bonds
As of June 30, 2020[1]

FY Ending	Aggregate Debt Serv. Bonds Outstanding[1]	Tax-Exempt Bonds Principal	Tax-Exempt Bonds Interest	Taxable Bonds Principal	Taxable Bonds Interest	Total
2021	$ 184,346,973	-	$ 7,417,424	-	$ 1,153,539	$ 192,917,936
2022	168,254,858	-	10,076,500	3,140,000	1,556,192	183,027,550
2023	160,295,615	650,000	10,060,250	7,280,000	1,518,267	179,804,132
2024	141,874,834	4,760,000	9,925,000	4,250,000	1,472,862	162,282,696
2025	141,893,764	5,655,000	9,664,625	3,770,000	1,435,444	162,418,833
2026	142,688,034	6,155,000	9,369,375	3,815,000	1,392,333	163,419,742
2027	142,622,240	6,580,000	9,051,000	3,860,000	1,339,600	163,452,840
2028	127,128,697	7,125,000	8,708,375	3,920,000	1,279,835	148,161,907
2029	102,293,183	-	8,530,250	35,325,000	942,481	147,090,914
2030	129,958,202	-	8,530,250	4,175,000	596,885	143,260,337
2031	130,035,386	-	8,530,250	4,255,000	516,411	143,337,046
2032	127,103,264	-	8,530,250	4,340,000	431,127	140,404,641
2033	113,748,985	-	8,530,250	3,010,000	354,873	125,644,107
2034	111,971,597	-	8,530,250	4,875,000	268,302	125,645,149
2035	111,511,923	-	8,530,250	5,455,000	150,189	125,647,361
2036	111,891,587	1,665,000	8,488,625	3,555,000	43,264	125,643,476
2037	111,153,799	6,200,000	8,292,000	-	-	125,645,799
2038	111,145,380	6,525,000	7,973,875	-	-	125,644,255
2039	111,153,020	6,855,000	7,639,375	-	-	125,647,395
2040	111,153,317	7,200,000	7,288,000	-	-	125,641,317
2041	100,758,691	18,235,000	6,652,125	-	-	125,645,816
2042	92,897,375	23,485,000	5,609,125	-	-	121,991,500
2043	92,900,125	24,690,000	4,404,750	-	-	121,994,875
2044	104,912,625	7,900,000	3,590,000	-	-	116,402,625
2045	94,142,500	8,300,000	3,185,000	-	-	105,627,500
2046	94,147,000	8,725,000	2,759,375	-	-	105,631,375
2047	59,098,250	9,175,000	2,311,875	-	-	70,585,125
2048	59,103,000	9,640,000	1,841,500	-	-	70,584,500
2049	59,099,906	10,145,000	1,346,875	-	-	70,591,781
2050	59,102,381	10,655,000	826,875	-	-	70,584,256
2051	59,099,781	11,210,000	280,250	-	-	70,590,031
2052	59,096,044	-	-	-	-	59,096,044
2053	59,099,675	-	-	-	-	59,099,675
2054	40,017,500	-	-	-	-	40,017,500
2055	21,883,750	-	-	-	-	21,883,750
Total[2]	**$3,647,583,259**	**$201,530,000**	**$206,473,924**	**$95,025,000**	**$14,451,605**	**$4,165,063,788**

(1) Adjusted to reflect the issuance of the Bonds and the refunding of the Refunded Bonds.
(2) Totals may not add due to rounding.

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SECURITY AND SOURCES OF PAYMENT FOR THE BONDS

Parity Bonds

All Water and Wastewater Revenue Bonds (other than Subordinated Bonds) are equally and ratably secured under the General Ordinance. No Subordinated Bonds are Outstanding under the General Ordinance.

Pledge of Project Revenues

Pursuant to the General Ordinance, the City pledges and assigns to the Fiscal Agent, in trust, for the security and payment of all Water and Wastewater Revenue Bonds (other than Subordinated Bonds) issued under or subject to the General Ordinance, and grants to the Fiscal Agent, in trust, a lien on and security interest in all Project Revenues and amounts on deposit in or standing to the credit of the Water and Wastewater Funds (other than the Rebate Fund). The Fiscal Agent must hold and apply the security interest in and lien on Project Revenues and funds and accounts, in trust, for the equal and ratable benefit and security of all present and future holders of Water and Wastewater Revenue Bonds (other than Subordinated Bonds). The General Ordinance provides that such pledge also may be for the benefit of the provider of a Credit Facility or a Qualified Swap (as defined therein), or any other person who undertakes to provide monies for the account of the City for the payment of principal or redemption price of and interest on any series of Water and Wastewater Revenue Bonds (other than Subordinated Bonds), on an equal and ratable basis with the holders of Water and Wastewater Revenue Bonds (other than Subordinated Bonds).

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Priority and Application of Project Revenues

The priority and application of Project Revenues under the terms of the General Ordinance and other amounts deposited into the Revenue Fund are set forth in the waterfall below:

1	payment of Operating Expenses;
2	payment of the principal or redemption price of and interest on Water and Wastewater Revenue Bonds issued under the General Ordinance (except Subordinated Bonds), regularly scheduled payments under any parity Swap Agreement, payments under any parity Credit Facility to repay advances thereunder to pay any of the foregoing and payments with respect to fees and expenses in respect of any parity Credit Facility;
3	if the transfers in (1) and (2) are made when due, payments into the Debt Reserve Account to the extent necessary to cure a deficiency therein;
4	if the transfers in (1) and (2) are made when due, and following any transfer described in (3), payments into any debt reserve account established within the Sinking Fund and not held for the equal and ratable benefit of all Water and Wastewater Revenue Bonds (other than Subordinated Bonds) to the extent necessary to cure a deficiency therein;
5	if the transfers in (1) and (2) are made when due, and following any transfers described in (3) and (4), payment of principal or redemption price of and interest on any Subordinated Bonds and payments due under any Swap Agreement or Credit Facility respecting Subordinated Bonds;
6	if the transfers in (1) and (2) are made when due, and following any transfers described in (3) through (5), all payments due under a Qualified Swap, other than regularly scheduled swap payments, including, without limitation, any payments due to a Swap Provider upon the early termination of a Swap Agreement;
7	if the transfers in (1) and (2) are made when due, and following any transfers described in (3) through (6), transfer to the City of the amount necessary to pay General Obligation Bonds issued for the System;
8	if the transfers in (1) and (2) are made when due, and following any transfers described in (3) through (7), transfer to the Rate Stabilization Fund of the amount determined by the Water Commissioner;
9	if the transfers in (1) and (2) are made when due, and following any transfers described in (3) through (8), transfer to the Capital Account of the Construction Fund the sum of the Capital Account Deposit Amount, the Debt Service Withdrawal and the Operating Expense Withdrawal, less any amounts transferred to the Capital Account from the Residual Fund; and
10	if the transfers in (1) and (2) are made when due, and following any transfers described in (3) through (9), after providing for repayment of any interfund loans, transfer to the Residual Fund of any amount remaining on deposit in the Revenue Fund.

The General Ordinance permits the application of Project Revenues to pay Interfund Charges (defined herein) and permits monies to be transferred in each Fiscal Year from the Residual Fund to the City's General Fund in an amount not to exceed the lesser of (A) all Net Reserve Earnings (as defined below) and (B) $4,994,000. "Net Reserve Earnings" means the amount of interest earnings during the Fiscal Year on amounts in the Debt Reserve Account and the Subordinated Bond Fund less the amount of interest earnings during the Fiscal Year on amounts in any such reserve funds and accounts giving rise to a rebate obligation pursuant to Section 148(f) of the Internal Revenue Code of 1986, as amended. In Fiscal Years 2018 and 2019, the Water Department transferred $1,627,838 and $4,094,824 respectively, from the Residual Fund to the City's General Fund. The budgeted transfer to the City's General Fund for Fiscal Year 2020 was $4,000,000. The budgeted transfer for Fiscal Year 2021 is $4,000,000. For a brief discussion of the Residual Fund, see "–Residual Fund" below.

Water and Wastewater Funds

Funds and Accounts. The Act and the General Ordinance establish the following funds and accounts to be held by the Fiscal Agent:

(a) Revenue Fund;

(b) Sinking Fund and within such fund a Debt Service Account, a Charges Account and a Debt Reserve Account;

(c) Subordinated Bond Fund;

(d) Rate Stabilization Fund;

(e) Construction Fund and within such fund an Existing Projects Account, a Bonds Proceeds Account and a Capital Account; and

(f) Residual Fund and within such fund a Special Water Infrastructure Account.

The foregoing funds are referred to herein as the "Water and Wastewater Funds." The Water and Wastewater Funds are required under the General Ordinance to be held separate and apart from all other funds and accounts of the City and the Fiscal Agent, and the funds and accounts therein shall not be commingled with, loaned or transferred among themselves or to any other City funds or accounts except as expressly permitted by the General Ordinance. The General Ordinance also establishes a Rebate Fund, which is not held for the benefit of the holders of the Water and Wastewater Revenue Bonds, and provides that the City can direct transfers to the Rebate Fund at the times and in the amounts necessary to pay any amounts required to be rebated pursuant to Section 148(f) of the Code.

Project Revenues. The City is required by the General Ordinance to cause all Project Revenues received by it on any date to be deposited into the Revenue Fund upon receipt thereof by the City, and the Fiscal Agent shall, upon receipt of Project Revenues, deposit such Project Revenues into the Revenue Fund. The City and the Fiscal Agent also shall cause to be deposited into the Revenue Fund such portion of the proceeds of the Bonds as are designated by Supplemental Ordinance or Bond Committee Determination and any other funds directed to be deposited into the Revenue Fund by the City. The City has covenanted in the General Ordinance that it will not direct the Fiscal Agent to transfer, loan or advance proceeds of the Bonds or Project Revenues from the Water and Wastewater Funds to any City account for application other than as permitted under the General Ordinance.

Project Revenues include, among other things, rents, rates, fees and charges from users of the products and services generated by the System (collectively, "rates and charges"). Collection and accounting of rates and charges are administered by the Water Revenue Bureau within the City's Department of Revenue. See "THE

WATER DEPARTMENT – Administration" herein. Historically, all rates and charges collected by the Water Revenue Bureau, whether by cashier, mail, or electronic payment, are recorded upon receipt, and are held temporarily by the City's fiscal agent in a consolidated cash account of the City. The City generates a report of rates and charges collected at each day's end and transfers, typically on the next day, all rates and charges so held to one or more accounts controlled by the Fiscal Agent for the Water and Wastewater Funds for deposit by the Fiscal Agent into the Revenue Fund. The City continues to examine the collection and accounting process with a view towards causing rates and charges to be deposited with the Fiscal Agent into the Revenue Fund as and when received.

See APPENDIX I – "FINANCIAL STATEMENTS OF THE WATER FUND DERIVED FROM THE CITY'S AUDITED COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR FISCAL YEAR ENDED JUNE 30, 2019" and APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance" for additional information concerning the priority and application of Project Revenues and further description of the funds and accounts established under the General Ordinance and their purposes.

Interfund Loans. If at any time sufficient monies are not available in the Revenue Fund to pay both Operating Expenses and to make the transfers described above under the heading "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Priority and Application of Project Revenues," then amounts on deposit in the Construction Fund, Rate Stabilization Fund and/or Residual Fund may be loaned temporarily, at the written direction of the City, to the Revenue Fund, for the payment of such Operating Expenses until such loaned amounts are required by the Water Department for purposes of the Fund making the loan. Such interfund loans permit the Water Department then to use Project Revenues for the other transfers described above under " – Priority and Application of Project Revenues." If a similar deficiency exists in the Construction Fund, amounts on deposit in any of the Revenue Fund, Rate Stabilization Fund and Residual Fund may be loaned temporarily, at the written direction of the City, to the Construction Fund, to the extent of the deficiency, until required by the Water Department for purposes of the Fund making the loan.

The Water Department has from time to time made interfund loans in prior Fiscal Years from the Rate Stabilization Fund to the Revenue Fund. The Water Department did not make such loans in Fiscal Years 2019 and 2020 and does not expect to make a loan from the Rate Stabilization Fund to the Revenue Fund in Fiscal Year 2021.

Debt Reserve Account

General. The General Ordinance establishes within the Sinking Fund a Debt Reserve Account that will be funded (if required to be funded) with the proceeds of each series of Water and Wastewater Revenue Bonds; provided, however, that if the Supplemental Ordinance authorizing a series of Water and Wastewater Revenue Bonds shall so authorize, the deposit to the Debt Reserve Account in respect of such Water and Wastewater Revenue Bonds may be accumulated from Project Revenues over a period of not more than three Fiscal Years after the issuance and delivery of the related Water and Wastewater Revenue Bonds. The monies and investments in the Debt Reserve Account will be held and maintained in an amount equal at all times to the Debt Reserve Requirement.

If at any time the monies in the Debt Service Account of the Sinking Fund are insufficient to pay as and when due the principal of (and premium, if any) or interest on any series of Water and Wastewater Revenue Bonds or other obligations payable from the Debt Service Account (including obligations arising in connection with Qualified Swap Agreements and Credit Facilities), the Fiscal Agent is required to transfer from the Debt Reserve Account the amount of such deficiency for deposit in the Debt Service Account.

With respect to any issue of Water and Wastewater Revenue Bonds, in lieu of the required deposit into the Debt Reserve Account, the City may cause to be deposited into the Debt Reserve Account a surety bond, an insurance policy or an irrevocable letter of credit. In addition, the General Ordinance authorizes the City to apply monies on deposit in the Debt Reserve Account to purchase a surety bond, an insurance policy or an irrevocable letter of credit. Under the terms of the General Ordinance, any surety bond, insurance policy or letter of credit provided by the City in lieu of required deposits within the Debt Reserve Account would, at the time of issuance thereof, be required to meet the credit quality requirements of the General Ordinance as described in APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Debt Reserve Account."

Debt Reserve Requirement. As of June 30, 2020, the Debt Reserve Requirement for all Outstanding Water and Wastewater Revenue Bonds based on maximum annual Debt Service Requirements prior to the issuance of the Bonds was approximately $187,870,330.82. The balance of cash and investments credited to the Debt Reserve Account as of June 30, 2020 was $212,188,343.11.

On November 26, 2007, the City purchased a surety policy from Assured Guaranty Municipal Corp. ("AGM") in the aggregate principal amount of $67,000,000 (the "AGM Surety Policy"). The AGM Surety Policy expires on July 1, 2035. In the event of a draw on the Debt Reserve Account, the AGM Surety Policy requires that cash available in the Debt Reserve Account be applied first, before the AGM Surety Policy is drawn upon. The AGM Surety Policy remains in effect, but it does not meet the rating requirements of the General Ordinance. **Thus, the value of the AGM Surety Policy is excluded in calculating the amount on deposit in the Debt Reserve Account.**

On the date of issuance of the Bonds, money deposited in the Debt Reserve Account will satisfy the Debt Reserve Requirement for all Water and Wastewater Revenue Bonds outstanding after the issuance of the Bonds. In addition, as authorized in the General Ordinance, the City intends to transfer a portion of estimated Net Reserve Earnings from the Debt Reserve Account to the Residual Fund as part of the Fiscal Year end 2020 closing process, as described in (10) of the waterfall contained in "– Priority and Application of Project Revenues" above.

Springing Amendments. The Springing Amendments include certain provisions that relate to the calculation and maintenance of the Debt Reserve Requirement. Once the Springing Amendments are approved, the City will be authorized to, among other things, determine at the time of issuance whether to secure a Series of Water and Wastewater Revenue Bonds by depositing monies into the Debt Reserve Account or a Series subaccount within the Debt Reserve Account solely for such Series of bonds. See "INTRODUCTORY STATEMENT – Recent Amendments to the General Ordinance" herein and APPENDIX III-A and APPENDIX III-B of this Official Statement hereof.

The Springing Amendments also contain certain provisions that change the rating requirements to qualify a Credit Facility for deposit into the Debt Reserve Account to meet the Debt Reserve Requirement. The Springing Amendments further provide that if the City had deposited cash into the Debt Reserve Account to cure a deficiency caused by a downgrade or withdrawal of the ratings on such a Credit Facility, and subsequently that Credit Facility meets the new rating requirements contained in the Springing Amendments, no excess of the Debt Reserve Requirement will result. Thus, the cash that the City had deposited described above will not become in excess of the Debt Reserve Requirement and available for other purposes.

Rate Stabilization Fund

Pursuant to the General Ordinance, as of June 30 of each Fiscal Year, the City may transfer (i) from the Rate Stabilization Fund to the Revenue Fund or (ii) from the Revenue Fund to the Rate Stabilization Fund, the amount determined by the Water Commissioner to be transferred for such Fiscal Year. For purposes of calculating Net Revenues, transfers from the Rate Stabilization Fund to the Revenue Fund are included in the calculation, whereas transfers from the Revenue Fund to the Rate Stabilization Fund are excluded from Net Revenues. As discussed above under "Water and Wastewater Funds – Interfund Loans," amounts on deposit in the Rate Stabilization Fund also may be loaned temporarily to the Revenue Fund to pay Operating Expenses under certain conditions. See APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Rate Stabilization Fund."

Residual Fund

Amounts on deposit in the Residual Fund may be used at the written direction of the City (i) to pay Operating Expenses; (ii) to fund transfers to any fund or account established under the General Ordinance or under a Supplemental Ordinance (other than the Revenue Fund and the Rate Stabilization Fund); (iii) to make payments required under any Exchange Agreement; (iv) for the payment of principal, redemption premium, if any, and interest on any revenue bonds or notes (the proceeds of which were applied in respect of the System) issued under the Act but not under the General Ordinance; (v) for the payment of principal, redemption premium, if any, and interest on any General Obligation Bonds; (vi) for the payment of principal, redemption premium, if any, and interest on other general obligation debt issued in respect of the System; (vii) for the payment of amounts due under capitalized leases or similar obligations relating to the System; and (viii) to fund a transfer to the City's "General Fund" in an amount not to exceed the lower of (A) all Net Reserve Earnings or (B) \$4,994,000. See APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Residual Fund." In addition, as discussed above under "Water and Wastewater Funds – Interfund Loans," amounts on deposit in the Residual Fund also may be loaned temporarily to the Revenue Fund to pay Operating Expenses under certain conditions. For a discussion of certain policies that the Rate Board adopted, including for the target amount to be maintained in the Residual Fund, see "RATES – Philadelphia Water, Sewer and Stormwater Rate Board".

Additional Sources of Funds for Deficiencies in Sinking Fund

At the written direction of the City, the General Ordinance permits monies on account in the Capital Account of the Construction Fund and in the Residual Fund to be utilized to cure deficiencies in the Sinking Fund. See APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Construction Fund" and "– Residual Fund."

Rate Covenant

The General Ordinance contains a number of covenants (collectively, the "Rate Covenant") concerning the City's imposition of rates and charges sufficient to support the System. The Rate Covenant requires, while any Water and Wastewater Revenue Bonds remain outstanding, the City to establish rents, rates, fees and charges for the use of the Water and Wastewater Systems sufficient to yield Net Revenues in each Fiscal Year at least equal to 1.20 times the Debt Service Requirements for such Fiscal Year (recalculated to exclude principal and interest payments in respect of Subordinated Bonds, of which none exist). In addition, Net Revenues, in each Fiscal Year must be at least equal to (A) 90% of the Debt Service Requirements for such Fiscal Year (recalculated to exclude principal and interest payments in respect of Subordinated Bonds and transfers from the Rate Stabilization Fund), provided that, for purposes of this clause (A), Net Revenues will be calculated to exclude any amounts transferred from the Rate Stabilization Fund to the Revenue Fund in, or as of the end of, such Fiscal Year and (B) 1.00 times the sum of the following for such Fiscal Year: (i) the Debt Service Requirements (including Debt Service Requirements in respect of Subordinated Bonds); (ii) amounts required to be deposited into the Debt Reserve Account; (iii) debt service payable on General Obligation Bonds issued for the System; (iv) debt service due on Interim Debt; and (v) the Capital Account Deposit Amount, less any amounts transferred from the Residual Fund to the Capital Account. As of the date hereof, no Subordinated Bonds, General Obligation Bonds issued for the System or Interim Debt are outstanding.

"Net Revenues" for any period means: the Project Revenues collected during such period and deposited into the Revenue Fund plus (x) the amounts, if any, transferred from the Rate Stabilization Fund into the Revenue Fund as of the end of such period and (y) interest earnings during such period on monies in any of the funds or accounts established under the General Ordinance to the extent such interest earnings are credited to the Revenue Fund pursuant to the General Ordinance, and minus the sum of (a) Operating Expenses incurred during such period and (b) the amounts, if any, transferred from the Revenue Fund to the Rate Stabilization Fund as of the end of such period; provided, however that in determining such Net Revenues, the Initial Deposit (as defined in APPENDIX III-A) shall not reduce such Net Revenues. To ensure compliance with the Rate Covenant, the General Ordinance requires that the City review its rents, rates, fees and charges promptly upon any material change in the circumstances which were contemplated at the time such rents, rates, fees and charges were reviewed, but not less frequently than once each Fiscal Year. For a discussion of the Water Department's experience in meeting the Rate Covenant, see "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Compliance with Rate Covenant" herein. Notwithstanding any future changes in the rate-making process, while any Water and Wastewater Bonds remain outstanding, the City is required to comply with the Rate Covenant.

Additional Bonds

The General Ordinance permits the issuance of additional bonds, which may be secured on a parity basis with the outstanding bonds issued thereunder. The General Ordinance imposes certain conditions precedent (which conditions have been met in connection with the issuance of the Bonds) to the issuance of additional bonds, including the delivery of the Engineering Report concluding that Net Revenues are currently sufficient to comply with the Rate Covenant and are projected to be sufficient to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the additional bonds are to be issued. Such conditions precedent to the issuance of additional bonds are described in APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Covenants of the City – Conditions of and Provisions Relating to Issuing Bonds."

Limitations on Effectiveness of Pledge of Project Revenues and Water and Wastewater Funds

The effectiveness of the pledge of the Project Revenues and the Water and Wastewater Funds may be limited because, although the Fiscal Agent will have custody of the Water and Wastewater Funds, the City will have complete control of deposits into and expenditures from the Water and Wastewater Funds, except for amounts on deposit in the Sinking Fund, including the Debt Reserve Account. While the City has covenanted not to direct the Fiscal Agent to transfer Project Revenues other than as permitted under the General Ordinance, no requisition procedure or other similar procedure will be established for the expenditure of monies by the City from the Water and Wastewater Funds (other than the Sinking Fund, including the Debt Reserve Account), and no consent or approval of the Fiscal Agent is required to be obtained by the City as a condition of the City's expenditure of such monies. The Fiscal Agent will not monitor deposits into or withdrawals from the Water and Wastewater Funds (other than the Sinking Fund, including the Debt Reserve Account) or the purposes for which such monies are utilized.

The General Ordinance provides that if the City fails to make a deposit of Project Revenues as required under the General Ordinance, the Fiscal Agent is authorized to and shall seek, by mandamus or other suit, action or proceeding at law or in equity, the specific enforcement or performance of the obligation of the City to cause the Project Revenues to be transferred to the Revenue Fund.

No daily, monthly or other periodic deposits are required to be made into the Sinking Fund prior to the dates on which debt service payments on the Water and Wastewater Revenue Bonds are due.

REMEDIES OF BONDHOLDERS

Remedies under the Act and the General Ordinance available to Bondholders and to any trustee for Bondholders appointed by the holders of 25% of the outstanding principal amount of any series of Water and Wastewater Revenue Bonds in default are described in APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Defaults and Remedies." In addition to the remedies therein described, Bondholders or a trustee therefor are entitled under the Pennsylvania Uniform Commercial Code to remedies as secured parties with respect to the Project Revenues and the funds on deposit in the Water and Wastewater Funds. See “INVESTMENT CONSIDERATIONS – Limited Recourse on Default.”

Enforcement of Bondholders’ rights may be limited by and is subject to the provisions of the Federal Bankruptcy Code, as now or hereafter enacted, and to other laws or legal or equitable principles which may affect the enforcement of creditors’ rights. References to the Federal Bankruptcy Code should not be construed as implying that the City expects to resort to the provisions of such statute or that, if it did, any proposed restructuring would include a dilution of the sources of payment of and security for the Bonds. See “INVESTMENT CONSIDERATIONS – Bankruptcy” herein.

OUTSTANDING INDEBTEDNESS AND OTHER LONG-TERM AGREEMENTS

Outstanding Indebtedness

As set forth in the table below, adjusted to reflect the issuance of the Bonds and the refunding of the Refunded Bonds, $2,321,914,340 aggregate principal amount of Water and Wastewater Revenue Bonds are outstanding. The table below does not account for the 2020 Forward Delivery Bonds (defined herein) to be delivered on October 7, 2020.

Table 2
Outstanding Indebtedness
as of June 30, 2020*

Series of Bonds	Original Principal Amount	Outstanding Principal Amount	Fixed/ Variable Rate	Year of Maturity
1997B**	$ 100,000,000	$ 4,400,000	Variable	2020
Pennvest 2009B	42,886,030	17,023,901	Fixed	2032
Pennvest 2009C	57,268,193	29,405,657	Fixed	2032
Pennvest 2009D	84,759,263	45,780,493	Fixed	2032
Pennvest 2010B	30,000,000	21,024,289	Fixed	2033
2010C**	185,000,000	3,230,000	Fixed	2020
2011A	135,000,000	135,000,000	Fixed	2041
2011B	49,855,000	10,735,000	Fixed	2021
2013A	170,000,000	78,880,000	Fixed	2023
2014A	123,170,000	97,700,000	Fixed	2043
2015A	275,820,000	275,820,000	Fixed	2045
2015B	141,740,000	131,375,000	Fixed	2035
2016A	192,680,000	177,985,000	Fixed	2035
2017A	279,865,000	239,865,000	Fixed	2052
2017B	174,110,000	171,205,000	Fixed	2034
2018A	276,935,000	266,935,000	Fixed	2053
2019A	68,335,000	68,335,000	Fixed	2040
2019B	250,660,000	250,660,000	Fixed	2054
2020A	201,530,000	201,530,000	Fixed	2050
2020B	95,025,000	95,025,000	Fixed	2035
TOTAL	**$2,934,638,486**	**$2,321,914,340**		

*Adjusted to reflect the issuance of the Bonds and the refunding of the Refunded Bonds.
**$4,400,000 of the 1997B Bonds and $3,230,000 of the 2010C Bonds outstanding as of the date of this Official Statement are subject to redemption on August 1, 2020.

Other Obligations

Forward Purchase Contract

On February 27, 2019, the City entered into a Forward Purchase Contract and Bond Committee Determination for the issuance and purchase of certain City of Philadelphia, Pennsylvania, Water and Wastewater Revenue Refunding Bonds, Series 2020 (Forward Delivery), to be delivered on October 7, 2020 (the "2020 Forward Delivery Bonds"). The proceeds of the 2020 Forward Delivery Bonds will be used to refund all or a portion of the City's outstanding Water and Wastewater Revenue Bonds, Series 2011A and pay or reimburse the City for issuance costs of the 2020 Forward Delivery Bonds.

Contract for Biosolids Treatment with Philadelphia Biosolids Services, LLC

In 2008, the City entered into a long-term contract and lease with the Philadelphia Municipal Authority (the "PMA") for the PMA to operate the Water Department's existing Biosolids Recycling Center (the "Biosolids Recycling Center"). The PMA and Philadelphia Biosolids Services, LLC ("Philadelphia Biosolids") entered into a Service Agreement (the "Biosolids Service Contract"), pursuant to which Philadelphia Biosolids designed and built, and currently operates, a facility at the Biosolids Recycling Center to heat, dry and dispose of biosolids captured during wastewater treatment, and the PMA pays Philadelphia Biosolids for operating such Biosolids Recycling Center. Pursuant to a Service Agreement between the PMA and the City (the "City Service Contract"), the City assumed all of PMA's obligations under the Biosolids Service Contract. The obligations under the City Service Contract constitute Operating Expenses of the Water Department. In Fiscal Year 2018 and Fiscal Year 2019, the City paid to PMA, from revenues generated from the Water Department, $21,782,486, and $19,494,403, respectively. The Water Department's budgeted obligation for Fiscal Year 2020 was approximately $25,705,000, and the budgeted obligation for Fiscal Year 2021 is $26,694,000. The City Service Contract contains adjusters for the Consumer Price Index, Producer Price Index and fluctuations in fuel prices, among others; thus, expenditures under the City Service Contract may vary over time. The Biosolids Service Contract expires on February 10, 2032 and contains the possibility of a five-year renewal term at the option of the City. In addition to facilitating compliance with various state and federal environmental regulations, including the Clean Air Act, the Biosolids Service Contract has produced cost savings for the Water Department. See "THE SYSTEM – Wastewater System – Environmental Compliance – Clean Air Act and – Biosolids Treatment and Utilization."

Northeast Water Pollution Control Plant Cogeneration Facility

In 2011, the City entered into a long-term contract and lease with the PMA for the PMA to arrange the construction, financing, maintenance and sublease of a digester gas cogeneration facility at the Northeast Water Pollution Control Plant. The PMA entered into a lease (the "Lease") with BAL Green Biogas I, LLC, a special purpose entity of Bank of America (the "Lessor"), which requires the PMA to make certain lease payments to the Lessor. Pursuant to a sublease dated December 23, 2011 (the "Sublease"), the City assumed all of the PMA's obligations under the Lease. The obligations under this contract constitute Operating Expenses of the Water Department. In Fiscal Year 2018 and Fiscal Year 2019, the City paid to the Lessor from revenues generated from the Water Department, $5,937,935 and $6,701,044, respectively. The Water Department's budgeted obligation for Fiscal Year 2020 was $5,660,000 and is budgeted to be the same for Fiscal Year 2021. Expenditures, including maintenance fees, may vary during the term of the contract. The Sublease expires on September 25, 2029, unless renewed by PMA for an additional term of eighteen months.

Contract for Automatic Meter Reading System with ITRON

In 1997, the City, through the PMA, entered into a long-term contract with ITRON for the replacement of residential water meters with new meters equipped with radio transmitter devices and for services and materials required to implement, operate and maintain the Water Department's Automatic Meter Reading

(“AMR”) System. The agreement with ITRON expired on September 2019. The Water Department made payments, which are an operating expense of the Water Department, to ITRON for Fiscal Year 2018 of $2,052,000 for meter reading services and $1,880,000 for new water meters. Payments for Fiscal Year 2019 were $3,067,000 for meter reading services and $2,907,000 for the purchase and installation of new water meters. The Water Department’s budget for Fiscal Year 2020 was $435,000 for ITRON’s meter reading services.

Contract for Advanced Meter Reading Infrastructure

In February 2019, the City, through PMA, entered into a contract with Sensus USA Inc. (“Sensus”) for the delivery of an advanced metering infrastructure (“AMI”) system for water meter reading, including installation, operation and maintenance of the AMI system. The transition from AMR to Sensus was completed in September 2019, and Sensus has assumed the meter reading services formerly provided by ITRON. The installation of the AMI system and communications network was completed on February 12, 2020. The deployment phase, during which AMR equipment will be replaced with AMI units, is expected to take approximately 24 months. The deployment phase is expected to start in December of 2020. The costs for installation and deployment are included in the Water Capital Improvement Program. See “CAPITAL IMPROVEMENT PROGRAM.” After the initial installation and deployment phase, the AMI operations and maintenance term of the contract will begin for a term of 20 years, with the option to renew for additional one-year terms for a period of up to three years. Payments to Sensus constitute operating expenses of the Water Department. The budget for such payments for Fiscal Year 2020 was $2.5 million. The budgeted obligation for Fiscal Year 2021 is $3.2 million for meter reading services and $3.0 million for the purchase and installation of new water meters.

THE WATER DEPARTMENT

General

The City established the Water Department to operate, maintain, repair and improve the Water and Wastewater Systems. The Charter requires that rates and charges for supplying water and for wastewater treatment be fixed and regulated in accordance with standards established by City Council. Such standards must enable the City to realize from rates and charges an amount at least equal to operating expenses and Debt Service Requirements on any debt incurred or to be incurred for the Water and Wastewater System, including general obligations and revenue bond obligations, and proportionate charges for all services performed for the Water Department by all officers, departments, boards or commissions of the City. See “HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Compliance with Rate Covenant” below. The Charter also authorizes the Water Department, with the approval of City Council, to enter into contracts for supplying water service and sewer and sewage disposal service to users outside the limits of the City.

The operations of the Water Department are accounted for in the Water Fund, which is an enterprise fund of the City. The Water Fund is an accounting convention established pursuant to the Charter for the purpose of accounting for the assets, liabilities, revenues, expenses of and Rate Covenant compliance for, the Water and Wastewater Systems. See APPENDIX I – “FINANCIAL STATEMENTS OF THE WATER FUND DERIVED FROM THE CITY’S AUDITED COMPREHENSIVE ANNUAL FINANCIAL REPORT FOR FISCAL YEAR ENDED JUNE 30, 2019” attached hereto.

Relationship to the City

The Water Department is one of the City’s operating departments and is overseen by the Office of the Managing Director. Various City departments and agencies provide operational support to the Water Department, for which they receive a direct appropriation at the beginning of each Fiscal Year (a “Direct Appropriation”), which provides a portion of the funding for such department or agency from the Water Department’s operating budget. The departments that receive Direct Appropriations from the Water Department are: the Revenue Department (Water Revenue Bureau) for meter reading, billing and collection services; the

Law Department for legal services; the Department of Public Property for the rental of office space and parking; the Office of Fleet Management for vehicle acquisition, fuel, and vehicle maintenance; the Office of Innovation and Technology for communications and computer support services; the Procurement Department for services related to the acquisition of goods and services; the Office of the Director of Finance for fringe benefits, indemnities and support services; the Sinking Fund Commission for the payment of debt service; the Office of Sustainability for energy procurement services; and the Office of Transportation and Infrastructure Systems. The Rate Board also receives a Direct Appropriation from the Water Department.

In addition, approximately 15 City departments and agencies, including the Revenue Department and the Department of Public Property, provide services to the Water Department for which they bill the Water Department at the close of each Fiscal Year ("Interfund Charges"). These services are distinct from the ones discussed in the previous paragraph and include, but are not limited to, cash management (City Treasurer); auditing (City Controller); debt management (City Treasurer); testing and hiring (Human Resources and Labor Relations); and other support services (Managing Director's Office, Civil Service Commission, Department of Licenses & Inspections, and Police Department).

All Direct Appropriations and Interfund Charges are accounted for in the historical operating results in Table 9 and factored into the forecast in Table 11A. See also "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – The Water Department's Budget."

The City is the largest customer of the Water Department. The City, through the General Fund and the Aviation Fund, pays the Water Department for water and wastewater services, maintenance of the fire system (consisting of hydrants system capacity and pumping stations), inlet cleaning and snow removal. Such payments are credited to the Water Fund for each Fiscal Year as of the last day of such Fiscal Year, and payment occurs on or before October 31 in the same calendar year. See "THE SYSTEM – The City and Other Large Customers" and APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA."

Administration

The Water Department is managed by a Commissioner appointed by the Managing Director of the City with the approval of the Mayor. The Commissioner then appoints deputies with the approval of the City's Managing Director. Substantially all other employees of the Water Department are hired pursuant to the City's Civil Service Regulations.

Under the Charter, the City's Department of Revenue performs all functions relating to meter reading, customer accounts and collections for the Water Department through the Water Revenue Bureau. The Department of Revenue and the Water Revenue Bureau are under the direction of the Director of Finance. The Director of Finance, as the chief financial, accounting and budget officer of the City, has overall responsibility for the fiscal administration of all City departments, including the Water Department. Audits of all City departments, including the Water Department, are performed annually by the Office of the City Controller. The Law Department of the City, headed by the City Solicitor, handles all legal matters affecting the Water Department.

The following are brief biographical descriptions of the Commissioner, his deputies and the senior management of the Water Department:

Randy E. Hayman was appointed Water Commissioner on May 13, 2019. He is tasked with overseeing the Water Department. Prior to joining the Water Department, he served fifteen (15) years as the General Counsel for two major water/wastewater systems – the Metropolitan St. Louis Sewer District and the District of Columbia Water and Sewer Authority. In addition, Mr. Hayman served as an Assistant Attorney General for the state of Missouri and has practiced law in the private sector at highly respected law firms. Most recently, he was a partner at the law firm of Beveridge & Diamond, P.C., a top-tier environmental law firm. Throughout his career, Mr. Hayman has worked to solve similar water and wastewater utility challenges to those presently faced by the Water Department, including, but not limited to, successfully negotiating agreements with regulatory agencies to address wastewater system issues related to combined sewer overflows, as well as implementing large water and wastewater capital improvement plans, while managing financial performance and balancing the effects of customer rates and charges. He is a graduate of the University of Michigan and the Georgetown University Law Center.

Donna Schwartz was appointed Deputy Water Commissioner in March 2016. She is principally responsible for managing the Water Department's Operations Division. She has served the Water Department for 36 years in various capacities. Since her initial appointment with the Water Department in 1982, Ms. Schwartz has held a number of increasingly responsible engineering and managerial positions, such as program manager in industrial waste and plant manager in water treatment. She has a B.S. in chemical engineering from Drexel University, a professional engineer's license from Pennsylvania and is a certified plant operator.

Scott J. Schwarz was appointed as Divisional Deputy City Solicitor and General Counsel to the Philadelphia Water Department in March 2013. He joined the City's Law Department in 2009, serving as a Senior Attorney in the Law Department's Regulatory Affairs Unit. Prior to that, he spent over 25 years working in the environmental law divisions of law firms in Philadelphia and Washington, D.C. and gained government experience working for the State of Alabama's Office of the Attorney General and the U.S. Environmental Protection Agency. Mr. Schwarz received a B.S. in biology from Bucknell University and a J.D. from George Washington University.

Gerald D. Leatherman was appointed Deputy Water Commissioner for Human Resources & Administration in April 2013. Since March 2008, Mr. Leatherman was Divisional Deputy City Solicitor and General Counsel to the Water Department. He joined the City's Law Department in 2003, serving as a Deputy City Solicitor in the Housing Code Enforcement and Neighborhood Transformation Divisions. Prior to that, Mr. Leatherman worked in the General Counsel's Office of the Philadelphia Housing Development Corporation and in private practice. Mr. Leatherman received a B.A. from American University and a J.D. from the Temple University Beasley School of Law.

Glen Abrams was appointed Deputy Water Commissioner of Communications and Engagement in September 2019. Most recently from 2001 to 2013, Mr. Abrams worked for the Water Department as a Policy and Strategic Planning Manager with the Water Department's Office of Watersheds. He has worked for the Pennsylvania Horticultural Society ("PHS") since 2013 and most recently served as the Senior Director of Planning and Sustainable Communities for PHS. He holds a B.A. and an M.A. in City and Regional Planning, both from Ohio State University.

Melissa LaBuda was appointed Deputy Water Commissioner in August 2014 and Assistant Deputy Commissioner in October 2013. Ms. LaBuda has overall responsibility for the Water Department's financial management including: accounting operations and financial reporting; budget formulation and execution; and financial planning. Ms. LaBuda joined the Water Department from a global financial institution where she was an investment banker to Public Power and Combined Utility systems. Previously, Ms. LaBuda worked for Public Financial Management, Inc. (now PFM Financial Advisors LLC) as both a financial advisor and a fixed income trader. In these roles, Ms. LaBuda has raised in excess of $25 billion in the capital markets. Ms. LaBuda received a B.S. from Bloomsburg University in 1995.

Stephen J. Furtek was appointed General Manager of Planning and Engineering (now Engineering and Construction) in March 2005. Mr. Furtek is a registered Professional Engineer and holds a B.A. in Civil and Urban Engineering from the University of Pennsylvania. He has held a number of increasingly responsible positions since joining the Water Department in 1982, including Supervisor of the Water and Sewer Design Section and Manager of the Design Branch.

Michelle L. Bethel was appointed Deputy Revenue Commissioner in charge of the Water Revenue Bureau in July 2008. She holds a B.S. in Accounting with a Minor in Public Relations from Kutztown University and an M.B.A. in Human Resource Management from the University of Phoenix. Prior to her appointment as Deputy Revenue Commissioner, Ms. Bethel worked for the Commonwealth of Pennsylvania Department of Revenue in Harrisburg for 14 years. Ms. Bethel has extensive knowledge of and experience with customer service, collections, and compliance issues gained through working in increasingly responsible management positions.

Marc Cammarata was appointed Deputy Water Commissioner for Planning and Environmental Services in November of 2016. His responsibilities include the integration, direction and management of numerous aspects of the Water Department's planning initiatives, including strategic environmental and sustainability programming, water quality and quantity modeling, wet weather compliance, flood mitigation, both green and traditional infrastructure planning, stream and wetland restoration, watershed and source water protection, laboratory services, and climate mitigation and adaptation efforts. He has over 20 years of experience in water resources engineering and environmental planning. He is a Professional Environmental Engineer with a B.S. in Civil and Environmental Engineering from Villanova University and a M.S. in Environmental Engineering, Water Resources from Drexel University.

Alicia Robertson was appointed Assistant Deputy Water Commissioner in October 2016 and manages the Water Department's accounts payable processing and payroll functions. Since joining the Water Department in 2006, she has held increasingly responsible fiscal and managerial positions. Prior to her tenure at the Water Department, Ms. Robertson worked for the City Controller's office as an auditor for seven years. She holds a B.B.A. in Accounting from Temple University and an M.A. in Public Administration from Villanova University.

Jaclyn Rogers was appointed Assistant Deputy Water Commissioner in February 2019 and manages the Water Department's rate setting, budgeting and wholesale functions. Since joining the Water Department in 2009, she has held engineering, fiscal and managerial positions of increasing responsibility. She holds a B.S. and M.S. in Civil Engineering from Villanova University and an M.B.A. from Temple University.

There is currently a vacancy in the Deputy Water Commissioner role that oversees environmental compliance.

Personnel Information

As of June 1, 2020, the Water Department employed approximately 2,166 full-time employees (this figure excludes seasonal workers), of whom 1,536 are represented by District Council 33 and 414 by District Council 47, both of the American Federation of State, County and Municipal Employees. The balance (216 full-time employees) represents the Water Department's upper management, supervisory and senior engineering and administrative personnel who are not eligible for union membership. The wages and salaries of approximately 200 employees in the Water Revenue Bureau are funded by the Water Department. Water Revenue Bureau employee participation in unions parallels that of the Water Department. For a discussion of the Water Department's contributions to the pension plans, see "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Pension Obligations of the Water Department". For information on the status of arbitration awards and labor contract settlements and certain retirement plan information, see APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Expenditures of the City – Overview of Current Labor Situation."

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THE SYSTEM

The Water Department provides water and wastewater services (which includes stormwater services) to residents and businesses located in the City. Additionally, the Water Commissioner is authorized to enter into agreements with municipalities, townships, authorities and entities outside the limits of the City to provide for the sale of fresh water or the receipt, conveyance, treatment and disposal of wastewater. The Water Department currently has ten wholesale wastewater contracts and one wholesale water contract. The following sections describe the largest customers of the Water Department, the Water Department's wholesale contracts and the System, including certain environmental matters.

Large Customers

The ten largest customers of the Water Department for water and wastewater services, which include stormwater services, for Fiscal Year 2019 are set forth in Table 3 below. The Water Department does not charge itself or include in revenue the retail value of the water and wastewater services (including stormwater services) used by the Water Department.

The City is the largest customer of the Water Department. In addition to charges for general service customers, which are based on metered water consumption, the Water Department charges the City for water and wastewater services provided to City properties and for operation and maintenance of the fire system (consisting of hydrants and pumping stations).

Table 3
Top 10 Customers
Fiscal Year Ending June 30, 2019

	Customer	Revenue ($)	% Total Revenue**
1	City of Philadelphia*	$24,496,079.25	3.29%
2	Philadelphia Housing Authority	11,516,189.73	1.55%
3	School District of Philadelphia	6,178,537.15	0.83%
4	Veolia Energy Philadelphia	5,932,223.58	0.80%
5	University of Pennsylvania	4,982,621.72	0.67%
6	SEPTA	4,477,079.20	0.60%
7	AdvanSix Inc.	4,007,612.69	0.54%
8	Temple University	3,700,471.68	0.50%
9	University of Pennsylvania Health System	3,157,122.82	0.42%
10	Federal Government	2,508,614.52	0.34%
	TOTALS* **	**$70,956,552.34**	**9.52%**

*The total above for the City of Philadelphia includes, among others, charges for water, wastewater and stormwater services as follows: (i) $19,785,783.43– General Fund; and (ii) $4,392,877.37 – Aviation Fund.
**The percentage of Total Revenue is calculated using the yearly revenue received by the customer divided by the total yearly revenue of the Water Operating Fund. The total revenue for Fiscal Year 2019 was $745,330,463.
***Totals may not add due to rounding.

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Wholesale Customers. The Water Department generates approximately 5.78% of total revenues from wholesale wastewater and water customers ("Wholesale Customers"). Table 4 on the following page presents revenues as of June 30, 2019 from Wholesale Customers and describes certain terms of the Water Department's wholesale contracts for water and wastewater services. The last column on Table 4 sets forth each wholesale customer's proportional share of the Water Department's expenditures ("COA Expenditures") relating to its Consent Order and Agreement (the "COA") with the Pennsylvania Department of Environmental Protection (the "PADEP"). For more information regarding the Water Department's COA and its associated costs, see "THE SYSTEM – The Wastewater System – Environmental Compliance – Combined Sewer Overflow Program." Revenues for Fiscal Year 2018 from wholesale wastewater contracts and the wholesale water contract were approximately $37.4 million and $3.3 million, respectively. Revenues from wholesale contracts for Fiscal Year 2019 were approximately $39.5 million for wholesale wastewater customers and $3.6 million for the wholesale water customer. Budgeted revenues from wholesale contracts for Fiscal Year 2020 were approximately $39.0 million for wholesale wastewater customers and $3.85 million for the wholesale water customer. The budgeted revenue for Fiscal Year 2021 from wholesale contracts for wholesale wastewater customers is $40.0 million and $3.85 million for the wholesale water customer.

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Table 4
Preliminary Wholesale Water and Wastewater Customer Revenues and Contract Terms
Fiscal Year Ending June 30, 2019

	Total Revenue	%Total Revenue*	Contract End Date	COA%**
Wastewater				
Bucks County Water & Sewer Authority (BCWSA)	$9,370,113.27	1.26%	3/31/2038	N/A
BCWSA – Springfield Township(1)(2)	2,458,149.40	0.33	6/30/2023	0.79%
BCWSA – Bensalem (1)	1,402,273.70	0.19	6/30/2023	N/A
BCWSA Total	$13,230,536.37	1.78%		0.79%
Delcora (3)(4)	$10,080,693.68	1.35%	4/1/2028	9.44%
Aqua Pennsylvania Wastewater, Inc. (5)	4,103,125.86	0.55	6/30/2025	2.43
Lower Southampton Township	4,007,035.10	0.54	6/30/2024	0.96
Upper Darby Township	2,841,010.39	0.38	8/8/2023	N/A
Lower Merion Township	2,545,596.09	0.34	N/A	N/A
Abington Township	1,811,341.43	0.24	6/30/2023	0.58
Lower Moreland Township	896,097.20	0.12	6/30/2025	0.36
Sub-total	$39,515,436.11	5.30%		14.57%
Water				
Aqua Pennsylvania	3,589,560.07	0.48	3/1/2026	N/A
Sub-total	$3,589,560.07	0.48%		
Total Wholesale Revenues	**$43,104,996.18**	**5.78%**		

Note: The Water Department includes capital charges within operation and maintenance charges for all customers except Bensalem, Lower Merion, and Upper Darby.

*The percentage of Total Revenue is calculated using the yearly revenue received from the municipality or the authority divided by the total yearly revenue of the Water Operating Fund. The total revenue for Fiscal Year 2019 was $745,330,463.

**COA% or Consent Order and Agreement (COA) percentage is the Township's share of expenses for the Long-Term Control Plan to mitigate combined sewer overflows (CSOs).

(1) Bucks County Water and Sewer Authority purchased the wastewater collection and disposal system of Springfield Township in December 2015 and purchased the wastewater collection system of Bensalem in September 1999.
(2) The COA% reflects the total amount for Wyndmoor and Erdenheim combined.
(3) Delcora allocated capital is based on assets placed in service on or after July 4, 2011.
(4) Delcora has signed an asset purchase agreement with Aqua PA Wastewater (defined herein) to sell its wastewater assets. The transaction is subject to approval by the Public Utility Commission.
(5) Cheltenham Township sold its sewer system to Aqua PA Wastewater in December of 2019. The Water Department's contract with the township was transferred to Aqua PA Wastewater in connection with the sale.

The Water System

General

The Water System's service area includes the City. The Water System has one wholesale water service contract (see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2019 above). Based on the 2018 U.S. Census Bureau estimate, the Water System served 1,584,138 individuals.

As of June 30, 2019, the Water System served approximately 490,000 active customer accounts using approximately 3,100 miles of mains and approximately 25,000 fire hydrants. Customer accounts have been stable the past several years, but consumption patterns are expected to be negatively affected in Fiscal Year 2021 as a result of the COVID-19 pandemic. See "RATES – Current Rates" and " – Billing and Collections" herein.

The City obtains approximately 58% of its water from the Delaware River and the balance from the Schuylkill River. Under the City's water allocation permit issued by the PADEP, which expires in September 2041, the City is authorized to withdraw up to 423 million gallons per day ("MGD") from the Delaware River and up to 258 MGD from the Schuylkill River.

Water treatment is provided by the Samuel S. Baxter Water Treatment Plant on the Delaware River and by the Belmont and Queen Lane Water Treatment Plants on the Schuylkill River. The combined rated treatment capacity of these plants under the Water Department's Partnership for Safe Water procedures is 546 MGD. The combined maximum source water withdrawal capacity from the two rivers that supply these plants is 680 MGD. The excess source water capacity enables higher than normal withdrawal from either river should conditions limit withdrawals from one. The storage capacity for treated and untreated water in the combined plant and distribution system totals 950 million gallons ("MG"). In Fiscal Year 2019, the Water System distributed 80,943 MG of water at an average daily rate of 221.8 MG. In Fiscal Year 2019, the maximum delivery experienced by the Water System in one day was 258.1 MG.

Baxter Water Treatment Plant Clear Well

The Baxter Water Treatment Plant is the Water Department's largest water treatment facility. Its current clear water basin (the "CWB") contains 50 million gallons of water, which is supplied to the Lardner's Point Pump Station. In February 2017, the Water Department commenced construction to replace the CWB with four 5MG basins. Construction is expected to be completed in two phases and take five and a half years to complete. The first phase is expected to be completed in late calendar year 2021 and is anticipated to cost approximately $115 million. The second phase is expected to start after the first phase is completed.

Wholesale Contracts

The Water Department has a wholesale contract for water services with Aqua Pennsylvania, Inc. ("AP") under which the Water Department has agreed to provide wholesale water service through March 1, 2026. For wholesale water customer revenues for Fiscal Year 2019, see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2019 on the preceding page.

Environmental Compliance

Drinking Water Regulatory Matters

The water provided by the Water System meets all physical, chemical, radiological and bacteriological water quality standards established by the United States Environmental Protection Agency (the "EPA") under the federal Safe Drinking Water Act and by the PADEP. The EPA required a second round of source water sampling for the Long Term 2 Enhanced Surface Water Treatment Rule beginning in April 2015 to measure the concentration of Cryptosporidium present at the intakes of the three water treatment plants. The first round of sampling resulted in the Queen Lane Water Treatment Plant being classified in the BIN 2 category in 2008. The second round of sampling resulted in the Baxter Water Treatment Plant being classified in the BIN 2 category in 2018. The Water Department currently has a Watershed Control Program Plan in place for the Schuylkill River Watershed to better manage sources of Cryptosporidium upstream of the Queen Lane Water Treatment Plant. A similar plan may also be required for the Delaware River Watershed. In October 2018, the Water Department submitted a letter of intent to the PADEP to expand the scope of the Schuylkill River Watershed Control Program Plan to priority areas of the Delaware River Watershed to support compliance at the Baxter Water Treatment Plant. The updated Watershed Control Program Plan Update will target the same priority sources: agricultural operations, wildlife, and wastewater treatment plant effluent through a combination of on-the-ground projects, research, and education and outreach initiatives. The Water Department expects to submit the updated Watershed Control Program Plan to PADEP in 2020.

The Water Department continues to prepare for possible future regulations regarding the distribution system using a variety of tools that allow the Water Department to track water through the Water System. The Water Department also is actively involved in monitoring, commenting on, and implementing practices to respond to rules and regulations for water systems enacted by the PADEP and the EPA. The Water Department submitted its Risk and Resilience Assessment certification as required under AWIA in March 2020 and is currently on track to submit its Emergency Response Plan certification in September 2020.

Lead and Copper Rule

Pursuant to the federal Safe Drinking Water Act, the Water Department is required to conduct Lead and Copper Rule ("LCR") monitoring as required by the EPA and PADEP. In February 2016, the EPA re-issued guidance for public water systems regarding LCR tap sampling procedures, and in May 2016, the PADEP endorsed the EPA's guidance. The Water Department follows such guidance.

The Water Department conducted the latest round of LCR monitoring in 2019. To secure more sampling, the Water Department conducted a mail recruitment campaign that reached all residential customers. The Water Department also directly contacted customers that had previously participated in prior LCR testing and partnered with a community service organization to conduct outreach in underserved areas of the City. The Water Department's efforts resulted in 199 responses, and 99 customers completed testing in 2019. Regulatory action levels are 15 parts-per-billion ("ppb") for lead and 1.3 ppm for copper. Results for ninety percent (90%) of the homes were less than 3 ppb for lead and less than 0.279 ppm for copper, which are below the action levels set by the regulation. The Water Department is on a reduced monitoring schedule due to consistent results below regulatory action levels for lead and copper. It conducts monitoring every three years. The next round of LCR sampling is expected to occur in 2022.

On October 10, 2019, the EPA released proposed revisions to the LCR. The proposed revisions, if made into regulations as proposed, could significantly affect the Water Department's operations by requiring the following, among others: additional public education and notification; education, sampling and testing for all schools and childcare facilities every 5 years; provision of pitcher filters and follow-up sampling after the replacement of any lead service line; additional sampling to determine corrosion and for samples indicating elevated lead exposure; and development and maintenance of an inventory of service line materials along with annual communication to those customers with lead lines. The Water Department will continue evaluating the potential effects of the proposed revisions on its operations.

Clean Streams Law

The Water System is subject to various environmental laws and regulations, and from time to time, receives notices of violations of such environmental laws and regulations. As a result of such violations, the Water Department has incurred minor fines from time to time.

Storage Tanks

Under the Pennsylvania Storage Tank and Spill Prevention Act and regulations adopted thereunder, field-constructed underground storage tanks were required to be registered with the PADEP by February 20, 2019. Such tanks must comply with certain other regulatory requirements by December 22, 2019. The new registration and regulatory requirements apply to five field-constructed underground storage tanks at the Water Department's Belmont and Queen Lane water treatment plants. The Water Department did not register these field-constructed underground storage tanks with PADEP until March 20, 2019 and previously advised PADEP that it would not meet all of the regulatory requirements effective December 22, 2019. As a result, the Water Department entered into a Consent Order and Agreement with PADEP on June 3, 2019, pursuant to which the Water Department will close, upgrade or perform a change-in-service of its underground storage tanks by December 31, 2020. The original Consent Order and Agreement deadline was extended from June 30, 2020 to December 31, 2020 at the Water Department's request. The Water Department intends to submit an additional extension request before the end of the calendar year. The Water Department expects to comply with the Consent Order and Agreement; however, in the event the Water Department fails to comply, it will be required to pay nominal penalties.

The Wastewater System

General

The Wastewater System's service area includes the City. The Water Department has ten wholesale wastewater service contracts (see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2019). Based on the 2018 U.S. Census Bureau estimate, the Wastewater System served 1,584,138 individuals that live in the City and ten wholesale contracts.

As of June 30, 2019, the Wastewater System served approximately 545,000 accounts, including approximately 60,000 stormwater-only accounts (see "THE SYSTEM – Stormwater Management" below), and ten wholesale contracts with neighboring municipalities and authorities. Customer accounts have been stable the past several years and are expected to remain constant in Fiscal Year 2020.

The Wastewater System consists of three water pollution control plants, the Northeast, Southwest and Southeast water pollution control plants (the "WPCPs"), 29 pumping stations, approximately 3,700 miles of sewers, and a privately managed centralized biosolids handling facility. It includes approximately 1,850 miles of combined sewers, 770 miles of sanitary sewers, 750 miles of stormwater sewers, 16 miles of force mains (sanitary and storm) and approximately 330 miles of appurtenant piping. The three WPCPs processed a combined average of 484 MGD of wastewater in Fiscal Year 2019, have a 522 MGD combined average design capacity and a peak capacity of 1,059 MGD.

Stormwater Management Services

The Water Department delivers many of the City's stormwater management services, including maintenance of the City's approximately 750 miles of separate storm sewers, 1,850 miles of combined sewers and 71,500 stormwater inlets. In recent years, changes in work practices and investment in new equipment have enabled the Water Department to steadily increase the number of inlets cleaned annually.

Wastewater Regulation and Permits

The Clean Water Act requires cities, like Philadelphia, whose separate storm sewer systems serve a population of over 100,000 to obtain a permit from the National Pollutant Discharge Elimination System ("NPDES") for their discharges. The EPA has delegated the NPDES program for the Commonwealth to the PADEP. In addition to the Clean Water Act, the City and its WPCPs are subject to regulation by the PADEP, which exercises regulatory authority over municipal sewage treatment operations, and by the Delaware River

Basin Commission ("DRBC"), which exercises regulatory authority over withdrawals from and discharges into the Delaware and Schuylkill Rivers. The City's NPDES permits require reduction of pollution from commercial and residential areas, illicit connections, industrial facilities and construction sites. The NPDES permits also require the City to manage and treat the excess stormwater and wastewater mix that discharges directly into local waterways during certain precipitation events. See – "Environmental Compliance – Combined Sewer Overflow Program" below.

Current NPDES permits for the Northeast, Southeast and Southwest WPCPs expired on August 31, 2012. The facilities are operating under an extension of the expired permits, as dictated by the policies of the PADEP. The expired NPDES permits will remain in place until new permits are issued. The Water Department submitted applications for renewals to the PADEP in February of 2012. The Water Department and the PADEP are continuing negotiations for the Northeast WPCP permit. The Water Department anticipates that the other two permits will be negotiated shortly after the Northeast WPCP permit is finalized. See "Environmental Compliance – *Combined Sewer Overflow Program*" below.

In 2019, all three of Philadelphia's WPCPs were selected by the National Association of Clean Water Agencies ("NACWA") to receive awards for excellent performance during 2018. The Southwest and Southeast WPCPs were selected to receive Platinum Awards. NACWA's Peak Performance Awards Program recognizes excellence in wastewater treatment as measured by compliance with NPDES permits. Platinum Awards pay special tribute to facilities that have been awarded 5 or more consecutive Gold Awards, which recognize 100% compliance for the calendar year. As of February 29, 2020, the Southwest and Southeast WPCPs have achieved 100% compliance for the past 8 years and 19 years, respectively. The Northeast WPCP received one violation in June 2018 and had achieved prior perfect compliance for 13 consecutive years as of May 31, 2018 and has achieved perfect compliance again for the calendar year of 2019. The Southwest plant was non-compliant in the months of March and April 2020 due, in part, to the COVID-19 requirements of reduced staffing, which produced slower response times to equipment failures and process disruptions. For 2018, the Northeast WPCP received the Silver Award from NACWA.

Wholesale Contracts

Contracts for wastewater treatment service with neighboring municipalities and authorities provide for charges based on operating costs attributable to the volume and strength of the wastewater received from each of these customers. The contracts of wholesale wastewater customers have different expiration dates. As these contracts have been extended or amended, management fees have increased from 10% to 12%. The way customers are billed for capital costs has changed from paying a proportionate share of facility investments to paying depreciation and return on investment on a monthly basis. Customers have also been assigned their proportionate share of COA expenditures. See Table 4 for Fiscal Year 2019 revenues, contract end dates, and which customers are currently paying their proportionate share of COA expenditures. Wholesale revenues for Fiscal Year 2018 were $37,427,704. Revenues for Fiscal Year 2019 were $39,515,436.

The Water Department has implemented certain changes to the existing long-term wholesale contracts presented in Table 4. Such changes include extending the terms of certain contracts, excluding the contracts with Lower Moreland Township and Abington Township, which had already been extended, increasing management fees from 10% to 12%, and requiring wholesale wastewater customers to assume their respective proportionate share of COA Expenditures. The contract end dates shown in Table 4 represent the extended contract dates. As demonstrated in Table 4, the Water Department currently charges six wholesale wastewater customers for their respective share of COA Expenditures.

Cheltenham Township

Cheltenham Township sold its sewer system to Aqua Pennsylvania Wastewater, Inc. ("Aqua PA Wastewater"), a privately-owned water and wastewater utility and subsidiary of Aqua America, Inc., in

December of 2019. The Water Department has transferred its Wastewater Service Agreement with Cheltenham Township to Aqua PA Wastewater.

Delaware County Regional Water Quality Control Authority ("DELCORA")

Aqua PA Wastewater signed an asset purchase agreement to acquire DELCORA's wastewater assets. The pending transaction is subject to approval by the Pennsylvania Public Utility Commission ("PUC"). During the pendency of PUC's review, Delaware County Council has filed a suit to block the sale. If approved by PUC, Aqua PA Wastewater and DELCORA have informed the Water Department that they may build infrastructure to divert wastewater flows from the Water Department. Wholesale wastewater revenues from DELCORA for Fiscal Year 2019 were 1.35%; see Table 4 – Wholesale Water and Wastewater Customer Revenues Fiscal Year Ending June 30, 2019 herein. See also APPENDIX II – Engineering Report; the Report includes annual wholesale wastewater revenue from DELCORA through Fiscal Year 2025, the end of the projection period. At this time, the Water Department has no additional information regarding PUC's approval process.

Environmental Compliance

Combined Sewer Overflow Program

The current NPDES permits require the Water Department to implement a program to manage combined system overflows. In certain sections of the City, both wastewater and stormwater are collected and conveyed in a single pipe to the sewage treatment plant. During certain precipitation events, the additional stormwater produced exceeds the capacity of the treatment plant, resulting in a combined system overflow that discharges directly into local waterways ("CSOs").

The PADEP and the Water Department signed the COA on June 1, 2011 that allowed the Water Department to implement its Combined Sewer Overflow Program known as the "Green City, Clean Waters Program." Under the program, the City has been investing in green and traditional infrastructure, including wastewater treatment facility enhancements, interceptor pipe lining and collection system improvements, to mitigate CSOs and enhance the quality of local waterways.

As required under the COA, by the year 2036 (year 25 of the COA), the City's Combined Sewer Overflow Program seeks to eliminate and remove the mass of pollutants that otherwise would be removed by the capture of 85% by volume, city-wide, of CSOs. The COA further requires that once the required standard of 85% capture by volume has been achieved in the year 2036, the City must continue to operate its combined sewer system to maintain this required standard for at least an additional twenty years. The COA requires interim milestones at the end of the fifth, tenth, fifteenth and twentieth years in four categories: (1) Total Greened Acres; (2) Overflow Reduction Volume; (3) Miles of Interceptor Lined; and (4) Wastewater Treatment Plant Upgrades in design and construction. The COA also includes significant penalties for non-compliance with the milestones. Penalties start at $25,000 per month for each violation (for the first 6 months) and increase up to $100,000 monthly for uncured violations of 13 months or more.

In November 9, 2016, the Water Department received a revised request directing the Water Department to analyze the controls necessary to achieve 85% capture in each of the City's three combined sewer systems, which is inconsistent with the metrics contained in its approved COA that require 85% capture based on a city-wide average. On April 10, 2017, the EPA agreed to stay the obligation to respond to the information request and scheduled a meeting with the Water Department to discuss the issue further, which meeting took place on June 26, 2018. As of the date of this Official Statement, the information request remains stayed.

The Water Department anticipates that over the next 16 years, compliance with the COA will significantly increase capital and operating expenditures related to its Combined Sewer Overflow Program. Moreover, any resulting changes to the COA as a result of the EPA's information request could further increase the costs of compliance. Looking ahead to the 10th-year milestone, the Water Department continues to review program cost and delivery in an effort to optimize the program while satisfying the necessary regulatory requirements. As of the most recent projections, the total cost of the 25-year program is approximately $4.5 billion, of which approximately $3.5 billion are capital related costs and $1 billion are operation and maintenance costs.

The City allocated $76 million for capital COA Expenditures in the budgets for Fiscal Years 2018 and 2019. The budget for Fiscal Year 2020 was $91 million. The budget for Fiscal Year 2021 is $227 million. See Table 5 – Fiscal Years 2021-2026 6-year Water Capital Improvement Program and COA Budget. From July 1, 2011 through and including June 30, 2019, the Water Department's capital spending for COA projects was approximately $190 million. During the same period, the Water Department spent $254 million from its operating budget. For more information on stormwater credits, see Table 12 – Stormwater Incentives and Assistance Program.

The Water Department has completed the requirements of the fifth-year milestone of 744 greened acres and reducing annual CSO volume by 660 million gallons. Under the COA, the Water Department must complete a total of 2,148 greened acres and reduce annual CSO volume by 2,044 million gallons by June 1, 2021 (the "Ten-Year Milestone"). As of January 1, 2020, the Water Department has completed approximately 1,400 greened acres, inclusive of the acres completed towards the fifth-year milestone. The City has the option to petition the PADEP for an extension of time to satisfy the requirements of the COA if the wastewater component of a customer's bill were to exceed 2.27% of median household income or in the case of a force majeure event. The City anticipated meeting all required compliance requirements for the Ten-Year Milestone prior to the COVID-19 pandemic. Restrictions related to the pandemic disrupted, and continue to disrupt, both ongoing and planned construction projects. As such, the City has notified the PADEP of anticipated delays in completing some of the Ten-Year Milestones and deliverables and of the City's intent to seek an extension for compliance with the Ten-Year Milestones pursuant to the force majeure provision of the COA. Communication is ongoing between the City and the PADEP.

The Water Department's Stormwater Management Incentives Program ("SMIP") and Green Acre Retrofit Program ("GARP") typically provide 100% funding for the private sector to build, own, operate and maintain green stormwater infrastructure on private property. Once the project is complete, the recipient receives up to an 80% reduction on stormwater charges. Since the program's inception, the Water Department has achieved 391 acres as of June 30, 2018, 577 acres as of June 30, 2019, and 602 acres as of December 31, 2019. These acres are part of the Water Department's totaled greened acres discussed above. See Table 12 – Stormwater Incentives and Assistance Program.

The City has the option to petition the PADEP for an extension of time to satisfy the requirements of the COA if the wastewater component of a customer's bill were to exceed 2.27% of median household income. The Water Department currently anticipates that it will meet the targets for the Ten-Year Milestone and has procedures in place to track compliance with the COA. Delays in completing greened acres and reducing CSO can occur and no assurance can be given that any milestone under the CSO will be met. For more information regarding the COA, see APPENDIX II – Engineering Report.

Clean Streams Law

The Wastewater System is subject to environmental laws and regulations and receives notices, from time to time, of violations of such environmental laws and regulations. As a result of such violations, the Water Department has occasionally incurred minor fines.

Clean Air Act

The federal Clean Air Act sets forth requirements for the regulation of certain air emissions. The PADEP, pursuant to the Clean Air Act's mandates, issued regulations for the control of Volatile Organic Compounds ("VOC") and Nitrogen Oxide ("NOx") emissions from major stationary sources. The Northeast and Southwest WPCPS and the Biosolids Recycling Center were found to be major sources of VOC and NOx emissions, while the Southeast WPCP is a minor source. From time to time, the Water Department has incurred minor fines for violation of the Clean Air Act.

Polychlorinated Biphenyls (PCBs)

Pursuant to Section 303(d) of the Clean Water Act, the Delaware River has been declared impaired because of the levels found in the water of an organic chemical known as polychlorinated biphenyls ("PCBs"). As a result, the Delaware River Basin Commission is performing a Total Maximum Daily Load ("TMDL") analysis that will define the magnitude of PCBs and set forth a plan to reduce loadings of PCBs into the river. The current understanding is that the river exceeds its allowable loadings by 1,000 times its allowance. Loadings come from virtually every source, e.g., sediments, air, runoff from land, contaminated sites and the PCBs that are contained in the influent of the Water Department's three WPCPs. The Water Department's NPDES permits require implementation of a pollutant minimization plan, which involves tracking down sources of PCBs and referring them to the appropriate agency for remediation. This involves additional staff to track the sources of PCBs and to devise programs to reduce the loadings. The level and extent of clean up that will be required by each source category in the future is currently being evaluated by the Delaware River Basin Commission, the EPA and the states comprising the Delaware River Basin Commission.

Biosolids Treatment and Utilization

The City is required by federal and state law administered by the EPA and the PADEP to treat and dispose of biosolids captured during wastewater treatment at the City's WPCPs. Under the Biosolids Service Contract, Philadelphia Biosolids treats biosolids from the City's three WPCPs and produces and disposes of Class A pellets to be used as fertilizer and potentially fuel. For more information on the Biosolids Service Contract, see "OUTSTANDING INDEBTEDNESS AND OTHER LONG-TERM AGREEMENTS – Other Obligations" – Contract for Biosolids Treatment with Philadelphia Biosolids Services, LLC.

Stormwater Management

The Water Department's Municipal Separate Storm Sewer NPDES Permit, a city-wide permit, expired in 2010. The Water Department submitted an application for renewal to the PADEP in 2010 and is in negotiations with the PADEP to finalize the permit requirements. The Water Department continues operating under an extension of the expired permit, as dictated by the policies of the PADEP, which will remain in place until a new permit is issued.

The Water Department's stormwater system is subject to environmental laws and regulations and receives notices, from time to time, of violations of such environmental laws and regulations. As a result of such violations, the Water Department has occasionally incurred minor fines.

CAPITAL IMPROVEMENT PROGRAM

The Charter requires City Council to adopt annually, on or prior to May 31, a one-year capital budget for the ensuing Fiscal Year and a six-year budget showing the capital expenditures planned for that year and each of the five ensuing Fiscal Years known as the "City Capital Improvement Program." The Water Capital Improvement Program is included in the City Capital Improvement Program. The City Capital Improvement Program is prepared annually by the City Planning Commission to present the capital expenditures planned for each of the five ensuing Fiscal Years, including the estimated total cost of each project and the estimated sources of funding (local, state, federal, and private) for each project. The City Capital Improvement Program is reviewed by the Mayor and transmitted to City Council for adoption with his recommendation. The capital budget ordinance, authorizing in detail the capital expenditures to be made or incurred in the ensuing Fiscal Year from City Council appropriated funds, is adopted by City Council concurrently with the City Capital Improvement Program. The one-year capital budget must be in full conformity with the City Capital

Improvement Program applicable to the Fiscal Year that it covers. City Council approved the City Capital Improvement Program for Fiscal Years 2021 through 2026 on June 26, 2020. The Fiscal Year 2021 budget is $611,385,000. The budget for the Water Capital Improvement Program for Fiscal Year 2021 to Fiscal Year 2026 is approximately $3.6 billion. In Fiscal Years 2018 and 2019, the Water Department's actual capital expenditures totaled $245 million and $315 million, respectively. As of June 30, 2020, capital expenditures for Fiscal Year 2020 totaled $265 million.

For a discussion of the Water Capital Improvement Program, see "– Capital Improvement Program" contained in APPENDIX II – Engineering Report. The Engineering Report sets forth the financing requirements for capital improvements through Fiscal Year 2025.

Table 5 summarizes the 6-year Water Capital Improvement Program and COA Budget for Fiscal Years 2021 through 2026. A list of the Water Department's top fifteen active and bid capital projects in terms of estimated cost and expected financing sources also are presented in Tables 6 and 7, respectively. The Water Department may change the elements of the Water Capital Improvement Program at any time and from time to time, including the proposed financing vehicles and/or schedules associated therewith.

Due to the effects of the COVID-19 pandemic, certain non-critical capital projects will be postponed or will have their budgets reduced. See "INTRODUCTORY STATEMENT – COVID-19 Response" herein. See also "CAPITAL IMPROVEMENT PROGRAM – Table 6 – Top Fifteen Active Capital Projects by Estimated Cost" and " – Water Main Replacement" and " – Sewer Replacement and Renewal" herein.

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Table 5
Fiscal Years 2021-2026
6-year Capital Improvement Program and COA Budget

Capital Budget Summary	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**Total FY 2021-2026**
Collector System/Flood Relief	$82,860,000	$82,860,000	$82,860,000	$82,860,000	$82,860,000	$82,860,000	$497,160,000
Collector System (*CSO COA)*	76,600,000	72,000,000	72,000,000	72,000,000	72,000,000	134,000,000	498,600,000
Conveyance System	98,060,000	106,060,000	177,160,000	122,460,000	113,060,000	113,060,000	729,860,000
Engineering Administration & Material Support	25,865,000	25,865,000	25,865,000	25,865,000	25,865,000	25,865,000	155,190,000
Water & Wastewater Facilities	178,000,000	199,200,000	296,500,000	130,200,000	291,200,000	319,200,000	1,414,300,000
Wastewater Treatment Facilities (*CSO COA)*	150,000,000	60,000,000	60,000,000	60,000,000	10,000,000	10,000,000	350,000,000
Total	**$611,385,000**	**$545,985,000**	**$714,385,000**	**$493,385,000**	**$594,985,000**	**$684,985,000**	**$3,645,110,000**
Subtotal Non-CSO COA	$384,785,000	$413,985,000	$582,385,000	$361,385,000	$512,985,000	$540,985,000	$2,796,510,000
Subtotal CSO COA*	226,600,000	132,000,000	132,000,000	132,000,000	82,000,000	144,000,000	848,600,000
Total	**$611,385,000**	**$545,985,000**	**$714,385,000**	**$493,385,000**	**$594,985,000**	**$684,985,000**	**$3,645,110,000**

* COA Expenditures represent 23.3% of the Capital Improvement Program budget for Fiscal Years 2021 through 2026.

The following table presents the Water Department's top fifteen active and bid capital projects in terms of estimated cost. Such projects are included in the Water Capital Improvement Program and are constructed and paid over a number of Fiscal Years.

Table 6
Philadelphia Water Department
Top Fifteen Active Capital Projects by Estimated Cost
Fiscal Year Ending June 30, 2019

No.	Project Title	Status	Estimated Cost	Fiscal Year Commencement
1	New 10 Million Gallon Clear Water Basin at Baxter Water Treatment Plant	Under Construction	$115,800,000	2017
2	Three 30 Million Gallon Storage Tanks at East Park	Under Construction	111,000,000	2017
3	Advanced Metering Infrastructure (AMI)	Project Commenced	75,000,000	2019
4	Water Main Replacements*	Ongoing Replacement	56,000,000	
5	Sewer Main Replacements*	Ongoing Replacement	37,000,000	
6	Drinking Water System Security – Belmont, Queen Lane & Various Locations	Under Construction	24,100,000	2017
7	Dissolved Air Floatation System Improvements at Southwest Water Pollution Control Plant	Under Construction	21,900,000	2018
8	Belmont Raw Water Pumping Station Standby Generator	Under Construction	18,900,000	2019
9	Final Sedimentation Tank Improvements at Southeast Water Pollution Control Plant	Under Construction	16,400,000	2017
10	Return Sludge Line Final Sedimentation Tank 2	Under Construction	15,500,000	2020
11	Flood Relief in Germantown from Wildey to Girard – Northern Liberties Phase 5	Under Construction	13,500,000	2017
12	Facade Improvements at QL PTB	Under Construction	12,000,000	2020
13	American Street Corridor Improvements	Under Construction	10,500,000	2018
14	Wissinoming Green Street	Under Construction	8,750,000	2020
15	Replacement of Flocculator Shafts and Bearings at Baxter WTP	Under Construction	7,750,000	2019
	TOTAL		**$544,100,000**	

*Due to the effects of the COVID-19 pandemic, expenditures will be lower than originally budgeted.

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Capital Improvement Program Financing Sources

The Water Department expects to finance the Water Capital Improvement Program using revenue bonds, pay-as-you-go financing, and possibly alternative sources of funding, including loans or grants. The Rate Board set a target of twenty percent pay-as-you-go financing for funding the Water Capital Improvement Program. The majority of the remaining portion of the costs of the Water Capital Improvement Program is expected to be funded with the proceeds of debt as indicated below. The City expects most of such debt to be in the form of new money revenue bonds issued in several transactions, as necessary. The emphasis of the Water Capital Improvement Program is on: (i) renewal and replacement of the water conveyance and sewage collection systems, (ii) improvements to water and wastewater treatment plants and (iii) CSO mitigation projects consistent with the Water Department's COA.

As described in the Engineering Report, the Water Department anticipates additional borrowings for Fiscal Years 2021 through 2025 as follows:

Table 7
Anticipated Future Borrowings for Water Capital Improvement Program

Fiscal Year	Estimated Principal Amount
2021	$175,510,000
2022	511,010,000
2023	459,895,000
2024	544,085,000
2025	523,305,000

City Council has preauthorized by supplemental ordinance a portion of the debt that will finance a majority of the projects contained in the Water Capital Improvement Program. The Water Department may change the financing elements of the Water Capital Improvement Program, including the financing vehicles utilized and the timing thereof, at any time and from time to time.

The Water Department also considers alternative sources of financing from time to time, in addition to the anticipated borrowings described above. On February 5, 2020, the City of Philadelphia, through the Water Department, submitted a financing application to the Pennsylvania Infrastructure Investment Authority ("PENNVEST") for $73,350,000 to fund the rehabilitation of the Torresdale Filtered Water Pump Station. The Water Department was awarded the loan on or about April 22, 2020. The financing is required to close within 270 days of the award date.

Capital Planning Initiatives

The Water Department's Operations, Planning and Environmental Services, and Engineering and Construction 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 based system records viewer, a capital facilities assessment program, and a standardized planning process for all large capital projects.

The Water Department has enhanced its planning process for capital projects that have an initial estimated design and construction cost of $2 million or more. As part of such initiative, the Water 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 the Water Department's future critical strategic planning efforts, in addition to improving communication and coordination among units within the Water Department. Below is a discussion of a few of the Water Department's capital planning initiatives. See also "MANAGEMENT INITIATIVES – Water Master Planning" for information on the Water Department's 25-year Master Planning process.

Water Main Replacement

The Water Department's five-year average breaks per 100 miles is 25.8 per year. The Water Department assesses its water main break rate against the optimal level of 15 breaks per 100 miles/year as defined by the Distribution System Optimization Program under the American Waterworks Association (the "AWWA") Partnership for Safe Water. The Water Department closely monitors water main conditions to determine that adequate capital investment is made, to predict long-term water main replacement needs and refine the criteria for replacement selection. Over the last 25 years, the Water Department has replaced on average 19 miles of water mains per year. In Fiscal Year 2020, the Water Department budgeted $78 million for water main replacement in order to accelerate its water main replacement program with a new goal of replacing a total of 34 miles of water mains. For Fiscal Year 2021, the Water Department's budget for water main replacement is $93 million. For Fiscal Years 2020 through 2024, the Water Department intends to continue to target an increase of 2 miles of water main replacement per year until it reaches a total of 42 miles of water main replacement for that period. For Fiscal Years 2025 and thereafter the Water Department intends to continue to target the replacement of 42 miles of water mains annually. However, due to the impact of COVID-19 on revenues and operations, the Water Department expects that expenditures for water main replacement will be less than originally budgeted.

Linear Asset Management Program

The Linear Asset Management Program ("LAMP") evaluates the Water Department's water and sewer assets. LAMP is leveraging several information systems, existing programs and statistical tools to evaluate non-capital options for extending an asset's useful life and assess the risk of pipeline failure for the water distribution system and the sewer collector system, the costs of replacement, ancillary damages and operations and maintenance history. With this information, a new long-term plan for water pipeline renewal was developed in Fiscal Year 2016, under which the Water Department has commenced replacement of additional miles of failure prone leadite joint piping, a cohort that has the highest statistical likelihood of failure.

Distribution System Reservoir Planning Initiative

The reservoir team was created to better manage the strategic and capital planning and operations and maintenance functions of the Water Department's finished water reservoirs. Initially, the team updated all standard operating procedures and improved as-built facility documentation and has since strategically focused on the East Park Reservoir. The costs and construction status of the East Park Reservoir project are detailed in the preceding Table 6 – Top Fifteen Active Capital Projects by Estimated Cost.

Sewer Replacement and Renewal Program

Over the last 25 years, the Water Department has reconstructed and/or rehabilitated, on average, approximately 8 miles of sewer annually. The Water Capital Improvement Program currently includes reconstructing or relining from six to ten miles of sewers per year based upon results of the Sewer Infrastructure Assessment Program and other reports, including data from LAMP. Some sewers are scheduled for reconstruction as a result of programmed water main replacement. As infrastructure is studied further, it is likely that annual sewer renewal will increase. The Fiscal Year 2020 budget was $57 million. For Fiscal Year 2021 through Fiscal Year 2025, the Water Department's budget for sewer replacement is $57 million, which is expected to yield 8 to 10 miles per year of sewer reconstruction or rehabilitation. However, due to the impact of COVID-19 on revenues and operations, the Water Department anticipates that expenditures for sewer reconstruction and rehabilitation will be less than originally budgeted.

Sewer Infrastructure Assessment Program

The Water Department has incorporated a sewer assessment program to evaluate the condition of its sewer system. Data collected from the program is used to determine necessary repairs and capital and operating costs of such repairs. The program has helped to identify sewers in immediate need of repair, and it is anticipated that over time it will result in a reduction of costly and disruptive emergency sewer repairs. The sewer assessment program also is used to schedule repairs for sewers that have reached the end of their useful life. Such sewers will be reconstructed as part of the Water Capital Improvement Program.

HISTORICAL AND PROJECTED FINANCIAL INFORMATION

Historical Comparative Statement of Net Position

The Water Department's financial statements are prepared in accordance with accounting principles promulgated by the Governmental Accounting Standards Board ("GASB"). The statement of net position presents the financial position of the Water Department. It presents information on the Water Department's assets, deferred outflows of resources, and liabilities with the difference between the three reported as net position. A three-year condensed summary of the Water Department's net position as of June 30 for Fiscal Years 2017 through 2019, as presented in the audited financial statements for such years, is presented below.

Table 8
Condensed Statement of Net Position as of June 30, 2019
(Thousands of Dollars)

	FY 2019	FY 2018 *	FY 2017
Assets:			
Current Assets	$ 284,260	$ 267,446	$ 258,444
Capital Assets	2,655,300	2,487,889	2,318,410
Restricted Assets	749,096	685,404	887,924
Total Assets	3,688,656	3,440,739	3,464,778
Deferred Outflows of Resources	69,542	84,100	94,211
Total Assets and Deferred Outflows	3,758,198	3,524,839	3,558,989
Liabilities:			
Current Liabilities *	240,323	223,523	240,464
Bonds Payable	2,070,390	1,890,590	2,022,636
Other Non-Current Liabilities *	609,514	615,952	483,646
Total Liabilities	2,920,227	2,730,065	2,746,746
Deferred Inflows of Resources	15,887	8,133	2,144
Total Liabilities and Deferred Inflows	2,936,114	2,738,198	2,748,890
Net Position:			
Net Investment in Capital Assets	649,536	687,482	542,042
Restricted	545,506	478,940	511,113
Unrestricted	(372,958)	(379,781)	(243,056)
Total Net Position, as Restated	$ 822,084	$ 786,641	$ 765,104

*The Fiscal Year 2018 current portion of compensated absences has been reclassified from Other Noncurrent Liabilities to Current Liabilities.

The following discussion relates to the Water Department's net position at June 30, 2019 and is based upon audited financials. The Water Fund's net position at June 30, 2019 was approximately $822 million, a $35.4 million or 4.5% increase from June 30, 2018. Total assets and deferred outflows of resources increased by $233.3 million, or 6.6%, to $3.8 billion, and total liabilities and deferred inflows of resources increased $197.9 million, or 7.2%, to $2.9 billion.

- Current assets increased by $16.8 million to $284.3 million, or 6.3%, due to increases in Equity in Treasurer's account and accounts receivable.
- Restricted assets increased by $63.7 million to $749.1 million, or 9.3%, due to increases in the Water Capital Fund.
- Deferred outflows of resources decreased by $14.6 million to $69.5 million, or 17.3%, due to deferred outflows of resources related to unamortized loss on refunded debt and the Water Fund's net pension liability which was partially offset by net OPEB liability.
- Current liabilities increased by $16.8 million to $240.3 million, or 7.5%, primarily due to increases in construction contracts payable and accrued expenses.
- Bonds payable increased by $179.8 million to $2.1 billion, or 9.5%, primarily due to additional debt issuances.
- Other noncurrent liabilities decreased by $6.4 million to $609.5 million, or 1.0%. primarily due to minor changes in net pension and net OPEB liability.
- Deferred inflows of resources increased by $7.8 million due to deferred inflows of resources related to net OPEB liability.
- The Water Fund's net position increased by $35.4 million to $822.1 million, or 4.5%, as a result of Fiscal Year 2019 operations and prior period adjustments.
- Net investment in capital assets decreased by $37.9 million, or 5.5%, to $649.5 million.
- Unrestricted net position increased by $6.8 million, or 1.8%, to a deficit of $373.0 million. The unrestricted component of net position represents the net amount of total assets, deferred outflows of resources, total liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or restricted components of net position.

Historical Operating Results (Legally Enacted Basis)

For purposes of rate setting, calculating compliance with the Rate Covenant and debt service coverage and budgeting, the Water Fund accounts are maintained on the modified accrual basis of accounting, also referred to as the "Legally Enacted Basis." Under this basis, revenues are recorded on a receipts basis, except revenues from other governments and interest, which are accrued as earned. A 100% reserve is provided for all doubtful non-governmental receivables. With respect to governmental receivables, a 100% reserve is provided when the City has reason to believe that no appropriation has been made by other governments to finance these receivables. The Water Department does not account for payments for water and sewer service from its governmental contract customers as "revenues from other governments."

Expenditures are recognized and recorded as expenses at the time they are paid or encumbered, except expenditures for debt service, which are recorded when paid. A reserve is maintained for encumbrances at the close of the Fiscal Year intended to pay expenses incurred in such Fiscal Year.

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Table 9
Philadelphia Water Department Historical Operating Results
(Thousands of Dollars)

		FY 2019	FY 2018	FY 2017
1.	**Operating Revenues:**			
2.	Sales to General Customers	$639,028	$635,072	$615,886
3.	Wholesale Wastewater Revenues	39,515	37,428	34,652
4.	Services to General and Aviation Fund	35,245	33,490	33,364
5.	Private Fire Connections	3,598	3,169	2,872
6.	Industrial Sewer Surcharge	4,699	5,628	5,911
7.	Other Operating Revenue	8,130	7,208	7,122
8.	Operating Grants	698	569	1,408
9.	**Total Operating Revenues**	**$730,913**	**$722,564**	**$701,215**
10.	**Non-Operating Revenues:**			
11.	Interest Earnings on Investments (1)	$3,725	$1,506	$920
12.	Other Non-Operating Revenues	6,908	26,000	18,511
13.	**Total Non-Operating Revenues**	**$10,633**	**$27,506**	**$19,431**
14.	**Total Revenues** (2)	**$741,546**	**$750,070**	**$720,646**
15.	**Operating Expenses** (3)	**$522,415**	**$506,184**	**$480,257**
16.	Less: Commitments Cancelled (Reduces Operating Expense)(4)	30,421	32,413	24,550
17.	**Net Operating Expenses**	**$491,994**	**$473,771**	**$455,707**
18.	**Adjustment: Debt Service and Net Operating Expenses due to timing differences**	**--**	**--**	**--**
19.	**Excess of Operating Revenues over Net Operating Expenses (Ln 8 - Ln 17)**	**$238,919**	**$248,793**	**$245,508**
20.	**Excess of Total Revenues over Net Operating Expenses (Ln 14 - Ln 17)**	**$249,552**	**$276,299**	**$264,939**
21.	**Interest Expenses:**			
22.	Revenue Bonds	$88,314	$86,294	$80,294
23.	**Total Interest Expenses**	**$88,314**	**$86,294**	**$80,294**
24.	**Excess of Total Revenues over Net Operating Expenses and Interest Expense (Ln 20 – Ln 23)**	**$161,238**	**$190,005**	**$184,645**
25.	Add: Unencumbered Funds Available for Appropriation at Beginning of FY	--	--	--
26.	Add: Debt Service Payments to Sinking Fund, Revenue Bond Payments, LOC expenses and Net Operating Expenses due to timing differences	(39)	235	1,244
27.	Deduct: Principal Paid on Bonded Indebtedness During Fiscal Year	102,555	132,189	125,848
28.	Deduct: Transfer to Escrow Account to Redeem Bonds	--	19,000	11,000
29.	**Net Unapplied Revenues (Ln 24 + Ln 25 + Ln 26 - Ln 27 - Ln 28)**	**$58,644**	**$39,051**	**$49,041**
30.	Deduct: Funds Transferred to Residual Fund (Further Transfer to Capital Acct)	$38,086	$28,905	$31,301
31.	Deduct: Funds Transferred to Capital Account (Required Transfer of 1% NPPE)	24,879	34,776	22,302
32.	Transfer (TO)/FROM the Rate Stabilization Fund	$4,321	$24,630	$4,562
33.	**Debt Service Coverage Ratio:**			
34.	Net Revenues 4/Total Debt Service and Other Transfers (Ln 14 - Ln 17 + Ln 32)/ (Ln 23 + Ln 27 + Ln 55)	1.18	1.19	1.18
35.	Net Revenues (5)/Revenue Bond Debt Service (Ln 14 - Ln 17 + Ln 32)/ (Ln 23 + Ln 27)	1.33	1.38	1.31

(1) Only includes interest earnings credited to the Revenue Fund pursuant to the GBO.
(2) Calculated to include Project Revenues, as defined in the GBO, plus interest earnings from line 10.
(3) Operating Expenses excludes, pursuant to the GBO, depreciation, amortization, interest and sinking fund charges.
(4) Commitments Cancelled represent the liquidation of encumbrances and offset operating expenses. An encumbrance is an expense that is anticipated to be charged to the Water Fund.
(5) As defined in the GBO.

As discussed above, the Water Department is required to comply with the Rate Covenant under the General Ordinance. For a discussion of the Rate Covenant, see “SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Rate Covenant” herein. All Water Fund expenditures are included in the Rate Covenant calculation under the General Ordinance. See “HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Historical Operating Results (Legally Enacted Basis)” above. Historically, the Water Department has used the Rate Stabilization Fund to manage compliance with the Rate Covenant each year. See Note 1 to the financial statement of the Water Fund contained in APPENDIX I. See also Table 11A – Projected Revenue and Revenue Requirements and Table 11B – Rate Stabilization Fund Flow of Funds contained herein.

In Fiscal Year 2017, the Water Department complied with the Rate Covenant, with a revenue bond debt service coverage ratio of 1.31 and a total coverage ratio of 1.18, after taking into account a withdrawal from the Rate Stabilization Fund of $4,563,000. In Fiscal Year 2018, the Water Department complied with the Rate Covenant, with a revenue bond debt service coverage ratio of 1.38 and a total coverage ratio of 1.19 after taking into account a withdrawal from the Rate Stabilization Fund of $24,630,000. In Fiscal Year 2019, the Water Department complied with the Rate Covenant, with a revenue bond debt service coverage ratio of 1.33 and a total coverage ratio of 1.18 after accounting for a withdrawal from the Rate Stabilization Fund of $4,321,000. The Water Department’s current financial plan calls for debt service coverage ratios of 1.20 times in Fiscal Year 2021; see Table 11A – Projected Revenue and Revenue Requirements. In light of the COVID-19 pandemic, the Water Department intends to continue to target debt service coverage ratios of 1.20 times in Fiscal Years 2022 and 2023 and to resume targeting debt service coverage ratios of 1.30 times in Fiscal Years 2024 and 2025.

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Table 10
Philadelphia Water Department
Rate Covenant Compliance
(Thousands of Dollars)

	FY19	FY18	FY17
Coverage A(1):			
Net Revenues	$253,873	$300,929	$269,501
/Revenue Bonds Debt Service	190,869	218,483	206,142
= Coverage A	1.33x	1.38x	1.31x
Coverage B(2):			
Net Revenues	$253,873	$300,929	$269,501
/Total Debt Service + Transfer to Capital Fund	215,748	253,259	228,444
= Coverage B	1.18x	1.19x	1.18x
Coverage C(3):			
Net Revenues +/-Transfer (To) From Rate Stabilization Fund	$249,552	$276,299	$264,938
/Revenue Bonds Debt Service	190,869	218,483	206,142
= Coverage C	1.31x	1.26x	1.29x

The rate covenant contained in the General Ordinance requires the City to establish rates and charges for the use of the Water and Wastewater Systems to yield Net Revenues, as defined therein, in each fiscal year sufficient to meet three coverage tests:

(1) **Coverage A:** Net Revenues must equal at least 120% of the Debt Service Requirements payable in such fiscal year (excluding debt service due on any Subordinated Bonds).
(2) **Coverage B:** Net Revenues must equal at least 100% of : (i) the Debt Service Requirements (including Debt Service Requirements in respect of Subordinated Bonds) payable in such fiscal year; (ii) amounts required to be deposited into the Debt Reserve Account during such fiscal year; (iii) debt service on all General Obligations Bonds issued for the Water and Wastewater Systems payable in such fiscal year; (iv) debt service on Interim Debt payable in such fiscal year; and (v) the Capital Account Deposit Amount for such fiscal year, less amounts transferred from the Residual Fund to the Capital Account during such fiscal year.
(3) **Coverage C:** Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such fiscal year) must equal at least equal to 90% of the Debt Service Requirements (excluding debt service on any Subordinated Bonds) payable in such fiscal year.

To ensure compliance with the rate covenant, the General Ordinance requires that the City review its rates, rents, fees, and charges at least annually.

The Water Department's Budget

At least 90 days before the end of the Fiscal Year, the operating budget for the next Fiscal Year is prepared by the Mayor and submitted to City Council for adoption. The budget, as adopted, must be balanced and provide for discharging any estimated deficit from the current Fiscal Year and make appropriations for all items to be funded with City revenues. At least 30 days before the end of the Fiscal Year, City Council must adopt by ordinance an operating budget.

The City's Fiscal Year 2020 operating budget was presented to City Council on March 7, 2019 and approved by City Council and signed by the Mayor on June 18, 2019. The Water Fund budget for Fiscal Year 2020 was $866,547,000, which excluded commitments cancelled from the prior year. See footnote to Table 9 above regarding commitments cancelled. Fiscal Year 2020 Water Fund budgeted revenues total $826,547,000 inclusive of the transfer from the Rate Stabilization Fund in the amount of approximately $84,680,000. The amount of such transfer from the Rate Stabilization Fund is calculated solely for purposes of the budget to provide additional appropriations to balance the budget, but it does not represent the Water Department's expected transfer at the end of Fiscal Year 2020. See Table 11A – Projected Revenue and Revenue Requirements. The Consulting Engineer's calculation of the operating budget and transfer from the Rate Stabilization Fund differs from how the City calculates the transfer from the Rate Stabilization Fund for purposes of the budget. For more information on the City's budget procedure, see APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Discussion of Financial Operations – Budget Procedure. The City's Fiscal Year 2021 operating budget was presented to City Council on March 5, 2020. Due to the COVID-19 pandemic, the Water Department and the rest of the City's departments were asked to submit revised budgets for Fiscal Year 2021. The Water Department submitted its revised budget to City Council on May 18, 2020, and it was approved by the Mayor on June 26, 2020. The revised budget for the Water Fund for Fiscal Year 2021 is $860,271,000, which excludes commitments cancelled from the prior year, and is approximately $25 million less than the budget originally proposed. See footnote to Table 9 above regarding commitments cancelled. The Water Fund revenues for Fiscal Year 2021 are anticipated to be $820,271,000, inclusive of the budgeted transfer from the Rate Stabilization Fund in the amount of approximately $85,326,000. The Water Department will utilize the Rate Stabilization Fund to manage through the effects of the COVID-19 pandemic on revenues generally and specifically in light of the Water Department's delayed rate case, see "RATES – Current Rates" herein.

Pension Obligations of the Water Department

As of the date of this Official Statement, the Water Fund has made its scheduled payments for the Municipal Pension Fund (defined herein) and its allocable share of the City's Pension Bonds (as defined in APPENDIX IV) for Fiscal Year 2019. The City maintains a single employer defined-benefit pension program (the "Municipal Pension Fund"), which provides benefits to police officers, firefighters, non-uniformed employees, and non-represented appointed and elected officials, including employees of the Water Department. Contributions are made by the City to the Municipal Pension Fund from (i) the City's General Fund, (ii) funds that are received by the City from the Commonwealth for deposit into the Municipal Pension Fund, and (iii) various City inter-fund transfers, representing amounts contributed, or reimbursed, to the City's General Fund for pension payments for employees of the Water Fund, Aviation Fund, and certain other City funds or agencies. An additional source of expected funding is that portion of the 1% sales tax rate increase that is required under Pennsylvania law to be deposited to the Municipal Pension Fund. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Revenues of the City – Sales and Use Tax" and APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Pension System."

Payments from the Water Fund to the City's General Fund for the Municipal Pension Fund for Fiscal Years 2019 and Fiscal Year 2018 were approximately $64.7 million and $62.6 million, respectively. The estimated payment for Fiscal Year 2020 was $67.3 million, of which $67.2 million has been paid, and the budgeted payment for Fiscal Year 2021 is $69.0 million.

See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Pension System – Annual Contributions – Table 29."

Payments from the Water Fund to the City's General Fund for the Water Fund's allocable share of principal and interest payments on the City's Pension Bonds for Fiscal Years 2019 and 2018 were approximately $14.2 million and $14.3 million, respectively. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Pension System – Annual Contributions – Table 30." Payments for Fiscal Year 2020 are expected to be $14.3 million. The Fiscal Year 2021 budget is $14.1 million (solely from the Revenue Fund).

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As of Fiscal Year 2019, contributions from the Water Fund to the City's General Fund for the Municipal Pension Fund were approximately 10% of total payments to the Municipal Pension Fund, exclusive of the Water Department's allocable share of Pension Bonds. In Fiscal Year 2018, contributions from the Water Fund to the City's General Fund for the Municipal Pension Fund were approximately 10% of total payments to the Municipal Pension Fund, exclusive of the Water Department's allocable share of Pension Bonds.

Projected Revenues, Expenses and Debt Service

Table 11A – Projected Revenue and Revenue Requirements, presents a statement of projected revenues and revenue requirements for the operation of the Water and Wastewater Systems for Fiscal Years Ending June 30, 2020 through June 30, 2025, consistent with the requirements of the General Ordinance. See APPENDIX II – Engineering Report herein for the full text of the Engineering Report. The Engineering Report should be read in its entirety. As stated in the Engineering Report, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur and are unknown at this time and/or which are beyond the control of the Consulting Engineer.

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Table 11A
Philadelphia Water Department
Projected Revenue and Revenue Requirements
Fiscal Year Ending June 30 (Thousands of Dollars)

	Description	Percent Increase	Initial Increase % of Year Effective	2020	2021	2022	2023	2024	2025
	OPERATING REVENUE								
1	Water Service - Existing Rates			263,983	255,097	260,199	263,321	266,481	263,438
2	Wastewater Service - Existing Rates			429,540	417,604	425,956	431,067	436,240	433,464
3	Total Service Revenue - Existing Rates			693,523	672,700	686,154	694,388	702,721	696,902
	Year	Percent Increase	Initial Increase % of Year Effective						
4	FY 2021	0.00%	83.3%		0	0	0	0	0
5	FY 2022	9.30%	83.3%			53,177	64,578	65,353	64,812
6	FY 2023	9.70%	83.3%				61,350	74,503	73,886
7	FY 2024	8.60%	83.3%					60,385	71,862
8	FY 2025	7.70%	83.3%						58,229
9	Total Additional Revenue Required			0	0	53,177	125,928	200,241	268,788
10	Total System Service Revenue			693,523	672,700	739,331	820,316	902,962	965,690
	Other Income								
11	Other Operating Revenue			15,996	12,121	12,654	13,010	14,280	13,556
12	Interest Income			745	663	538	538	575	613
13	Transfer from Debt Reserve Account			12,810	0	0	0	0	0
14	**Total Operating Revenues**			723,074	685,484	752,523	833,864	917,817	979,859
	OPERATING EXPENSES								
15	Water & Wastewater Operations			(308,445)	(303,168)	(313,618)	(334,380)	(365,456)	(377,192)
16	Direct Interdepartmental Charges			(197,035)	(203,111)	(209,419)	(215,969)	(222,769)	(229,833)
17	**Total Operating Expenses**			(505,480)	(506,279)	(523,037)	(550,349)	(588,226)	(607,025)
	NET REVENUES								
18	Transfer From/(To) Rate Stabilization Fund			32,971	50,000	0	(15,000)	(15,000)	(10,000)
19	**NET REVENUES (L14 +L17+L18)**			250,565	229,205	229,486	268,515	314,591	362,834
	DEBT SERVICE								
	Senior Debt Service								
	Revenue Bonds								
20	Outstanding Bonds			(195,534)	(174,138)	(162,678)	(154,860)	(136,562)	(136,710)
21	Pennvest Parity Bonds				(10,631)	(10,631)	(10,631)	(10,631)	(10,631)
22	Projected Future Revenue Bonds			0	(1,845)	(13,522)	(51,713)	(89,144)	(126,039)
23	Projected Future Pennvest Parity Loans			0	(265)	(2,793)	(4,453)	(4,453)	(4,453)
24	Total Senior Debt Service			(206,165)	(186,878)	(189,624)	(221,657)	(240,791)	(277,834)
	Subordinate Debt Service								
25	Outstanding General Obligation Bonds			0	0	0	0	0	0
26	Pennvest Subordinate Bonds			0	0	0	0	0	0
27	Total Subordinate Debt Service			0	0	0	0	0	0
28	Transfer to Escrow			0	0	0	0	0	0
29	Total Debt Service on Bonds Plus Transfer to Escrow			(206,165)	(186,878)	(189,624)	(221,657)	(240,791)	(277,834)
30	Capital Account Deposit			(27,065)	(29,230)	(31,569)	(34,094)	(36,822)	(39,767)
31	**NET FOR TRANSFER TO RESIDUAL FUND (L19+L29+L30)**			17,335	13,096	8,293	12,764	36,978	45,233
32	Coverage Test 1 – 1.20X (Ln 19 / Ln 24)			1.21	1.22	1.21	1.21	1.30	1.30
33	Coverage Test 2 – 1.00X (Ln 19 / (Ln 24 + Ln 27 + Ln 30))			1.07	1.06	1.03	1.04	1.13	1.14
34	Coverage Test 3 – 0.90X (Ln 19 – Ln 18) / Ln 24			1.05	0.95	1.21	1.27	1.36	1.34
	RESIDUAL FUND								
35	**Beginning of Year Balance**			15,881	15,000	15,000	15,000	15,000	15,000
36	Interest Income			77	75	75	75	75	75
	Transfer in								
37	From Revenue Fund			17,335	13,096	8,293	12,764	36,978	45,233
38	From Debt Reserve Account			986	967	1,026	1,121	1,247	1,426
	Transfers Out								
39	Transfer to Construction Fund			(18,293)	(13,171)	(8,368)	(12,839)	(37,053)	(45,308)
40	Transfer to City General Fund			(986)	(967)	(1,026)	(1,121)	(1,247)	(1,426)
41	Transfer to Debt Reserve Account			0	0	0	0	0	0
42	End of Year Balance			15,000	15,000	15,000	15,000	15,000	15,000

Note 1: Minor variances in summations due to rounding.
Note 2: Line 22 reflects net debt service after application of capitalized interest for Fiscal Year 2021 though Fiscal Year 2023.

The table below sets forth the flow of funds for the Rate Stabilization Fund for Fiscal Years ending June 30, 2020 through June 30, 2025.

Table 11B
Rate Stabilization Fund Flow of Funds
Fiscal Year Ending June 30 (Thousands of Dollars)

No.	Description	2020	2021	2022	2023	2024	2025
	RATE STABILIZATION FUND						
1	Beginning of Year Balance	177,971	145,000	95,000	95,000	110,000	125,000
2	Interest Income	445	363	238	238	275	313
	Transfers In						
3	From Revenue Fund	0	0	0	15,000	15,000	15,000
	Transfers Out						
4	To Revenue Fund – Transfer	(32,971)	(50,000)	0	0	0	0
5	To Revenue Fund – Interest	(445)	(363)	(238)	(238)	(275)	(313)
6	End of Year Balance	145,000	95,000	95,000	110,000	125,000	135,000

RATES

Current Rates

Pursuant to the Rate Ordinance, the Water Department initiated a general rate increase proceeding by filing an advance notice with the Rate Board and City Council on February 12, 2018, followed by formal notice on March 14, 2018. In accordance with its regulations, the Rate Board appointed Community Legal Services to serve as the Public Advocate to represent the concerns of the residential consumers and other small users in the proceeding and held nine public hearings and five days of technical hearings. On July 12, 2018, the Rate Board issued a Rate Determination approving overall rate increases of 1.33% and 1.20% to take effect in Fiscal Years 2019 and 2020, respectively. As proposed by the Water Department, the first rate change became effective on September 1, 2018 for Fiscal Year 2019, and the second became effective on September 1, 2019 for Fiscal Year 2020. On June 27, 2019, as part of the TAP Rate Rider Reconciliation Proceeding, the Rate Board approved annual adjustments to the rates effective September 1, 2019. See "TAP Rate Reconciliation" below. The Water Department has estimated that the rate changes and targets for financial metrics approved by the Rate Board will result in total revenue increases of approximately $7,884,000 in Fiscal Year 2019 and $14,467,000 in Fiscal Year 2020.

The Water Department initiated a general rate increase proceeding for Fiscal Year 2021 and Fiscal Year 2022 by filing an advance notice with the Rate Board and City Council on February 11, 2020. The Water Department filed its formal notice on or about March 12, 2020 and subsequently withdrew its general rate increase proceeding in accordance with the regulations of the Rate Board as a result of the COVID-19 pandemic. As of the date of this Official Statement, the Water Department expects to reinitiate its general rate increase proceeding during the first quarter of the 2021 calendar year.

Water rates for general service customers of the Water Department consist of a service charge related to the size of the meter, plus a schedule of quantity charges for water use. Sewer rates for general service customers are similar. To more fairly reflect the burden on the System, stormwater charges are calculated based on a customer's property size and its relative imperviousness. A uniform stormwater charge based on the average size and imperviousness of residential properties is billed to residential customers. Charges to non-residential and condominium customers are based on each property's specific size and impervious area.

Special rates with partial discounts are established pursuant to the Water Department's Rates and Charges for the following customers: (1) public and private schools which provide instruction up to or below the twelfth grade; (2) institutions of "purely public charity;" (3) places used for religious worship; (4) residences of eligible senior citizens; (5) universities and colleges; and (6) public housing properties of the Philadelphia Housing Authority. In addition, the Rate Board approved discounts of 100% on stormwater rates for eligible community gardens in 2016 and an exemption from water, sewer and stormwater rates for unoccupied properties of the Philadelphia Land Bank in 2018. Some real estate also is exempt from stormwater charges, including, cemeteries, residential sideyards, City-owned or City-controlled vacant lots or improvements, portions of Fairmount Park, streets, medians, sidewalks, and rights-of-way. Water and sewer charges, including stormwater charges, terminate when any vacant or unoccupied premises are acquired by the City and when property is acquired by the Philadelphia Housing Development Corporation or the Philadelphia Redevelopment Authority under provisions of the Philadelphia Code pertaining to vacant properties.

In addition to the special rates referenced above, the Water Department offers additional assistance and incentive programs to customers, which constitute either an Operating Expense of the Water Department or contra-revenue in the form of credits or reductions to customers' bills.

The Tiered Assistance Program ("TAP") program was launched on July 1, 2017 and assists low-income households at or below 150% of the federal poverty level ("FPL") and those experiencing a special hardship, as discussed herein. Under the TAP program bills are tied to household income and do not fluctuate based on actual consumption. Under the TAP program, monthly bills for water, sewer, and stormwater usage and service charges are as follows:

Income		Fixed Charge %*	
50% of FPL or lower		at 2% of the household income	$12.00 minimum bill
Above 50% and at or below 100%		At 2.5% of the household income	
Above 100% and at or below 150% FPL		3% of the household income	
Above 150% FPL, with proof of hardship		4% of the household income	A special hardship can be increase in household size, loss of a job lasting more than 4 months, serious illness lasting more than 9 months, death of primary wage earner, domestic violence, other circumstances that threaten household's access to necessities of life

*Any actual charges above the fixed amount are forgiven.

Certain financial information regarding some of the programs discussed above is set forth in Table 12 – Stormwater Incentives and Assistance Program on the following page.

Table 12
Stormwater Incentives and Assistance Program
Fiscal Year Ending June 30, 2019

Program	Program Type	FY 2019	FY 2018	FY 2017
SMIP[1] and GARP [2][3]	Operating Expense	$ 30,433,976	$ 21,484,429	$ 18,354,069
Phase in Program (CAP)[4]	Bill Reduction	2,003,238	2,011,096	2,531,367
Stormwater Credits[4]	Bill Reduction	17,988,320	16,038,856	13,819,758
Community Gardens	Bill Reduction	9,966	14,320	-
Tiered Assistance Program (TAP)[5]	Bill Reduction	8,992,124	2,927,221	-
Total		**$59,427,624**	**$42,475,922**	**$34,705,194**

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(1) Stormwater Management Incentives Program. In previous years, Fiscal Year obligations were reporting for this program. The table above is reporting Fiscal Year expenses.
(2) Grant and Greened Acres Retrofit Program. In previous years, Fiscal Year obligations were reporting for this program. The table above is reporting Fiscal Year expenses.
(3) In Fiscal Year 2017 to Fiscal Year 2019, the SMIP and GARP operating expenses were partially funded with grants totaling $1.9 million for the three-year period.
(4) Amounts are credits against certain customers' bills and results in a reduction in revenue for the Water Department.
(5) TAP is a low-income assistance program that commenced in July of 2017. It reduces customers' bills and results in a reduction in revenue for the Water Department.

Rate Board Appeal and Rate Decision

On August 9, 2018, the Public Advocate filed an appeal of the Rate Board's rate determination with the Court of Common Pleas of Philadelphia County. The appeal is captioned Public Advocate v. Philadelphia Water, Sewer and Storm Water Rate Board, and appears on the Court of Common Pleas Civil Docket as Case ID 180800527 (August Term 2018, No. 00527). On August 28, 2018, the Public Advocate filed a motion asking the Court to stay the new rates and charges, which was denied. The Court issued a scheduling order and consolidated the briefing on the motion and the merits. The Public Advocate and the City submitted their briefs and oral Argument before the court occurred on April 25, 2019. The Public Advocate asserted the Rate Board violated the Public Advocate's due process rights because it: (1) failed to avoid even the appearance or lack of impartiality due to the participation of the City Treasurer as a member of the Rate Board; (2) failed to require a legally-sufficient hearing officer report to which the Public Advocate could supply meaningful exceptions; and (3) incorporated and relied upon calculations submitted by the Water Department after the close of the record. On June 24, 2019, the Court of Common Pleas issued an order denying the appeal. On July 15, 2019, the Public Advocate filed a Notice of Appeal to the Commonwealth Court of the Court of Common Pleas Order. Briefs were filed by the Public Advocate and the City between February and May of 2020. Prior cases involving rate case appeals by the Public Advocate typically have not been resolved in less than two years from the commencement of the initial filing with the court.

TAP Rate Reconciliation

In a rate proceeding that occurred in July of 2018, the Rate Board approved a TAP Rate Rider Surcharge and reconciliation process, which permits annual increases or decreases of certain rates to recover lost revenues related to the TAP Program to prevent either over or under recovery. The Water Department commenced its 2020 annual rate adjustment proceeding by filing an Advance Notice of the proposed adjustments to rates and charges and a Preliminary Proposed Reconciliation Statement with the Rate Board and City Council on May 20, 2020. The Water Department expects to submit its Formal Notice of the proposed adjustments to rates and charges and Final Preliminary Proposed Reconciliation Statement to the Department of Records and the Rate Board on or about June 22, 2020. The Rate Board decision is expected in early August 2020.

TAP reconciliation proceedings are conducted annually by the Water Department. The period from the filing of the Advance Notice of the proposed adjustments to rates and charges to the effective date of the new rates is approximately 120 days.

Residential Monthly Water and Sewer Rate Charges

Table 13 below shows monthly water and sewer bills for Fiscal Years 2018 through 2020 and proposed charges for Fiscal Year 2021, and is based, in each case, on a typical residential customer with a 5/8-inch meter using 500 cubic feet per month.

Table 13
Typical Residential
Monthly Water and Sewer Rate Charges

	Effective Date	Water	Sewer	Stormwater	Service Charge	Total	Percentage Change
5/8" Meter	10/1/2020*	$22.69	$16.02	$15.80	$12.22	$66.73	-0.4%
Residential	9/1/2019	22.76	16.21	15.80	12.22	66.99	1.0
500 Cu. Ft. Monthly	9/1/2018	22.76	15.88	15.53	12.16	66.33	-0.3
	7/1/2017	21.54	16.23	14.71	14.02	66.50	--

*Proposed charges.

Billing and Collections

Under the Charter, the Water Revenue Bureau is directly responsible for the billing, metering and collection of revenues for the Water Fund. Since February 2003, oversight of the Water Revenue Bureau has been under the City's Revenue Commissioner, who reports directly to the Finance Director. The Water Revenue Bureau uses outside collection agencies to collect delinquent accounts.

The Water Department's overall collection factor was approximately 96.5% for Fiscal Year 2019 (including collections realized in Fiscal Year 2020), approximately 96% for Fiscal Year 2018 and approximately 95% for Fiscal Year 2017. Currently, the Engineering Report indicates a decline in the overall collection factor to approximately 93% for Fiscal Year 2021 due to the COVID-19 pandemic and its impact on consumption patterns. Collections are also expected to be negatively affected by the moratorium on account shut-offs currently in effect through August 31, 2020. See "INTRODUCTORY STATEMENT – COVID-19 Response."

The City continues to pursue a multifaceted strategy for improving collections while decreasing delinquencies, key compliance strategies of which include revocation of commercial licenses and sequestration. Although these efforts have concentrated primarily on general fund revenues, certain improvements in processes and equipment may affect Water Fund revenues. The financial projections provided herein do not include any additional revenue or acceleration of revenue as a result of these initiatives.

In addition to compliance efforts, the City is engaged in two active projects to implement technology solutions for its cashier and payment processing systems and to develop an integrated data warehouse and case management system. These initiatives are designed to improve operational efficiencies by providing tools currently unavailable to the City. See also “OTHER OBLIGATIONS – Contract for Automatic Meter Reading System with ITRON and – Contract for Advanced Meter Reading Infrastructure.”

Automatic Meter Reading System and Advanced Meter Reading Infrastructure

The Water Department’s AMR System has produced a number of positive results, including more accurate meter reading and billing, fewer billing disputes, better customer service and increased revenue collection, including collection of delinquent accounts. The Water Department anticipates similar results under AMI. See also “OTHER OBLIGATIONS – Contract for Automatic Meter Reading System with ITRON and – Contract for Advanced Meter Reading Infrastructure.”

Charter Amendment and Rate Ordinance

In November 2012, Philadelphia voters approved an amendment to the Charter to allow City Council to establish an independent rate-making body responsible for fixing and regulating rates and charges for water and sewer services. The Rate Ordinance became effective January 20, 2014, and the Rate Board was formed, promulgated regulations governing the rate review process in December 2015, and completed its first rate proceeding in June 2016.

The Charter still mandates that the standards pursuant to which rates and charges are fixed shall be such as to yield to the City at least an amount equal to operating expenses and interest and sinking fund charges on any debt incurred or about to be incurred for water supply, sewage and sewage disposal purposes. In computing operating expenses, proportionate charges for all services performed for the Water Department by all officers, departments, boards or commissions of the City also are included.

While any Water and Wastewater Bonds are outstanding, the Rate Board also will be required to set rates and charges in amounts sufficient for the City to comply with the provisions of the General Ordinance. The Rate Ordinance subjects the Rate Board to certain standards when making a rate determination in addition to those set forth in the General Ordinance. The Rate Ordinance also requires the Water Department to develop a comprehensive plan, pursuant to which the Water Department forecasts capital and operating costs and expenses and corresponding revenue requirements.

See “— Philadelphia Water, Sewer and Stormwater Rate Board” and “— Rate Setting” below. A copy of the Rate Ordinance is available at the Office of the Director of Finance, 1300 Municipal Services Building, 1401 JFK Boulevard, Philadelphia, Pennsylvania 19102 and must be read in conjunction with the Philadelphia Code.

Philadelphia Water, Sewer and Stormwater Rate Board

The Rate Board consists of five members serving staggered terms. The members are appointed by the Mayor and confirmed by City Council, and the Mayor has sole discretion to remove members for cause, including conflicts of interest and neglect of duty. Members who resign or are removed may be replaced by a mayoral appointee confirmed by City Council, and such successor may serve for the remaining term of the replaced member. Members are not compensated for their services but are entitled to reasonable expenses consistent with their duties. The Rate Board receives an appropriation sufficient to allow it to carry out its responsibilities.

In connection with the rate proceeding that occurred in July of 2018, the Rate Board adopted a target of \$150 million in the Rate Stabilization Fund and the Residual Fund and concluded that a 1.30x Senior Debt Service Coverage Ratio is a reasonable target for the future. There is no requirement in the General Ordinance or the Act to maintain such amount and no assurance can be given that it will be maintained.

The Rate Ordinance requires that Board members be City residents with a minimum of five years professional experience in one or more of the following fields: (1) public or business administration, (2) finance, (3) utilities, (4) engineering or (5) water resources management. At least one member must have experience as a consumer advocate in utility rate cases, and one member must be a commercial and/or industrial ratepayer with knowledge and experience related to stormwater management and rates. Brief biographical descriptions of the members of the Rate Board can be found at https://www.phila.gov/departments/water-sewer-storm-water-rate-board/about/.

MANAGEMENT INITIATIVES

The Water Department has implemented several initiatives designed to increase the efficiency of its operations and reduce costs.

Water Accountability

The Water Department has been successful in developing and implementing programs to recover uncaptured revenue through reduction in the loss of finished water from the distribution system. The Water Department's non-revenue water has averaged 85-95 MGD from Fiscal Year 2015 to Fiscal Year 2018. The Water Department accounts for all finished water as either consumption or losses. Losses are accounted for in two ways: (i) apparent losses are calculated losses, due to customer meter inaccuracies, billing errors or unauthorized consumption that cause water utilities to lose a portion of consumption-based revenue, (ii) real losses are physical losses, largely leakage, that cause excess production costs for water utilities.

Over recent years the Water Department has implemented a host of programs to reduce and control water and revenue losses. The Water Department operates a Customer Meter Management Program and a Revenue Protection Program, which have increased billing by approximately \$4.4 million in Fiscal Year 2016, \$4.9 million in Fiscal Year 2017 and \$4.5 million in Fiscal Years 2018 and 2019. See also "RATES – Automatic Meter Reading System and Advanced Meter Reading Infrastructure" for more information on the program.

The Water Department conducts a variety of activities to proactively contain leakage losses, including (i) the Leak Detection Program, (ii) the district metered area and (iii) the hydrant tracking program. The Water Department was one of the first water utilities in the United States to employ such techniques to mitigate leakage and lessen the occurrence of water main breaks. Through the Leak Detection Program, the Water Department also contracts for in-line leak detection in active large-diameter transmission water piping. This service has added another highly effective tool to minimize lost water. The small pilot district metered area has achieved up to 90% reduction in the leakage rate through installed instrumentation to control leakage by advanced pressure management. Finally, the hydrant tracking program has resulted in hydrant availability remaining significantly above 99% through initiatives such as routine inspection, repair and painting.

Wastewater Master Planning

The Wastewater Facilities Planning Program is planning to develop an updated 25-year Master Plan as an update to the Wastewater Master Plan that was completed in 2016. The updated Wastewater Master Plan will incorporate the regulatory requirements contained in the COA as well as other existing regulatory drivers and goals to ensure that the wastewater system meets regulatory requirements and any changes to system needs. The Wastewater Master Planning Program's data and findings will help refine the Water Capital Improvement Program, prioritize capital projects and inform facility planning as it relates to potential water quality regulations, resource recovery, and process renewal technologies.

Water Master Planning

The Water Facilities Planning Program developed a 25-year Water System Master Plan that outlines a program to upgrade the City's drinking water treatment and supply facilities. The improvements identified in the plan are required to address aging infrastructure to increase the reliability of the Water System and ensure sustainable delivery of safe, clean and affordable drinking water. The Water System Master Plan focuses on six key categories: water quality, operability, capital availability, water quantity, service pressure and public perception. The plan was completed in early calendar year 2019 and projects the capital improvement needs at water treatment, pumping and storage facilities over a 25-year period, which will assist the Water Department in developing the Water Capital Improvement Program and prioritizing capital projects. The Water System Master Plan has identified approximately 400 projects to rehabilitate existing facilities and construct several new facilities. The estimated cost of these projects over the next 25 years is $2.5 billion, half of which has already been accounted for in the existing Water Capital Improvement Program.

Security of Water Department Facilities and Water Supply and AWIA

The Water Department draws and conducts nearly one thousand tests on water samples from various locations each day. Online water quality monitors provide continuous testing during all stages of the treatment process. The City also has implemented a surveillance and response system, a source water protection program and the Delaware Valley Early Warning System for the Schuylkill and Delaware Rivers and surrounding areas. To further ensure the safety of the City's drinking water, the Water Department utilizes the surveillance and response system to monitor water quality using online instrumentation that allows real-time tracking of water conditions at strategic locations throughout the City's water distribution system. Additional upgrades are planned to enhance security at the three water treatment plants and the pumping stations.

The Water Department has performed a vulnerability analysis of its entire potable water system and has extensive water quality monitoring, protection and security plans in place. America's Water Infrastructure Act of 2018 ("AWIA") requires the Water Department to certify completion of a Risk and Resilience Assessment and to review or update, as applicable, its Emergency Response Plan. The Risk and Resilience Assessment has been completed, and its major findings were presented to the Water Department's senior management at the end of February 2020. Overarching themes from the Risk and Resilience Assessment include the following: that the Water Department should (i) proceed with the Water Master Plan, (ii) continue to strengthen efforts around cybersecurity, and (iii) remain an active partner in river basin planning efforts with respect to water supply and drought mitigation. As required by AWIA, the Water Department certified completion of the Risk and Resilience Assessment on or about March 31, 2020. The Water Department will have six (6) months from such date to certify that it has reviewed, and if necessary, updated, its Emergency Response Plan and is currently working towards completing that review and certification no later than September 2020.

Watershed Protection

The Water Department's multi-faceted approach to watershed protection includes leveraging regional and national partnerships, applying the latest science and advanced technologies, and developing watershed management strategies that guide watershed protection efforts and infrastructure investment planning. To gain an understanding of emerging risks to Philadelphia's water supply, the Water Department employs a research program to identify contaminants of emerging concern, track the state of the science in the water industry, and assess the risk to Philadelphia's drinking water supply. The Water Department may collaborate with peer utilities and/or design and implement special water quality monitoring programs to gather additional information to inform planning initiatives. To mitigate potential impacts to Philadelphia's drinking water from accidental or intentional contamination events in the water supply, the Water Department operates a private web-based communication system that is capable of quickly notifying downstream users of water quality events via phone and email.

Information Technology Systems and Continuity Planning

The Water Department is increasingly dependent on the continuous and reliable operation of information technology systems and relies on such systems with respect to customer service, billing and accounting and, in some cases, the monitoring and operation of treatment, storage and pumping facilities. In addition, the Water Department relies on these systems to track utility assets and to manage maintenance and construction projects, materials and supplies.

The Water Department is reviewing various technology systems, installing firewalls, creating cyber security policies and developing a cyber security program. The Water Department also is developing continuity plans for other emergency situations, including power outages caused by breached computer systems. To mitigate against such emergencies, operators stationed at treatment facilities monitor the control systems 24 hours a day, 7 days a week. In the event of any failure of, or tampering with, the computer systems or other cyber security breach, the impact to treatment plant control systems could be recognized and remediated quickly by onsite personnel, including by using standalone backup control panels and field panels to control processes at the treatment plants. See "MANAGEMENT INITIATIVES – Security of Water Department Facilities and Water Supply and AWIA"; see also "CERTAIN INVESTMENT CONSIDERATIONS – Cyber Security" below.

Climate Change Initiatives and CCAP

Climate change is receiving ever-increasing attention worldwide, and it poses a significant challenge to water, wastewater and stormwater utilities across the nation. While the long-term effects of climate change (including sea level rise, storm surges and increased severity of storms, to mention a few) and the nature of the regulations that will be in place to address them are uncertain, the Water Department is undertaking measures to address the known effects of climate change through its Climate Change Adaptation Program ("CCAP"). Formed in 2014, CCAP aims to understand the effects of climate change on the System's operations and financial condition in order to manage the resulting risks and associated expenses to the Water Department. Current CCAP priorities include disseminating and utilizing current climate risk information to inform planning processes, design standards, operational strategies and investments in infrastructure. Specific initiatives include, but are not limited to, the following: performing onsite assessments at treatment facilities and developing strategies to protect existing infrastructure; regularly coordinating with the Water and Wastewater Master Planning Programs to ensure that climate projections are considered in their planning processes; and developing climate resilient planning and design guidance. The planning and design guidance will include flood protection strategies for infrastructure vulnerable to sea level rise as well as tools and information for the Water Department to evaluate the risks associated with increasing rainfall and higher air temperatures. CCAP aims to help address the System's climate-related risks to enable the Water Department to maintain current levels of service under changing climatic conditions. Despite the Water Department's planning efforts, the magnitude of the effects of climate change on the System and its operations is indeterminate. See "CERTAIN INVESTMENT CONSIDERATIONS – Climate Change" below.

For further discussion of Climate Change and its potential effects on the City, see "APPENDIX I – THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Climate Change."

CERTAIN INVESTMENT CONSIDERATIONS

Introduction

The purchase of the Bonds involves numerous investment risks, some of which are referred to in this Official Statement. No representation is made that the risks described or referred to in this Official Statement constitute all of the risks associated with investing in the Bonds. Accordingly, prior to making a decision to invest in the Bonds, each prospective purchaser thereof should make an independent evaluation of all of the information presented in this Official Statement, including the Appendices, and should review other pertinent information.

COVID-19

The City has taken various emergency measures and other actions to respond to the spread of COVID-19 in the City. The City continues to closely monitor and assess the effects of the COVID-19 pandemic and its impact on the City's financial position and operations. For more information on the City's response to COVID-19 and the related financial effects on the City, see "INTRODUCTION – COVID-19 Response", "CAPITAL IMPROVEMENT PROGRAM – Table 6 – Top Fifteen Active Capital Projects by Estimated Cost" and " – Water Main Replacement" and " – Sewer Replacement and Renewal", "HISTORICAL AND PROJECTED FINANCIAL INFORMATION – Historical Operating Results (Legally Enacted Basis)" and " – The Water Department's Budget", "RATES – Current Rates" and " – Billing and Collections" and APPENDIX IV – "OVERVIEW – Fiscal Health of the City – COVID-19."

System Revenues, Expenditures, Financing and Capital Assets

Actual operation, maintenance and repair expenses of the System may be greater or less than currently projected. Factors such as damages to facilities and infrastructure, changes in technology, regulatory standards, and increased costs of material, energy, labor and administration can substantially affect the expenses of the Water Department. Although the City has covenanted to set rates and charges in amounts sufficient to pay debt service on all Water and Wastewater Revenue Bonds in accordance with the provisions of the General Ordinance, there can be no assurance that amounts will be so sufficient or that sufficient amounts will be collected. Furthermore, increases in rates and charges could result in a decrease in demand for usage and result in a decrease in revenues.

Operation of the System requires significant capital expenditures that are partially dependent on the City's ability to secure appropriate financing. Disruptions in the capital and credit markets may limit the City's access to capital. Without sufficient capital, or if the cost of borrowing increases, it may materially and adversely affect the business, financial condition, and results of operations of the Water Department.

Water and wastewater operations entail specific risks and may impose significant costs. Wastewater collection and treatment and septage pumping and sludge hauling involve various unique risks. If collection or treatment systems fail or do not operate properly, or if there is a spill, untreated or partially treated wastewater could discharge onto property or into nearby streams and rivers, causing various damages and injuries, including environmental damage. These risks are most acute during periods of substantial rainfall or flooding, which are the main causes of CSO and system failure. Any failure of water and wastewater treatment plants, networks of water and wastewater pipes, or water reservoirs could result in losses and damages that may adversely affect the business, financial condition, and results of operations of the Water Department.

General Economic Conditions

General economic conditions may affect the Water Department's financial condition and results of operations. A general economic downturn may lead to a reduction in discretionary and recreational water use. General economic turmoil also may lead to an investment market downturn, which may result in asset market values (including pension plan assets) suffering a decline and significant volatility. For instance, a decline in the City's pension plans' asset market values could increase required cash contributions to these plans from the Water Fund and increased pension expenses in subsequent years.

Environmental Regulations

The City is subject to state and federal environmental laws and regulations applicable to the System. These laws and regulations are subject to change, and the City may be required to expend substantial funds to meet the requirements of such changing laws and regulations in the future. Failure to comply with these laws and regulations may result in the imposition of administrative, civil and criminal penalties, or the imposition of an injunction requiring the City to take or refrain from taking certain actions. In addition, the City may be required to remediate contamination on properties owned or operated by the City or on properties owned by others but contaminated as a result of City operations.

Water and wastewater services are governed by various federal and state environmental protection and health and safety laws and regulations, including the federal Safe Drinking Water Act, the Clean Water Act and similar state laws, and federal and state regulations issued under these laws by the EPA and PADEP. These laws and regulations establish, among other things, criteria and standards for drinking water and for discharges into the waters of the United States and nearby states. Pursuant to these laws, the Water Department is required to obtain various environmental permits for operations. Violations or noncompliance could result in fines or other sanctions by regulators and/or such violations or noncompliance could result in civil suits. Environmental laws and regulations are complex and change frequently. These laws, and the enforcement thereof, have tended to become more stringent over time. While the Water Department has budgeted for future capital and operating expenditures to comply with these laws and permitting requirements, it is possible that new or stricter standards could be imposed that will require additional capital expenditures or raise operating costs.

Weather and Seasonal Fluctuations

The Water Department's operations are affected by weather conditions and are subject to seasonal fluctuations, which could adversely affect demand for services and revenues and earnings.

The Water Department depends on an adequate water supply to meet the present and future demands of customers. Drought conditions could interfere with sources of water supply and could reduce demand due to the implementation of the Water Department's drought emergency restrictions, which could adversely affect the Water Department's ability to supply water in sufficient quantities to existing and future customers. An interruption in water supply could have a material adverse effect on the operations and financial condition of the Water Department.

Climate Change

Despite the Water Department's planning efforts, the magnitude of the effects of climate change on the System and its operations is indeterminate. No assurance can be given that the System will not encounter negative environmental and infrastructural consequences as a result of climate change and that such events will not have a material adverse effect on the operations or financial condition of the System.

Security of the System

Damage to the System resulting from information technology breaches, vandalism, sabotage, or terrorist activities may adversely affect the operations and financial condition of the System. There can be no assurance that the City's security, emergency preparedness and response plans will be adequate to prevent or mitigate such damage, or that the costs of maintaining such security measures will not be greater than currently anticipated. See "MANAGEMENT INITIATIVES – Security of Water Department Facilities and Water Supply and AWIA" and also "– Information Technology Systems and Continuity Planning" for efforts the Water Department has taken to secure the System.

Cyber Security

Information technology systems are vulnerable to a range of cyber security-related risks. These risks include, without limitation, data breaches and system compromises resulting from, ransomware attacks, attacks from hackers, email phishing campaigns, computer viruses, physical or electronic break-ins, insider threats, system misconfigurations, and other methods of compromise. Such events or issues could lead to the disclosure of personally identifiable information or other confidential or proprietary information, could have an adverse effect on the ability of the Water Department to operate, and could result in significant exposure and liabilities to the Water Department.

No assurance can be given that the Water Department will not be exposed to cyber threats or attacks or that such incidents will not have a material adverse effect on the future operations and financial condition of the Water Department.

Limited Recourse on Default

The rights of Bondholders are limited in the event the City defaults on its obligation to pay debt service on the Bonds. The ultimate enforcement of Bondholders' rights upon any default by the City in the performance of its obligations under the Act, the General Ordinance and the Bonds will depend upon the application of remedies provided in the Act, the General Ordinance and other applicable laws. Litigation may be necessary to obtain relief in accordance with these remedies. Such litigation may be protracted and costly. Remedies such as mandamus, specific performance or injunctive relief are equitable remedies, which are subject to the discretion of the court. See "REMEDIES OF BONDHOLDERS" and APPENDIX III-A – "SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS – Summary of Operative Provisions of the General Ordinance – Remedies to be Enforced Only Against Project Revenues" herein.

Bankruptcy

The rights of the owners of the Bonds are subject to the limitations on legal remedies against the City, including applicable bankruptcy, moratorium, insolvency or other laws affecting creditor's rights or remedies and are subject to general principles of equity (regardless of whether such enforceability is considered in equity or at law), to the exercise of judicial discretion in appropriate cases and to the limitations on legal remedies against governmental entities in the Commonwealth of Pennsylvania. Bankruptcy proceedings, or the exercise of powers by the federal or state government, if initiated, could subject the owners of the Bonds to judicial discretion and interpretation of their rights in bankruptcy or otherwise, and consequently may entail risks of delay, limitation, or modification of their rights or the modification of City covenants affecting the System or Project Revenues.

The Pennsylvania Intergovernmental Cooperation Authority Act for Cities of the First Class (the "PICA Act") prevents the City from filing a petition for relief under Chapter 9 of the Federal Bankruptcy Code ("Chapter 9") as long as the Pennsylvania Intergovernmental Cooperation Authority ("PICA") has outstanding any bonds issued pursuant to the PICA Act ("PICA Bonds"). In order to file for bankruptcy under Chapter 9 after the PICA Bonds have been repaid in full, the City must obtain the written approval of the Governor of the Commonwealth. As of June 30, 2020, the principal amount of PICA Bonds outstanding was $56,075,000. The final maturity date of the PICA Bonds is June 15, 2023. See APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – The Government of the City of Philadelphia – Local Government Agencies – Non-Mayoral-Appointed or Nominated Agencies – PICA and Debt of the City – PICA Bonds."

The filing of a petition under Chapter 9 operates as an automatic stay of the commencement or continuation of any judicial or other proceeding against the debtor or its property. However, a petition filed under Chapter 9 does not operate as a stay of the application of pledged special revenues to the payment of indebtedness secured by such revenues. Special revenues include receipts derived from the ownership or operation of systems that are primarily used or intended to be used primarily to provide transportation, utility or other services, including the proceeds of borrowings to finance such systems. The Federal Bankruptcy Code further provides that special revenues acquired by the debtor after the commencement of a Chapter 9 case shall remain subject to any lien resulting from any security agreement entered into by the debtor before the commencement of the case. However, the lien on special revenues derived from a system will be subject to the payment of the necessary operating expenses of that system. Therefore, Project Revenues acquired by the City after the filing of a Chapter 9 petition would remain subject to the lien created by the General Ordinance in favor of the Bondholders but would be subject to the payment of Operating Expenses of the System, which are priority payments. A bankruptcy court's interpretation of 'necessary operating expenses' under the Federal Bankruptcy Code could differ from the definition of Operating Expenses of the System under the General Ordinance. The

Federal Bankruptcy Code also provides that a pre-bankruptcy transfer of property of a debtor to or for the benefit of a bondholder, on account of such bond, may not be avoided as a preferential transfer. Although Project Revenues appear to satisfy this definition, no assurance can be given that a court would hold that Project Revenues are special revenues. If Project Revenues were determined not to be "special revenues," then there is a risk that Project Revenues collected after the commencement of the bankruptcy case would not be subject to the lien of the General Ordinance, such that the recovery by holders of the Bonds could be negatively affected.

Unless the debtor consents or the plan proposed under Chapter 9 so provides, the bankruptcy court may not interfere with any of the property or revenues of a Chapter 9 debtor or with such debtor's use or enjoyment of any income-producing property. Accordingly, the City may be able to defer the application of Bond proceeds, Project Revenues or the pledged Water and Wastewater Funds to payment of the Bondholders during the pendency of the bankruptcy case, but the lien on such funds and revenues would remain, and would continue to encumber such funds and revenues (subject again to payment of 'necessary operating expenses' and Operating Expenses of the System, to the extent these differ from 'necessary operating expenses' as determined by a bankruptcy court under the Federal Bankruptcy Code). Even if a bankruptcy court had the power to compel immediate payment, the court, in the exercise of its equitable powers, could decline to require the City to use Bond proceeds, Project Revenues and the Water and Wastewater Funds to pay Bondholders during the pendency of the case.

The debtor may file a plan for the adjustment of its debts that may include provisions modifying or altering the rights of creditors generally, or any class of them, secured or unsecured. The plan, when confirmed by the court, binds all creditors that have had notice or knowledge of the plan and discharges all claims against the debtor provided for in the plan. No plan may be confirmed unless certain conditions are met, among which are that the plan is in the best interests of creditors, is feasible and has been accepted by each class of claims impaired thereunder. Even if the plan is not so accepted, it may be confirmed if the court finds that the plan is fair and equitable with respect to each class of non-accepting creditors impaired thereunder and does not discriminate unfairly. Thus, under the above described "cram-down" provisions of the Federal Bankruptcy Code, a plan of adjustment could be imposed on the Bondholders that would give them less than their anticipated rate of interest on the Bonds or possibly even less than a full return of their principal under certain circumstances, and/or extend the time for payment of principal of or interest on the Bonds.

The foregoing references to the Federal Bankruptcy Code should not be construed as implying that the City expects to resort to the provisions of such statute or that, if it did, any proposed restructuring would include a dilution of the sources of payment of and security for the Bonds.

Water Conservation

Decreased customer water consumption as a result of water conservation efforts may adversely affect demand for water services and may reduce revenues and earnings. There may be declines in water usage per customer as a result of an increase in conservation awareness, and the structural impact of an increased use of more efficient plumbing fixtures and appliances. Difficulty obtaining future rate increases to offset decreased customer water consumption to cover investments and expenses, may adversely affect the business, financial condition, and results of operations of the Water Department.

Limitations on Effectiveness of Pledge of Project Revenues and Water and Wastewater Funds

The effectiveness of the pledge of the Project Revenues and the Water and Wastewater Funds may be limited because, although the Fiscal Agent will have custody of the Water and Wastewater Funds, the City will have complete control of deposits into and expenditures from the Water and Wastewater Funds, except for amounts on deposit in the Sinking Fund, including the Debt Reserve Account. While the City has covenanted not to direct the Fiscal Agent to transfer Project Revenues other than as permitted under the General Ordinance, no requisition procedure or other similar procedure will be established for the expenditure of monies by the City from the Water and Wastewater Funds (other than the Sinking Fund, including the Debt Reserve Account), and no consent or approval of the Fiscal Agent is required to be obtained by the City as a condition of the City's expenditure of such monies. For more information on the limitations of the pledge, see "SECURITY AND SOURCES OF PAYMENT FOR THE BONDS – Limitations on Effectiveness of Pledge of Project Revenues and Waste and Wastewater Funds."

Other Considerations

Debt Covenants. The City is obligated to comply with the Rate Covenant and other debt covenants under certain agreements, including its insurance contracts. Failure to comply with such covenants, which if not cured or waived, could result in the City's being required to repay or finance the related borrowings before their due date, limit future borrowings, cause cross default issues, and increase borrowing costs. If forced to repay or refinance (on less favorable terms) these borrowings, the Water Department's business, financial condition, and results of operations could be adversely affected by increased costs and rates.

Variable Rate Bonds. The City has one series of variable rate Water and Wastewater Revenue Bonds outstanding, which are subject to fluctuation in interest rates. Such variable rate bonds are expected to be refunded with the proceeds of the Bonds.

LITIGATION AND CLAIMS

Claims against the City relating to the Water Department are paid out of the Water and Wastewater Funds and only secondarily out of the City's General Fund, in the event cash balances in the Water and Wastewater Funds are insufficient at the time of payment of the claim. The General Fund is then reimbursed by the Water and Wastewater Funds for any such advance. The following discussion concerning litigation and claims, which has been prepared based on information supplied by the Law Department of the City and has been reviewed by the Law Department of the City, relates to litigation and claims against the City chargeable to the Water Fund. A discussion of other litigation affecting the City is set forth under the caption in APPENDIX IV – "GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA – Litigation."

On March 15, 2018, a religious organization filed a complaint against the City for alleged miscalculation of stormwater management service charges and asserts the following causes of action against the City: (1) a request for declaratory judgment that the stormwater management charge is a tax improperly imposed on the organization; and (2) a violation of procedural due process related to termination of water service to the premises. The City filed preliminary objections to the complaint. The trial court sustained the City's preliminary objections and dismissed all claims with prejudice on July 3, 2018. The organization filed an appeal of the trial court's decision before the Commonwealth Court of Pennsylvania, which was denied. In a non-precedential opinion issued on June 28, 2019, the Commonwealth Court affirmed the trial court's order dismissing the complaint, but on other grounds, that is because the organization failed to exhaust its administrative remedies by first appealing to the Tax Review Board. In December 2019, the organization filed a petition with the Tax Review Board, which reasserts its claim that the stormwater management service charge is an illegal tax. The Tax Review Board has not yet scheduled a hearing on this matter. The City believes that its stormwater charges are equitable and closely reflect the actual cost of servicing stormwater in City properties; however, there can be no assurance of the outcome of this litigation in the event of further proceedings or appeal, or of the effect of such litigation on future rates or on potential refunds of previously collected stormwater charges.

Various other claims have been asserted against the City respecting the Water Department and in some cases lawsuits have been initiated. The City may be liable if these claims are reduced to judgment or otherwise settled in a manner requiring payment by the City.

The City, from the Water and Wastewater Funds, paid \$5.44 million in Fiscal Year 2016 and \$6.90 million in Fiscal Year 2017 in judgments and settlements for claims. The Water Department paid \$6.20 million and \$3.81 million in Fiscal Year 2018 and Fiscal Year 2019, respectively. The Fiscal Year 2020 budget was \$7.50 million. The Fiscal Year 2021 budget is 7.50 million.

TAX MATTERS

Federal Tax Matters – Tax-Exempt Bonds

In the opinion of Co-Bond Counsel, interest on the Tax-Exempt Bonds is excludable from gross income for purposes of federal income tax under existing laws as enacted and construed on the date of initial delivery of the Tax-Exempt Bonds, assuming the accuracy of the certifications of the City and continuing compliance by the City with the requirements of the Internal Revenue Code of 1986, as amended (the *"Code"*). Interest on the Tax-Exempt Bonds is not an item of tax preference for purposes of federal alternative minimum tax.

Original Issue Premium. Certain of the Tax-Exempt Bonds may be offered at a premium ("original issue premium") over their principal amount. For federal income tax purposes, original issue premium is amortizable periodically over the term of a Tax-Exempt Bond through reductions in the bondholder's tax basis for the Tax-Exempt Bond for determining taxable gain or loss upon sale or redemption prior to maturity. Amortization of premium does not create a deductible expense or loss. Bondholders should consult their tax advisers for an explanation of the amortization rules.

No Other Opinions. Co-Bond Counsel expresses no opinion regarding other federal tax consequences relating to ownership or disposition of, or the accrual or receipt of interest on, the Tax-Exempt Bonds.

General – Tax-Exempt Bonds

The opinions expressed by Co-Bond Counsel are based upon existing legislation and regulations as interpreted by relevant judicial and regulatory authorities as of the date of issuance and delivery of the Tax-Exempt Bonds, and Co-Bond Counsel will not express any opinion as of any date subsequent thereto or with respect to any proposed or pending legislation, regulatory initiatives or litigation.

The foregoing is only a general summary of certain provisions of the Code as enacted and in effect on the date hereof and does not purport to be complete; holders of the Tax-Exempt Bonds should consult their own tax advisors as to the effects, if any, of the Code in their particular circumstances.

Federal Tax Matters – Taxable Bonds

THE MATERIAL UNDER THIS CAPTION "FEDERAL TAX MATTERS – TAXABLE BONDS" CONCERNING THE TAX CONSEQUENCES OF OWNERSHIP OF THE BONDS WAS WRITTEN TO SUPPORT THE MARKETING OF THE BONDS, AND EACH OWNER SHOULD SEEK ADVICE BASED ON THE OWNER'S PARTICULAR CIRCUMSTANCES FROM AN INDEPENDENT TAX ADVISOR. THIS MATERIAL WAS NOT INTENDED OR WRITTEN TO BE USED, AND CANNOT BE USED BY ANY TAXPAYER, FOR THE PURPOSE OF AVOIDING PENALTIES THAT MAY BE IMPOSED ON THE TAXPAYER.

General

Interest on and profit, if any, on the sale of the Taxable Bonds are not excludable from gross income for federal income tax purposes.

General Federal Tax Matters

The following discussion summarizes the material United States federal income tax consequences generally applicable to the purchase, ownership and disposition of the Taxable Bonds by the beneficial owners thereof ("Owners"). The discussion is limited to the tax consequences to the initial Owners of the Taxable Bonds who purchase the Taxable Bonds at the issue price within the meaning of Section 1273 of the Internal Revenue Code of 1986, as amended (the "Code") and generally does not address the tax consequences to subsequent purchasers of the Taxable Bonds. The discussion does not purport to be a complete analysis of all of the potential United States federal income tax consequences relating to the purchase, ownership and disposition of the Taxable

Bonds, nor does this discussion address any state, local, foreign taxes, or federal estate or gift tax consequences. Furthermore, the discussion does not address all aspects of taxation that might be relevant to particular purchasers in light of their individual circumstances. For instance, the discussion does not address the alternative minimum tax provisions of the Code or special rules applicable to certain categories of purchasers including dealers in securities or foreign currencies, insurance companies, regulated investment companies, real estate mortgage investment conduits, financial institutions, tax-exempt entities, persons required to accelerate the recognition of any item of gross income with respect to the Taxable Bonds as a result of such income being recognized on an applicable financial statement, Owners whose functional currency is not the United States dollar and, Foreign Owners (as defined below) that are classified for federal income tax purposes as "controlled foreign corporations," "passive foreign investment companies," "expatriates," "surrogate foreign corporations," "personal holding companies," or corporations that accumulate earnings to avoid United States federal income tax.

The discussion also does not address the special rules applicable to purchasers who hold the Taxable Bonds as part of a hedge, straddle, conversion, constructive ownership or constructive sale transaction or other risk reduction transaction. The discussion is based on the Code, the regulations of the Department of the Treasury, and administrative and judicial interpretations, all as in effect today. Legislative, judicial and administrative changes may occur, possibly with retroactive effect, that could alter or modify the continued validity of the statements and conclusions set forth herein. The discussion assumes that the Taxable Bonds are held as capital assets within the meaning of Section 1221 of the Code.

Tax Consequences to United States Owners

The Taxable Bonds will be treated as debt instruments and, accordingly, stated interest payments on the Taxable Bonds will be taxable to a United States Owner as ordinary income at the time the interest accrues or is received in accordance with the United States Owner's method of accounting for United States federal income tax purposes. A "United States Owner" is an Owner of a Taxable Bond that is, for United States federal income tax purposes: (1) a citizen or resident of the United States, (2) a corporation, or an entity treated as a corporation for U.S. federal income tax purposes, created or organized in or under the laws of the United States or of any political subdivision thereof, (3) an estate, the income of which is subject to United States federal income taxation regardless of its source, or (4) a trust, the administration of which is subject to the primary supervision of a court within the United States and which has one or more United States persons with authority to control all substantial decisions, or a trust that was in existence on August 20, 1996, and has elected to continue its then current treatment as a United States trust. If a partnership (or an entity taxable as a partnership) holds the Taxable Bonds, the United States federal income tax treatment of a partner generally will depend upon the status of the partner and the tax status of the partnership. Partners of partnerships holding the Taxable Bonds should consult their own tax advisors with regard to the U.S. federal income tax treatment of the purchase, ownership and disposition of the Taxable Bonds.

Bond Premium. A holder of a Taxable Bond who purchases such Taxable Bond at a cost that exceeds the stated principal amount of such Taxable Bond will have amortizable bond premium equal to such excess. If the holder elects to amortize the bond premium, such election will apply to all Taxable Bonds held by the holder on the first day of the taxable year to which the election applies, and to all Taxable Bonds thereafter acquired by the holder. The premium must be amortized using constant yield principles based on the purchaser's yield to maturity. Amortizable bond premium is generally treated as an offset to interest income, but a reduction in basis is required for amortizable bond premium even though such premium is applied to reduce interest payments. Bond premium on a Taxable Bond held by a holder that has not elected to amortize bond premium will decrease the gain or loss otherwise recognized on the disposition the Taxable Bond.

Sale, Exchange, Redemption or Retirement of the Taxable Bonds. In general, unless a nonrecognition provision applies, upon the sale, exchange, redemption or retirement of a Taxable Bond, a United States Owner will recognize capital gain or loss equal to the difference between the amount realized on such sale, exchange, redemption or retirement (not including any amount attributable to accrued but unpaid interest that the United

States Owner has not already included in gross income) and such United States Owner's adjusted tax basis in the Taxable Bond. Any amount attributable to accrued but unpaid interest that the Owner has not already included in gross income will be treated as a payment of interest. A United States Owner's adjusted tax basis in a Taxable Bond generally will equal the cost of the Taxable Bond to such United States Owner, reduced by principal payments received by such United States Owner and increased by any accrued but unpaid interest (including OID, if any) the United States Owner has included in taxable income.

Backup Withholding. Owners will be subject to "backup withholding" of federal income tax (currently at a rate of 24%) in the event they fail to furnish a taxpayer identification number to the paying agent or there are other, related compliance failures. Backup withholding is not an additional tax. The amount of any backup withholding from a payment to an Owner will be allowed as a credit against the Owner's U.S. federal income tax liability and may entitle the Owner to a refund, provided that the required information is timely furnished to the IRS. Owners should consult their tax advisors concerning the application of information reporting and backup withholding rules.

Net Investment Income Tax. Certain United States Owners that are individuals, estates or trusts whose income exceeds certain thresholds are required to pay an additional 3.8% tax on, among other things, interest income and capital gains, subject to certain limitations and exceptions (the "Net Investment Income Tax"). United States Owners that are individuals, estates or trusts are urged to consult their tax advisors regarding the applicability of the Net Investment Income Tax to their income and gains from the Taxable Bonds.

Tax Consequences to Foreign Owners

Payments of interest (including OID) on a Taxable Bond to an Owner that is not a United States Owner (a "Foreign Owner") are generally not subject to United States federal income tax or nonresident withholding tax, provided that:

- the Foreign Owner is not actually or constructively a "10-percent shareholder" as that term is defined in Section 871(h) or 881(c)(3)(B) of the Code;

- the Foreign Owner is not, for United States federal income tax purposes, a controlled foreign corporation (as that term is defined in the Code) with respect to which the City is a "related person" within the meaning of Section 881(c)(3)(C) of the Code;

- the Foreign Owner is not a bank receiving interest described in Section 881(c)(3)(A) of the Code;

- the certification requirements under Section 871(h) or 881(c) of the Code and regulations (summarized below) are met; and

- the Taxable Bond interest is not effectively connected with the conduct by the Foreign Owner of a trade or business in the United States under Section 871(b) or Section 882 of the Code.

In order to obtain the exemption from income and withholding tax, either (1) the Foreign Owner must provide its name and address, and certify, under penalties of perjury on Internal Revenue Service Form W-8BEN, W-8BEN-E, W-8IMY or W-8EXP, as applicable, to the City, its paying agent, or other applicable withholding agent as the case may be, that such Owner is a Foreign Owner or (2) a securities clearing organization, bank or other financial institution that holds customers' securities in the ordinary course of its trade or business ("Financial Institution") and holds a Taxable Bond on behalf of the Foreign Owner, must certify, under penalties of perjury, to the City or its paying agent that such certificate has been received from the Owner by it or by any intermediary Financial Institution and must furnish the City or its paying agent with a copy of the certificate. A certificate is generally effective only with respect to payments of interest made to the certifying Foreign Owner after issuance of the certificate in the calendar year of its issuance and the two immediately succeeding calendar years. A

Foreign Owner who does not satisfy the exemption requirements is generally subject to United States withholding tax on payments of interest (including OID).

Interest on a Taxable Bond (including OID) that is effectively connected with the conduct of a United States trade or business by the Foreign Owner is generally subject to United States federal income tax in the same manner as with a United States Owner, except to the extent otherwise provided under an applicable tax treaty. Effectively connected interest income received by a corporate Foreign Owner may also, under certain circumstances, be subject to an additional branch profits tax. Effectively connected interest income will not be subject to withholding tax if the Foreign Owner delivers a properly completed Internal Revenue Service Form W-8ECI to the City or its paying agent.

U.S. Federal Estate Tax. A Taxable Bond that is held by an individual who, at the time of death, is not a citizen or resident of the U.S. will not be subject to U.S. federal estate tax as a result of such individual's death, provided that, at the time of such individual's death, payments of interest with respect to such Taxable Bond would not have been effectively connected to a trade or business conducted by such individual in the U.S.

Sale, Exchange, Redemption or Retirement of the Taxable Bonds. In general, a Foreign Owner of a Taxable Bond will not be subject to United States federal income or withholding tax on the receipt of payments of principal on a Taxable Bond and will not be subject to United States federal income tax on any gain recognized on the sale, exchange, redemption, retirement or other taxable disposition of such Taxable Bond unless:

- the Foreign Owner is a nonresident alien individual who is present in the United States for 183 or more days in the taxable year of disposition and certain other conditions are met under Section 871(a)(2) of the Code;

- the Foreign Owner is required to pay tax pursuant to the provisions of United States tax law applicable to certain United States expatriates; or

- the gain is effectively connected with the conduct of a United States trade or business by the Foreign Owner (or pursuant to an applicable tax treaty is attributable to a United States permanent establishment of the Foreign Owner).

Foreign Account Tax Compliance Act (FATCA)

Pursuant to the Foreign Account Tax Compliance Act (commonly referred to as "FATCA"), foreign financial institutions (which term includes most foreign banks, hedge funds, private equity funds, mutual funds, securitization vehicles and other investment vehicles) and certain other foreign entities generally must comply with certain information reporting rules with respect to their U.S. account holders and investors or confront a withholding tax on U.S.-source payments made to them (whether received as a beneficial owner or as an intermediary for another party). A foreign financial institution or such other foreign entity that does not comply with the FATCA reporting requirements will generally be subject to a 30% withholding tax with respect to any "withholdable payments." For this purpose, withholdable payments generally include U.S.-source payments otherwise subject to nonresident withholding tax (e.g., U.S.-source interest including OID) and also include the entire gross proceeds from the sale or other disposition of any debt instruments of U.S. issuers, even if the payment would otherwise not be subject to U.S. nonresident withholding tax (e.g., because it is capital gain). Under the applicable final Treasury regulations, withholding under FATCA, if required, generally will apply to payments of U.S.-source interest on the Taxable Bonds and to payments of gross proceeds from dispositions (including redemptions) of the Taxable Bonds. However, the IRS recently issued proposed Treasury regulations that eliminate withholding on payments of gross proceeds (but not on payments of interest). Pursuant to the proposed Treasury regulations, the City and any applicable withholding agent may (but are not required to) rely on this proposed change to FATCA withholding until the final regulations are issued or the proposed regulations are withdrawn. Foreign financial institutions located in jurisdictions that have an intergovernmental agreement with the United States pursuant to FATCA may be subject to different rules with respect to information reporting and related requirements.

The City will not pay any additional amounts in respect of any amounts withheld, including pursuant to FATCA. Under certain circumstances, a holder might be eligible for refunds or credits of such taxes. Holders are urged to consult with their own tax advisors regarding the effect, if any, of the FATCA provisions to them based on their particular circumstances.

State, Local and Foreign Taxes

Interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax under the laws of the Commonwealth of Pennsylvania as enacted and construed on the date of initial delivery of the Bonds.

Owners may be subject to other state, local, or foreign taxes with respect to an investment in the Bonds. Prospective investors are urged to consult their tax advisors with respect to the state, local and foreign tax consequences of an investment in the Bonds.

See APPENDIX VI hereto for the proposed Form of Co-Bond Counsel Opinion.

ERISA CONSIDERATIONS

The following is a summary of certain considerations associated with the acquisition and holding of the Taxable Bonds by an "employee benefit plan" (as defined in Section 3(3) of the Employee Retirement Income Security Act of 1974, as amended ("ERISA")) that is subject to Title I of ERISA, a "plan" covered by Section 4975 of the Code (including an individual retirement account or "IRA"), a benefit plan subject to provisions under applicable federal, state, local, non-U.S. or other laws or regulations that are similar to the provisions of Title I of ERISA or Section 4975 of the Code ("Similar Laws") and any entity whose underlying assets include "plan assets" by reason of such employee benefit or retirement plan's investment in such entity (each of which is referred to as a "Plan").

General Fiduciary Matters

ERISA imposes certain duties on persons who are fiduciaries of a Plan subject to Title I of ERISA, and ERISA and Section 4975 of the Code prohibit certain transactions involving the assets of a Plan subject to ERISA as well as the assets of "plans" covered by Section 4975 of the Code (including individual retirement accounts ("IRAs") described in Sections 408 and 408A of the Code) with its fiduciaries or other interested parties (such plans are referred to herein as "Benefit Plans"). In general, under ERISA and the Code, any person who exercises any discretionary authority or control over the administration of such a Benefit Plan or the management or disposition of the assets of such a Benefit Plan, or who renders investment advice for a fee or other compensation (direct or indirect) to such a Benefit Plan, is generally considered to be a fiduciary of the Benefit Plan. Plans that are governmental plans (as defined in Section 3(32) of ERISA), certain church plans (as defined in Section 3(33) of ERISA or Section 4975(g)(3) of the Code) and non-U.S. plans (as described in Section 4(b)(4) of ERISA) are not subject to the requirements of ERISA or Section 4975 of the Code but may be subject to similar prohibitions under Similar Laws. In considering the acquisition, holding and, to the extent relevant, disposition of Taxable Bonds with a portion of the assets of a Plan, a fiduciary should determine whether the investment is in accordance with the documents and instruments governing the Plan and the applicable provisions of ERISA, the Code or any Similar Law relating to a fiduciary's duties to the Plan including, without limitation, the prudence, diversification, delegation of control and prohibited transaction provisions of ERISA, the Code and any other applicable Similar Laws.

Prohibited Transactions – In General

Section 406 of ERISA prohibits Benefit Plans from engaging in specified transactions involving plan assets with persons or entities who are "Parties in Interest," within the meaning of Section 3(14) of ERISA, and Section 4975 of the Code imposes an excise tax on certain "Disqualified Persons," within the meaning of Section 4975 of the Code, who engage in similar prohibited transactions, in each case unless a statutory or administrative exemption is available.

A Party in Interest or Disqualified Person who engages in a non-exempt prohibited transaction may be subject to other penalties and liability under ERISA and the Code. In the case of an IRA, the occurrence of a prohibited transaction could cause the IRA to lose its tax-exempt status. Further, a separate prohibited transaction could arise if, subsequent to the acquisition, the City or one of its affiliates becomes a Party in Interest or Disqualified Person with respect to such a Benefit Plan or a subsequent transfer of a Taxable Bond is between a Benefit Plan and a Party in Interest or Disqualified Person with respect to such Plan.

The definitions of "Party in Interest" and "Disqualified Person" are expansive. While other entities may be encompassed by these definitions, they include, most notably: (1) a fiduciary with respect to a Benefit Plan; (2) a person providing services to a Benefit Plan; and (3) an employer or employee organization any of whose employees or members are covered by a Benefit Plan.

Plan Asset Issues

Certain transactions involving the purchase, holding or transfer of the Taxable Bonds might be deemed to constitute a prohibited transaction under ERISA and the Code if assets of the City were deemed to be assets of a Benefit Plan. Under final regulations issued by the United States Department of Labor at 29 C.F.R. Section 2510.3-101, as modified by Section 3(42) of ERISA (the "Plan Asset Regulations"), the assets of the City would be treated as plan assets of a Benefit Plan for purposes of ERISA and the Code only if the Benefit Plan acquires an "equity interest" in the City and none of the exceptions contained in the Plan Asset Regulations is applicable. An equity interest is defined under the Plan Asset Regulations as an interest in an entity other than an instrument which is treated as indebtedness under applicable local law and which has no substantial equity features.

Although there is little statutory or regulatory guidance on this subject, the Taxable Bonds should be treated as debt, without substantial equity features, for purposes of the Plan Asset Regulations. Accordingly, the assets of the City should not be treated as plan assets of Benefit Plans investing in the Taxable Bonds. However, there can be no complete assurance that the Taxable Bonds will be treated as debt obligations without substantial equity features for purposes of the Plan Asset Regulations. If the City assets were deemed to constitute "plan assets" pursuant to the Plan Asset Regulations, transactions that the City might enter into, or may have entered into in the ordinary course of business, might constitute non-exempt prohibited transactions under ERISA or the Code. Therefore, a Plan fiduciary should consult with its counsel prior to making such purchase.

Prohibited Transaction Exemptions

However, without regard to whether the Taxable Bonds are treated as debt obligations without substantial equity features for such purpose, the acquisition or holding of Taxable Bonds by or on behalf of a Benefit Plan could be considered to give rise to a prohibited transaction if the City, and other parties connected with the offering (such as the Underwriter), or any of their respective affiliates, is or becomes a Party in Interest or a Disqualified Person with respect to such Benefit Plan. In such case, certain status-based exemptions from the prohibited transaction rules could be applicable depending on the type and circumstances of the plan fiduciary making the decision to acquire the Taxable Bonds. These are commonly referred to as prohibited transaction class exemptions of "PTCEs." Included among these exemptions are:

- PTCE 75-1, which exempts certain transactions between a plan and certain broker-dealers, reporting dealers and banks;

- PTCE 96-23, which exempts certain transactions effected at the sole discretion of an “in-house asset manager” (an “INHAM”));

- PTCE 90-1, which exempts certain investments by insurance company pooled separate accounts;

- PTCE 95-60, which exempts certain transactions effected on behalf of an “insurance company general account”;

- PTCE 91-38, which exempts certain investments by bank collective investment funds; and

- PTCE 84-14, which exempts certain transactions effected at the sole discretion of a “qualified professional asset manager” (a “QPAM”)).

Note that IRAs, and certain other plans described in Section 4975(e)(1) of the Code, are typically not represented by banks, insurance companies or registered investment advisors so that, practically speaking, these status-based exemptions may not be available.

There is also a statutory exemption in Section 408(b)(17) of ERISA and Section 4975(d)(20) of the Code (which may be available to IRAs and other Plans) which is commonly referred to as the “Service Provider Exemption”. The Service Provider Exemption covers transactions involving “adequate consideration” with persons who are Parties in Interest or Disqualified Persons solely by reason of their (or their affiliate’s) status as a service provider to the Plan involved and none of which is a fiduciary with respect to the Plan assets involved (or an affiliate of such a fiduciary).

The availability of each of these PTCEs and/or the Service Provider Exemption is subject to a number of important conditions which the Benefit Plan’s fiduciary must consider in determining whether such exemptions apply. Also, there can be no assurance that all the conditions of any such exemptions will be satisfied at the time that the Taxable Bonds are acquired by a purchaser, or thereafter, if the facts relied upon for utilizing a prohibited transaction exemption change, or that the scope of relief provided by these exemptions will necessarily cover all acts that might be construed as prohibited transactions. Therefore, a Benefit Plan fiduciary considering an investment in the Taxable Bonds should consult with its counsel prior to making such purchase.

Because of the foregoing, the Taxable Bonds (and any interest therein) may not be purchased or held by any person investing “plan assets,” of a Plan, unless such purchase or holding will not constitute or result in a non-exempt prohibited transaction under ERISA or the Code or similar violation of any applicable Similar Laws. Any Benefit Plan fiduciary considering whether to purchase the Taxable Bonds on behalf of a Benefit Plan should consult with its counsel regarding the applicability of the fiduciary responsibility and prohibited transaction provisions of ERISA and the Code to such investment and the availability of any of the exemptions referred to above. Persons responsible for investing the assets of employee benefit plans that are not subject to the requirements of ERISA or Section 4975 of the Code should seek similar counsel with respect to the application of similar prohibitions under Similar Laws.

Representations

BY ITS ACQUISITION OF THE TAXABLE BONDS (OR ANY INTEREST THEREIN) EACH PURCHASER AND SUBSEQUENT TRANSFEREE THEREOF WILL BE DEEMED TO HAVE REPRESENTED, WARRANTED AND AGREED THAT, ON EACH DAY IT HOLDS A TAXABLE BOND OR ANY INTEREST THEREIN, EITHER (a) IT IS NOT A PLAN, SUCH AS AN IRA, AND THAT NO PORTION OF THE ASSETS USED TO ACQUIRE OR HOLD THE TAXABLE BONDS CONSTITUTES ASSETS OF A PLAN OR (b) THE ACQUISITION, HOLDING AND DISPOSITION OF A TAXABLE BOND

(OR AN INTEREST THEREIN) BY A PLAN WILL NOT CONSTITUTE A PROHIBITED TRANSACTION UNDER SECTION 406 OF ERISA OR SECTION 4975 OF THE CODE OR SIMILAR VIOLATION UNDER ANY APPLICABLE SIMILAR LAWS FOR WHICH THERE IS NO APPLICABLE STATUTORY, REGULATORY OR ADMINISTRATIVE EXEMPTION.

The foregoing discussion is general in nature and is not intended to be all-inclusive. Due to the complexity of these rules and the penalties that may be imposed upon persons involved in non-exempt prohibited transactions, it is particularly important that fiduciaries, or other persons considering purchasing Taxable Bonds on behalf of, or with the assets of, any Plan, consult with their counsel regarding the potential applicability of ERISA, Section 4975 of the Code and any Similar Laws to such investment and whether an exemption would be applicable to the purchase and holding of the Taxable Bonds. The acquisition, holding and, to the extent relevant, disposition of Taxable Bonds by or to any Plan is in no respect a representation by the City (or any affiliates or representatives thereof) that such an investment meets all relevant legal requirements with respect to investments by such Plans generally or any particular Plan, or that such an investment is appropriate for Plans generally or any particular Plan.

NEGOTIABLE INSTRUMENTS

The Act provides that bonds issued thereunder shall have all the qualities and incidents of securities under the Uniform Commercial Code of the Commonwealth of Pennsylvania and shall be negotiable instruments.

ENGINEERING REPORT

The Engineering Report is included in APPENDIX II of this Official Statement in reliance upon the authority of the Consulting Engineer in engineering and related financial matters. Potential purchasers of the Bonds should read the Engineering Report in its entirety. As stated in the Engineering Report, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that actually occur that are unknown at this time and/or which are beyond the control of the Consulting Engineer.

UNDERWRITING

The Bonds are being purchased by the underwriters listed on the front cover page of the Official Statement (collectively, the "Underwriters") pursuant to a Bond Purchase Agreement between the City and Citigroup Global Markets Inc., on behalf of itself and as representative of the other Underwriters. The purchase price of the Tax-Exempt Bonds is $257,550,067.48, reflecting a total par amount of $201,530,000.00, plus original issue premium of $56,887,100.50, less an Underwriters' discount of $867,033.02; the purchase price of the Taxable Bonds is $94,640,723.14, reflecting a total par amount of $95,025,000.00, less an Underwriters' discount of $384,276.86. The Underwriters will purchase all of the Bonds if any such Bonds are purchased. The obligation of the Underwriters to purchase the Bonds is subject to certain terms and conditions set forth in the Bond Purchase Agreement.

The initial public offering prices of the Bonds set forth on the inside front cover page hereof may be changed without notice by the Underwriters. The Underwriters may offer and sell Bonds to certain dealers (including dealers depositing Bonds into investment trusts, certain of which may be sponsored or managed by one or more of the Underwriters) and others at prices lower than the offering prices set forth on the inside front cover page hereof.

Citigroup Global Markets Inc., an Underwriter of the Bonds, has entered into a retail distribution agreement with Fidelity Capital Markets, a division of National Financial Services LLC (together with its affiliates, "Fidelity"). Under this distribution agreement, Citigroup Global Markets Inc. may distribute municipal securities to retail investors at the original issue price through Fidelity. As part of this arrangement, Citigroup Global Markets Inc. will compensate Fidelity for its selling efforts with respect to the Bonds.

Certain of the other Underwriters have entered into distribution agreements with other broker-dealers (that have not been designated by the City as Underwriters) for the distribution of the Bonds to retail investors at the original issue prices. Such agreements generally provide that the relevant Underwriter will share a portion of its underwriting compensation or selling concession with such broker-dealers.

The Underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include sales and trading, commercial and investment banking, advisory, investment management, investment research, principal investment, hedging, market making, brokerage and other financial and non-financial activities and services. Certain of the Underwriters and their respective affiliates have provided, and may in the future provide, a variety of these services to the issuer and to persons and entities with relationships with the issuer, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the Underwriters and their respective affiliates, officers, directors and employees may purchase, sell or hold a broad array of investments and actively trade securities, derivatives, loans, commodities, currencies, credit default swaps and other financial instruments for their own account and for the accounts of their customers, and such investment and trading activities may involve or relate to assets, securities and/or instruments of the City (directly, as collateral securing other obligations or otherwise) and/or persons and entities with relationships with the City. The Underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of such assets, securities or instruments and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in such assets, securities and instruments.

RATINGS

Fitch, Moody's and S&P have assigned to the Bonds municipal bond ratings "A+", "A1" and "A+", respectively, each with a "stable" outlook. Certain information was supplied by the City and the Water Department to the rating agencies to be considered in evaluating the Bonds. Such ratings express only the views of the respective rating agencies and are not a recommendation to buy, sell or hold the Bonds.

Any desired explanation of the significance of such ratings should be obtained from the rating agency furnishing the same, at the following addresses: Moody's, 7 World Trade Center, 250 Greenwich Street, New York, New York 10007; S&P, 55 Water Street, New York, New York 10041; and Fitch, One State Street Plaza, New York, New York 10004. Generally, a rating agency bases its rating on the information and materials furnished to it and on investigations, studies and assumptions of its own. There is no assurance such ratings will not be revised downward or withdrawn entirely by the rating agencies, if in the judgment of such rating agencies, circumstances so warrant. Any such downward revision or withdrawal of such ratings may have an adverse effect on the market price of the Bonds.

The Underwriters have not assumed responsibility to advise the owners of the Bonds of any change in any rating on the Bonds and neither the City nor the Underwriters have undertaken any responsibility to maintain any particular rating on the Bonds. The City has agreed, in the Continuing Disclosure Agreement, to report actual rating changes on the Bonds. See "CONTINUING DISCLOSURE" herein and APPENDIX VII. Any downward change in or withdrawal of a credit rating may have an adverse effect on the marketability or market price of the Bonds.

VERIFICATION

American Municipal Tax-Exempt Compliance Corporation (the "Verification Agent") will deliver to the City, on or before the date of the delivery of the Bonds, its report (the "Verification Report") indicating that it has verified the mathematical accuracy of the information provided by the City and its representatives with respect to the refunding requirements of the Refunded Bonds. Included within the scope of its engagement will be a verification of (a) the mathematical accuracy of the computations indicating that the cash and maturing principal of the securities, along with initial cash deposits, will be sufficient to meet the scheduled payment of interest on the Refunded Bonds until redemption and the payment of the redemption price of the Refunded Bonds on their respective redemption dates; and (b) the mathematical accuracy of the computations supporting the conclusion of Co-Bond Counsel that the Tax-Exempt Bonds are not "arbitrage bonds" under the Code and the regulations promulgated thereunder.

The verification performed by the Verification Agent will be based solely upon data, information and documents provided to the Verification Agent by the City and its representatives. The Verification Report will state that the Verification Agent has no obligation to update the Verification Report for events occurring, or data or information coming to their attention, subsequent to the date of the Verification Report.

LEGAL MATTERS

Certain legal matters incident to the authorization, issuance and sale of the Bonds will be passed upon by Ballard Spahr LLP and Ahmad Zaffarese LLC, both of Philadelphia, Pennsylvania, Co-Bond Counsel. The proposed form of such legal opinion is included herein as APPENDIX VI. Certain legal matters will be passed upon for the City by Greenberg Traurig, LLP and Turner Law, P.C., both of Philadelphia, Pennsylvania, Co-Disclosure Counsel. Certain legal matters relating to the information contained in APPENDIX IV and APPENDIX V will be passed upon for the City by Hawkins Delafield & Wood LLP. Certain legal matters will be passed upon for the Underwriters by Dilworth Paxson LLP of Philadelphia, Pennsylvania. Certain legal matters will be passed upon for the City by the City Solicitor.

FINANCIAL ADVISORS

PFM Financial Advisors LLC, of Philadelphia, Pennsylvania and Acacia Financial Group, Inc., of Mount Laurel, New Jersey, have been retained by the City as Co-Financial Advisors in connection with the issuance of the Bonds and, in such capacity, have assisted the City in the preparation of Bond-related documents. The Co-Financial Advisors' fee for services rendered with respect to the sale of the Bonds is contingent upon the issuance and delivery of the Bonds. Although the Co-Financial Advisors have read and participated in the preparation of this Official Statement, they have not independently verified any of the information set forth herein. The information contained in this Official Statement has been obtained primarily from the City's records and from other sources that are believed to be reliable, including financial records of the City, reports of consultants and other entities that may be subject to interpretation. No guarantee is made as to the accuracy or completeness of any such information. No person, therefore, is entitled to rely upon the participation of the Co-Financial Advisors as an implicit or explicit expression of opinion as to the completeness and accuracy of the information contained in this Official Statement.

NO LITIGATION OPINION

Upon the delivery of the Bonds, the City Solicitor will furnish an opinion, in form satisfactory to Co-Bond Counsel and the Underwriters, to the effect that, among other things, and except as disclosed in this Official Statement, there is no litigation or other legal proceeding pending, or, to the best of his knowledge after customary inquiry, threatened in writing against the City, to restrain or enjoin the issuance or delivery of the Bonds or challenging the validity of the proceedings of the City taken in connection therewith or the pledge or application of any monies provided for the payment of the Bonds, or contesting the powers of the City with respect to any of the foregoing.

CERTAIN REFERENCES

All summaries of the provisions of the Bonds and the security therefor, the Act and the General Ordinance set forth herein and in APPENDIX III-A and all summaries and references to other materials not purported to be quoted in full, are only brief outlines of certain provisions thereof and do not constitute complete statements of such documents or provisions. Reference is made hereby to the complete documents relating to such matters for the complete terms and provisions thereof or for the information contained therein. All estimates, assumptions and statistical information contained herein, while taken from sources considered reliable, are not guaranteed. So far as any statements are made in this Official Statement involving matters of opinion, or projections or estimates, whether or not expressly so stated, they are made merely as such and not as representations of fact.

The attached Appendices are integral parts of this Official Statement and should be read in their entireties together with all foregoing statements in this Official Statement.

The agreement between the City and holders of Bonds is fully set forth in the Bonds and the General Ordinance. Neither this Official Statement nor any advertisement for the Bonds is to be construed as constituting an agreement with purchasers of the Bonds.

CONTINUING DISCLOSURE

In order to assist the Underwriters in complying with the requirements of Rule 15c2-12 promulgated by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as amended (the "Rule"), the City (i) will enter into a Continuing Disclosure Agreement with Digital Assurance Certification, L.L.C., as dissemination agent for the benefit of the holders of the Bonds, to be dated the date of original delivery and payment for the Bonds, the form of which is annexed hereto as APPENDIX VII, and (ii) has provided the disclosure in the following paragraphs.

During the previous five years, in one instance, the City timely filed notice of a rating change, but did not associate the notice with all specific relevant outstanding obligations and filed the notice through incorporation by reference of information in an offering document. The foregoing description of an instance of non-compliance by the City with its continuing disclosure undertakings should not be construed as an acknowledgement by the City that such instance was material.

The City has reviewed and updated its disclosure policies and procedures to assist the City in complying with its continuing disclosure undertakings in the future.

CERTAIN RELATIONSHIPS

Ballard Spahr LLP, Co-Bond Counsel, Turner Law, P.C., Co-Disclosure Counsel, and Greenberg Traurig, LLP, Co-Disclosure Counsel, represent some of the Underwriters of the Bonds, from time to time, in matters unrelated to the issuance of the Bonds. Dilworth Paxson LLP, counsel to the Underwriters, from time to time represents the City in matters unrelated to the issuance of the Bonds.

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This Official Statement has been duly executed and delivered by the following officer on behalf of the City of Philadelphia, Pennsylvania.

THE CITY OF PHILADELPHIA

By: /s/ Rob Dubow
Rob Dubow, Director of Finance

SCHEDULE 1
REFUNDED BONDS

1. The following maturities of the City's outstanding Water and Wastewater Revenue Bonds, Variable Rate Series 1997B:

Maturity Date	Principal Amount
08/01/2021	$4,600,000.00
08/01/2022	4,800,000.00
08/01/2023	5,000,000.00
08/01/2024	5,200,000.00
08/01/2025	5,500,000.00
08/01/2026	5,700,000.00
08/01/2027	6,000,000.00

2. The following maturities of the City's outstanding Water and Wastewater Revenue Bonds, Series 2010C:

Maturity Date	Principal Amount
08/01/2035	$1,045,000.00

3. The following maturities of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2011B:

Maturity Date	Principal Amount
11/01/2022	$1,865,000.00

4. The following maturities of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2012:

Maturity Date	Principal Amount
11/01/2028	$34,400,000.00

5. The following maturities of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2013A:

Maturity Date	Principal Amount
01/01/2041	$15,840,000.00
01/01/2042	16,655,000.00
01/01/2043	17,505,000.00

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APPENDIX I

FINANCIAL STATEMENTS OF THE WATER FUND
DERIVED FROM THE CAFR
FOR FISCAL YEAR ENDED JUNE 30, 2019

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City of Philadelphia
Philadelphia Water Department
Financial Statements
Fiscal Years Ended June 30, 2019 and 2018

CITY OF PHILADELPHIA WATER DEPARTMENT

YEAR ENDED JUNE 30, 2019 AND 2018

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The City of Philadelphia Water Department Management Discussion and Analysis

The Philadelphia Water Department is one of the City's ten operating departments and its activities are accounted for under a dedicated Water Fund established pursuant to the Philadelphia Home Rule Charter. Pursuant to the Charter, the Water Department has the power and duty to operate, maintain, repair, and improve the City's water system (the "Water System"), the City's wastewater system (the "Wastewater System") and, together, the "Water and Wastewater Systems" (or the "Combined System").

The Water Department's primary mission is to plan for, operate, and maintain both the infrastructure and the organization necessary to purvey high-quality drinking water, to provide an adequate and reliable water supply for all household, commercial, and community needs, and to sustain and enhance the region's watersheds and quality of life by managing wastewater effectively.

The Water Department serves the City of Philadelphia and also provides wastewater services to ten bulk customers and water services to one bulk water customer. The Water Department operates three drinking water plants which have the capacity to treat and deliver about 546 million gallons per day of top quality drinking water that meets or exceeds all federal, state, and local regulations. Additionally, it operates three water pollution control plants that have the capacity to treat over 1 billion gallons of wastewater per day at a level that meets or exceeds federal and state standards.

The operations and activities of the Water Department are accounted for with a separate set of balancing accounts that comprise the assets, deferred outflows of resources, liabilities, deferred inflows of resources, net position, revenues, and expenses. The activity of the Water Department is grouped in the financial statements into the broad category referred to as an enterprise fund (the "Water Fund"). The Water Fund is comprised of the funds and accounts established by the City under its Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended (the "General Ordinance").

2019 Financial Highlights

The Water Fund met its required coverage ratios for the year with a revenue bond coverage ratio of 1.33, a coverage ratio of 1.18 for total debt service and certain other transfers and expenditures, and a net operating revenue bond coverage ratio of 1.31 prior to the inclusion of the transfer from the Rate Stabilization Fund.

At the end of the current fiscal year, the Water Fund's net position totaled $822 million resulting from an excess of its assets and deferred outflows of resources over its liabilities and deferred inflows of resources; its unrestricted net position showed a deficit of $373 million. This deficiency will have to be funded from resources generated in future years.

The Water Fund's net position showed a $35 million increase during the current fiscal year compared with the prior fiscal year.

Overview of the Financial Statements

This section serves as an introduction to the Basic Financial Statements. It represents management's examination and analysis of the Water Fund's financial condition and performance.

The Financial Statements report information about the Water Fund using the Full Accrual Accounting method as used by similar business activities in the private sector. The Water Fund's basic financial statements include the Statements of Net Position, Statements of Revenues, Expenses, and Changes in Net Position, Statements of Cash Flows, and Notes to the Financial Statements.

The financial statements are prepared in accordance with accounting principles promulgated by the Governmental Accounting Standards Board ("GASB").

> **Statement of Net Position:** The statement of net position presents the financial position of the Water Fund. It presents information on the assets, deferred outflows of resources, liabilities, and deferred inflows of resources with the difference between them reported as net position. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position of the Water Fund is improving or deteriorating.
>
> **Statement of Revenues, Expenses, and Changes in Net Position:** The statement of revenues, expenses, and changes in net position presents information showing how the net position changed during the most recent fiscal year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, regardless of the timing of related cash flows. Revenues are recognized when earned, not when they are received. Expenses are recognized when incurred, not when they are paid. Thus, revenues and expenses are reported in this statement for some items that will result in cash flows in future fiscal periods (e.g. salaries and wages payable).
>
> **Statement of Cash Flows:** The statement of cash flows presents information on the effects changes in assets, liabilities, and operations have on cash during the course of the fiscal year.

The Water Fund's financial statements can be found following the Management Discussion and Analysis. The notes provide additional information that is essential to a full understanding of the data provided in the Water Fund financial statements. In addition to the basic financial statements and accompanying notes, government accounting standards require presentation of required supplementary information ("RSI"). Following the RSI, the Fund has presented other supplementary information ("OSI").

Please see the Comprehensive Annual Financial Report of the City of Philadelphia for complete financial information for the City and its component units, which can be found at http://www.phila.gov/investor/CAFR.html.

Financial Analysis

Net Position

A three year condensed summary of the Water Fund's net position as of June 30 of each year follows:

Condensed Statement of Net Position
(Thousands of Dollars)
June 30

	2019	2018 *	2017
Assets:			
Current Assets	$ 284,260	$ 267,446	$ 258,444
Capital Assets	2,655,300	2,487,889	2,318,410
Restricted Assets	749,096	685,404	887,924
Total Assets	3,688,656	3,440,739	3,464,778
Deferred Outflows of Resources	69,542	84,100	94,211
Total Assets and Deferred Outflows	3,758,198	3,524,839	3,558,989
Liabilities:			
Current Liabilities *	240,323	223,523	240,464
Bonds Payable	2,070,390	1,890,590	2,022,636
Other Noncurrent Liabilities *	609,514	615,952	483,646
Total Liabilities	2,920,227	2,730,065	2,746,746
Deferred Inflows of Resources	15,887	8,133	2,144
Total Liabilities and Deferred Inflows	2,936,114	2,738,198	2,748,890
Net Position:			
Net Investment in Capital Assets	649,536	687,482	542,042
Restricted	545,506	478,940	511,113
Unrestricted Deficit	(372,958)	(379,781)	(243,056)
Total Net Position, as Restated	$ 822,084	$ 786,641	$ 810,099

* The fiscal year 2018 current portion of compensated absences has been reclassified from Other Noncurrent Liabilities to Current Liabilities.

The Water Fund's net position at June 30, 2019 was approximately $822 million, a $35.4 million or 4.5% increase from June 30, 2018. Total assets and deferred outflows of resources increased by $233.3 million, or 6.6%, to $3.8 billion, and total liabilities and deferred inflows of resources increased $197.9 million, or 7.2%, to $2.9 billion.

The following is a discussion of the more significant changes in assets and deferred outflows of resources, liabilities and deferred inflows of resources, and net position in fiscal year 2019:

- Current assets increased by $16.8 million to $284.3 million, or 6.3%, due to increases in Equity in Treasurer's account and accounts receivable.

- Restricted assets increased by $63.7 million to $749.1 million, or 9.3%, due to increases in the Water Capital Fund.

- Deferred outflows of resources decreased by $14.6 million to $69.5 million, or 17.3%, due to deferred outflows of resources related to unamortized loss on refunded debt and the Water Fund's net pension liability which was partially offset by Net OPEB liability.

- Current liabilities increased by $16.8 million to $240.3 million, or 7.5%, primarily due increases construction contracts payable and accrued expenses.

- Bonds payable increased by $179.8 million to $2.1 billion, or 9.5%, primarily due to additional debt issuance.

- Other noncurrent liabilities decreased by $6.4 million to $609.5 million, or 1.0%, primarily due to minor changes net pension and OBEP liability.

- Deferred inflows of resources increased by $7.8 million due to deferred inflows of resources related to the net other postemployment benefits.

- The Water Fund's net position increased by $35.4 million to $822.1 million, or 4.5%, as a result of fiscal year 2019 operations and prior period adjustments.

- Net investment in capital assets decreased by $37.9 million, or 5.5%, to $649.5 million.

- Unrestricted net position deficit decreased by $6.8 million, or 1.8%, to a deficit of $373.0 million. The unrestricted component of net position represents the net amount of total assets, deferred outflows of resources, total liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or restricted components of net position.

Changes in Net Position

A condensed summary of the Water Fund's Statement of Revenues, Expenses, and Changes in Net Position for the years ended June 30 is presented as follows:

Condensed Statement of Revenues, Expenses, and Changes in Net Position
(Thousands of Dollars)
Year Ended June 30

	2019	2018	2017
Operating Revenues:			
Charges for Goods and Services	$723,373	$ 713,730	$ 702,059
Miscellaneous Operating Revenues	13,001	12,642	12,607
Operating Grants	698	570	1,283
Total Operating Revenues	746,072	726,942	715,949
Operating Expenses:			
Operating Expenses excluding Depreciation and Amortization	455,611	439,972	413,339
Depreciation and Amortization	124,315	101,847	105,208
Total Operating Expenses	579,926	541,819	518,547
Operating Income	166,146	185,123	197,402
Nonoperating Revenues (Expenses):			
Federal, State and Local Grants	-	1,647	-
Interest Income	24,054	10,865	7,626
Debt Service – Interest	(74,742)	(70,136)	(66,295)
Other Expenses	(31,110)	(19,117)	(16,909)
Total Nonoperating Revenues (Expenses)	(81,798)	(76,741)	(75,578)
Increase in Net Position before Transfers	84,348	108,382	121,824
Transfers Out	(39,917)	(33,280)	(28,483)
Capital Contributions	481	9,372	1,077
Change in Net Position	44,912	84,474	94,418
Net Position – Beginning of Period, Before Restatement	786,641	810,099	765,104
Cumulative Effect of Change in Accounting Principle - Adoption of GASB 75 and Reclassification of Expense	(9,469)	(107,932)	(49,423)
Net Position – Beginning of Period, as Restated*	777,172	702,167	715,681
Net Position – End of Period	$822,084	$ 786,641	$ 810,099

*For more information on the restatement, see Note III. 11. to the financial statements.

- Operating revenues increased by $19.1 million to $746.1 million due to an increase in charges for goods and services.
- Operating expenses increased by $38.1 million to $579.9 million due primarily to increases in personal services, purchase of services, depreciation and materials and supplies partially offset by a reduction in employee benefits, indemnities and taxes.
- Nonoperating expenses increased by $5.1 million to $81.8 million. The increase in non-operating expenses is due primarily to the debt service interest expense and other expense increases of $16.6 million, partially offset by the $13.2 million increase in interest income.

Capital Assets and Debt Administration

Capital Assets

Investment in capital assets, net of accumulated depreciation, amounted to $2.7 billion as of June 30, 2019. This represented an increase of $167.4 million, or 6.7% over the previous year's total of $2.5 billion. Capital assets consist primarily of land, infrastructure, construction in progress, buildings, and equipment. Infrastructure consists of water and wastewater transmission and distribution lines. The following is a summary of capital assets as of June 30:

Capital Asset Activity
(Thousands of Dollars)
June 30

	2019	2018	2017
Land	$ 5,919	$ 5,919	$ 5,919
Construction in Progress	666,130	523,417	354,702
Infrastructure	2,677,405	2,601,207	2,544,238
Buildings and Equipment	1,753,974	1,730,817	1,766,014
Accumulated Depreciation	(2,448,128)	(2,373,471)	(2,352,463)
Total Capital Assets, net	$2,655,300	$2,487,889	$ 2,318,410

The capital assets of 2019, 2018 and 2017 were restated for reclassifications. For more information on the 2019 restatement, see Note III. 11. to the financial statements.

Long-Term Debt

As of June 30, 2019, the Water Fund had $2.7 billion of noncurrent liabilities outstanding. This was an increase of $173.4 million from the prior fiscal year. The following is a summary of the noncurrent liability outstanding as of June 30:

Noncurrent Liability Activity
(Thousands of Dollars)
June 30

	2019	2018	2017
Revenue Bonds - Net	$2,070,390	$1,890,590	$2,022,636
Derivative Instrument	-	3	356
Other Noncurrent Liabilities *	41,938	40,283	39,057
Net OPEB Liability	137,036	139,806	-
Net Pension Obligation	430,540	435,860	444,233
Total Noncurrent Liabilities	$2,679,904	$2,506,542	$2,506,282

* The fiscal year 2018 current portion of compensated absences has been reclassified from Other Noncurrent Liabilities to Other Current Liabilities.

The following details activity of debt during fiscal years 2019 and 2018:

	(Thousands of Dollars)	
	2019	2018
Long Term Bonds Outstanding	$ 2,004,181	$ 1,824,507
Current Portion	(105,372)	(102,581)
	1,898,809	1,721,926
Unamortized Bond Premium	171,581	168,643
Unamortized Swaption	-	21
Bond Payable (Net)	$ 2,070,390	$ 1,890,590

More detailed information concerning long-term debt activity and capital asset activity is disclosed in Note III. 6. and Note III. 5., respectively, of the financial statements.

Budgetary Highlights

Please see the supplementary Budgetary Comparison Schedule located in the Required Supplementary Information section.

Requests for Information

This financial report is designed to provide a general overview of the City of Philadelphia Water Department's finances for all interested parties. Questions concerning any of the information provided in this report, or requests for additional information, should be addressed to the Philadelphia Water Department, Finance Division, Attention Deputy Commissioner of Finance, 5th Floor, 1101 Market Street, Jefferson Tower, Philadelphia, Pennsylvania 19107.

CITY OF PHILADELPHIA WATER DEPARTMENT

STATEMENTS OF FUND NET POSITION, JUNE 30, 2019 AND 2018

(amounts in thousands)

ASSETS	**2019**	**2018**
Current Assets:		
Cash on Deposit and on Hand	$ 30	$ 30
Equity in Treasurer's Account	112,784	102,997
Due from Other Governments	-	1,500
Accounts Receivable	167,854	158,767
Allowance for Doubtful Accounts	(12,378)	(11,489)
Inventories	15,787	15,502
Other Assets	183	139
Total Current Assets	284,260	267,446
Noncurrent Assets:		
Restricted Assets:		
Equity in Treasurer's Account	545,013	484,011
Sinking Funds and Reserves	201,367	199,833
Receivables	2,716	1,560
Total Restricted Assets	749,096	685,404
Capital Assets:		
Land	5,919	5,919
Infrastructure	2,677,405	2,601,207
Construction in Progress	666,130	523,417
Buildings and Equipment	1,753,974	1,730,817
Less: Accumulated Depreciation	(2,448,128)	(2,373,471)
Total Capital Assets, Net	2,655,300	2,487,889
Total Noncurrent Assets	3,404,396	3,173,293
Total Assets	**3,688,656**	**3,440,739**
DEFERRED OUTFLOWS OF RESOURCES:		
Deferred Outflow - Fin. Instruments	-	3
Deferred Outflow - Net Pension Liability	15,957	24,543
Deferred Outflow - Net OPEB Liability	10,989	7,240
Unamortized Loss - Refunded Debt	42,596	52,314
Total Deferred Outflows	**69,542**	**84,100**
LIABILITIES		
Current Liabilities:		
Vouchers Payable	7,090	5,788
Accounts Payable	12,619	10,758
Due to Other Funds	4,709	5,299
Salaries & Wages Payable	3,547	4,580
Construction Contracts Payable	58,190	48,729
Due to Other Components Units	292	1,668
Accrued Expenses	34,653	30,046
Funds Held in Escrow	1,667	1,667
Unearned Revenue	10,738	11,193
Bonds Payable - Current	105,372	102,581
Other Current Liabilities *	1,446	1,214
Total Current Liabilities	240,323	223,523
Derivative Instrument Liability	-	3
Net OPEB Liability	137,036	139,806
Net Pension Liability	430,540	435,860
Noncurrent Liabilities:		
Bonds Payable	1,898,809	1,721,912
Unamortized Premium/(Discount and Loss)	171,581	168,678
Other Noncurrent Liabilities *	41,938	40,283
Total Noncurrent Liabilities	2,112,328	1,930,873
Total Liabilities	**2,920,227**	**2,730,065**
DEFERRED INFLOWS OF RESOURCES:		
Deferred Inflows - Net Pension Liability	542	1,336
Deferred Inflows - Net OPEB Liability	15,345	6,797
Total Deferred Inflows	**15,887**	**8,133**
NET POSITION		
Net Investment in Capital Assets	649,536	687,482
Restricted For:		
Capital Projects	163,690	99,230
Debt Service	201,367	200,225
Rate Stabilization	180,449	179,485
Unrestricted	(372,958)	(379,781)
Total Net Position	**$ 822,084**	**$ 786,641**

* The fiscal year 2018 current portion of compensated absences has been reclassified from Other Noncurrent Liabilities to Other Current Liabilities.

The notes to the financial statements are an integral part of these statements.

CITY OF PHILADELPHIA WATER DEPARTMENT

STATEMENTS OF REVENUES, EXPENSES AND CHANGES IN NET POSITION
FOR FISCAL YEAR ENDED JUNE 30, 2019 AND 2018

(amounts in thousands)

	2019	2018
Operating Revenues:		
Charges for Goods and Services	$ 732,373	$ 713,730
Operating Grants	698	570
Miscellaneous Operating Revenues	13,001	12,642
Total Operating Revenues	746,072	726,942
Operating Expenses:		
Personal Services	142,914	139,566
Purchase of Services	128,587	111,777
Materials and Supplies	38,709	37,471
Employee Benefits	141,799	144,815
Indemnities and Taxes	3,602	6,343
Depreciation	124,315	101,847
Total Operating Expenses	579,926	541,819
Operating Income (Loss)	166,146	185,123
Non-Operating Revenues (Expenses):		
Federal, State, & Local Grants	-	1,647
Interest Income	24,054	10,865
Debt Service - Interest	(74,742)	(70,136)
Other Revenue (Expenses)	(31,110)	(19,117)
Total Non-Operating Revenue (Expenses)	(81,798)	(76,741)
Income (Loss) Before Contributions & Transfers	84,348	108,382
Transfers In/(Out)	(39,917)	(33,280)
Capital Contributions	481	9,372
Change in Net Position	44,912	84,474
Net Position - July 1	786,641	810,099
Reclassification of Expense	(9,469)	(107,932)
Net Position Adjusted - July 1	777,172	702,167
Net Position - June 30	**$ 822,084**	**$ 786,641**

The notes to the financial statements are an integral part of these statements.

CITY OF PHILADELPHIA WATER DEPARTMENT

STATEMENTS OF CASH FLOWS
FOR FISCAL YEAR ENDED JUNE 30, 2019 AND 2018

(amounts in thousands)

	2019	2018
Cash Flows from Operating Activities		
Receipts from Customers	$ 736,722	$ 728,606
Payments to Suppliers	(169,084)	(155,723)
Payments to Employees	(276,673)	(270,613)
Claims Paid	(3,816)	(6,343)
Net Cash Provided (Used)	**287,149**	**295,927**
Cash Flows from Non-Capital Financing Activities		
Operating Grants Received	2,198	716
Operating Subsidies and Transfers to Other Funds	(37,378)	(33,301)
Net Cash Provided (Used)	**(35,180)**	**(32,585)**
Cash Flows from Capital & Related Financing Activities		
Proceeds from Debt Issuance	301,500	1,784
Acquisition and Construction of Capital Assets	(309,552)	(231,545)
Interest Paid on Debt Instruments	(88,073)	(85,749)
Principal Paid on Debt Instruments	(102,554)	(132,202)
Other Receipts (Payments)	664	296
Net Cash Provided (Used)	**(198,015)**	**(447,416)**
Cash Flows from Investing Activities		
Interest and Dividends on Investments	16,836	8,136
Net Cash Provided (Used)	16,836	8,136
Net Increase (Decrease) in Cash & Cash Equivalents	70,790	(175,938)
Cash and Cash Equivalents, July 1	587,038	762,976
Cash and Cash Equivalents, June 30	**$ 657,828**	**$ 587,038**
Reconciliation of Operating Income (Loss) to Net Cash Provided (Used) by Operating Activities:		
Operating Income (Loss)	166,146	185,123
Adjustments to Reconcile Operating Income to Net Cash Provided (Used) by Operating Activities:		
Depreciation Expense	124,315	101,847
Change in Assets and Liabilities:		
Receivables, Net	(8,896)	(663)
Inventories	(284)	(731)
Accounts and Other Payables	(66)	2,673
Accrued Expenses	6,388	6,399
Unearned Revenue	(454)	1,279
Net Cash Provided by operating activities	**$ 287,149**	**$ 295,927**

The notes to the financial statements are an integral part of these statements.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The financial statements of the Water Department have been prepared in conformity with generally accepted accounting principles ("GAAP") as applied to governmental units. The Governmental Accounting Standards Board ("GASB") is the accepted standard setting body for establishing governmental accounting and financial reporting principles. The more significant of the Water Department's accounting policies are described below.

1. REPORTING ENTITY

The City of Philadelphia was founded in 1682 and was merged with the county in 1854. Since 1951 the City has been governed largely under the Philadelphia Home Rule Charter. However, in some matters, including the issuance of short-term and long-term debt, the City is governed by the laws of the Commonwealth of Pennsylvania.

The operations and activities of the Water Department are accounted for with a separate set of balancing accounts that comprise the assets, deferred outflows of resources, liabilities, deferred inflows of resources, net position, revenues, and expenses. The activity of the Water Department is grouped in the financial statements into the broad category referred to as an enterprise fund (the "Water Fund"). The Water Fund is comprised of the funds and accounts established by the City under its Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended (the "General Ordinance"),

2. FINANCIAL STATEMENTS

The Water Fund's financial statements (i.e., the Statement of Net Position, Statement of Revenues, Expenses and Changes in Net Position, and Statement of Cash Flows) report information of all Water Fund activities.

The Statement of Revenues, Expenses and Changes in Net Position demonstrates the degree to which direct operating expenses are offset by operating revenues.

3. BASIS OF ACCOUNTING, MEASUREMENT FOCUS AND FINANCIAL STATEMENTS

The Water Fund, reported by the City as a major proprietary fund, accounts for the activities related to the operation of the City's water delivery and sewage systems. The Water Fund's financial statements are reported using the economic resources measurement focus and the accrual basis of accounting. Revenues are recorded when earned and expenses are recorded when a liability is incurred regardless of the timing of related cash flows. Grants and similar items are recognized as revenues as soon as all eligibility requirements imposed by the provider have been met.

Operating revenues and expenses are distinguished from nonoperating items in the Statement of Revenues, Expenses and Changes in Net Position. Operating revenues

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

3. BASIS OF ACCOUNTING, MEASUREMENT FOCUS AND FINANCIAL STATEMENTS (continued)

and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's ongoing operations. The principal operating revenues of the Water Fund are charges for water and sewer service. When calculating user fees charged to customers, the Water Department includes a component for the repayment of principal on the Water Department's outstanding debt.

The Water Fund distinguishes operating revenues and expenses from nonoperating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with the Fund's ongoing operations. All revenues and expenses not meeting this definition are reported as nonoperating revenues and expenses.

When both restricted and unrestricted resources are available for use, it is the City's policy to use restricted resources first, then unrestricted resources as they are needed.

The Water Fund's activities are used to account for operations (1) that are financed and operated in a manner similar to private business enterprises – where the intent of the government body is that costs (expenses, including depreciation) of providing goods and services to the general public on a continuous basis be recovered primarily through user charges or (2) where the government body has decided that periodic determination of revenues earned, expenses occurred, and/or net income is appropriate for capital maintenance, public policy, management's control of accountability, and other purposes.

The activities of the Water Fund are segregated as follows:

- The Revenue Fund is used to account for the operations of the water and wastewater systems.
- The Revenue Bond Sinking Fund is used to account for the payment of interest of the outstanding revenue bonds.
- The Debt Reserve Fund account of the sinking fund is funded from the proceeds of each series of Water and Wastewater Revenue Bonds; provided, however, that if the Supplemental Ordinance authorizing a series of Water and Wastewater Revenue Bonds shall so authorize, the deposit to the Debt Reserve Account in respect of such Water and Wastewater Revenue Bonds may be accumulated from project revenues over a period of not more than three fiscal years after the issuance and delivery of such Water and Wastewater Revenue

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

3. BASIS OF ACCOUNTING, MEASUREMENT FOCUS AND FINANCIAL STATEMENTS (continued)

Bonds. The moneys and investments in the Debt Reserve Account are held and maintained in an amount equal at all times to the Debt Reserve Requirement. If at any time the moneys in the Debt Service Account of the Sinking Fund shall be insufficient to pay as and when due the principal of (and premium, if any) or interest on any Water and Wastewater Revenue Bonds or other obligations payable from the Debt Service Account (including obligations arising in connection with Qualified Swap Agreements and Credit Facilities), the fiscal agent is required to pay over from the Debt Reserve Account the amount of such deficiency for deposit in the Debt Service Account. With respect to any issue of Water and Wastewater Revenue Bonds, in lieu of the required deposit into the Debt Reserve Account, the City may cause to be deposited into the Debt Reserve Account a surety bond, an insurance policy or an irrevocable letter of credit meeting the requirements of the General Ordinance and the Bond Committee Determination relating to such issue.

The Debt Reserve Account Amendment authorizes (i) the Director of Finance to apply moneys currently on deposit in the Debt Reserve Account to purchase a surety bond or insurance policy complying with the terms of the General Ordinance (described below), (ii) the transfer of the resulting excess moneys in the Debt Reserve Fund to the Revenue Fund and from there, upon compliance with the provisions of the General Ordinance to a new account in the Residual Fund called the Special Water Infrastructure Account and (iii) the application of the moneys deposited in the Special Water Infrastructure Account to the cost of certain renewals, replacements and improvements to the water and wastewater systems described in the Debt Reserve Account Amendment.

- The Rate Stabilization Fund was created with the sale of the Series 1993 Revenue Bonds on August 20, 1993. The purpose of the Fund is to maintain assets to be drawn down to offset future deficits (and corresponding rate increase requirements) in the Water Fund.

  During Fiscal 2019, the Fund had the following activity:

Balance at July 1, 2018	$179,403,369
Transfer to Revenue Fund	(4,321,032)
Interest Earnings	5,367,028
Balance at June 30, 2019	$180,449,365

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

3. BASIS OF ACCOUNTING, MEASUREMENT FOCUS AND FINANCIAL STATEMENTS (continued)

During Fiscal 2018, the Fund had the following activity:

Balance at July 1, 2017	$202,108,361
Transfer to Revenue Fund	(24,629,566)
Interest Earnings	1,924,574
Balance at June 30, 2018	$179,403,369

- The Residual Fund was created with the sale of the Series 1993 Revenue Bonds on August 20, 1993. The Residual Fund is the last Fund into which Project Revenues are transferred from the Revenue Fund. Money in the Residual Fund may be used to pay Operating Expenses or debt service, or other purpose to support the System. In addition, money in the Residual Fund is used transfer to the annual payment to the City's general fund of an amount equal to the lesser of (i) the interest earnings for the Fiscal Year on the Debt Reserve Account and Subordinated Bond Fund (less amounts subject to rebate) and (ii) $4.994 million.

During Fiscal 2019, the Fund had the following activity:

Balance at July 1, 2018	$15,440,795
Transfer from Debt Service Reserve	4,094,824
Transfer to General Fund	(4,094,824)
Investment Earnings	440,453
Balance at June 30, 2019	$15,881,248

During Fiscal 2018, the Fund had the following activity:

Balance at July 1, 2017	$15,285,705
Transfer from Debt Service Reserve	1,627,838
Transfer to General Fund	(1,627,838)
Investment Earnings	155,090
Balance at June 30, 2018	$15,440,795

4. DEPOSITS AND INVESTMENTS

The Water Fund’s deposits and investments are held in segregated operating and capital accounts due to either legal requirements or operational needs. Sinking funds and reserves are maintained in segregated investment accounts to comply with reserve and other requirements of the bond covenants.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

4. DEPOSITS AND INVESTMENTS (continued)

All highly liquid investments (except for Repurchase Agreements) with a maturity of three months or less when purchased are considered to be cash equivalents.

The Water Fund reports investments at fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on national or international exchanges are valued at the last reported sales price. The fair value of real estate investments is based on independent appraisals. Investments which do not have an established market are reported at estimated fair value.

Statutes authorize the City to invest in obligations of the Treasury, agencies, and instruments of the United States, repurchase agreements, collateralized certificates of deposit, bank acceptance or mortgage obligations, certain corporate bonds, and money market funds. The Pension Trust Fund is also authorized to invest in corporate bonds rated AA or better by Moody's Bond Ratings, common stocks, and real estate.

5. INVENTORIES

The materials and supplies inventories are valued at moving average cost.

6. CAPITAL ASSETS

Capital assets, which include property, plant, equipment and infrastructure assets, are defined by the City as assets with an initial individual cost of more than $5,000 and an estimated useful life in excess of three years. Capital assets are recorded at cost. Costs recorded do not include interest incurred as a result of financing asset acquisition or construction. Assets acquired by gift or bequest are recorded at their acquisition price at the date of the gift. Upon sale or retirement, the cost of the assets and the related accumulated depreciation, if any, are removed from the accounts. Maintenance and repair costs are charged to operations.

The Water Fund uses "substantially complete" as the determining basis for transferring Construction in Process to one or more of the major asset classes.

Cost of construction includes all direct contract costs plus overhead costs. Overhead costs include direct and indirect engineering costs and interest incurred during the construction period for projects financed with bond proceeds. Interest is capitalized on proprietary fund assets acquired with tax-exempt debt. The amount of interest to be capitalized is calculated by offsetting interest expense incurred from the date of the borrowing until completion of the project with interest on invested proceeds over the

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

6. CAPITAL ASSETS (continued)

same period. Capitalization of interest during construction for Fiscal Year 2019 was $10.5 million and for Fiscal Year 2018 was $7.4 million.

Depreciation on the capital assets is provided on the straight-line method over their estimated useful lives: buildings - 20 to 40 years; equipment and storage facilities - 3 to 25 years; and transmission and distribution lines - 50 years.

7. BONDS AND RELATED PREMIUMS, DISCOUNTS & ISSUANCE COSTS

Bond premiums and discounts are deferred and amortized over the life of the bonds using the effective interest method. In FY13, GASB Statement No. 65 was implemented resulting in bond issuance costs being recognized as an expense and reported in the period incurred.

8. INSURANCE

The City, except for the Airport and certain other properties, is self-insured for most fire and casualty losses to its structures and equipment and provides statutory workers' compensation and unemployment benefits to its employees. The City is self-insured for medical benefits provided to employees in the City administered health plan.

9. RECEIVABLES AND PAYABLES

Activities between funds that are representative of lending/borrowing arrangements outstanding at the end of the fiscal year are referred to as due to/from other funds.

Accounts receivable included in current assets consists of billed and unbilled fees, which have been earned but not collected as of June 30, 2019 and 2018. Credit balance accounts have been included in unearned revenue in the statement of net position. The allowance for doubtful accounts is management's estimate of the amount of accounts receivable which will be deemed to be uncollectible and is based upon specific identification. Unpaid accounts are referred to the City's Law Department if deemed uncollectible. Accounts are written off when recommended by the Law Department.

As of June 30, 2019 and 2018, the allowance for doubtful accounts was $12,378,155 and $11,489,296, respectively.

10. DEFERRED OUTFLOWS/INFLOWS OF RESOURCES AND NET POSITION

In accordance with GASB Statement No. 63, *Financial Reporting of Deferred Outflows of Resources, Deferred Inflows of Resources, and Net Position*, the Water Fund reports deferred outflows of resources in the Statement of Financial Position in a separate section following Assets. Similarly, the Water Fund reports deferred inflows of resources in the Statement of Net Position in a separate section following Liabilities.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

10. DEFERRED OUTFLOWS/INFLOWS OF RESOURCES AND NET POSITION (continued)

Deferred outflows of resources represents consumption of net position that applies to a future period(s) and will not be recognized as an expense until that time. Deferred inflows of resources represents an acquisition of net position that applies to future periods and will not be recognized as revenue until that time.

On the full accrual basis of accounting, the Water Fund has three items that qualify for reporting as deferred outflows of resources and deferred inflows of resources:

- Derivative instruments are reported for the changes in fair value.
- Deferred refunding results from the difference in the refunding of debt and its reacquisition price.
- Deferred pension and OPEB transactions are recognized as expenses or revenues in a future period. Deferred outflows and inflows of resources related to pensions are discussed in Note IV. 1 and OPEB is discussed in Note IV.3.

11. COMPENSATED ABSENCES

It is the City's policy to allow employees to accumulate earned but unused vacation benefits. Vacation pay is accrued when earned in the financial statements. Sick leave balances are not accrued in the financial statements because sick leave rights are non-vesting.

The Water Fund's employees' total vacation time accrued under Other Current Liabilities in Fiscal Years 2019 and 2018 was $1.4 million and $1.2 million, respectively. The long-term portion reported in Other Noncurrent Liabilities on the Statement of Net Position in Fiscal Years 2019 and 2018 was $13.0 million and $10.9 million, respectively.

12. CLAIMS AND JUDGMENTS

Pending claims and judgments are recorded as expenses in the financial statements when the City solicitor has deemed that a probable loss to the Water Fund has occurred.

13. UNEARNED REVENUE

GASB Statement No. 65 prohibits the usage of the term "deferred" on any line items other than deferred inflows or outflows. Therefore, the term "Deferred Revenue" has been replaced by "Unearned Revenue". Unearned revenues in the Water Fund's financial statements represents revenue received in advance of being earned. Unearned revenues relate principally to overpaid water and sewer bills.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

14. NEW ACCOUNTING STANDARDS

Effective July 1, 2017, the City adopted **GASB issued Statement No. 75**, **Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions**. The primary objective of this Statement is to improve accounting and financial reporting by state and local governments for postemployment benefits other than pensions (OPEB). This Statement replaces the requirements of Statement No. 45, Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions. It establishes standards for recognizing and measuring liabilities, deferred outflows of resources, deferred inflows of resources, and expense. For defined benefit OPEB, this Statement identifies the methods and assumptions that are required to be used to project benefit payments, discount projected benefit payments to their actuarial present value, and attribute that present value to periods of employee service. Note disclosure and required supplementary information requirements about defined benefit OPEB also are addressed. This Statement was effective for fiscal year 2018. The City's adoption of Statement No. 75 resulted in a prior period adjustment and affects the reporting of net OPEB liabilities, deferred inflows of resources, deferred outflows of resources, and the recognition of OPEB expense in accordance with the provisions of the Statement in the Water Fund's financial statements.

In November 2016, **GASB issued Statement No. 83**, **Certain Asset Retirement Obligations**. This Statement addresses accounting and financial reporting for certain asset retirement obligations (AROs). An ARO is a legally enforceable liability associated with the retirement of a tangible capital asset. The requirements of this Statement were effective for reporting periods beginning after June 15, 2018. The adoption of this Statement on July 1, 2018 did not result in any significant changes to the Water Fund's financial statements.

In January 2017, **GASB issued Statement No. 84**, **Fiduciary Activities**. The objective of this Statement is to improve guidance regarding the identification of fiduciary activities for accounting and financial reporting purposes and how those activities should be reported. The requirements of this Statement are effective for reporting periods beginning after December 15, 2018. The City has not completed the process of evaluating the impact of adopting this Statement. The Water Fund is required to adopt the provisions of GASB Statement No. 84 for its fiscal year 2020 financial statements.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

14. NEW ACCOUNTING STANDARDS (continued)

In March 2017, **GASB issued Statement No. 85, Omnibus 2017.** The objective of this Statement is to address practice issues that have been identified during implementation and application of certain GASB Statements. This Statement addresses a variety of topics including issues related to blending component units, goodwill, fair value measurement and application, and postemployment benefits (pensions and other postemployment benefits [OPEB]). The requirements of this Statement were effective for reporting periods beginning after June 15, 2017. The adoption of this statement did not result in any significant changes to the Water Fund's financial statements.

In May 2017, **GASB issued Statement No. 86, Certain Debt Extinguishment Issues.** The objective of this Statement is to improve consistency in accounting and financial reporting for in-substance defeasance of debt by providing guidance for transactions in which cash and other monetary assets acquired with only existing resources - resources other than the proceeds of refunding debt - are placed in an irrevocable trust for the sole purpose of extinguishing debt. This Statement also improves accounting and financial reporting for prepaid insurance on debt that is extinguished and notes to financial statements for debt that is defeased in substance. The requirements of this Statement are effective for reporting periods beginning after June 15, 2017. The adoption of this statement did not result in any significant changes to the Water Fund's financial statements.

In June 2017, **GASB issued Statement No. 87, Leases.** The objective of this Statement is to better meet the information needs of financial statement users by improving accounting and financial reporting for leases by governments. This Statement increases the usefulness of governments' financial statements by requiring recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this Statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset, and a lessor is required to recognize a lease receivable and a deferred inflow of resources, thereby enhancing the relevance and consistency of information about governments' leasing activities. The requirements of this Statement are effective for reporting periods beginning after December 15, 2019. The City has not completed the process of evaluating the impact of adopting this Statement on the Water Fund's financial statements.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)
14. NEW ACCOUNTING STANDARDS (continued)

In April 2018, **GASB issued Statement No. 88**, **Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements.** The primary objective of this Statement is to improve the information that is disclosed in notes to government financial statements related to debt, including direct borrowings and direct placements. It also clarifies which liabilities governments should include when disclosing information related to debt. This Statement defines debt for purposes of disclosure in notes to financial statements as a liability that arises from a contractual obligation to pay cash (or other assets that may be used in lieu of cash) in one or more payments to settle an amount that is fixed at the date the contractual obligation is established. This Statement requires that additional essential information related to debt be disclosed in notes to financial statements, including unused lines of credit; assets pledged as collateral for the debt; and terms specified in debt agreements related to significant events of default with finance-related consequences, significant termination events with finance-related consequences, and significant subjective acceleration clauses. For notes to financial statements related to debt, this Statement also requires that existing and additional information be provided for direct borrowings and direct placements of debt separately from other debt. The requirements of this Statement are effective for reporting periods beginning after June 15, 2018. The adoption of this statement did not result in any significant changes to the Water Fund's financial statements.

In June 2018, **GASB issued Statement No. 89, Accounting for Interest Cost Incurred before the End of a Construction Period.** The objectives of this Statement are to enhance the relevance and comparability of information about capital assets and the cost of borrowing for a reporting period and to simplify accounting for interest cost incurred before the end of a construction period. This Statement establishes accounting requirements for interest cost incurred before the end of a construction period. Such interest cost includes all interest that previously was accounted for in accordance with the requirements of paragraphs 5–22 of Statement No. 62, Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements, which are superseded by this Statement. This Statement requires that interest cost incurred before the end of a construction period be recognized as an expense in the period in which the cost is incurred for financial statements prepared using the economic resources measurement focus. As a result, interest cost incurred before the end of a construction period will not be included in the historical cost of a capital asset reported in a business-type activity or enterprise fund. This Statement also reiterates that in financial statements prepared using the current financial resources measurement focus, interest cost incurred before the end of a construction period should be recognized as an expenditure on a basis consistent with governmental fund accounting principles. The requirements of this Statement are

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)
14. NEW ACCOUNTING STANDARDS (continued)

effective for reporting periods beginning after December 15, 2019. The City has not completed the process of evaluating the impact of adopting this Statement on the Water Fund's financial statements.

In August 2018**, GASB issued Statement No. 90, Majority Equity Interests—an amendment of GASB Statements No. 14 and No. 61).** The primary objectives of this Statement are to improve the consistency and comparability of reporting a government's majority equity interest in a legally separate organization and to improve the relevance of financial statement information for certain component units. It defines a majority equity interest and specifies that a majority equity interest in a legally separate organization should be reported as an investment if a government's holding of the equity interest meets the definition of an investment. A majority equity interest that meets the definition of an investment should be measured using the equity method, unless it is held by a special-purpose government engaged only in fiduciary activities, a fiduciary fund, or an endowment (including permanent and term endowments) or permanent fund. Those governments and funds should measure the majority equity interest at fair value. For all other holdings of a majority equity interest in a legally separate organization, a government should report the legally separate organization as a component unit, and the government or fund that holds the equity interest should report an asset related to the majority equity interest using the equity method. This Statement establishes that ownership of a majority equity interest in a legally separate organization results in the government being financially accountable for the legally separate organization and, therefore, the government should report that organization as a component unit. This Statement also requires that a component unit in which a government has a 100 percent equity interest account for its assets, deferred outflows of resources, liabilities, and deferred inflows of resources at acquisition value at the date the government acquired a 100 percent equity interest in the component unit. Transactions presented in flows statements of the component unit in that circumstance should include only transactions that occurred subsequent to the acquisition. The requirements of this Statement are effective for reporting periods beginning after December 15, 2018. The City has not completed the process of evaluating the impact of adopting this Statement on the Water Fund's financial statements.

In May 2019, **GASB issued Statement No. 91, Conduit Debt Obligations**. The primary objectives of this Statement are to provide a single method of reporting conduit debt obligations by issuers and eliminate diversity in practice associated with (1) commitments extended by issuers, (2) arrangements associated with conduit debt obligations, and (3) related note disclosures This Statement achieves those objectives by clarifying the existing definition of a conduit debt obligation; establishing that a conduit debt obligation is not a liability of the issuers; establishing standards for accounting and financial reporting of additional commitments and voluntary

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

14. NEW ACCOUNTING STANDARDS (continued)

commitments extended by issuers and arrangements associated with conduit debt obligations; and improving required debt disclosures. The requirements of this Statement are effective for reporting periods beginning after December 15, 2020. The City has not completed the process of evaluating the impact of adopting this Statement on the Water Fund's financial statements.

In January 2020, **GASB issued Statement No. 92, Omnibus 2020**. The primary objectives of this Statement are to enhance comparability in accounting and financial reporting and to improve the consistency of authoritative literature by addressing practice issues that have been identified during implementation and application of certain GASB Statements. This Statement addresses a variety of topics and includes specific provisions about the following: GASB Statement No. 87, intra-entity transfers of assets between a primary government employer and a component unit defined benefit pension or other postemployment benefit (OPEB) plans, the applicability of Statements No. 73, No. 68, and No. 74 to reporting assets accumulated for postemployment benefits, the applicability of Statement No. 84 to postemployment benefit arrangements, the measurement of liabilities and assets (if any) related to asset retirement obligations (AROs) in a government acquisition, reporting by public entity risk pools for amounts that are recoverable from reinsurers or excess insurers, reference to nonrecurring fair value measurements of assets or liabilities in authoritative literature, and terminology used to refer to derivative instruments. This Statement is effective on two dates: the requirements related to the effective date of Statement No. 87, reinsurance recoveries, and terminology used to refer to derivative instruments are effective upon issuance, and the other requirements are effective for fiscal years beginning after June 15, 2020. The City has not completed the process of evaluating the impact of adopting this Statement on the Water Fund's financial statements.

15. RESTRICTED ASSETS

Restricted assets represent revenues set aside for liquidation of specific obligations as described in Note IV. 13.

16. PAYMENT TO THE CITY

In accordance with an agreement between the Finance Director and the Water Department, the Finance Director may transfer to the City's General Fund up to a limit of $4,994,000 in any fiscal year in "excess interest earnings" as defined under the General Ordinance. In Fiscal Years 2019 and 2018, excess interest earnings of $4,094,824 and $1,627,838, respectively, were transferred from the Residual Fund to the General Fund of the City.

I. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

17. TRANSFERS FOR LONG TERM CONTRACTS

In addition to the transfer of funds to the General Fund of the City, the Water Fund had operating expenses of $32,272,755 and $29,573,198 and capital expenses of $2,897,056 and $2,079,339 in Fiscal Years 2019 and 2018, respectively, payable to the Philadelphia Municipal Authority ("PMA") under the long-term contracts described in Note IV.11 A, B, C and D.

18. ACCOUNTING ESTIMATES

The preparation of financial statements, in conformity with accounting principles generally accepted in the United States of America, requires management to make estimates and assumptions that affect the reported amounts of assets, deferred outflows of resources, liabilities, deferred inflows of resources and net position and disclosures at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results may differ from those estimates.

II. LEGAL COMPLIANCE

1. BUDGETARY INFORMATION

The City's budgetary process accounts for certain transactions on a basis other than U.S. generally accepted accounting principles (GAAP). In accordance with the Philadelphia Home Rule Charter, the City has formally established budgetary accounting control for its operating and capital improvement funds.

One of the City's operating funds is the Water Fund. Included in the Water Fund is the Water Residual Fund. These budgets appropriate funds for all City departments, boards and commissions by major class of expenditure within each department. Major classes are defined as personal services; purchase of services; materials and supplies; equipment; contributions and indemnities; debt service; payments to other funds; and advances and other miscellaneous payments. The appropriation amounts for each fund are supported by revenue estimates and take into account the elimination of accumulated deficits and the re-appropriation of accumulated surpluses to the extent necessary. All transfers between major classes (except for materials and supplies and equipment, which are appropriated together) must have council approval. Appropriations that are not expended or encumbered at year end are lapsed. Comparisons of budget to actual activity at the legal level of compliance are located in the Water Fund's *Budgetary Comparison Schedule (Legally Enacted Basis) – Water Operating Fund*.

During the year, classification adjustments and supplementary appropriations were necessary for City funds. Therefore, budgeted appropriation amounts presented are as originally passed and as amended by the City Council. As part of the amendment process, budget estimates of City related revenues are adjusted and submitted to City Council for review. Changes in revenue estimates are submitted in support of testimony with regard to the appropriation adjustments and do not need City Council approval. Revenue estimates are presented as originally passed and as amended.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS

1. DEPOSITS AND INVESTMENTS

Deposits

State statutes require banks to collateralize City deposits at amounts equal to or in excess of the City's balance. Such collateral is to be held by the Federal Reserve Bank or the trust department of a commercial bank other than the pledging bank. At year end, the Water Fund's bank balances were $177.8 million and $164.3 million for 2019 and 2018, respectively.

Investments

The City has established a comprehensive investment policy that covers the Water Fund. The City's investments include all operating, capital, debt service, and debt service reserve accounts of each of the City's General Fund, Water Fund, and Aviation

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

1. DEPOSITS AND INVESTMENTS (continued)

Division. All City investments must be in compliance with applicable provisions of the City Code and City bond resolutions, as well as the City's Investment Policy. The City's Investment Policy is meant to supplement the applicable provisions of the City Code and City bond resolutions, and is reviewed and adopted by the City's Investment Committee. The City's Investment Committee consists of the Director of Finance, the City Treasurer, and a representative from the Water Department, Aviation Division, and the Philadelphia Gas Works.

As of June 30, 2019, the fair values of the Water Fund's investments consist of the following:

(Thousands of Dollars)

Classifications		Fair Value	Percent of Total
U.S. Government Securities	$	231,156	35.01%
U.S. Government Agency Securities		317,547	48.10%
Corporate Bonds		69,179	10.48%
Other Bonds and Investments		42,313	6.41%
	$	660,195	100.00%

As of June 30, 2018, the fair values of the Water Fund's investments consist of the following:

(Thousands of Dollars)

Classifications		Fair Value	Percent of Total
U.S. Government Securities	$	415,826	69.10%
U.S. Government Agency Securities		127,988	21.27%
Corporate Bonds		43,459	7.22%
Other Bonds and Investments		14,499	2.41%
	$	601,772	100.00%

Water Fund Investments - Credit Risk

The City's policy to limit credit risks by limiting the type of allowable investment, as well as the maximum percent of the portfolio for each type of investment.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

1. DEPOSITS AND INVESTMENTS (continued)

The Water Fund's investment in U.S. Government Securities (35.0%) or U.S. Government Agency obligations (48.1%) are allowable investments up to 100% of the portfolio. The U.S. Government Agency obligations must be rated AAA by Standard & Poor's Corp. (S&P) or Aaa by Moody's Investor Services. All U.S. Government Securities meet the criteria.

The Water Fund's investment in corporate bonds (10.5%) is limited to 25% of the portfolio, and had a S&P rating of AAA to AA or Moody's rating of Aa2 or better. All corporate investments meet the criteria.

Short Term Investment Pools are rated AAA by S&P and Aaa by Moody's Investor Services. The Short Term Investment Pools' amortized cost-based net asset value per share/unit is the same as the value of the pool shares. Cash accounts are swept nightly and idle cash invested in money market funds (short term investment pools).

The City limits its foreign currency risk by investing in certificates of deposit and banker's acceptances issued or endorsed by non-domestic banks that are denominated in U.S. dollars providing that the banking institution has assets of not less than $100 million and has a Thompson's Bank Watch Service "Peer Group Rating" not lower than II. At the end of the fiscal year, the City did not have any investments of that nature.

To minimize custodial credit risk, the City's policy is to select custodian banks that are members of the Federal Reserve System to hold its investments. Delivery of the applicable investment documents to the City's custodian is required for all investments.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

1. DEPOSITS AND INVESTMENTS (continued)

As of June 30, 2019, the fixed income investments of the Water Fund had the following ratings by Moody's or S&P:

Classifications	Credit Quality Rating	Percent of Investment Type
U.S Government Securities	Aaa	100%
U.S. Government Agency Securities	Aaa	100%
U.S. Government Agency Securities	AA	0%
Corporate Bonds	Aaa	24%
Corporate Bonds	Aa1	17%
Corporate Bonds	Aa2	45%
Corporate Bonds	Aa3	11%
Corporate Bonds	A1	4%
Other Bonds and Investments	Aa1	18%
Other Bonds and Investments	Aa2	68%
Other Bonds and Investments	Aaa	14%

As of June 30, 2018, the fixed income investments of the Water Fund had the following ratings by Moody's or S&P:

Classifications	Credit Quality Rating	Percent of Investment Type
U.S Government Securities	Aaa	100%
U.S. Government Agency Securities	Aaa	100%
Corporate Bonds	Aaa	50%
Corporate Bonds	Aa1	18%
Corporate Bonds	Aa2	32%
Other Bonds and Investments	Aa2	80%
Other Bonds and Investments	Aa3	20%

Interest Rate Risk

The City's investment portfolio is managed to accomplish preservation of principal, maintenance of liquidity, and to maximize the return on investments. To limit its exposure to fair value losses from rising interest rates, the City's investment policy limits fixed income investments to maturities of no longer than two years, except in Sinking Fund Reserve portfolios.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

1. DEPOSITS AND INVESTMENTS (continued)

As of June 30, 2019, the maturities of the Water Fund's fixed income investments were as follows:

(Thousands of Dollars)

Classifications	Less Than 1 Year	1 – 2 Years
U.S. Government Securities	$ 139,385	$ 91,771
U.S. Government Agency Securities	203,669	113,878
Corporate Bonds	42,316	26,863
Other Bonds and Investments	28,229	14,084
Grand Total	$ 413,599	$ 246,596

As of June 30, 2018, the maturities of the Water Fund's investments were as follows:

(Thousands of Dollars)

Classifications	Less Than 1 Year	1 – 2 Years
U.S. Government Securities	$ 315,600	$ 100,226
U.S. Government Agency Securities	89,405	38,583
Corporate Bonds	14,899	28,560
Other Bonds and Investments	11,612	2,887
Grand Total	$ 431,516	$ 170,256

Fair Value Measurement

The City measures and records its investments using fair value measurement guidelines established by U.S. generally accepted accounting principles. These guidelines recognize a three-tiered fair value hierarchy, as follows:

- Level 1: Observable inputs that reflect quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2: Inputs other than quoted prices included in Level 1 that are observable for the asset or liability.
- Level 3: Unobservable inputs for assets or liabilities.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

1. DEPOSITS AND INVESTMENTS (continued)

The Water Fund has the following recurring fair value measurements as of June 30, 2019:

- U.S. Government Securities of $231.2 million are valued using quoted prices for identical securities traded in active markets (Level 1).
- U.S. Agency Securities of $317.5 million are valued using quoted prices from identical securities that are traded in active markets when sufficient activity exists (Level 2).
- Corporate Bonds of $69.2 million and other bonds and investments of $42.3 million are valued using quoted prices for similar securities in active markets and via matrix pricing models (Level 2).

Municipal Pension Fund

See Footnote IV. 1. E. PENSION PLANS Cash Deposits, Investments and Securities Lending

2. SECURITIES LENDING

A. GOVERNMENTAL FUNDS

The City Treasurer is prohibited from lending or selling City-owned securities with an agreement to buy them back after a stated period of time (City of Philadelphia – Investment Policy Section VI. Investment Restrictions).

B. PENSION TRUST FUNDS

The Board of Directors of the Municipal Pension Fund has authorized management of the Fund to participate in securities lending transactions.

See Footnote IV. 1. E. PENSION PLANS Cash Deposits, Investments and Securities Lending.

3. AMOUNTS HELD BY FISCAL AGENT

Under Section 4.02 of the General Bond Ordinance, which authorizes the issuance of Water and Wastewater Revenue Bonds, the City pledges and assigns to the Fiscal Agent, for the security and payment of all Water and Wastewater Revenue Bonds issued under the General Ordinance, a lien on and security interest in all Project Revenues and amounts on deposit in or standing to the credit of the: 1) Revenue Fund; 2) Sinking Fund et.al.; 3) Subordinated Bond Fund; 4) Rate Stabilization Fund;

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

3. AMOUNTS HELD BY FISCAL AGENT (continued)

5) Residual Fund; and 6) Construction Fund and all of the accounts established therein. The Fiscal Agent shall hold and apply the security interest so granted in trust for the holders of Water and Wastewater Revenue Bonds, excluding Subordinate Bonds, without preference, priority, or distinction; provided however, that the pledge of General Bond Ordinance may also be for the benefit of a credit facility and qualified swap, or any other person who undertakes to provide moneys for the account of the City for the payment of principal or redemption price and interest on any series of Water and Wastewater Revenue Bonds (other than subordinated bonds), on an equal and ratable basis with Water and Wastewater Revenue Bonds, to the extent provided by any Supplemental Ordinance or Determination. The purpose for the debt secured by the pledge can be found in Note III. 6. to the financial statements.

The following chart displays information related to the pledge as of June 30, 2019:

	Water and Wastewater Revenue Bonds
Pledged Revenue Required for Principal and Interest Payments	$3,545.4 million
Term of Pledge	2054
Percentage of Revenue Pledged	100%
Current Year Pledged Revenue	$746 million
Current Year Principal and Interest Paid	$180.1 million
Current Year Transfers to Escrow	$0

The following chart displays information related to the pledge as of June 30, 2018:

	Water and Wastewater Revenue Bonds
Pledged Revenue Required for Principal and Interest Payments	$3,076.4 million
Term of Pledge	2053
Percentage of Revenue Pledged	100%
Current Year Pledged Revenue	$726 million
Current Year Principal and Interest Paid	$218.5 million
Current Year Transfers to Escrow	$19.0 million

4. INTERFUND PAYABLES

A. Primary Government

Interfund receivable and payable balances among Water and City Funds at year-end are the result of the time lag between the dates that interfund goods and services are

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

4. INTERFUND PAYABLES (continued)

provided, the date the transactions are recorded in the accounting system and the date payments between funds are made. All balances are expected to be settled during the subsequent year.

Interfund receivable and payable balances at June 30, 2019 are as follows:

(Amounts in Thousands)

	Interfund Receivables Due to:				
		Nonmajor Governmental			
	General	Special Revenue	Pension Fund	Other Funds	Total
Interfund Payables Due From:					
General	$ -	$ -	$ 91,750	$ 699	$ 92,449
Grants Revenue Fund	-	-	-	-	-
Water and Sewer Fund	-	4,709	-	-	4,709
Nonmajor Special Revenue Funds	11,752	38	-	-	11,805
Total	$ 11,752	$ 4,747	$ 91,750	$ 699	$ 108,963

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

5. CAPITAL ASSET ACTIVITY

Capital asset activity for the years ended June 30, 2019 and 2018 was as follows:

	Beginning Balance*	Additions	Dispositions	Ending Balance
Fiscal Year Ended June 30, 2019				
Capital Assets Not Being Depreciated				
Land	$ 5,919,160	$ -	$ -	$ 5,919,160
Construction in Progress	490,566,238	309,591,733	(134,027,736)	666,130,235
Total Capital Assets Not Being Depreciated	$ 496,485,398	$ 309,591,733	$ (134,027,736)	$ 672,049,395
Capital Assets Being Depreciated				
Buildings and related improvements	1,612,058,303	41,056,544	(21,325,849)	1,631,788,998
Intangible Assets	19,775,929	1,994,173	-	21,770,102
Equipment	106,551,462	17,973,499	(2,340,104)	122,184,857
Infrastructure	2,564,951,533	91,353,857	(670,000)	2,655,635,390
Total Capital Assets Being Depreciated	$ 4,303,337,227	$ 152,378,073	$ (24,335,953)	$ 4,431,379,347
Less Accumulated Depreciation For:				
Buildings and related improvements	(997,551,194)	(43,549,637)	12,753,331	(1,028,347,500)
Intangible Assets	(12,670,129)	(1,272,042)	-	(13,942,171)
Equipment	(80,511,334)	(8,792,797)	253,927	(89,050,204)
Infrastructure	(1,247,304,362)	(69,496,833)	12,620	(1,316,788,575)
Total Accumulated Depreciation	(2,338,037,019)	(123,111,309)	13,019,878	(2,448,128,450)
Total Capital Assets, Being Depreciated, Net	1,965,300,208	29,266,764	(11,316,075)	1,983,250,897
Total Capital Assets	$ 2,461,785,606	$ 338,858,497	$ (145,343,811)	$ 2,655,300,292

	Beginning Balance*	Additions	Dispositions	Ending Balance
Fiscal Year Ended June 30, 2018				
Capital Assets Not Being Depreciated				
Land	$ 5,919,160	$ -	$ -	$ 5,919,160
Construction in Progress	354,701,381	235,026,430	(66,310,882)	523,416,929
Total Capital Assets Not Being Depreciated	$ 360,620,541	$ 235,026,430	$ (66,310,882)	$ 529,336,089
Capital Assets Being Depreciated				
Buildings and related improvements	1,671,398,354	14,039,700	(61,172,379)	1,624,265,675
Intangible Assets	17,707,314	2,068,615	-	19,775,929
Equipment	94,615,621	35,855,956	(23,920,115)	106,551,462
Infrastructure	2,526,530,734	68,318,550	(13,417,979)	2,581,431,305
Total Capital Assets Being Depreciated	$ 4,310,252,023	$ 120,282,821	$ (98,510,473)	$ 4,332,024,371
Less Accumulated Depreciation For:				
Buildings and related improvements	(1,018,241,212)	(41,459,825)	53,778,475	(1,005,922,562)
Intangible Assets	(11,886,095)	(1,510,786)	726,752	(12,670,129)
Equipment	(77,451,232)	(6,727,767)	3,641,163	(80,537,836)
Infrastructure	(1,244,884,162)	(52,148,359)	22,691,645	(1,274,340,876)
Total Accumulated Depreciation	(2,352,462,701)	(101,846,737)	80,838,035	(2,373,471,403)
Total Capital Assets, Being Depreciated, Net	1,957,789,322	18,436,084	(17,672,438)	1,958,552,968
Total Capital Assets	$ 2,318,409,863	$ 253,462,514	$ (83,983,320)	$ 2,487,889,057

*Fiscal years 2019 and 2018 beginning balances have been restated; see Note III. 11. for additional information.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

5. CAPITAL ASSET ACTIVITY (continued)

Impaired Assets

Government Accounting Standards Board (GASB) Statement 42 requires the disclosure of the impairment of any major capital assets. Over the years, there have been a number of the Water Fund's assets that were either damaged or destroyed, were abandoned or became functionally obsolete.

No asset impairments occurred during fiscal years 2019 and 2018.

6. DEBT PAYABLE

(1) Governmental Debt Payable

A summary of changes in long-term debt obligations as of June 30, 2019 follows:

(In Thousands)

	Beginning Balance	Additions	Reductions	Ending Balance	Amounts Due Within One Year
Water and Sewer Revenue Bonds	$ 1,696,535	$ 345,270	$ (159,010)	$ 1,882,795	$ 97,220
Pennvest Loans	127,972	1,500	(8,086)	121,386	8,152
Unamortized Bond Premium	168,678	19,582	(16,679)	171,581	-
Derivative Instrument Liability	3	-	(3)	-	-
Net Pension Liability	435,860	3,266	(8,586)	430,540	-
Net OPEB Liability	139,806	-	(2,770)	137,036	-
Other Liabilities:					
Accrued Worker's Compensation	23,738	-	(214)	23,524	-
Accrued Legal Claims	5,614	-	(213)	5,401	-
Compensated Absences *	12,144	4,489	(2,174)	14,459	1,446
Total	$ 2,610,350	$ 374,107	$ (197,735)	$ 2,786,722	$ 106,818

* The fiscal year 2018 current portion of compensated absences has been reclassified from Other Noncurrent Liabilities to Current Liabilities.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

A summary of changes in long-term debt obligations as of June 30, 2018 follows:

(In Thousands)

	Beginning Balance	Additions	Reductions	Ending Balance	Amounts Due Within One Year
Water and Sewer Revenue Bonds	$ 1,862,120	$ 174,110	$ (339,695)	$ 1,696,535	$ 94,465
Pennvest Loans	134,796	1,784	(8,608)	127,972	8,116
Unamortized Bond Premium **	155,569	30,223	(17,114)	168,678	-
Derivative Instrument Liability	356	-	(353)	3	-
Net Pension Liability	444,233	4,766	(13,139)	435,860	-
Net OPEB Liability **	-	146,603	(6,797)	139,806	-
Other Liabilities:					
Accrued Worker's Compensation	21,553	2,185	-	23,738	-
Accrued Legal Claims	6,050	-	(436)	5,614	-
Compensated Absences *	11,454	2,730	(2,040)	12,144	1,214
Total	$ 2,636,131	$ 362,401	$ (388,182)	$ 2,610,350	$ 103,795

* The fiscal year 2018 current portion of compensated absences has been reclassified from Other Noncurrent Liabilities to Current Liabilities.

** 2018 Additions amounts have been adjusted for prior period adjustments; see Note III. 11. for additional information.

An analysis of debt service requirements to maturity on the long-term obligations follows:

(In Millions of USD)

Year Ended June 30:	Principal Requirements	Interest Requirements	Total Debt Service Requirements
2020	$ 105.4	$ 91.8	$ 197.2
2021	87.9	87.4	175.3
2022	81.7	83.4	165.1
2023	79.2	79.9	159.1
2024	53.1	76.5	129.6
2025 - 2029	289.2	348.1	637.3
2030 - 2034	292.9	283.5	576.4
2035 - 2039	303.4	218.1	521.5
2040 - 2044	364.4	134.6	499.0
2045 - 2049	197.8	58.3	256.1
2050 - 2053	149.2	17.8	167.0
	$ 2,004.2	$ 1,479.4	$ 3,483.6

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

Pertinent information regarding long-term debt obligations outstanding is presented below:

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2019	June 30, 2018
1997	$78,500,000	Water and Wastewater Revenue Bonds, Variable Rate Series of 1997B, issued for various capital projects, to fund the Debt Reserve Account, and to pay the costs of issuance related to the bond issue at a variable rate.	$45,400,000	$49,400,000
1999	6,700,000	Pennsylvania Infrastructure Investment Authority Loan of 1999, issued for various capital projects. The bonds bear rates of 1.41% - 2.73%.	-	74,618
2005	83,665,000	Water and Wastewater Revenue Refunding Bonds, Variable Rate Series of 2005B, issued to defease a portion of the Series of 1995 Bonds, and to pay the costs of issuance related to the bonds. The bonds bear rates at a variable rate.	-	165,000
2009	140,000,000	Water and Wastewater Revenue Bonds, Series of 2009A, issued for various capital projects, issued to fund the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance. The bonds bear rates of 4% - 5.75%.	-	4,615,000
2009	31,216,779	Pennsylvania Infrastructure Investment Authority Loan of 2009 (B), issued for various capital projects. The bonds bear rates of 1.193% - 2.107%.	18,229,377	19,409,742
2009	49,157,776	Pennsylvania Infrastructure Investment Authority Loan of 2009 (C), issued for various capital projects. The bonds bear rates of 1.193% - 2.107%.	31,537,115	33,624,172
2009	75,744,096	Pennsylvania Infrastructure Investment Authority Loan of 2009 (D), issued for various capital projects. The bonds bear rates of 1.193% - 2.107%.	49,233,978	52,615,521

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III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)
6. DEBT PAYABLE (continued)

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2019	June 30, 2018
2010	$28,500,000	Pennsylvania Infrastructure Investment Authority Loan of 2010 (B), issued for various capital projects. The bonds bear rates of 1.193% - 2.107%.	$22,385,626	$ 22,248,264
2010	396,460.000	Water and Wastewater Revenue Refunding Bonds, Series of 2010A, issued to defease the Series of 2003 Bonds, issued for funding a payment to terminate the Series of 2003 Swap Agreement, funding the required deposit into the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance. The bonds bear rates of 2.00% - 5.00%.	-	35,760,000
2010	185,000,000	Water and Wastewater Revenue Bonds, Series of 2010C, issued for funding a payment to terminate the Series of 2007 Swap Agreement, fund the required deposit into the Debt Reserve Account of the Sinking Fund, and to pay the costs of issuance. The bonds bear rates of 3.00% - 5.00%.	7,350,000	61,970,000
2011	184,855,000	Water and Wastewater Revenue Bonds, Series of 2011A, and Water and Wastewater Revenue Refunding Bonds, Series of 2011B, issued for partially defeasing the Series of 2001A and Series of 2007A Bonds, for various capital projects, for funding of capitalized interest, for financing any required deposit into the Debt Reserve Account of the Sinking Fund, and to pay the cost of issuance. The bonds bear rates of 4.00% - 5.00%.	155,750,000	172,015,000
2012	70,370,000	Water and Wastewater Revenue Refunding Bonds, Series of 2012, issued for defeasing the Series of 2001A and 2001B Bonds and to pay the cost of issuance. The bonds bear rates of 1.00% - 5.00%.	34,400,000	38,785,000

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2019	June 30, 2018
2013	$170,000,000	Water and Wastewater Revenue Bonds, Series of 2013A, issued to finance capital improvements, finance a deposit to the Debt Reserve Account, and to pay the cost of issuance. The bonds bear rates of 3.00% to 5.125%.	$159,725,000	$ 163,150,000
2014	123,170,000	Water and Wastewater Revenue Bonds, Series of 2014A, issued to advance refund a portion of the Series of 2005A Bonds, to finance capital improvements, finance a deposit to the Debt Reserve Account, and to pay the cost of issuance. The bonds bear rates of 3.00% to 5.00%.	104,500,000	110,975,000
2015	417,560,000	Water and Wastewater Revenue Bonds, Series of 2015A and 2015B, issued to finance capital improvements, finance a deposit to the Debt Reserve Account, current refund a portion of the Series of 2005 A Bonds, advance refund a portion of the Series of 2007A Bonds, and pay the cost of issuance The bonds bear rates of 3.45% to 5.00%.	417,560,000	417,560,000
2016	192,680,000	Water and Wastewater Revenue Refunding Bonds, Series 2016A issued to finance (i) the advance refunding of portions of the City's outstanding (a) Water and Wastewater Revenue Refunding Bonds, Series 2007A, (b) Water and Wastewater Revenue Bonds, Series 2009A, and (c) Water and Wastewater Revenue Bonds, Series 2010C, and (ii) the costs of issuance relating to the bonds. The bonds bear rates of 3.00% to 5.00%.	181,770,000	191,070,000

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

Date of Issue	Amount of Original Issue	Purpose	Balance Outstanding at: June 30, 2019	Balance Outstanding at: June 30, 2018
2017	$279,865,000	Water and Wastewater Revenue Bonds, Series 2017A issued to finance (i) capital improvements to the City's Water and Wastewater Systems, (ii) a deposit to the Debt Reserve Account of the Sinking Fund and (iii) the costs of issuance relating to the Bonds. The bonds bear interest rates of 5.00% to 5.25%.	$259,865,000	$279,865,000
2017	174,110,000	Water and Wastewater Revenue Refunding Bonds, Series 2017B issued to finance (i) the refunding of portions of the City's outstanding (a) Water and Wastewater Revenue Refunding Bonds, Series 2007B, (b) portions of Water and Wastewater Revenue Bonds, Series 2010C, and (c) portions of Water and Wastewater Revenue Bonds, Series 2012, and (ii) the costs of issuance relating to the bonds. The bonds bear interest rates of 2.00% to 5.00%.	171,205,000	171,205,000
2018	276,935,000	Water and Wastewater Revenue Bonds, Series 2018A issued to provide funds which, together with other available funds of the City, will be used to finance (i) capital improvements to the City's Water and Wastewater Systems and (ii) the costs of issuance relating to the bonds. The bonds bear an interest rate of 5.00%.	276,935,000	-
2019	68,335,000	Waste and Wastewater Revenue Refunding Bonds, Series 2019A, issued to finance (i) the refunding of all or a portion of the City's outstanding Water and Wastewater Revenue Bonds, Series 2010C and portions of Water and Wastewater Revenue Refunding Bonds, Series 2011B and Series 2012 and (ii) for the costs of issuance relating to the bonds. The Bonds bear interest rates of 2.826% to 4.099%. The transaction resulted in a total savings of $3.9 million over the next 22 years; the economic gain was $2.9 million.	68,335,000	-
		Totals	$2,004,181,096	$1,824,507,317

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

(2) Pennvest Loans

In July 2010, the Water Department received approval from the Pennsylvania Infrastructure Investment Authority ("PENNVEST") for the Green Infrastructure Project (Series 2010B) bringing the total financing from PENNVEST to $214.9 million. During fiscal year 2019 and 2018, PENNVEST drawdowns totaled $1,500,000 and $1,783,849, respectively, which represent an increase in bond issuances. The funding is through low interest loans evidenced by and payables secured on a parity basis with water and wastewater revenue bonds which bear interest of 1.193% during the construction period and for the first five years of amortization (interest only payments are due during the construction period up to three years) and 2.107% for the remaining fifteen years.

Individual loan information, by series of bonds, as of June 30, 2019 is as follows:

Date	Series	Maximum Loan Amount	Amount Received through 6/30/19	Current Balance Outstanding 6/30/19
October 2009	2009B	$ 42,886,030	$31,216,779	$18,229,377
October 2009	2009C	57,268,193	49,157,776	31,537,115
March 2010	2009D	84,759,263	75,744,096	49,233,978
July 2010	2010B	30,000,000	30,000,000	22,385,626
	Totals	$214,913,486	$186,118,651	$121,386,096

Individual loan information, by series of bonds, as of June 30, 2018 is as follows:

Date	Series	Maximum Loan Amount	Amount Received through 6/30/18	Current Balance Outstanding 6/30/18
October 2009	2009B	$ 42,886,030	$ 31,216,779	$19,409,742
October 2009	2009C	57,268,193	49,157,776	33,624,172
March 2010	2009D	84,759,263	75,744,096	52,615,521
July 2010	2010B	30,000,000	28,500,000	22,248,264
	Totals	$214,913,486	$184,618,651	$127,897,699

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

The purposes of the loans are:

a. 2009B – Water Plant Improvements
b. 2009C – Water Main Replacements
c. 2009D – Sewer Projects
d. 2010B – Green Infrastructure Project

(3) Defeased Debt

As of the current fiscal year-end, the Water Fund defeased certain bonds by placing the proceeds of new bonds in irrevocable trusts to provide for all future debt service payments on the old bonds. Accordingly, the trust account assets and the liability for the defeased bonds are not included in the Water Fund's financial statements. As of June 30, 2019 and 2018, $148.7 million and $211.0 million of bonds outstanding are considered defeased, respectively.

(4) Arbitrage Liability

The City has its Water and Wastewater Revenue Bonds subject to federal arbitrage requirements. Federal tax legislation requires that the accumulated net excess of interest income on the proceeds of these issues over interest expense paid on the bonds be paid to the federal government at the end of a five-year period. At June 30, 2019 and 2018, the City had no arbitrage liability.

(5) Derivative Instrument

Beginning in fiscal year 2010, the City adopted the provisions of GASB Statement No. 53, *Accounting and Financial Reporting for Derivative Instruments*. The fair value balances and notional amounts of the derivative instrument outstanding at June 30, 2019 and 2018 follow:

City of Philadelphia, 2005 Water & Sewer Swap

Objective: In December 2002, the City entered into a swaption that provided the City with an up-front payment of $4.0 million. As a synthetic refunding of all or a portion of its 1995 Bonds, this payment approximated the present value savings, as of December 2002, of a refunding on May 4, 2005. The swaption gave Citigroup (formerly of Salomon Brothers Holding Company, Inc.), the option to enter into an interest rate swap to receive fixed amounts and pay variable amounts.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

Terms: Citigroup exercised its option to enter into a swap May 4, 2005, and the swap commenced on that date. Under the terms of the swap, the City pays a fixed rate of 4.53% and receives a variable payment computed as the actual bond rate or the alternatively, 68.5% of one-month LIBOR, in the event the average rate on the Bonds as a percentage of the average of one-month LIBOR has exceeded 68.5% for a period of more than 180 days. Citigroup is currently paying 68.5% of one-month LIBOR under the swap. The payments are based on an amortizing notional schedule (with an initial notional amount of $86.1 million), and when added to an assumption for remarketing, liquidity costs and cost of issuance expected to approximate the debt service of the refunded bonds at the time the swaption was entered into.

In May 2013, the City and Water Department converted the original variable rate bonds associated with the swap to an index-based rate, terminating the existing letter of credit in the process.

As of June 29, 2018, the swap had a notional amount of $165,000 and the associated variable-rate bond had a $165,000 principal amount. The bonds' variable-rate coupons are based on the same index as the receipt on the swap. The bonds matured on August 1, 2018 and the related swap agreement terminated on August 1, 2018.

Fair value: As of June 29, 2018, the swap had a negative fair value of $2,676. This means that the Water Department would have had to pay this amount if the swap terminated. The fair value reflects the effect of non-performance risk, which includes credit risk. The fair value of the swap was measured using the income approach and is categorized within Level 2 of the fair value hierarchy.

Risk: As of June 29, 2018, the City is not exposed to credit risk because the swap had a negative fair value. Should interest rates change and the fair value of the swap become positive, the City would be exposed to credit risk in the amount of the swap's fair value. Since the City is now receiving 68.5% of one-month LIBOR and paying 68.5% of one-month LIBOR plus a fixed spread, the City is no longer exposed to basis risk or tax risk. The swap includes an additional termination event based on credit ratings. The swap may be terminated by the City if the ratings of Citigroup or its Credit Support Provider fall below A3 and A-, or by Citigroup if the rating of the City's water and wastewater revenue bonds falls below A3 or A-. There are 30-day cure periods to these termination events. However, because the City's swap payments are insured by Assured Guaranty Municipal Corporation (formerly FSA), no termination event based on the City's water and wastewater revenue bond ratings can occur as long as Assured is rated at least A or A2.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

6. DEBT PAYABLE (continued)

As of June 29, 2018, rates were as follows:

Terms	Rates	
Interest Rate Swap		
Fixed payment to Citi	Fixed	4.53000%
Variable rate payment from Citi	68.5% of 1-month LIBOR	-1.43182%
Net interest rate swap payments		3.09818%
Variable rate note coupon payments	68.5% of 1-month LIBOR + fixed spread	1.43182% *
Synthetic interest rate on bonds		4.53000%

**Excludes fixed spread, which is similar to the City's expected Letter of Credit costs on a comparable variable rate bond*

7. PENSION SERVICE AGREEMENT

In Fiscal 1999, the Philadelphia Authority for Industrial Development issued $1.3 billion in Pension Funding Bonds. These bonds were issued pursuant to the provisions of the Pennsylvania Economic Development Financing Law and the Municipal Pension Plan Funding Standard and Recovery Act (Act 205). The bonds are special and limited obligations of PAID. The City entered into a Service Agreement with PAID agreeing to make yearly payments equal to the debt service on the bonds. PAID assigned its interest in the service agreement to the parties providing the financing and in accordance with GASB Interpretation #2, PAID treats this as conduit debt and does not include conduit debt transactions in its financial statements. The Pension Service Agreement of $1.4 billion is reflected in the City's financial statements in Other Long-Term Obligations. The net proceeds of the bond sale of $1.3 billion were deposited with the Municipal Pension Fund. The deposit of the proceeds reduced the Unfunded Actuarial Accrued Liability by that same amount. The deposit resulted in reductions to the City's actuarially determined pension plan payments. The fiscal year 2019 Pension Funding Bonds liability of $772.3 million is reflected in the City's financial statements as another Long-Term Obligation.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

8. LEASE COMMITMENTS AND LEASED ASSETS

The Water Fund enters into various operating leases to finance the purchase of photocopier and computer equipment. Leases are defined by the Financial Accounting Standard Board in Statement 13, Accounting for Leases. The assets acquired through the leases are shown as equipment within the Capital Asset Note (See Note III. 5.).

9. DEFERRED COMPENSATION PLAN

The City offers its employees a deferred compensation plan in accordance with Internal Revenue Code section 457. As required by the Code and Pennsylvania laws in effect at June 30, 2014, the assets of the plan are held in trust for the exclusive benefit of the participants and their beneficiaries. In accordance with GASB Statement No. 32, *Accounting and Financial Reporting for Internal Revenue Code Section 457 Deferred Compensation Plans*, the City does not include the assets or activity of the plan in its financial statements.

10. NET POSITION POLICIES

GASB requires the classification of net position into three components – net investment in capital assets, restricted, and unrestricted. These classifications are defined as follows:

Net Investment in Capital Assets – This component of net position consists of capital assets, net of accumulated depreciation, reduced by the outstanding balances of bonds, mortgages, notes, or other borrowings, net of unspent bond proceeds that are attributable to the acquisition, construction, or improvement of those assets. Deferred outflows of resources and deferred inflows of resources that are attributable to the acquisition, construction, or improvement of those assets or related debt are included.

Restricted – This component of net position consists of restricted assets and deferred outflows of resources reduced by liabilities and deferred inflows of resources related to those assets. The restrictions would be imposed by external parties including creditors, grantors, contributors, or laws or regulations of other governments and restrictions imposed by law through constitutional provisions or enabling legislation.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

10. NET POSITION POLICIES (continued)

Unrestricted – This component of net position consists of the net amount of the assets, deferred outflows of resources, liabilities, and deferred inflows of resources that are not included in the determination of net investment in capital assets or the restricted component of net position.

When both restricted and unrestricted resources are available for use, it is the City's policy to use restricted resources first, then unrestricted resources, as needed.

11. PRIOR PERIOD ADJUSTMENTS

For the year ended June 30, 2019, the Water Fund's beginning Net Position decreased by $9.5 million as a result of the following:

(1) The net effect of ($0.9) million for projects that were completed in fiscal year 2018 and prior but not transferred to fixed assets until fiscal year 2019.

(2) The net effect of ($8.6) million for adjustments to depreciation expenses due to changes in estimated useful lives and calculation adjustments.

The effect of the adjustments is reflected as a decrease in the Water Fund's Net Position as of July 1, 2018 in the June 30, 2019 Statement of Revenues, Expenses and Changes in Net Position.

For the year ended June 30, 2018, the Water Fund's beginning Net Position decreased by ($107.9) million as a result of the following:

(1) increase in the OPEB liability by $136.8 million due to the implementation of GASB Statement No. 75,

(2) recognized ($4.2) million of the federal subsidy portion of various projects placed in service in the previous year,

(3) the net effect of ($19.5) million due to a calculation adjustment of accumulated depreciation,

(4) the net effect of ($6.3) million for projects previously expensed that should have been included in capital assets and duplicate projects that should have been removed, and

(5) adjustment of amortization of the bond discount/premium of $1.1 million to coincide with the debt manager's schedule.

The effect of the adjustments is reflected as a decrease to the Water Fund's Net Position as of July 1, 2017 in the June 30, 2018 Statement of Revenues, Expenses and Changes in Net Position.

III. DETAILED NOTES ON ALL FUNDS AND ACCOUNTS (continued)

12. INTERFUND TRANSACTIONS

During the course of normal operations, the City has numerous transactions between funds. These transactions are recorded as operating transfers and are reported as transfers in the Water Fund. Some of the more significant transfers are: the PICA administrative fund collects a portion of the wage tax paid by City residents and transfer funds that are not needed for debt service and administrative costs to the general fund. Also, the general fund and the PICA administrative fund make transfers to the debt service funds for principal and interest payments.

Transfers between fund types during the fiscal year 2019 were:

(Amounts in Thousands of USD)

	Transfers To:				
	Govermental	Non Major Governmental			
Transfers From:	General	Special Revenue	Debt Service	Capital Improvement	Total
General Fund	$ -	$ 41,045	$ 177,005	$ 101,843	$ 319,893
Grants Revenue Fund	31,429	1,171	3,394	-	35,994
Non major Special Rev. Fds	493,551	-	35,576	500	529,627
Permanent Funds	-	119	-	-	119
Water Fund	4,095	35,822	-	-	39,917
Total	$ 529,075	$ 78,157	$ 215,975	$ 102,343	$ 925,550

IV. OTHER INFORMATION

1. CITY PENSION PLANS

The City maintains two single employer defined benefit plans for its employees and several of its component units. The two plans maintained by the City are the City Plan and the Philadelphia Gas Works (the "PGW") Plan. In addition to the City, the three other quasi-governmental agencies that participate in the City Plan are the Philadelphia Parking Authority (the "PPA"), the Philadelphia Municipal Authority (the "PMA"), and the Philadelphia Housing Development Corporation (the "PHDC").

Effective with Fiscal Year 2015, the City implemented GASB Statement No. 68, *Accounting and Financial Reporting for Pensions – An Amendment of GASB Statement No. 27*. This statement revises existing standards for measuring and reporting pension liabilities for pension plans. GASB Statement No. 68 defines a single employer as the primary government and its component units. All three quasi-governmental agencies that participate in the City Plan were determined to be component units of the City. Therefore the City Plan meets the definition of a single employer plan.

IV. OTHER INFORMATION (continued)

1. CITY PENSION PLANS (continued)

The note disclosures and Required Supplementary Information required by GASB Statement No. 68 are presented in separately issued audited financial statements of the City Plan and PGW plan. Copies of these financial statements may be obtained by contacting the Director of Finance of the City of Philadelphia.

A. PENSION FUND DESCRIPTION

Plan Administration. The Philadelphia Board of Pensions and Retirement (the "Board") administers the City of Philadelphia Municipal Pension Fund (the "Pension Fund"), a single employer defined benefit pension plan with a small but increasing defined contribution component, which provides pensions for all officers and employees of the City, as well as those of three quasi-governmental agencies (per applicable enabling legislation and contractual agreements). The Board was established by section 2-308 of the 1952 Philadelphia Home Rule Charter. Its actions in administering the Retirement System are governed by Title 22 of the Philadelphia Code.

The Board consists of nine voting members – four elected by the active members within the civil service, and the City's Controller, Solicitor, Managing Director, Personnel Director, and Director of Finance, who serves as the Chair.

Plan Membership. At July 1, 2018, the date of the most recent actuarial valuation, pension plan membership consisted of the following:

Actives	28,845
Terminated Vested	1,074
Disabled	3,890
Retirees	22,275
Beneficiaries	8,547
DROP	1,944
Total City Members	66,575
Annual Salaries	$ 1,805,400,096
Average Salary per Active Member	$ 62,590
Annual Retirement Allowances	$ 761,946,574
Average Retirement Allowance	$ 21,951

IV. OTHER INFORMATION (continued)

A. PENSION FUND DESCRIPTION (continued)

Contributions.

Per Title 22 of the Philadelphia Code, members contribute to the Fund at various rates based on bargaining unit, uniform/non-uniform/elected/exempt status, and entry date into the Fund. Beginning July 1, 2017, members contributed at one of the following rates:

Employee Contribution Rates

For the Period of July 1, 2018 to June 30, 2019

	Municipal (1)	Elected (2)	Police	Fire
Plan 67	7.00%	N/A	6.00%	6.00%
Plan 67 – 50% of Aggregate Normal Cost (3)	6.32%	N/A	N/A	N/A
Plan 87	3.08%	9.62%	6.84%	6.84%
Plan 87 – 50% of Aggregate Normal Cost (4)	3.47%	N/A	N/A	N/A
Plan 87 – Accelerated Vesting (5)	3.60%	11.72%	N/A	N/A
Plan 87 Prime (6)	4.08%	10.62%	7.84%	7.84%
Plan 87 Prime – Accelerated Vesting	4.60%	12.72%	N/A	N/A
Plan ‘10	2.21%	N/A	5.50%	5.50%
Plan ’10 – Accelerated Vesting	3.87%	N/A	N/A	N/A
Plan ’16 (7)	3.87%	N/A	N/A	N/A

1- For the Municipal Plan 67 members who participate in the Social Security System, employee contributions are 4.75% of compensation up to the social security wage base and 6% above it.
2- The employee contribution rate is based upon the normal cost of $474,193 under Plan 87 Elected, normal cost or $256,466 under Plan 87 Municipal and current annual payroll of $3,418,294.
3- Effective November 2014 guards represented by DC 33 contributions at 50% of the aggregate Normal Cost of all members in Plan J.
4- This represents 50% of aggregate Normal Cost for all members in Plan Y.
5- Member rates for Municipal Plan 87 (Y5) members eligible to vest in 5 years and Elected Officials (L8) eligible to be vested in 8 years instead of 10.
6- Plan 87 Prime refers to new hires who have the option to elect Plan 10 but have elected to stay in Plan 87.
7- Beginning January 1, 2019, all Municipal groups (except elected officials) will participate in Plan 16.

Employer contributions are made by the City throughout each fiscal year (which ends June 30) and by three (3) quasi-governmental agencies on a quarterly basis. These contributions, determined by an annual actuarial valuation report (“AVR”),

IV. OTHER INFORMATION (continued)

A. PENSION FUND DESCRIPTION (continued)

when combined with plan member contributions, are expected to finance the cost of benefits earned by plan members during the year, with an additional amount to finance any unfunded accrued liability.

Within the AVR, three contribution amounts are determined based upon two different sets of rules for determining the way the unfunded actuarial liability is funded.

The first method is defined in accordance with Act 205 and defines the Minimum Municipal Obligation (“MMO”), which is the City’s minimum required contribution under Pennsylvania state law.

The second method is in accordance with the City’s Funding Policy, which predates the Act 205 rules and calls for contributions that are greater than the MMO until the initial unfunded liability determined in 1984 is fully funded.

The third method currently followed by the City, the Revenue Recognition Policy (RRP), calls for additional revenue to be contributed each year to the fund in excess of the MMO. There are three sources of additional revenue that will be received by the Fund: 1) a portion of the sales tax according to the State Legislation, 2) additional tiered member contributions based on salary level for all municipal employees, and 3) additional member contributions from the current and future uniform members in Plan 87.

Under all funding methods, there are two components: the normal cost and the amortized unfunded actuarial liability. The actuarial unfunded liability is the amount of the unfunded actuarial liability that is paid each year based upon the given or defined amortization periods. The amortization periods are the same under the MMO and RRP, but different under the City’s Funding Policy.

IV. OTHER INFORMATION (continued)

A. PENSION FUND DESCRIPTION (continued)

Funding Policy:

The initial July 1, 1985 unfunded actuarial liability ("UAL") is amortized over 34 years ended June 30, 2019 with payments increasing at 3.3% per year, the assumed payroll growth. Other charges in the actuarial liability are amortized in level-dollar payments as follows:

- Actuarial gains and losses – 20 years beginning July 1, 2009. Prior gains and losses were amortized over 15 years.
- Assumptions changes – 15 years beginning July 1, 2010. Prior to July 1, 2010, assumption changes were amortized over 20 years.
- Plan changes for active members – 10 years.
- Plan changes for inactive members – 1 year.
- Plan changes mandated by the State – 20 years.

In fiscal year 2019, the City and other employers' contributions of $797.8 million was less than the actuarially determined employer contribution (ADEC) of $874.7 million. In the event that the City contributes less than the funding policy, an experience loss will be created that will be amortized in accordance with funding policy over a closed 20-year period.

The Schedule of Employer Contributions (based on the City's Funding Policy) is included as Required Supplemental Information and provides a 10-year presentation of employer contributions.

Minimum Municipal Obligation (MMO):

For the purposes of the MMO under Act 205 reflecting the fresh start amortization schedule, the July 1, 2009 UAL was "fresh started" to be amortized over 30 years ending June 30, 2039. This is a level dollar amortization of the UAL. All future amortization periods will follow the City's Funding Policies as outlined above.

In fiscal year 2019, the City and other employers' contributions of $797.8 million exceeded the Minimum Municipal Obligation of $668.3.

The Schedule of Employer Contributions (based on the MMO Funding Policy) is included as Required Supplemental Information and provides a 10-year presentation of the employer contributions.

IV. OTHER INFORMATION (continued)

A. PENSION FUND DESCRIPTION (continued)

Revenue Recognition Policy (RRP)

Revenue Recognition Policy is similar to the MMO except that the assets used to determine the unfunded liability do not include portion of sales tax revenue, tiered member contributions from the municipal employees, and additional uniform members' contributions. These sources of income are contributed over and above the City's contribution of the MMO and will be in addition to the MMO. Therefore, under this funding method, the additional revenue amounts are separately tracked and accumulated in a notional account which is then subtracted from the assets before calculating the contribution amounts due under the Minimum Municipal Obligation (MMO) methodology. The Pension Fund accumulates these amounts in a notional account and deducts them from the Actuarial Asset Value before the MMO is determined. These amounts are accumulated at the Actuarial Asset Value return rates to preserve the new funding methodology objective.

In fiscal year 2019, the City and other employers' contributions of $797.8 million exceeded the contribution under the Revenue Recognition Policy of $680.8 million.

The Schedule of Employer Contributions (based on the RRP Funding Policy) is included as Required Supplementary Information and provides a 10-year presentation of the employer contributions.

B. BENEFITS

The Pension Fund provides retirement, disability, and death benefits according to the provisions of Title 22 of the Philadelphia Code. These provisions prescribe retirement benefit calculations, vesting thresholds, and minimum retirement ages, that vary based on bargaining unit, uniform/non-uniform status, and entry date into the System.

Non-uniform employees may retire at either age 55 with up to 80% of average final compensation ("AFC") or age 60 with up to either 100% or 25% of AFC, depending on entry date into the Fund. Uniform employees may retire at either age 45 with up to 100% of AFC or age 50 with up to either 100% or 35% of AFC, depending on entry date into the Pension Fund. Survivorship selections may result in an actuarial reduction to the calculated benefit.

Members may qualify for service-connected disability benefits regardless of length of service. Service-connected disability benefits are equal to 70% of a member's final rate of pay, and are payable immediately without an actuarial reduction. These applications require approval by the Board. Eligibility to apply for non-service-connected disability benefits varies by bargaining unit and uniform/non-uniform

IV. OTHER INFORMATION (continued)

B. BENEFITS (continued)

status. Non-service connected disability benefits are determined in the same manner as retirement benefits, and are payable immediately.

Service-connected death benefits are payable to:

1) surviving spouse/life partner at 60% of final rate of pay plus up to 2 children under age 18 at 10% each of final rate of pay (maximum payout: 80%);

2) if no surviving spouse/life partner, up to 3 children under age 18 at 25% each of final rate of pay (maximum payout 75%); or

3) if no surviving spouse/life partner or children under age 18, up to 2 surviving parents at 15% each of final rate of pay (maximum payout 30%).

Non-service-connected deaths are payable as a lump sum payment, unless the deceased was either vested or had reached minimum retirement age for their plan, in which case the beneficiary(s) may instead select a lifetime monthly benefit, payable immediately with an actuarial reduction.

A Pension Adjustment Fund ("PAF") is funded with 50% of the excess earnings that are between 1% and 6% above the actuarial assumed earnings rate. Each year within sixty days of the end of the fiscal year, by majority vote of its members, the Board of Directors of the Fund (the "Board") shall consider whether sufficient funds have accumulated in the PAF to support an enhanced benefit distribution (which may include, but is not limited to, a lump sum bonus payment, monthly pension payment increases, ad-hoc cost-of-living adjustments, continuous cost-of-living adjustments, or some other form of increase in benefits as determined by the Board) to retirees, their beneficiaries and their survivors. As of July 1, 2018, the date of the most recent actuarial valuation, there was $1,160,247 in the PAF, and the Board voted to make PAF distributions of $822 during the fiscal year ended June 30, 2019.

The Pension Fund includes a Deferred Retirement Option Plan (DROP Plan). The DROP Plan allows a participant to declare that they will retire within 4 years. During the 4-year period, the City will make no further contributions for the participant. The participant would continue to work and to receive their salary; however, any increases would not be counted towards their pension benefit. During the 4-year period the individual participates in the DROP Plan, their pension benefits will be paid into an escrow account in the participant's name. After the 4-year period, the participant would begin to receive their pension benefits and the amount that has been accumulated in the escrow account in a lump sum payment. The balance in the DROP Plan as of June 30, 2019 is $156.8 million.

IV. OTHER INFORMATION (continued)

C. INVESTMENTS

The Pension Board's Investment Policy Statement provides, in part:

The overall investment objectives and goals should be achieved by use of a diversified portfolio, with safety of principal a primary emphasis. The portfolio policy should employ flexibility by prudent diversification into various asset classes based upon the relative expected risk-reward relationship of the asset classes and the expected correlation of their returns.

The Pension Fund seeks an annual total rate of return of not less than 7.55% over a full market cycle. It is anticipated that this return standard should enable the Fund to meet its actuarially assumed earnings projection (currently 7.55%) over a market cycle. The investment return assumption was reduced by the Board from 7.60% to 7.55%. The Pension Fund's investment program will pursue its aforestated total rate of return by a combination of income and appreciation, relying upon neither exclusively in evaluating a prospective investment for the Pension Fund.

All investments are made only upon recommendation of the Pension Fund's Investment Committee and approval by a majority of the Pension Board. In order to document and communicate the objectives, restrictions, and guidelines for the Fund's investment staff and investments, a continuously updated Investment Policy Statement will be maintained. The Investment Policy Statement is updated (and re-affirmed) each year at the January Board meeting.

The following was the Board's approved asset allocation policy as of June 30, 2019:

Asset Class	Target Allocation
Broad Fixed Income	10.0%
Global Fixed Income	2.0%
Emerging Market Debt	2.0%
U.S. Large-Cap Core	22.0%
U.S. Mid-Cap Core	3.0%
U.S. Small-Cap Core	5.0%
ACWI ex-U.S.	15.0%
Non-U.S. Small Cap	6.0%
Emerging Markets	4.0%
Public REITs	1.0%
Real Estate Core	11.0%
Real Estate-Mezzanine	1.0%
Real Estate-Opportunistic	1.0%
Infrastructure	5.0%
Private Equity	10.0%
Private Debt	2.0%
Total	100.0%

IV. OTHER INFORMATION (continued)

C. INVESTMENTS (continued)

Money Weighted Rate of Return: For the year ended June 30, 2019, the annual money-weighted return on pension plan investments, net of pension plan investment expense, was 6.48%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for changing amounts actually invested.

D. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

Financial statements of the Pension Fund are prepared using the accrual basis of accounting. Member contributions are recognized in the period in which the contributions are due. Employer contributions are recognized when due and the employer has made a formal commitment to provide the contributions. Benefits and refunds of contributions are recognized when due and payable in accordance with the terms of the Pension Fund.

Methods Used to Value Investments

The Pension Fund's investments are reported at fair value. Fair value is the amount that the Pension Fund can reasonably expect to receive for an investment in a current sale between a willing buyer and a willing seller, that is, other than in a forced or liquidation sale. Fixed income securities and common and preferred stocks are generally valued based on published market prices and quotations from national security exchange or security pricing services. Securities which are not traded on a national security exchange are valued by the respective fund manager or other third parties based on similar sales.

For private market investments which include private equity, private debt, venture capital, hedge funds and equity real estate investments where no readily ascertainable market value exists, management, in consultation with the general partner and investment advisors, has determined the fair values for the individual investments based upon the partnership's most recent available financial information. Some of the investment values provided in the report are estimates due to a lag in reporting for private market investments.

Futures contracts, foreign exchange contracts, and options are marked-to-market daily with changes in market value recognized as part of net appreciation/depreciation in the fair value of investments. Initial margin requirements for such financial instruments are provided by investment securities pledged as collateral or by cash.

IV. OTHER INFORMATION (continued)

D. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

Investment expenses consist of investment manager fees and investment consultant fees related to the traditional investments only, and not those fees related to the alternative investments. Unsettled investment sales are reported as Accrued Interest and Other Receivable, and unsettled investment purchases are included in Accrued Expenses and Other Liabilities.

Dividend income is recorded on the ex-dividend date. Interest income is recorded as earned on an accrual basis.

Income Taxes

The Pension Fund qualifies under Section 401(a) of the Internal Revenue Code (IRC) and is exempt from income taxation as allowed by Section 501(a) of the IRC.

Related Parties

The City's Department of Finance provides cash receipt and cash disbursement services to the Pension Fund. The City Solicitor's office provides legal services to the Pension Fund. Other administrative services are also provided by the City.

Use of Estimates in Preparing Financial Statements

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the reported amounts of assets, liabilities and changes therein, and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

Risks and Uncertainties

The Pension Fund invests in various investment securities. Investment securities are exposed to various risks such as interest rate, market, and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in the values of investment securities will occur in the near term and that such changes could materially affect the amounts reported in the Pension Fund’s Statement of Fiduciary Net Position.

Contributions are calculated based on certain assumptions pertaining to interest rates, inflation rates, and employee demographics, all of which are subject to change. Due to uncertainties inherent in the estimation and assumption process, it is at least reasonably possible that changes in these statements and assumptions in the near term would be material to the financial statements.

V. OTHER INFORMATION (continued)

D. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (continued)

Administrative Expenses

Administrative expenses of the Pension Fund are paid for by the Pension Fund.

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING

Legal Provisions

The Pension Fund is authorized to invest in "prudent investments," including obligations of the U.S. Treasury, agencies and instrumentalities of the United States, investment grade corporate bonds, common stock, real estate, private market, etc. City ordinances contain provisions which preclude the Pension Fund from investing in organizations that conduct business in certain countries and also impose limitations on the amounts invested in certain types of securities.

Custodial Credit Risk

Custodial credit risk for Deposits is the risk that in the event of a bank failure, the Pension Fund’s deposits may not be returned to them. The Pension Fund’s cash deposits are held in two banks as of June 30, 2019. Amounts are insured up to $250,000 per bank by the Federal Deposit Insurance Corporation (FDIC). Deposits in excess of the FDIC limit are collateralized with securities held by the pledging financial institution’s trust department or agent in the Pension Fund’s name. The Pension Fund classifies Money Market funds held by the custodian institution as cash equivalents. The Pension Fund also classifies Treasury Bills as cash equivalents if the date of maturity is three months or less from the acquisition date. Custodial credit risk for investments is the risk that in the event of counter-party failure, the Pension Fund may not be able to recover the value of its investment or collateral securities that are in the possession of an outside party. Investment securities are exposed to custodial credit risk if the securities held by the counterparty or counterparty’s trust department, are uninsured and are not registered in the name of the Pension Fund. The Pension Fund requires that all investments be clearly marked as to ownership, and to the extent possible, be registered in the name of the Pension Fund. Certain investments may be held by the managers in the Pension Fund’s name.

Interest Rate Risk

Interest rate risk is the largest risk faced by an investor in the fixed income market. The price of a fixed income security generally moves in the opposite direction of the change in interest rates. Securities with long maturities are highly sensitive to interest rate changes.

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

Duration is a measure of the approximate sensitivity of a bond's value to interest rate changes. The higher the duration, the greater the changes in fair value when interest rates change. The Pension Fund measures interest rate risk using segmented time distribution, which shows the total fair value of investments maturing during a given period.

The table below details the exposure to interest rate changes based upon maturity dates of the fixed income securities at June 30, 2019:

2019 (in Thousands)	Total Fair Value	Less Than 1 Year	1-5 Years	6-10 Years	More Than 10 Years
Asset Backed Securities	$ 23,677	$ 1,774	$ 7,187	$ 4,982	$ 9,734
CDO	483	483	-	-	-
CMO/REMIC	7,992	2,317	25	239	5,411
Commercial Mortgage Backed Securities	19,779	6,376	393	1,250	11,760
Corporate Bonds	345,432	123,575	73,751	102,850	45,256
Government Bonds	364,123	78,583	82,906	127,614	75,020
Mortgage Backed Securities	73,379	482	386	6,037	66,474
Municipal Bonds	12,995	-	454	6,088	6,453
Total Interest Risk of Debt Securities	$ 847,860	$ 213,590	$ 165,102	$ 249,060	$ 220,108

Concentration of Credit Risk

Concentration of credit risk is the risk of substantial loss if investments are concentrated in one issuer. As of June 30, 2019, the Pension Fund has no single issuer that exceeds 5% of total investments. Investments issued or explicitly guaranteed by the U.S. government and investments in mutual funds, external investment pools, and other pooled investments are excluded.

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

Credit Risk

Credit Risk is the risk that an issuer or other counterparty to an investment will not fulfill its obligation. The Pension Fund is subject to credit risk on $847.9 million of directly owned fixed income. The Pension Fund's directly owned rated debt investments as of June 30, 2019 were rated by Standard & Poor's, a nationally recognized statistical rating agency and are presented below using Standard & Poor's rating scale:

		Credit Rating									
2019 (in Thousands)	Total Fair Value	AAA	AA	A	BBB	BB	B	CCC	C	D	NR
Asset Backed Securities	$ 23,677	$ 6,335	$ 2,159	$ 3,088	$ -	$ -	$ -	$ -	$-	$ -	$ 9,648
CDO	483	483	-	-	-	-	-	-	-	-	-
CMO/REMIC	7,992	853	4,485	165	45	31	333	-	-	-	2,080
Commercial Mortgage Backed Securities	19,779	6,859	11,137	437	4	-	243	-	-	91	1,008
Corporate Bonds	345,432	1,034	4,242	105,606	104,442	52,587	50,363	13,925	147	269	12,817
Government Bonds	364,123	9,230	250,385	46,054	23,780	17,774	10,109	5,307	-	891	593
Mortgage Backed Securities	73,379	-	73,379	-	-	-	-	-	-	-	-
Municipal Bonds	12,995	-	7,999	3,278	852	866	-	-	-	-	-
Total Credit Risk of Debt Securities	$847,860	$24,794	$353,786	$157,987	$132,211	$71,258	$61,048	$19,232	$147	$1,251	$26,146

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

Foreign Currency Risk

The Pension Fund's exposure to foreign currency risk derives from its position in foreign currency-denominated cash and investments in fixed income, equities, and derivatives. The foreign currency investment in equity securities is 41.4% of the total investment in equities.

The Fund's exposure to foreign currency risk at June 30, 2019 was as follows (expressed in thousands):

Currency	Cash	Fixed Income	Equities	Derivatives	Total
Euro (EUR)	$ 1,792	$ 552	$ 329,463	$ 35	$ 331,842
Japanese Yen (JPY)	677	31	257,817	7	258,532
Pound Sterling (GBP)	452	1,038	184,595	21	186,106
Canadian Dollar (CAD)	333	560	128,992	13	129,898
Hong Kong Dollar (HKD)	248	-	107,630	-	107,878
Australian Dollar (AUD)	187	7,176	78,382	(2)	85,743
Swiss Franc (CHF)	729	-	85,679	(2)	86,406
South Korean Won (KRW)	-	-	35,058	(5)	35,053
Mexican Peso (MXN)	32	21,678	6,133	(1)	27,842
South African Rand (ZAR)	-	8,335	13,094	(248)	21,181
Swedish Krona (SEK)	337	-	26,222	185	26,744
Brazilian Real (BRL)	4	9,703	16,917	6	26,630
Malaysian Ringgit (MYR)	-	8,920	5,846	-	14,766
Danish Krone (DKK)	268	-	16,347	-	16,615
Indonesian Rupiah (IDR)	12	7,828	6,017	6	13,863
Polish Zloty (PLN)	18	9,427	3,159	8	12,612
Singapore Dollar (SGD)	299	-	13,183	-	13,482
Norwegian Krone (NOK)	172	-	8,745	297	9,214
Thai Baht (THB)	2	-	7,428	-	7,430
New Turkish Lira (TRY)	6	-	1,233	-	1,239
Chilean Peso (CLP)	69	862	2,198	1	3,130
Philippine Peso (PHP)	-	-	4,210	-	4,210
All Others	2,769	11,806	13,451	135	28,161
	$ 8,406	$ 87,916	$ 1,351,799	$ 456	$ 1,448,577

Derivatives

The Pension Fund may invest in derivatives as permitted by guidelines established by the Pension Board. Pursuant to such authority, the Pension Fund may invest in foreign currency forward contracts, options, futures (S&P Fund) and swaps. No derivatives were purchased with borrowed funds.

Derivatives are generally used to provide market exposure in the equity portfolio and to hedge against foreign currency risk and changes in interest rates, improve

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

yield and adjust the duration of the Pension Fund's fixed income portfolio. These securities are subject to changes in value due to changes in interest rates or currency valuations. Credit risk for derivatives results from the same considerations as other counterparty risk assumed by the Pension Fund, which is the risk that the counterparty might be unable to meet its obligations.

Derivative instruments such as swaps, options, futures and forwards are often complex financial arrangements used by governments to manage specific risks or to make investments. By entering into these arrangements, governments receive and make payments based on market prices without actually entering into the related financial or commodity transactions. Derivative instruments associated with changing financial and commodity prices result in changing cash flows and fair values that can be used as effective risk management or investment tools. Derivative instruments, however, also can expose governments to significant risks and liabilities.

The Pension Fund enters into a variety of financial contracts, which include options, futures, forwards and swap agreements to gain exposure to certain sectors of the equity and fixed income markets; collateralized mortgage obligations (CMOs); other forward contracts, and U.S. treasury strips. The contracts are used primarily to enhance performance and reduce the volatility of the portfolio. The Pension Fund is exposed to credit risk in the event of non-performance by counterparties to financial instruments. The Pension Fund generally enters into transactions only with high quality institutions. Legal risk is mitigated through selection of executing brokers and review of all documentation. The Pension Fund is exposed to market risk, the risk that future changes in market conditions may make an instrument less valuable. Exposure to market risk is managed in accordance with risk limits set by senior management, through buying or selling instruments or entering into offsetting positions. The notional or contractual amounts of derivatives indicate the extent of the Pension Fund's involvement in the various types and uses of derivative financial instruments and do not measure the Pension Fund's exposure to credit or market risks and do not necessarily represent amounts exchanged by the parties. The amounts exchanged are determined by reference to the notional amounts and the other terms of the derivatives.

Derivative Instruments

The following table summarizes aggregate notional or contractual amounts for the Pension Fund's derivative financial instruments at June 30, 2019 in addition to the fair value and change in the fair value of derivatives.

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

List of Derivatives Aggregated by Investment Type

Classification	Change in Fair Value		Fair Value at June 30, 2019		Notional
Investment Derivatives					
Forwards Currency Contracts	Net Appreciation (Depreciation) in Investments	$ 2,210,016	Investments	$ 414,656	$ 190,108,181
Futures	Net Appreciation (Depreciation) in Investments	559,088	Investments	400,772	231
Grand Totals		$ 2,769,104		$ 815,428	$ 190,108,412

A Derivatives Policy Statement identifies and allows common derivative investments and strategies, which are consistent with the Investment Policy Statement of the City of Philadelphia Municipal Pension Fund. The guidelines identify transaction-level and portfolio-level risk control procedures and documentation requirements. Managers are required to measure and monitor exposure to counterparty credit risk. All counterparties must have credit ratings available from nationally recognized rating institutions such as Moody, Fitch, and S&P. The details of other risks and financial instruments in which the Fund involves are described below.

Credit risk:

The Pension Fund is exposed to credit risk on hedging derivative instruments that are in asset positions. To minimize its exposure to loss related to credit risk, it is the Pension Fund's policy to require counterparty collateral posting provisions in its non-exchange-traded hedging derivative instruments. These terms require full collateralization of the fair value of hedging derivative instruments in asset positions (net of the effect of applicable netting arrangements) should the counterparty's credit rating fall below AA as issued by Fitch Ratings and Standard & Poor's or Aa as issued by Moody's Investors Service. Collateral posted is to be in the form of U.S. Treasury securities held by a third-party custodian. The City has never failed to access collateral when required.

It is the Pension Fund's policy to enter into netting arrangements whenever it has entered into more than one derivative instrument transaction with counterparty. Under the terms of these arrangements, should one party become insolvent or

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

otherwise default on its obligations, close-out netting provisions permit the non-defaulting party to accelerate and terminate all outstanding transactions and net the transactions' fair values so that a single sum will be owed by, or owed to, the non-defaulting party.

Swap agreements:

These derivative instruments provide for periodic payments at predetermined future dates between parties based on the change in value of underlying securities, indexes or interest rates. Under fixed interest rate type swap arrangements, the Pension Fund receives the fixed interest rate on certain equity or debt securities or indexes in exchange for a fixed charge. There were not any total received fixed interest Swaps during 2019. On its pay-variable, received-fixed interest rate swap, as LIBOR increases, the Fund's net payment on the swap increases. Alternatively, on its pay-fixed, receive-variable interest rate swap, as LIBOR or the SIFMA swap index decreases, the Pension Fund's net payment on the swap increases.

Futures contracts:

These derivative instruments are types of contracts in which the buyer agrees to purchase and the seller agrees to make delivery of a specific financial instrument at a predetermined date and price. Gains and losses on futures contracts are settled daily based on a notional (underlying) principal value and do not involve an actual transfer of the specific instrument. Futures contracts are standardized and are traded on exchanges. The exchange assumes the risk that counterparty will not pay and generally requires margin payments to minimize such risk. In addition, the Pension Fund enters into short sales, sales of securities it does not presently own, to neutralize the market risk of certain equity positions. Initial margin requirements on futures contracts and collateral for short sales are provided by investment securities pledged as collateral and by cash held by various brokers. Although the Pension Fund has the right to access individual pledged securities, it must maintain the amount pledged by substituting other securities for those accessed. The realized loss from Futures contracts was ($313,449).

Forward contracts:

The Pension Fund is exposed to basis risk on its forward contracts because the expected funds purchase being hedged will price based on a pricing point different than the pricing point at which the forward contract is expected to settle. The realized loss from forward contracts was ($5,334,716).

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

Termination risk:

The Pension Fund or its counterparties may terminate a derivative instrument if the other party fails to perform under the terms of the contract. In addition, the Pension Fund is exposed to termination risk on its receive-fixed interest rate swap. The Pension Fund is exposed to termination risk on its rate cap because the counterparty has the option to terminate the contract if the SIFMA swap index exceeds 12%. If at the time of termination, a hedging derivative instrument is in a liability position, the City would be liable to the counterparty for a payment equal to the liability, subject to netting arrangements.

Rollover risk:

The Pension Fund is exposed to rollover risk on hedging derivative instruments that are hedges of debt that mature or may be terminated prior to the maturity of the hedged debt. When these hedging derivative instruments terminate, or in the case of a termination option, if the counterparty exercises its option, the Pension Fund will be re-exposed to the risks being hedged by the hedging derivative instrument.

Fair Value Measurement

The Municipal Pension Fund has the following recurring fair value measurement as of June 30, 2019 (expressed in thousands):

		Fair Value Measurements Using		
	June 30, 2019	Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by Fair Value Level				
U.S. Treasury Securities	$ 221,658	$ -	$ 221,658	$ -
Agency Bonds	22,252	-	22,252	-
Asset Backed Securities	23,677	-	23,677	-
Collateralized Debt Obligation	483	-	483	-
Corporate Bonds	345,432	-	345,432	-
Government Bonds	114,354	-	114,354	-
Mortgage Backed Securities	101,150	-	101,150	-
Municipal Bonds	12,995	-	12,995	-
Sovereign Debt	5,859	-	5,859	-
Mutual Funds	988	988	-	-
Equity	3,263,263	3,258,778	1,577	2,908
Total Investments by Fair Value Level	4,112,111	3,259,766	849,437	2,908
Investments Measured at the Net Asset Value (NAV)				
Credit Distressed Hedge Fund	$ 1,824			
Equity Long/Short Hedge funds	27,278			
Real Estate	638,690			
Private Equity	495,502			
Fixed Income Hedge Funds	79,321			
Total Investments Measured at the NAV	1,242,615			
Total Investments Measured at Fair Value	$ 5,354,726			
Investment Derivative Instruments				
Equity Index Futures (Assets)	$ 412	$ 412	$ -	
Currency Futures (Assets)	2	2	-	
Currency Futures (Liabilities)	(13)	(13)	-	
Forward Currency Contracts (Assets)	919	-	919	
Forward Currency Contracts (Liabilities)	(504)	-	(504)	
Total Investment Derivative instruments	$ 816	$ 401	$ 415	

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

Equity securities classified in Level 1 of the fair value hierarchy are valued using quoted market prices. Debt securities classified in Level 2 of the fair value hierarchy are valued using a matrix pricing technique. Corporate bonds and Equities in Level 3 are valued using discounted cash flow techniques.

Derivative instruments classified in Level 1 of the fair value hierarchy are valued using quoted market prices. Derivative instruments classified in Level 2 are valued using a market approach that considers benchmark for foreign exchange rates.

The valuation method for investments measured at the net asset value (NAV) per share (or its equivalent) is presented on the following table (expressed in thousands):

Investment Measured at the Net Asset Value (NAV)		Unfunded Commitments	Redemption Frequency (If Currently Eligible)	Redemption Notice Period
Credit Distressed Hedge Fund	$ 1,824	$ -	Quarterly	90 days
Equity Long/Short Hedge funds	27,278	-	Quarterly	90 days' notice
Real Estate	638,690	7,303	N/A	N/A
Private Equity	495,502	278,529	N/A	N/A
Fixed Income Hedge Funds	79,321	-	Quarterly	90-120 days
Total Investments Measured at the NAV	$ 1,242,615			

1. Credit distressed hedge funds: The Funds seek to identify and exploit event driven opportunities both on the long and short side in the stressed and distressed corporate debt markets. Investments are generally driven by fundamental, value-oriented analysis and specific credit events. The Funds maintain the flexibility to invest globally and across capital structures of stressed and distressed companies. Investments generally target secondary U.S. credit opportunities across all tranches of a company's debt capital structure. The Funds may also invest opportunistically in certain equities, long and short. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the investments. Investment can be redeemed with a 90 days' notice.

2. Equity long/short hedge funds: This Fund will typically hold 0-50 long positions and 10-15 short positions in U.S. common stocks. Management has the ability to shift investments from value to growth strategies, from small to large capitalization stocks, and from a net long position to a net short position. The Fund mitigates market risk by utilizing short positions. In periods of extreme volatility, the Fund may hold a significant portion of its assets in cash.

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

The fair values of the investments in this type have been determined using the NAV per share of the investments. Investment can be redeemed with a 90 days' notice.

3. Real estate funds: This type includes funds that invest in U.S. and Non-U.S. commercial and residential real estate. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital. These investments can never be redeemed with the funds. Distributions from each fund will be received as the underlying investments of the funds are liquidated. However, the individual investments that will be sold have not yet been determined. Because it is not probable that any individual investment will be sold, the fair value of each individual investment has been determined using the NAV per share (or its equivalent) of the Plan's ownership interest in partners' capital. Once it has been determined which investments will be sold and whether those investments will be sold individually or in a group, the investments will be sold in an auction process. The investee fund's management is required to approve of the buyer before the sale of the investments can be completed. It is expected that the underlying assets of the funds will be liquidated over the next seven to 10 years.

4. Private equity funds: The primary goal of these Funds is to generate returns for investors that exceed private equity industry benchmarks and are commensurate with asset class risk through the construction of a portfolio of opportunistic, highly performing private equity investments. Investments that fund may undertake include early-stage venture capital, later-stage growth financings, leveraged buyouts of medium and large-sized companies, mezzanine investments, PIPES and investments in companies that are being taken private. These investments can never be redeemed with the funds. Instead, the nature of the investments in this type is that distributions are received through the liquidation of the underlying assets of the fund. If these investments were held, it is expected that the underlying assets of the fund would be liquidated over five to 10 years. The fair values of the investments in this type have been determined using recent observable transaction information for similar investments and nonbinding bids received from potential buyers of the investments. Once a buyer has been identified, the investee fund's management is required to approve of the buyer before the sale of the investments can be completed.

5. Fixed Income funds: The primary goal of these Funds is to create alpha by sourcing proprietary opportunities, avoiding capital loss, buying securities below their intrinsic value and selling securities above their intrinsic value.

IV. OTHER INFORMATION (continued)

E. CASH DEPOSITS, INVESTMENTS AND SECURITIES LENDING (continued)

Firms look for opportunities that are currently mispriced, based on fundamentals or potentially an event that may improve the price of the holding.

Securities Lending Program

The Pension Fund, pursuant to a Securities Lending Authorization Agreement, has authorized J.P. Morgan Bank and Trust Company (J.P. Morgan) to act as the Pension Fund's agent in lending the Pension Fund's securities to approved borrowers. J.P. Morgan, as agent, enters into Securities Loan Agreements with borrowers.

During the fiscal year, J.P. Morgan lent, on behalf of the Pension Fund, certain securities of the Pension Fund held by J.P. Morgan Chase Bank, N.A. as custodian and received cash or other collateral including securities issued or guaranteed by the United States, U.K., and Eurozone governments. J.P. Morgan does not have the ability to pledge or sell collateral securities delivered absent a borrower default. Borrowers were required to deliver collateral for each loan equal to at least 102% or 105% of the market value of the loaned securities.

Pursuant to the Securities Lending Authorization Agreement, J.P. Morgan had an obligation to indemnify the Pension Fund in the event of default by a borrower. There were no failures by any borrowers to return loaned securities or pay distributions thereon during the fiscal year that resulted in a declaration or notice of default of the borrower.

During the fiscal year, the Pension Fund and the borrowers maintained the right to terminate securities lending transactions upon notice. The cash collateral received on each loan was invested in a separately managed account based upon the investment guidelines established by the Fund. As of June 30, 2019, the weighted average maturity was 48 days and the final maturity was 351 days. Because the securities lending transactions were terminable at will, their duration did not generally match the duration of the investments made with the cash collateral received from the borrower.

On June 30, 2019, the Pension Fund had no credit risk exposure to borrowers because all borrowers were required to deliver collateral for each loan.

As of June 30, 2019, the fair value of securities on loan was $356.9 million. Associated collateral totaling $381.4 million was comprised of cash which was invested in a separately managed account based upon the investment guidelines established by the Pension Fund. As of June 30, 2019, the invested cash collateral was $381.4 million and is valued at amortized cost.

IV. OTHER INFORMATION (continued)

F. INVESTMENT ADVISORS

The Pension Fund utilizes investment advisors to manage long-term debt, real estate, private market, and equity portfolios. To be eligible for consideration, investments must meet criteria set forth in governing laws and regulations.

G. NET PENSION LIABILITY

The components of the net pension liability as of June 30, 2019 were as follows:

Total Pension Liability	$ 11,774,268,695
Plan Fiduciary Net Position	5,688,383,351
Net Pension Liability	$ 6,085,885,344

Plan Fiduciary Net Position as a Percentage of the Total Pension Liability is 48.3%.

The Water Fund's portion of the net pension liability was $430,539,779 and $435,860,389 as of June 30, 2019 and 2018, respectively.

Actuarial Assumptions

The total pension liability was determined by an actuarial valuation as of June 30, 2018 and was rolled forward to June 30, 2019. The June 30, 2018 actuarial valuation used the following actuarial assumptions, applied to all periods including the measurement period:

Actuarial Cost Method: Entry Age Normal
Investment Rate of Return: 7.55% compounded annually, net of expenses
Salary Increases: Age Based Table

The investment return assumption was changed from 7.60% from the prior year valuation to 7.55% for the current year valuation.

To recognize the expense of the benefits payable under the Pension Adjustment Fund, the actuarial liabilities have been increased by 0.54%. This estimate is based on the statistical average expected value of the benefits.

Mortality Rates: For Municipal and Elected Officials, 127% and 119% for males and females, respectively, of the RP-2014 Healthy Annuitant Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017. For Uniform, 115% of the RP-2014 Blue Collar Healthy Annuitant Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017.

IV. OTHER INFORMATION (continued)

G. NET PENSION LIABILITY (continued)

The measurement date for the net pension liability (NPL) is June 30, 2019. Measurements are based on the fair value of assets as of June 30, 2019 and the total pension liability (TPL) as of the valuation date, July 1, 2018, updated to June 30, 2019. The roll-forward procedure included the addition of service cost and interest cost offset by actual benefit payments. During the measurement year, the collective NPL decreased by approximately $83 million. The service cost and interest cost increased the collective NPL by the approximately $1.04 billion while contributions plus investment income offset by administrative expenses decreased the collective NPL by approximately $1.19 billion.

There was a benefit change to increase the pay cap from $50,000 to $65,000 for DC 33 Municipal members participating in the Stacked Hybrid Plan 16 which increased the TPL by approximately $0.4 million. There was an actuarial experience loss during the year of approximately $11 million.

In addition, the Board adopted an assumption change to decrease the expected long-term return on assets from 7.60% to 7.55% which increased the TPL by approximately $53 million.

Long-term expected rate of return:

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

IV. OTHER INFORMATION (continued)

G. NET PENSION LIABILITY (continued)

Best estimates of geometric real rates of return for each major asset class included in the pension plan's target asset allocation as of June 30, 2019 are summarized in the following table: (See pension plan's investment policy: http://www.phila.gov/pensions/PDF/ips.pdf.)

Fixed Income	Long-Term Expected Real Rate of Return	Benchmark Index
Broad Fixed Income	2.80 %	Bloomberg Barclays U.S. Aggregate TR
Int. Government	2.20 %	Bloomberg Barclays U.S. Govt TR
High Yield	4.50 %	Bloomberg Barclays U.S. High Yield TR
Global Aggregate	1.70 %	Bloomberg Barclays U.S. Global Aggregate TR
Bank Loans	4.90 %	Credit Suisse Leveraged Loans
Emerging Market Debt	6.30 %	JP Morgan EMBI Global TR
Equities		
Broad U.S. Equity	7.30 %	Russell 3000
Global Equity	7.40 %	MSCI ACWI
Broad Non-U.S. Equity	7.60 %	MSCI EAFE
Emerging Market	8.60 %	MSCI Emerging Markets
Hedge Fund		
Hedge Funds	5.00 %	HFRI Fund of Funds Composite Index
Real Estate		
Real Estate – Core	7.60 %	NCREIF Fund Index
Public REITs	7.10 %	NAREIT
Opportunistic Real Estate	11.70 %	NCREIF Property Index
Real Asset		
MLPs	7.60 %	Alerian MLP Index
Global Infrastructure	7.50 %	Dow Jones Brookfield Global Infrastructure Index
Private Equity		
Private Equity	11.10 %	Cambridge Associates
Private Debt	10.00 %	Cambridge Associates
Cash		
TIPS	3.80 %	Bloomberg Barclays US TIPS TR
91 Day T-Bills	1.20 %	

The above table reflects the expected real rate of return for each major asset class. The expected inflation rate is projected at 2.0% for the same time period.

IV. OTHER INFORMATION (continued)

G. NET PENSION LIABILITY (continued)

Discount Rate: The discount rate used to measure the total pension liability was 7.55%. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and the participating governmental entity contributions will be made at rates equal to the difference between the actuarially determined contribution rates and the member rate. Based on those assumptions, the pension plan's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods on projected benefit payment to determine the total pension liability.

Sensitivity of the net pension liability: The following presents the net pension liability of the Fund, calculated using the discount rate of 7.55%, as well as what the Fund's net pension liability would be if it were calculated using a discount rate that is 1% lower or 1% higher than the current rate:

	1% Decrease 6.55%	Discount Rate 7.55%	1% Increase 8.55%
Total Pension Liability	$ 12,984,587,892	$ 11,774,268,695	$ 10,743,736,185
Plan Fiduciary Net Position	5,688,383,351	5,688,383,351	5,688,383,351
Collective Net Pension Liability	$ 7,296,204,541	$ 6,085,885,344	$ 5,055,352,834
Plan Fiduciary Net Position as a Percentage of the Total Pension Liability	43.8%	48.3%	52.9%

H. GUARANTEE OF BENEFITS

Benefits under the Pension fund are guaranteed by statute. In the event that employee contributions do no equal required benefits, the City's General Fund must provide any shortfall.

I. PARTICIPATION IN THE PENSION FUND

The trustees for the Pension Fund are also members of the Fund and as such, are subject to the provisions of the Fund as described in the notes to these financial statements.

J. SUBSEQUENT EVENTS

Management evaluated subsequent events as of the date the financial statements were available to be issued. Management noted no items which would require disclosure in the financial statements.

IV. OTHER INFORMATION (continued)

K. REPORTING INFORMATION FOR PARTICIPATING EMPLOYERS

Changes in Collective Net Pension Liability: The following table shows the changes in total pension liability (TPL), the plan fiduciary net position (i.e., fair value of the System assets) (FNP), and the net pension liability (NPL) during the measurement period ended on June 30, 2019.

Change in Collective Net Pension Liability

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balances at 6/30/2018	$ 11,510,667,823	$ 5,341,285,527	$ 6,169,382,296
Changes for the year:			
Service cost	183,755,848		$ 183,755,848
Interest	857,348,582		857,348,582
Changes of benefits	378,455		378,455
Differences between expected and actual experience	11,097,845		11,097,845
Changes of assumptions	53,488,769		53,488,769
Contributions - employer		797,805,518	(797,805,518)
Contributions - member		99,179,683	(99,179,683)
Net investment income		303,735,946	(303,735,946)
Benefit payments	(842,468,627)	(842,468,627)	0
Administrative expense		(11,154,696)	11,154,696
Net Changes	263,600,872	347,097,824	(83,496,952)
Balances at 6/30/2019	$ 11,774,268,695	$ 5,688,383,351	$ 6,085,885,344

Employer's Proportionate Shares: GASB 68 requires that the proportionate share for each employer be determined based upon the "employer's projected long-term contribution effort to the pension…as compared to the total long-term contribution effort of all employers." In addition to the City, three quasi-governmental agencies currently participate in the system, PHDC, PPA, and PMA. The method of allocation is based on the ratio of quasi-agency contributions in proportion to total contributions of the plan.

IV. OTHER INFORMATION (continued)

K. REPORTING INFORMATION FOR PARTICIPATING EMPLOYERS (continued)

Pension amounts by employer: The following schedule presents the pension amounts for each participating employer: Philadelphia Parking Authority (PPA), Philadelphia Municipal Authority (PMA), Philadelphia Housing Development Corporation (PHDC), and the City of Philadelphia (City):

Schedule of Pension Amounts by Employer

	For the year ended	PPA	PMA	PHDC	City	Total
Collective pension expenses		$ 16,393,565	$ 411,899	$ 1,482,835	$ 805,508,932	$ 823,797,231
Change in proportion		(6,798,067)	320,838	(1,134,625)	7,611,853	-
Contribution difference		6,372,084	67,422	488,547	(6,928,052)	-
Employer pension expense		15,967,582	800,159	836,757	806,192,733	823,797,231
Net pension liability	6/30/18	132,024,781	2,467,753	11,721,826	6,023,167,936	6,169,382,296
Net pension liability	6/30/19	121,109,118	3,042,943	10,954,594	5,950,778,689	6,085,885,344
Change in net pension liablility		(10,915,663)	575,190	(767,232)	(72,389,247)	(83,496,952)
Deferred outflows	6/30/18	27,191,684	511,556	2,071,464	352,592,300	382,367,004
Deferred outflows	6/30/18	14,583,914	712,752	1,237,713	235,767,146	252,301,525
Change in deferred outflows		(12,607,770)	201,196	(833,751)	(116,825,154)	(130,065,479)
Deferred inflows	6/30/18	(38,017,115)	(171,458)	(4,180,348)	(22,243,931)	(64,612,852)
Deferred inflows	6/30/19	(29,582,073)	(93,147)	(2,918,062)	(11,442,756)	(44,036,038)
Change in deferred inflows		8,435,042	78,311	1,262,286	10,801,175	20,576,814
Employer contributions		22,710,517	504,477	2,032,524	772,558,000	797,805,518
Employer pension expense		15,967,582	800,159	836,757	806,192,733	823,797,231

IV. OTHER INFORMATION (continued)

K. REPORTING INFORMATION FOR PARTICIPATING EMPLOYERS (continued)

Reconciliation of Net Pension Liability

The following table reconciles the Collective Net Pension Liability to the amount reported in the Statement of Net Position included in the City of Philadelphia's Comprehensive Annual Financial Report:

Reconciliation of Collective Net Pension Liability to the Primary Government Net Pension Liability

(Amounts in thousands of USD)

Municipal Pension Fund	Proportionate Share of NPL	Discretely Presented Component Units	City and Blended Component Units
City	5,950,779	-	5,950,779
PPA	121,109	121,109	-
PMA	3,043	-	3,043
PHDC (1)	10,955	10,955	-
Collective Net Pension Liability	6,085,885	132,064	5,953,822
State Pension Fund			
PICA			1,553
City's Primary Government Net Pension Liability (Exhibit I)			5,955,375

(1) PHDC does not appear in the Component Unit Financial Statements (Exhibit XI Statement of Net Position and Exhibit XII Statement of Activities) due to immaterially.

Deferred Outflows by Employer

The following table summarizes the deferred outflows allocated to each employer for experience, assumption changes, investment returns, and contribution differences:

Schedule of Employer's Deferred Outflows

	PPA	PMA	PHDC	CITY	Total
Proportionate Shares	1.99%	0.05%	0.18%	97.78%	100.00%
Experience	$ 981,399	$ 24,658	$ 88,770	$ 48,221,693	$ 49,316,520
Assumption changes	2,162,374	54,331	195,592	106,249,723	108,662,020
Investment return	1,000,710	25,143	90,517	49,170,578	50,286,948
Proportion change	-	468,130	-	32,125,152	32,593,282
Contribution difference	10,439,431	140,490	862,834	-	11,442,755
	$ 14,583,914	$ 712,752	$ 1,237,713	$ 235,767,146	$ 252,301,525

The Water Fund's proportionate share of Deferred Outflows of Resources related to the pension plan as of June 30, 2019 and 2018 was $15,956,997 and $24,543,646, respectively.

IV. OTHER INFORMATION (continued)

K. REPORTING INFORMATION FOR PARTICIPATING EMPLOYERS (continued)

Deferred Inflows by Employer

The following table summarizes the deferred inflows allocated to each employer for experience, assumptions changes, investment return, and contribution differences:

Schedule of Employer's Deferred Inflows

	PPA	PMA	PHDC	CITY	Total
Proportionate Shares	1.99%	0.05%	0.18%	97.78%	100.00%
Experience	$ -	$ -	$ -	$ -	$ -
Assumption changes	-	-	-	-	-
Investment return	-	-	-	-	-
Proportion change	(29,582,073)	(93,147)	(2,918,062)	-	(32,593,282)
Contribution difference	-	-	-	(11,442,756)	(11,442,756)
	$ (29,582,073)	$ (93,147)	$ (2,918,062)	$ (11,442,756)	$ (44,036,038)

The Water Fund's proportionate share of Deferred Inflows of Resources related to the pension plan as of June 30, 2019 and 2018 was $542,404 and $1,336,290, respectively.

Recognition of Deferred Outflows and Inflows by Employer

The following table shows the net amount of deferred outflows and inflows to be recognized by each participating employer in each of the next five years and the total thereafter:

Schedule of Employer's Recognition of Deferred Outflows and Inflows

For Year Ending	PPA	PMA	PHDC	CITY	Total
2020	$ (9,642,669)	$ 167,382	$ (1,215,146)	$ 157,346,952	$ 146,656,519
2021	(5,654,225)	148,894	(567,059)	13,609,122	7,536,732
2022	17,131	148,343	38,966	20,186,609	20,391,049
2023	281,605	154,988	62,888	33,181,707	33,681,188
2024	-	-	-	-	-
Thereafter	-	-	-	-	-
	$ (14,998,158)	$ 619,607	$ (1,680,351)	$ 224,324,390	$ 208,265,488

IV. OTHER INFORMATION (continued)

2. ACCUMULATED UNPAID SICK LEAVE

Employees are credited with varying amounts of sick leave according to type of employee and/or length of service. Employees may accumulate unused sick leave to predetermined balances. Employees (upon retirement only) are paid varying amounts ranging from 25% to 60% of unused sick time, not to exceed predetermined amounts. Employees, who separate for any reason other than indicated above, forfeit their entire sick leave. The City budgets for and charges the cost of sick leave as it is taken.

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB)

Plan Description: The City of Philadelphia self-administers a single employer, defined benefit plan that provides OPEB for all eligible retirees. No assets are accumulated in a trust that meets the criteria in paragraph 4 of GASB Statement No. 75.

Benefits Provided: The City of Philadelphia subsidizes health care for five years from the time of coverage election for eligible retirees. Certain union represented employees may defer their coverage until a later date, but the amount that the City pays for their health care is limited to the amount that the City would have paid at the date of their retirement. The City also provides lifetime insurance coverage for all eligible retirees. Firefighters are entitled to $7,500 coverage and all other employees receive $6,000 in coverage. The plan does not issue stand-alone financial statements, and the accounting for the plan is reported within the financial statements of the City of Philadelphia.

Funding Policy: The City's funding policy is to pay the net expected benefits for the current retirees. To provide health care coverage, the City pays a negotiated monthly premium for retirees covered by union contracts and is self-insured for non-union employees. The City's contributions are estimated to be about $96.9 million for fiscal year ended June 30, 2019.

Employees covered by benefit terms: At July 1, 2018, the following employees were covered by the benefit terms:

Medical Coverage:	
Inactive employees or beneficiaries currently receiving medical coverage	3,572
DROPS with medical coverage	1,944
Inactive employees entitled to, but not yet receiving medical coverage	444
Active employees	28,845
Total	34,805
Life Insurance Coverage	
Inactive employees or beneficiaries currently receiving life insurance coverag	27,798
Active employees	28,845
Total	56,643

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

Total OPEB Liability: The City's total OPEB liability of $1,823,900,000 was measured as of June 30, 2018 and was determined by an actuarial valuation as of that date. The Water Fund's proportionate share of the OPEB liability as of June 30, 2019 was $137,036,000.

Actuarial assumptions and other inputs: The total OPEB liability in the June 30, 2018 actuarial valuation was determined using the following actuarial assumptions and other inputs, applied to all periods included in the measurement, unless otherwise specified.

Measurement Date: June 30, 2017 and June 30, 2018; reporting dates June 30, 2018 and June 30, 2019.

Discount Rate: The discount rate as of June 30, 2018 is 3.87%, which is the 20-year bond buyer index rate as of June 28, 2018. The discount rate that was used for June 30, 2017 liability calculation is 3.58%, which is the 20-year bond buyer index rate as of June 29, 2017.

Salary Increase Rate:

Age	Municipal and Elected Officials	Uniformed
<20	20.00%	20.00%
20 - 24	18.00%	11.00%
25 - 29	10.00%	7.00%
30 - 34	7.00%	5.00%
35 - 39	5.75%	4.25%
40 - 44	5.00%	4.00%
45 - 49	4.60%	3.50%
50 - 54	4.35%	3.30%
55 - 59	4.10%	3.00%
60 - 64	3.85%	3.00%
65 +	3.50%	2.75%

Per Person Cost Trends: The trend rates represent the annual rate of increase in employer claim payments, employer premiums (including those paid to union-sponsored plans), and retiree contributions.

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

To Year	Medical		Rx		Medical /Rx Combined	
Beginning July 1	Pre Medicare	Medicare Eligible	Pre Medicare	Medicare Eligible	Pre Medicare	Medicare Eligible
2019	8.00%	6.00%	9.00%	8.00%	8.20%	6.40%
2020	7.50%	5.75%	8.75%	7.75%	7.75%	6.15%
2021	7.00%	5.50%	8.50%	7.50%	7.30%	5.90%
2022	6.50%	5.25%	8.25%	7.25%	6.85%	5.65%
2023	6.28%	5.24%	7.74%	6.91%	6.57%	5.57%
2024	6.06%	5.23%	7.23%	6.56%	6.29%	5.49%
2025	5.84%	5.22%	6.72%	6.22%	6.02%	5.42%
2026	5.62%	5.21%	6.21%	5.87%	5.74%	5.34%
2027	5.40%	5.19%	5.69%	5.53%	5.46%	5.26%
2028	5.18%	5.18%	5.18%	5.18%	5.18%	5.18%
2029	5.18%	5.18%	5.18%	5.18%	5.18%	5.18%
2030	5.18%	5.18%	5.18%	5.18%	5.18%	5.18%
2031	4.87%	4.87%	4.87%	4.87%	4.87%	4.87%
2032	4.68%	4.68%	4.68%	4.68%	4.68%	4.68%
2033	4.56%	4.56%	4.56%	4.56%	4.56%	4.56%
2034	4.47%	4.47%	4.47%	4.47%	4.47%	4.47%
2035	4.40%	4.40%	4.40%	4.40%	4.40%	4.40%
2036	4.35%	4.35%	4.35%	4.35%	4.35%	4.35%
2037	4.31%	4.31%	4.31%	4.31%	4.31%	4.31%
2038	4.19%	4.19%	4.19%	4.19%	4.19%	4.19%
2039	4.06%	4.06%	4.06%	4.06%	4.06%	4.06%
2040 +	3.94%	3.94%	3.94%	3.94%	3.94%	3.94%

Dental and vision costs are assumed to increase at 3% per year.

Retirees Share of Benefit Related Costs:

Percent of Retirees Electing Coverage

Participation rate for medical coverage

- 85% of future retirees from Non-Represented groups are assumed to elect post-retirement medical covers.
- 100% of future retirees from represented groups (DC 33, DC 47, Fire, and Police) are assumed to elect post-retirement medical coverage.
- 100% of DROP participants are assumed to continue in DROP for the remainder of their DROP period (maximum four years) and then retire with a medical benefit.

Participation rate for life insurance

- 95% of current and future retired firefighters who participated in the pension plan are assumed to be covered by City-provided life insurance.
- 87% of all other current and future retired pension plan participants are assumed to be covered by City-provided life insurance.

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

Mortality Rates:

It is assumed deaths of active municipal and elected members, 110% and 115%, for males and females, respectively, follows RP-2014 Employee Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017.

It is assumed deaths of active uniformed members follow 85% of the RP-2014 Blue Collar Employee Table projected from base year of 2006 to 2021 using mortality improvements scale MP-2017.

For municipal and elected members, 127% and 119% for males and females, respectively, the rate of post-retirement and post-disability mortality follow RP-2014 Healthy Annuitant Table projected from base year 2006-2021 using mortality improvement scale MP-2017.

For uniformed members, the rate of post-retirement and post-disability mortality follow 115% of the RP-2014 Blue Collar Healthy Annuitant Table projected from base year of 2006 to 2021 using mortality improvement scale MP-2017.

For municipal and elected members, the rate of post-disability mortality follows 95% of the RP-2014 Disabled Retiree Table projected from base year 2006-2021 using mortality improvement scale MP-2017.

For uniformed members, the rate of post-disability mortality follows 80% of the RP-2014 Disabled Retiree Table projected from base year 2006-2021 using mortality improvement scale MP-2017.

Change in the Total OPEB Liability:

The table below shows the changes in the Total OPEB Liability (TOL), the plan fiduciary net position (i.e., the fair value of Plan assets) (FNP), and the Net OPEB Liability (NOL) during the measurement period ended on June 30, 2018.

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

Change in Net OPEB Liability	Increase (Decrease)		
	Total OPEB Liability (a)	Plan Fiduciary Net Position (b)	Net OPEB Liability (a) - (b)
Balances at 6/30/2017	$ 1,861,600,000	$ 0	$ 1,861,600,000
Changes for the year:			
Service cost	81,800,000		81,800,000
Interest	67,900,000		67,900,000
Changes of benefits	0		0
Differences between expected/actual	56,800,000		56,800,000
Changes of assumptions	(147,800,000)		(147,800,000)
Contributions - employer		96,400,000	(96,400,000)
Contributions - non employer		0	0
Contributions - member		0	0
Net investment income		0	0
Benefit payments	(96,400,000)	(96,400,000)	0
Administrative expense		0	0
Net changes	(37,700,000)	0	(37,700,000)
Balances at 6/30/2018	$ 1,823,900,000	$ 0	$ 1,823,900,000

During the measurement year, the NOL decreased by approximately $37.7 million. The service cost and interest cost increased the NOL by approximately $149.7 million while contributions decreased the NOL by approximately $96.4 million. The employer contribution of $96.4 million is based on a blend of actual contributions and estimated contributions based on the prior report. Because a portion of the contribution is estimated, this was reviewed by the City for reasonability.

There was a loss of $56.8 million due to experience. This is due to the change in population between the June 30, 2016 valuation and the June 30, 2018 valuation.

There were no benefit changes during the measurement period.

There were assumption changes, such as the change in the 20-year bond buyer index rate, the change in the medical claims and trend assumptions, and the change in the demographic assumptions, that resulted in a gain in the liability by $147.8 million.

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

Sensitivity of the total OPEB liability to changes in the discount rate:

The following represents the total OPEB liability (TOL) of the City, as well as what the City's total liability would be if it were calculated using a discount rate that is 1-percentage-point lower (2.87%) or 1-percentage-point higher (4.87%) than the current discount rate:

Changes in the discount rate affect the measurement of the TOL. Lower discount rates produce a higher TOL and higher discount rates produce a lower TOL. The table below shows the sensitivity of the NOL to the discount rate.

Sensitivity of Net OPEB Liability to Changes in Discount Rate	1% Decrease 2.87%	Discount Rate 3.87%	1% Increase 4.87%
Total OPEB Liability	$ 1,972,700,000	$ 1,823,900,000	$ 1,688,600,000
Plan Fiduciary Net Position	-	-	-
Net OPEB Liability	$ 1,972,700,000	$ 1,823,900,000	$ 1,688,600,000
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	0.0%	0.0%	0.0%

A one percent decrease in the discount rate increases the TOL and NOL by approximately 8%. A one percent increase in the discount rate decreases the TOL and NOL by approximately 7%.

Sensitivity of the total OPEB liability to changes in the healthcare cost trend rates.
The following represents the total OPEB liability of the City, as well as what the City's total liability would be if it were calculated using healthcare cost trend rates that are 1-percentage-point lower or 1-percentage-point higher than the current discount rate:

Changes in healthcare trends affect the measurement of the TOL. Lower healthcare trends produce a lower TOL and higher healthcare trends produce a higher TOL. The table below shows the sensitivity of the NOL to the healthcare trends.

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

Sensitivity of Net OPEB Liability to Changes in Healthcare Cost Trend Rates	1% Decrease	Healthcare Trend	1% Increase
Total OPEB Liability	$ 1,659,800,000	$ 1,823,900,000	$ 2,016,100,000
Plan Fiduciary Net Position	-	-	-
Net OPEB Liability	$ 1,659,800,000	$ 1,823,900,000	$ 2,016,100,000
Plan Fiduciary Net Position as a Percentage of the Total OPEB Liability	0.0%	0.0%	0.0%

A one percent decrease in the healthcare trends decreases the TOL and NOL by approximately 9%. A one percent increase in the healthcare trend rate increases the TOL and NOL by approximately 11%.

OPEB Expense and Deferred Outflows of Resources and Deferred Inflows of Resources Related to OPEB.

For the year ended June 30, 2019, the City recognized OPEB expense of $124,500,000. The table below shows the development of OPEB expense.

Calculation of OPEB Expense		
Fiscal Year Ending	**June 30, 2019**	**June 30, 2018**
Measurement Year Ending	**June 30, 2018**	**June 30, 2017**
Change in Net OPEB Liability	$ (37,700,000)	$ (75,000,000)
Change in Deferred Outflows	(50,500,000)	0
Change in Deferred Inflows	116,300,000	90,500,000
Non Employer Contributions	-	
Employer Contributions	96,400,000	114,800,000
OPEB Expense	**$ 124,500,000**	**$ 130,300,000**
OPEB Expense as % of Payroll	**6.90%**	**7.47%**
Operating Expenses		
Service cost	$ 81,800,000	$ 89,300,000
Employee contributions	-	-
Administrative expenses	-	-
Total	$ 81,800,000	$ 89,300,000
Financing Expenses		
Interest cost	$ 67,900,000	$ 56,100,000
Expected return on assets	-	-
Total	$ 67,900,000	$ 56,100,000
Changes		
Benefit changes	$ 0	$ 0
Recognition of assumption changes	(31,500,000)	(15,100,000)
Recognition of liability gains and losses	6,300,000	0
Recognition of investment gains and losses	-	0
Total	$ (25,200,000)	$ (15,100,000)
OPEB Expense	**$ 124,500,000**	**$ 130,300,000**

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

At June 30, 2019, the City reported deferred outflows of resources and deferred inflow of resources related to OPEB from the following sources:

Schedule of Deferred Inflows and Outflows of Resources as of June 30, 2019 Projected Fiscal Year End June 30, 2018 Measurement Date

	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 50,500,000	$ 0
Changes in assumptions	0	206,800,000
Net difference between projected and actual earnings on OPEB plan investments	0	0
Contributions subsequent to the measurement date	96,900,000	0
Total	$ 147,400,000	$ 206,800,000

Amounts reported as deferred outflows and deferred inflows of resources will be recognized in OPEB expense as follows:

Year ended June 30:	
2020	(25,200,000)
2021	(25,200,000)
2022	(25,200,000)
2023	(25,200,000)
2024	(25,100,000)
Thereafter	$ (30,400,000)

The subsequent contributions after the measurement date are reflected as a deferred outflow of resources, but this is not subject to a deferred recognition period in the OPEB expense. Instead, this will be fully recognized in the OPEB expense for the fiscal year ending June 30, 2020.

At June 30, 2019, the Water Fund reported deferred outflows of resources and deferred inflow of resources related to OPEB from the following sources:

	Deferred Outflows of Resources	Deferred Inflows of Resources
Changes in assumptions	$ 3,712,000	$ 15,345,000
Contributions subsequent to measurement date	7,277,000	-
Total	$ 10,989,000	$ 15,345,000

Amounts reported as deferred outflows and inflows of resources will be recognized in OPEB expense over a six-year period in the amount of ($2,326,600) per year.

IV. OTHER INFORMATION (continued)

3. OTHER POSTEMPLOYMENT BENEFITS (OPEB) (continued)

Required Supplementary Information: The schedule below shows the changes in NOL and related ratios required by GASB.

Schedule of Changes in Net OPEB Liability and Related Ratios		
Measurement Year Ending	**6/30/2018**	**6/30/2017**
Total OPEB Liability		
Service cost (BOY)	$ 81,800,000	$ 89,300,000
Interest (includes interest on service cost)	67,900,000	56,100,000
Changes of benefit terms	0	0
Differences between expected and actual experience	56,800,000	0
Changes of assumptions	(147,800,000)	(105,600,000)
Benefit payments, including refunds of member contributions	(96,400,000)	(114,800,000)
Net change in total OPEB liability	**$ (37,700,000)**	**$ (75,000,000)**
Total OPEB liability - beginning	**1,861,600,000**	**1,936,600,000**
Total OPEB liability - ending	**$ 1,823,900,000**	**$ 1,861,600,000**
Plan fiduciary net position		
Contributions - employer	$ 96,400,000	$ 114,800,000
Contributions - non-employer	-	-
Contributions - member	-	-
Net investment income	-	-
Benefit payments, including refunds of member contributions	(96,400,000)	(114,800,000)
Administrative expense	-	-
Net change in plan fiduciary net position	$ -	$ -
Plan fiduciary net position - beginning	-	-
Plan fiduciary net position - ending	$ -	$ -
Net OPEB liability - ending	**$ 1,823,900,000**	**$ 1,861,600,000**
Plan fiduciary net position as a percentage of the total OPEB liability	0.00%	0.00%
Covered payroll	$ 1,805,400,000	$ 1,744,700,000
Net OPEB liability as a percentage of covered payroll	101.02%	106.70%

The Plan is not currently being pre-funded so there is no actuarially determined contribution shown below. The actuarially determined contribution is a target or recommended contribution to the OPEB plan for the reporting period, determined in conformity with Actuarial Standards of Practice based on the most recent measurement available when the contributions for the reporting period was adopted. The Actuarial Required Contribution (ARC) determined under GASB 45 is not a recommended contribution under Actuarial Standards of Practice, and thus is not shown below. If the Plan decides to pre-fund the liabilities; the actuary will provide an appropriate actuarially determined contribution.

IV. OTHER INFORMATION (continued)

4. PENNSYLVANIA INTERGOVERNMENTAL COOPERATION AUTHORITY (PICA)

PICA, a body corporate and politic, was organized in June 1991 and exists under and by virtue of the Pennsylvania Intergovernmental Cooperation Authority Act for Cities of the First Class (the Act). Pursuant to the Act, PICA was established to provide financial assistance to cities of the first class. The City currently is the only city of the first class in the Commonwealth of Pennsylvania. Under the Act, PICA is administered by a governing Board consisting of five voting members and two ex officio non-voting members. The Governor of Pennsylvania, the President Pro Tempore of the Pennsylvania Senate, the Minority Leader of the Pennsylvania Senate, the Speaker of the Pennsylvania House of Representatives and the Minority Leader of the Pennsylvania House of Representatives each appoints one voting member to the Board.

The Act provides that, upon PICA's approval of a request of the City to PICA for financial assistance, PICA shall have certain financial and oversight functions. First, PICA shall have the power to issue bonds and grant or lend the proceeds thereof to the City. Second, PICA also shall have the power, in its oversight capacity, to exercise certain advisory and review powers with respect to the City's financial affairs, including the power to review and approve five-year financial plans prepared at least annually by the City and to certify noncompliance by the City with its current five-year financial plan (which certification would require the Secretary of the Budget of the Commonwealth of Pennsylvania to cause certain Commonwealth payments due to the City to be withheld).

PICA bonds are payable from the proceeds of a PICA tax on the wages and income earned by City residents. The City has reduced the amount of wage and earnings tax that it levies on City residents by an amount equal to the PICA tax so that the total tax remains the same. PICA returns to the City any portion of the tax not required to meet their debt service and operating expenses. In Fiscal 2019, this transfer amounted to $494.0 million.

5. RELATED PARTY TRANSACTIONS

The City is associated, through representation on the respective Board of Directors, with several local governmental organizations and certain quasi-governmental organizations created under the laws of the Commonwealth of Pennsylvania. These organizations are separate legal entities having governmental character and sufficient autonomy in the management of their own affairs to distinguish them as separate independent governmental entities.

IV. OTHER INFORMATION (continued)

5. RELATED PARTY TRANSACTIONS (continued)

A list of such related party organizations and a description of significant transactions with the City, where applicable, is as follows:

A. SOUTHEASTERN PENNSYLVANIA TRANSPORTATION AUTHORITY (SEPTA)

During the year the City provided an operating subsidy of $84.61 million to SEPTA.

B. OTHER ORGANIZATIONS

The City provides varying levels of subsidy and other support payments which totaled $99.86 million during the year to the following organizations:

- Philadelphia Health Management Corporation
- Philadelphia Industrial Development Corporation
- Fund for Philadelphia Incorporated

6. RISK MANAGEMENT

The City is exposed to various risks of loss related to torts; theft of, damage to, and destruction of assets; errors and omissions; injuries to employees; and natural disasters. The City (except for Aviation Fund operations, the Municipal Authority, and PICA) is self-insured for fire damage, casualty losses, public liability, Workers’ Compensation and Unemployment Compensation. The Aviation Fund is self-insured for Workers' Compensation and Unemployment Compensation and insured through insurance carriers for other coverage. The City is self-insured for medical benefits provided to employees in the Fraternal Order of Police, its city-administered health plan, the International Association of Fire Fighters, and District Council 47.

The City covers all claim settlements and judgments, except for those discussed above, out of the resources of the fund associated with the claim. Claim expenditures and liabilities are reported when it is probable that a loss has occurred and the amount of the loss can be reasonably estimated. These losses include: an estimate of claims that have been incurred but not reported; the effects of specific, incremental claims adjustment expenditures, salvage, and subrogation; and unallocated claims adjustment expenditures.

IV. OTHER INFORMATION (continued)

6. RISK MANAGEMENT (continued)

At June 30, the amount of these liabilities was $354.2 million for the Primary Government. This liability is the City's best estimate based on available information. Changes in the reported liability since June 30, 2016 resulted from the following:

(Amounts in Millions of USD)

	Beginning Liability	Current Year Claims & Changes In Estimates	Claim Payments	Ending Liability
Fiscal 2017	350.3	243.9	(229.1)	365.1
Fiscal 2018	365.1	199.3	(211.4)	353.0
Fiscal 2019	353.0	207.9	(217.0)	343.9

The City's Unemployment Compensation and Workers' Compensation coverages are provided through its General Fund. Unemployment Compensation and Workers' Compensation coverages are funded by a pro rata charge to the various funds. Payments for the year were $3.5 million for Unemployment Compensation claims and $69.85 million for Workers' Compensation claims.

The City's estimated outstanding workers' compensation liabilities are $261.4 million discounted at 3.5%. On an undiscounted basis, these liabilities total $344.5 million. These liabilities include provisions for indemnity, medical and allocated loss adjustment expense (ALAE). Excluding the ALAE, the respective liabilities for indemnity and medical payments relating to workers' compensation total $239.7 million (discounted) and $318.2 million (undiscounted). The Water Fund's accrued liability for workers' compensation was $23.5 million and $23.7 million at June 30, 2019 and 2018, respectively.

During the last five (5) fiscal years, no claim settlements have exceeded the level of insurance coverage for operations using third party carriers. None of the City's insured losses have been settled with the purchase of annuity contracts.

7. CONTINGENCIES

Generally, claims against the City are payable out of the General Fund, except claims against the City Water Department, City Aviation Division, or Component Units which are paid out of their respective funds and only secondarily out of the General Fund which is then reimbursed for the expenditure. Unless specifically noted otherwise, all claims hereinafter discussed are payable out of the General Fund or the individual

IV. OTHER INFORMATION (continued)

7. CONTINGENCIES (continued)

Enterprise Fund. The Act of October 5, 1980, P.L. 693, No. 142, known as the "Political Subdivision Tort Claims Act", established a $500,000 aggregate limitation on damages arising from the same cause of action or transaction or occurrence or series of causes of action, transactions or occurrences with respect to governmental units in the Commonwealth such as the City. The constitutionality of that aggregate limitation has been upheld by the United States Supreme Court. There is no such limitation under federal law.

Various claims have been asserted against the City and in some cases lawsuits have been instituted. Many of these claims are reduced to judgment or otherwise settled in a manner requiring payment by the Water Fund. The aggregate estimate of loss deemed to be probable as of June 30, 2019 and 2018 is approximately $5.4 million and $5.6 million, respectively. This amount has been included on the Statement of Net Position under Other Long-Term Liabilities.

The City's aggregate estimate of loss deemed to be probable is approximately $320.5 million. Of this amount, $36.13 million is charged to the current operations of the Enterprise Funds. The remaining $284.44 million pertaining to the General Fund is reflected in the City's Government Wide Statements

In addition to the above, there are certain lawsuits against the City for which an additional loss is reasonably possible. These lawsuits relate to General Fund and Enterprise Fund operations. The aggregate estimate of the amount of loss from these lawsuits in which some amount of loss is reasonably possible is approximately $76.1 million from the General Fund, $8.0 million from the Water Fund and $4.2 million from the Aviation Fund. This represents the best estimate of the entire current inventory of such litigation and pre-suits as of February 10, 2020.

8. SUBSEQUENT EVENTS

In preparing the accompanying financial statements, the Water Fund has reviewed events that occurred subsequent to June 30, 2019 through and including February 25, 2020. The following events are described below:

- In February 2019, the City Bond Committee approved the terms and provisions of its Water and Wastewater Revenue Refunding Bonds Series 2020 (Forward Delivery) to allow for the issuance in October 2020 of $127.7 million of the

IV. OTHER INFORMATION (continued)

8. SUBSEQUENT EVENTS

Series 2020 Bonds to refund all of the outstanding Series 2011A Bonds in the amount of $135.0 million and to pay the costs of issuing the Series 2020 Bonds. The total proceeds of the Series 2020 Bonds will be $138.6 million (which includes a premium of $10.9 million). The interest rates of the bonds to be refunded will range from 4.500% to 5.000%. The interest rates of the newly issued bonds will be 5.000%.

In August 2019, the City issued $250.7 million Water and Wastewater Revenue Bonds Series 2019B ("2019B"). The 2019B bonds were issued at an interest rate of 5.000%. The 2019B bonds were issued for the purpose of providing funds which, together with the other available funds of the City, will be used to finance (i) capital improvements of the City's Water and Wastewater systems, (ii) a deposit to the Debt Reserve Account of the Sinking Fund, and (iii) the costs of issuance relating to the Bonds.

9. ACCOUNTS RECEIVABLE

Balances of accounts receivable and allowance for doubtful accounts consisted of the following:

FISCAL YEAR ENDED JUNE 30, 2019

Accounts Receivable	
Billed in the Last Twelve Months	$158,151,911
Billed in 15-year Cycle Billing	3,522,122
Penalties on Receivables	11,000,836
Other Receivables	500,840
Subtotal	173,175,709
Bad Debt Written Off	5,321,610
Total	$167,854,099
Allowance for Doubtful Accounts	$ 12,378,155

IV. OTHER INFORMATION (continued)

9. ACCOUNTS RECEIVABLE (continued)

FISCAL YEAR ENDED JUNE 30, 2018	
Accounts Receivable	
Billed in the Last Twelve Months	$ 147,590,216
Billed in 15-year Cycle Billing	5,484,328
Penalties on Receivables	8,113,183
Other Receivables	4,053,616
Subtotal	165,241,343
Bad Debt Written Off	6,474,206
Total	$ 158,767,137
Allowance for Doubtful Accounts	$ 11,489,296

10. ACCOUNTING FOR THE NEW RIVER CITY PROJECT FUNDS – WATER SINKING FUND RESERVE SUBSTITUTION

Pursuant to the Water Department's General Bond Ordinance, the Sinking Fund Reserve provides a reserve against default of the payment of principal and interest on Water Revenue Bonds when due.

The New River City Ordinance dated January 23, 2007 (Bill No 060005) authorized the purchase and deposit of a surety bond that meets the requirements of the General Ordinance to replace $67,000,000 of the Sinking Fund Reserve Balance. The $67,000,000 was used as follows:

Cost of the surety bond	$ 2,010,000
Legal and financial services	290,000
Management fees	375,000
Costs of certain water and sewer infrastructure components of the New River City Program	64,325,000
Total	$ 67,000,000

The prepaid surety bond was recorded as an asset in the Sinking Fund Reserve and amortized over the lives of the outstanding bonds. The prepaid surety bond was fully amortized as of June 30, 2019.

In connection with the New River City Program, the City executed a program agreement with Philadelphia Authority for Industrial Development ("PAID") to provide program management and oversight for the program. To date, twelve projects totaling $83,697,833 have been executed (disbursements were limited to the $64,325,000). As of June 30, 2016, all projects were completed and all of the project

IV. OTHER INFORMATION (continued)

10. ACCOUNTING FOR THE NEW RIVER CITY PROJECT FUNDS – WATER SINKING FUND RESERVE SUBSTITUTION

funds have been disbursed. The transfer of the water and sewer utilities at Philadelphia Naval Business Center from PAID to the Water Department, including the projects outlined above, occurred in November, 2009.

11. LONG TERM AGREEMENTS

The City has entered into several long term agreements with third parties through the Philadelphia Municipal Authority as follows:

A. Automatic Meter Reading

In 1997, the City, through the PMA, entered into a long-term contract with ITRON for the replacement of residential water meters with new meters equipped with radio transmitter devices and for services and materials required to implement, operate and maintain the Water Department's Automatic Meter Reading ("AMR") System. The agreement with ITRON expired in September 2019.

The Water Department made payments, which are an operating expense of the Water Department, to ITRON for Fiscal Year 2018 of $2,052,000 for meter reading services and $1,880,000 for new water meters. Payments for Fiscal Year 2019 were $3,067,183 for meter reading services and $2,426,770 for new water meters.

B. Biosolids Treatment and Utilization

In 2008, the City entered into a long-term contract and lease with the Philadelphia Municipal Authority (the "PMA") for the PMA to operate the Water Department's existing Biosolids Recycling Center (the "BRC"). The PMA and Philadelphia Biosolids Services, LLC ("PBS") entered into a Service Agreement (the "PBS Service Contract"), pursuant to which PBS designed and built, and currently operates, a facility at the BRC to heat dry and dispose of biosolids captured during wastewater treatment. The PMA is required to make annual payments to PBS for operating the BRC. Pursuant to a Service Agreement between the PMA and the City (the "City Service Contract"), the City assumed all of PMA's obligations under the PBS Service Contract. The obligations under the City Service Contract constitute operating expenses of the Water Department. In Fiscal Years 2018 and 2019, the City paid to PMA, from revenues generated by the Water Department, $21,782,487 and $19,494,403, respectively. The City Service Contract contains adjusters for the Consumer Price Index, Producer Price Index, and fluctuations in fuel prices, among others; thus, expenditures under the City Service Contract may vary over time. The contract expires on October 13, 2028, and contains the possibility of a five-year renewal term at the option of the City. In addition to facilitating compliance with various state

IV. OTHER INFORMATION (continued)
11. LONG TERM AGREEMENTS (continued)

and federal environmental regulations, including the Clean Air Act, the PBS Service Contract has produced cost savings for the Water Department.

C. Northeast Water Pollution Control Plant Digester Gas Cogeneration Facility

In 2011, the City entered into a long-term contract and lease with the PMA for the PMA to arrange the construction, financing, maintenance and sublease of a digester gas cogeneration facility at the Northeast Water Pollution Control Plant. The PMA entered into a lease (the "Lease") with BAL Green Biogas I, LLC, a special purpose entity of Bank of America (the "Lessor"), which requires the PMA to make certain lease payments to the Lessor. Pursuant to a sublease dated December 23, 2011 (the "Sublease"), the City assumed all of the PMA's obligations under the Lease. The obligations under this contract constitute operating expenses of the Water Department. In Fiscal Year 2018 and Fiscal Year 2019, the City paid to the Lessor from revenues generated from the Water Department, $5,937,935 and $6,701,044 respectively. The Sublease expires on September 25, 2029, unless renewed by PMA for an additional term of eighteen months.

D. Advanced Meter Reading Infrastructure

In February 2019, the City, through PMA, entered into a contract with Sensus USA Inc. ("Sensus") for the delivery of an advanced metering infrastructure ("AMI") system for water meter reading, including installation, operation and maintenance of the AMI system. The transition from AMR vendor ITRON to Sensus was completed in September 2019 and Sensus has taken over ITRON's meter reading services. The Water Department expects installation of the AMI system and communications network to take approximately 12 months. The deployment phase, during which AMR equipment will be replaced with AMI units, is expected to take approximately 24 months. The costs for installation and deployment are included in the Water Capital Improvement Program. After the initial installation and deployment phase, the AMI operations and maintenance term of the contract will begin for a term of 20 years, with the option to renew for additional one-year terms for a period of three years. Payments to Sensus constitute operating expenses of the Water Department. In Fiscal Year 2019, the Water Department paid $3,010,125 for services and $470,285 for equipment.

IV. OTHER INFORMATION (continued)

11. LONG TERM AGREEMENTS (continued)

E. Laurel Street Combined Sewer Overflow

In 2011, the City entered into an Amended and Restated Development and Tax and Claim Settlement Agreement (the "Sugarhouse Agreement") with Sugarhouse HSP Gaming, L.P. ("HSP"). Under the terms of the Sugarhouse Agreement, HSP is required to fund the development and expansion of the Laurel Street Combined Sewer Overflow Project. As compensation for the development and expansion of the project, HSP has been allotted a five-year credit against real estate taxes and settlement payments otherwise due to the City. The amount of the credit corresponds to the amount expended by HSP on the Laurel Street Combined Sewer Overflow Project.

The Laurel Street Combined Sewer Overflow Project is a capital asset of the Water Department, and the credit awarded to HSP is a capital expenditure of the Water Department payable to the City. The Water Department paid the City $3,514,421 for Fiscal Year 2016. The Water Department paid the City $7,028,842 in Fiscal Year 2017, which sum included its payment obligations for both Fiscal Years 2017 and 2018 combined. The Water Department's final payment obligation under the terms of the Sugarhouse Agreement occurred during Fiscal Year 2019 for $652,752.

12. COMBINED SEWER OVERFLOW PROGRAM

The PaDEP and the City signed the Consent Order and Agreement ("COA") on June 1, 2011 that allowed the City to officially to embark on the implementation of its strategy known as the Green City, Clean Waters Program to use green and traditional infrastructure investments to substantially mitigate combined sewer overflows ("CSOs") and enhance the quality of local waterways over 25 years.

The Water Department anticipates that over the next 17 years, compliance with the COA will significantly increase capital and operating expenditures related to its Combined Sewer Overflow Program. Moreover, any resulting changes to the COA as a result of the EPA's information request could further increase the costs of compliance. Looking ahead to the 10th-year milestone, the Water Department continues to review program cost and delivery in an effort to optimize the program while satisfying the necessary regulatory requirements. As of the most recent projections, the total cost of the 25-year program is approximately $4.5 billion, of which approximately $3.5 billion are capital related costs and $1 billion are operation and maintenance costs.

IV. OTHER INFORMATION (continued)

12. COMBINED SEWER OVERFLOW PROGRAM (continued)

In its current form, the COA adopts the presumption approach to the management of CSOs. The goal under the presumption approach is to eliminate and remove by 2036 (year 25 of the COA) the mass of pollutants that otherwise would be removed by the capture of 85% by volume city-wide of the combined sewage otherwise collected in the City's combined sewer system during precipitation events. To ensure this ultimate goal is met, the COA requires interim milestones at the end of the fifth, tenth, fifteenth and twentieth years. The interim milestones require the City to achieve specific targets in four categories: (1) Total Greened Acres; (2) Overflow Reduction Volume; (3) Miles of Interceptor Lined; and (4) Wastewater Treatment Plant Upgrades: Design and Construction. The COA includes financial protections in the event that the costs of complying with the COA exceed the Water Department's projections. Should the costs of complying with the COA increase to the extent that the wastewater component of a customer's bill exceeds 2.27% of median household income, the City may petition the PaDEP for an extension of time to satisfy the requirements of the COA so that the financial burden does not become excessive on ratepayers. The COA also includes significant penalties for non-compliance with the various 5-year milestone targets. Penalties start at $25,000 per month for each violation (for the first 6 months) and increase up to $100,000 monthly for uncured violations of 13 months or more.

The City allocated $76 million for capital COA Expenditures in the budgets for both Fiscal Years 2018 and 2019. Since July 1, 2011 through and including June 30, 2019, the Water Department's capital spending for COA projects is approximately $165 million. During the same period, the Water Department has spent $254 million from its operating budget.

IV. OTHER INFORMATION (continued)

13. RESTRICTED ASSETS

Assets whose use is limited to a specific purpose have been classified as "restricted" in the Statement of Fund Net Position.

Restricted assets as of June 30, 2019, comprised the following:

	(Thousands of Dollars)	
	Cash and Investments	**Accrued Interest**
Amounts Reserved for:		
Capital Projects	$ 349,402	$ 1,031
Rate Stabilization	179,793	656
Residual	15,818	63
Sinking Fund	268	1
Sinking Fund Reserve	201,099	965
Total	$ 746,380	$ 2,716

Restricted assets as of June 30, 2018, comprised the following:

	(Thousands of Dollars)	
	Cash and Investments	**Accrued Interest**
Amounts Reserved for:		
Capital Projects	$ 450,667	$ 318
Rate Stabilization	201,759	349
Residual	15,262	23
Sinking Fund	823	-
Sinking Fund Reserve	218,277	446
Total	$ 886,788	$ 1,136

Required Supplementary Information

CITY OF PHILADELPHIA WATER DEPARTMENT
BUDGETARY COMPARISON SCHEDULE
Water Operating Fund
For the Fiscal Year Ended June 30, 2019
(Legally Enacted Basis) **(Thousands of Dollars)**

Revenues	Budgeted Amounts			Final Budget to Actual Positive (Negative)
	Original	Final	Actual	
Locally Generated Non-Tax Revenue	$ 700,211	$ 700,211	$ 705,202	$ 4,991
Revenue from Other Governments	1,000	1,000	698	(302)
Revenue from Other Funds	113,497	113,497	39,967	(73,530)
Total Revenues	**$ 814,708**	**$ 814,708**	**$ 745,867**	**$ (68,841)**
Expenditures and Encumbrances				
Personal Services	143,902	146,108	137,277	8,831
Pension Contributions	77,985	78,877	78,876	1
Other Employee Benefits	60,156	60,212	54,893	5,319
Sub-Total Employee Compensation	282,043	285,197	271,046	14,151
Purchase of Services	206,610	206,610	186,892	19,718
Materials and Supplies	52,367	52,293	45,542	6,751
Equipment	10,520	10,595	7,366	3,229
Contributions, Indemnities and Taxes	9,176	9,176	3,816	5,360
Debt Service	212,992	212,992	190,909	22,083
Payments to Other Funds	71,000	71,000	70,717	283
Advances and Other Miscellaneous Payments	-	-	-	-
Total Expenditures and Encumbrances	844,708	847,863	776,288	71,575
Operating Surplus (Deficit) for the Year	**$ (30,000)**	**$ (33,155)**	**$ (30,421)**	**$ 2,734**
Fund Balance Available, July 1, 2018	-	-	-	-
Operations in Respect to Prior Fiscal Years				
Commitments Cancelled - Net	30,000	30,000	30,421	421
Prior Period Adjustments	-	-	-	-
Adjusted Fund Balance, July 1, 2018	30,000	30,000	30,421	421
Fund Balance Available, June 30, 2019	**$ -**	**$ (3,155)**	**$ -**	**$ 3,155**

City of Philadelphia - Schedule of Changes in Net OPEB Liability and Related Ratios *(Amounts of USD)*

	FYE 2018	FYE 2017
Total OPEB Liability		
Service Cost (BOY)	81,800,000	89,300,000
Interest (includes interest on service cost)	67,900,000	56,100,000
Changes of benefit terms	0	-
Differences between expected and actual experience	56,800,000	-
Changes of assumptions	(147,800,000)	(105,600,000)
Benefit payments, including refunds of member contributions	(96,400,000)	(114,800,000)
Net change in total OPEB liability	**(37,700,000)**	**(75,000,000)**
Total OPEB liability - beginning	1,861,600,000	1,936,600,000
Total OPEB liability - ending	**1,823,900,000**	**1,861,600,000**
Plan fiduciary net position		
Contributions - employer	96,400,000	114,800,000
Contributions - non-employer	-	-
Contributions - member	-	-
Net investment income	-	-
Benefit payments, including refunds of member contributions	(96,400,000)	(114,800,000)
Administrative expense	-	-
Net change in plan fiduciary net position	-	-
Plan fiduciary net position - beginning	-	-
Plan fiduciary net position - ending	-	-
Net OPEB liability - ending	**1,823,900,000**	**1,861,600,000**
Plan fiduciary net position as a percentage of the total OPEB liability	0.00%	0.00%
Covered-employee payroll	1,805,400,000	1,864,800,000
Net OPEB liability as a percentage of covered-employee payroll	101.02%	99.83%

City of Philadelphia - Municipal Pension Plan - Schedule of Changes in Net Pension Liability *(Amounts of USD)*

	FYE 2019	FYE 2018	FYE 2017	FYE 2016	FYE 2015
Total Pension Liability					
Service Cost (MOY)	183,755,848	164,137,303	157,607,110	148,370,075	143,556,347
Interest (includes interest on service cost)	857,348,582	843,171,926	823,959,345	802,450,569	791,298,503
Changes of benefit terms	378,455	4,064,886	-	-	-
Differences between expected and actual experience	11,097,845	28,937,167	103,878,650	151,918,733	34,909,464
Changes of assumptions	53,488,769	106,021,273	51,441,475	85,147,737	48,146,352
Benefit payments, including refunds of member contributions	(842,468,627)	(828,266,043)	(821,495,227)	(889,343,124)	(881,464,964)
Net change in total pension liability	**263,600,872**	**318,066,512**	**315,391,353**	**298,543,990**	**136,445,702**
Total Pension liability - beginning	11,510,667,823	11,192,601,311	10,877,209,958	10,578,665,968	**10,442,220,266**
Total Pension liability - ending	**11,774,268,695**	**11,510,667,823**	**11,192,601,311**	**10,877,209,958**	**10,578,665,968**
Plan fiduciary net position					
Contributions - employer	797,805,518	781,984,326	706,236,698	660,246,511	577,195,412
Contributions - member	99,179,683	83,288,635	73,607,359	67,055,003	58,657,817
Net investment income	303,735,946	440,326,787	566,624,580	(145,681,480)	13,838,367
Benefit payments, including refunds of member contributions	(842,468,627)	(828,266,043)	(821,495,227)	(889,343,124)	(881,666,036)
Administrative expense	(11,154,696)	(10,123,004)	(8,873,657)	(8,553,837)	(10,478,541)
Net change in plan fiduciary net position	347,097,824	467,210,701	516,099,753	**(316,276,927)**	**(242,452,981)**
Plan fiduciary net position - beginning	5,341,285,527	4,874,074,826	4,357,975,073	4,674,252,416	**4,916,705,397**
Plan fiduciary net position - ending	**5,688,383,351**	**5,341,285,527**	**4,874,074,826**	**4,357,975,073**	**4,674,252,416**
Net pension liability - ending	**6,085,885,344**	**6,169,382,296**	**6,318,526,485**	**6,519,234,885**	**5,904,413,552**
Plan fiduciary net position as a percentage of the total pension liability	48.31%	46.40%	43.55%	40.07%	44.19%
Covered payroll	1,816,114,249	1,805,400,096	1,744,728,288	1,676,548,962	1,597,848,869
Net pension liability as a percentage of covered payroll	335.10%	341.72%	362.15%	388.85%	369.52%

This schedule represents the other postemployment benefits and pension plans of the City of Philadelphia. The Water Department is a department of the City of Philadelphia.

City of Philadelphia Schedule of Collective Contributions (Based on Minimum Municipal Obligations)

Last 10 Fiscal Years
Amounts in Thousands

	FYE 2019	FYE 2018	FYE 2017	FYE 2016	FYE 2015	FYE 2014	FYE 2013	FYE 2012	FYE 2011	FYE 2010
Actuarially determined Contribution	668,281	661,257	629,620	594,975	556,030	523,368	727,604	534,039	463,375	297,446
Contributions in Relation to the Actuarially Determined Contribution	797,806	781,984	706,237	660,247	577,195	553,179	781,823	555,690	470,155	312,556
Contribution Deficiency/(Excess)	(129,525)	(120,727)	(76,617)	(65,272)	(21,165)	(29,811)	(54,219)	(21,651)	(6,780)	(15,110)
Covered Payroll	1,816,114	1,805,400	1,744,728	1,676,549	1,597,849	1,495,421	1,429,723	1,372,174	1,371,274	1,421,151
Contributions as a Percentage of Covered Payroll	43.93%	43.31%	40.48%	39.38%	36.12%	36.99%	54.68%	40.50%	34.29%	21.99%

City of Philadelphia Schedule of Collective Contributions (Based on Revenue Recognition Policy)

Last 10 Fiscal Years
Amounts in Thousands

	FYE 2019	FYE 2018	FYE 2017	FYE 2016	FYE 2015	FYE 2014	FYE 2013	FYE 2012	FYE 2011	FYE 2010
Actuarially determined Contribution	680,808	662,139	629,620	594,975	556,030	523,368	727,604	534,039	463,375	297,446
Contributions in Relation to the Actuarially Determined Contribution	797,806	781,984	706,237	660,247	577,195	553,179	781,823	555,690	470,155	312,556
Contribution Deficiency/(Excess)	(116,998)	(119,845)	(76,617)	(65,272)	(21,165)	(29,811)	(54,219)	(21,651)	(6,780)	(15,110)
Covered Payroll	1,816,114	1,805,400	1,744,728	1,676,549	1,597,849	1,495,421	1,429,723	1,372,174	1,371,274	1,421,151
Contributions as a Percentage of Covered Payroll	43.93%	43.31%	40.48%	39.38%	36.12%	36.99%	54.68%	40.50%	34.29%	21.99%

City of Philadelphia Schedule of Collective Contributions (Based on Funding Policy)

Last 10 Fiscal Years
Amounts in Thousands

	FYE 2019	FYE 2018	FYE 2017	FYE 2016	FYE 2015	FYE 2014	FYE 2013	FYE 2012	FYE 2011	FYE 2010
Actuarially determined Contribution	874,706	871,802	881,356	846,283	798,043	823,885	738,010	722,491	715,544	581,123
Contributions in Relation to the Actuarially Determined Contribution	797,806	781,984	706,237	660,247	577,195	553,179	781,823	555,690	470,155	312,556
Contribution Deficiency/(Excess)	76,900	89,818	175,119	186,036	220,847	270,706	(43,813)	166,801	245,389	268,567
Covered Payroll	1,816,114	1,805,400	1,744,728	1,676,549	1,597,849	1,495,421	1,429,723	1,372,174	1,371,274	1,421,151
Contributions as a Percentage of Covered Payroll	43.93%	43.31%	40.48%	39.38%	36.12%	36.99%	54.68%	40.50%	34.29%	21.99%

Notes to Schedule

Valuation Date	7/1/2017
Timing	Actuarially determined contribution rates are calculated based on the actuarial valuation two years prior to the beginning of the plan year.

Key Methods and Assumptions Used to Determine Contribution Rates:

Actuarial cost method	Entry Age
Asset valuation method	Ten-year smoothed market
Amortization method	Gain/Losses are amortized over closed 20-year periods, assumption changes over 15years, benefit changes for actives over 10 years, benefit changes for inactive members over 1 year, and plan changes mandated by state over 20 years. Under the City's Funding policy, the initial July 1, 1985 unfunded actuarial liability (UAL) is amortized over 34 years ending June 30, 2019, with payments increasing 3.3% per year, the assumed payroll growth. Under the MMO Funding Policy, the July 1, 2009 unfunded actuarial liability (UAL) was "fresh started", to be amortized over 30 years, ending June 30, 2039. This is level dollar amortization of the UAL. Under the RRP Funding Policy, sales tax revenue and additional member contributions are dedicated to fund the unfunded liability instead of reducing the City's obligation such that this revenue is in addition to the MMO would be without these additional assets.
Discount rate	7.65%
Amortization growth rate	3.30%
Salary increases	Age based salary scale
Mortality	Sex distinct RP-2000 Combined Mortality with adjustments and improvements using Scale AA

A complete description of the methods and assumptions used to determine contribution rates for the year ending June 30, 2019 can be found in the July 1, 2017 actuarial valuation.

This schedule represents other postemployment benefits and pension plans of the City of Philadelphia. The Water Department is a department of the City of Philadelphia.

Other Supplementary Information

CITY OF PHILADELPHIA WATER DEPARTMENT
BONDED DEBT
WATER AND WASTEWATER REVENUE BONDS
AS OF DECEMBER 1, 2019

Year End	Principal Requirements	Interest Requirements	Total Debt Service
06/30/2020	105,371,757	100,769,789	206,141,546
06/30/2021	87,860,183	100,005,730	187,865,913
06/30/2022	81,692,298	96,022,380	177,714,678
06/30/2023	79,228,182	92,489,913	171,718,095
06/30/2024	62,682,914	88,829,014	151,511,928
06/30/2025	65,526,576	86,136,331	151,662,907
06/30/2026	69,404,251	83,281,693	152,685,945
06/30/2027	72,466,026	80,279,618	152,745,644
06/30/2028	59,966,987	77,506,884	137,473,871
06/30/2029	65,357,224	74,808,097	140,165,320
06/30/2030	60,611,827	71,958,513	132,570,340
06/30/2031	63,470,889	69,176,635	132,647,523
06/30/2032	63,390,629	66,324,772	129,715,401
06/30/2033	52,377,971	63,983,151	116,361,122
06/30/2034	53,093,383	61,490,351	114,583,735
06/30/2035	55,125,000	58,999,060	114,124,060
06/30/2036	59,055,000	56,468,905	115,523,905
06/30/2037	60,010,000	53,706,299	113,716,299
06/30/2038	63,000,000	50,707,880	113,707,880
06/30/2039	66,160,000	47,555,520	113,715,520
06/30/2040	69,475,000	44,240,817	113,715,817
06/30/2041	78,135,000	41,026,191	119,161,191
06/30/2042	74,515,000	36,788,075	111,303,075
06/30/2043	78,335,000	32,967,256	111,302,256
06/30/2044	76,270,000	28,642,625	104,912,625
06/30/2045	69,135,000	25,007,500	94,142,500
06/30/2046	72,685,000	21,462,000	94,147,000
06/30/2047	40,465,000	18,633,250	59,098,250
06/30/2048	42,545,000	16,558,000	59,103,000
06/30/2049	44,735,000	14,364,906	59,099,906
06/30/2050	47,055,000	12,047,381	59,102,381
06/30/2051	49,490,000	9,609,781	59,099,781
06/30/2052	52,050,000	7,046,044	59,096,044
06/30/2053	54,750,000	4,349,675	59,099,675
06/30/2054	38,000,000	2,017,500	40,017,500
06/30/2055	21,350,000	533,750	21,883,750
Total	**2,254,841,097**	**1,795,795,287**	**4,050,636,384**

(1) Interest on the Series 1997B bonds assumes a rate of 1.154589%, the average interest rate of the bonds during the period 24 consecutive calendar months preceding the date of calculation per the Ordinance.

(2) Totals may not add due to rounding.

CITY OF PHILADELPHIA WATER DEPARTMENT
SUPPLEMENTAL SCHEDULE OF RATE COVENANT COMPLIANCE FOR FISCAL YEARS ENDED
JUNE 30, 2019, 2018, AND 2017 (Legally Enacted Basis)

(amounts in thousands)

LINE NO.		YEAR ENDED JUNE 30, 2019	2018	2017
1.	Total Revenue	741,546	750,070	720,645
2.	Net Operating Expense	(522,415)	(506,184)	(480,257)
2a	Liquidated Encumbrances (Commitments Cancelled which reduces operating expenses)	30,421	32,413	24,550
3.	Transfer (To) From Rate Stabilization Fund	4,321	24,630	4,563
4.	**Net Revenues**	**253,873**	**300,929**	**269,501**
5.	Revenue Bonds Outstanding	(190,869)	(218,483)	(206,142)
6.	Transfer to Escrow Account to Redeem Bonds	-	(19,000)	(11,000)
6a	Other (Adjustment between Debt Service Payments to Sinking Fund, Revenue Bond Payments, LOC expenses and Net Operating Expenses due to timing differences)	(39)	235	1,244
7.	Pennvest Loan	-	-	-
8.	**Total Debt Service**	**(190,908)**	**(237,248)**	**(215,898)**
9.	**Net Revenue after Debt Service**	**62,965**	**63,681**	**53,603**
10.	Transfer to General Fund	-	-	-
11.	Transfer to Capital Fund	(24,879)	(34,776)	(22,302)
12.	Transfer to Residual Fund	(38,086)	(28,905)	(31,301)
13.	**Total Transfers**	**(62,965)**	**(63,681)**	**(53,603)**
14.	**Net Operating Balance for Current Year**	**$ -**	**$ -**	**$ -**

The rate covenant contained in the General Ordinance requires the City to establish rates and charges for the use of the Water and Wastewater Systems to yield Net Revenues, as defined therein, in each fiscal year sufficient to meet three coverage tests:

COVERAGE A: Net Revenues must equal at least 120% of the Debt Service Requirements payable in such fiscal year (excluding debt service due on any Subordinated Bonds).

COVERAGE B: Net Revenues must equal at least 100% of : (i) the Debt Service Requirements (including Debt Service Requirements in respect of Subordinated Bonds) payable is such fiscal year; (ii) amounts required to be deposited into the Debt Reserve Account during such fiscal year; (iii) debt service on all General Obligations Bonds issued for the Water and Wastewater Systems payable is such fiscal year; (iv) debt service on Interim Debt payable in such fiscal year; and (v) the Capital Account Deposit Amount for such fiscal year, less amounts transferred from the Residual Fund to the Capital Account during such fiscal year.

COVERAGE C: Net Revenues (excluding amounts transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such fiscal year) must equal at least equal to 90% of the Debt Service Requirements (excluding debt service on any Subordinated Bonds) payable in such fiscal year.

To ensure compliance with the rate covenant, the General Ordinance requires that the City review its rates, rents, fees, and charges at least annually.

COVERAGE A:

	2019	2018	2017
Line 4	**$ 253,873**	**$ 300,929**	**$ 269,501**
/ Line 5	**$ 190,869**	**$ 218,483**	**$ 206,142**
= COVERAGE A:	**1.33**	**1.38**	**1.31**

COVERAGE B:

Line 4	**$ 253,873**	**$ 300,929**	**$ 269,501**
/ Line 5 + Line 11	**$ 215,748**	**$ 253,259**	**$ 228,444**
= COVERAGE B:	**1.18**	**1.19**	**1.18**

COVERAGE C:

Line 4 - Line 3	**$ 249,552**	**$ 276,299**	**$ 264,938**
/ Line 5	**$ 190,869**	**$ 218,483**	**$ 206,142**
= COVERAGE C:	**1.31**	**1.26**	**1.29**

CITY OF PHILADELPHIA WATER DEPARTMENT
HISTORICAL OPERATING RESULTS FOR FISCAL
YEARS ENDED JUNE 30, 2019, 2018, AND 2017
JUNE 30, 2019

(Thousands of Dollars)

	Year Ended June 30,					
	2019		**2018**		**2017**	
Operating Revenues:						
Sales to General Customers	$	639,028	$	635,072	$	615,886
Wholesale Wastewater Revenues	$	39,515	$	37,428	$	34,652
Services to General and Aviation Fund	$	35,245	$	33,490	$	33,364
Private Fire Connections	$	3,598	$	3,169	$	2,872
Industrial Sewer Surcharge	$	4,699	$	5,628	$	5,911
Other Operating Revenue	$	8,130	$	7,208	$	7,122
Operating Grants	$	698	$	569	$	1,408
Total Operating Revenue	**$**	**730,913**	**$**	**722,564**	**$**	**701,215**
Non-Operating Revenues						
Interest Earnings on Investments [1]	$	3,725	$	1,506	$	920
Other Non-Operating Revenues	$	6,908	$	26,000	$	18,511
Total Non-Operating Revenues	**$**	**10,633**	**$**	**27,506**	**$**	**19,431**
Total Revenues [2]	**$**	**741,546**	**$**	**750,070**	**$**	**720,646**
Operating Expenses [3]	**$**	**522,415**	**$**	**506,184**	**$**	**480,257**
Less: Liquidated Encumbrances (Commitments Cancelled which reduces operating expenses)	$	30,421	$	32,413	$	24,550
Net Operating Expenses	**$**	**491,994**	**$**	**473,771**	**$**	**455,707**
Adjustment: Debt Service and Net Operating Expenses due to timing differences	**$**	**-**	**$**	**-**	**$**	**-**
Excess of Total Operating Revenues over Net Operating Expenses (*Line 9 - Line 17*)	**$**	**238,919**	**$**	**248,793**	**$**	**245,508**
Excess of Total Revenues over Net Operating Expenses (*Line 14 - Line* 17)	**$**	**249,552**	**$**	**276,299**	**$**	**264,939**
Interest Expense:						
Revenue Bonds	$	88,314	$	86,294	$	80,294
Total Interest Expense	**$**	**88,314**	**$**	**86,294**	**$**	**80,294**
Excess of Total Revenues over Net Operating and Interest Expenses (*Line 20 - Line 23*)	**$**	**161,238**	**$**	**190,005**	**$**	**184,645**
Add: Unencumbered Funds Available for Appropriation at Beginning of Fiscal Year	$	-	$	-	$	-
Add: Debt Service Payments to Sinking Fund, Revenue Bond Payments, LOC expenses and Net Operating Expenses due to timing differences	$	(39)	$	235	$	1,244
Deduct: Principal Paid on Bonded Indebtedness During Fiscal Year	$	102,555	$	132,189	$	125,848
Deduct: Transfer to Escrow Account to Redeem Bonds	$	-	$	19,000	$	11,000
Net UnappliedRevenues (Line 24 + Line 25 + Line 26- Line 27 - Line 28)	**$**	**58,644**	**$**	**39,051**	**$**	**49,041**
Deduct: Funds Transferred to Residual Fund (Further Transfer to Capital Account)	$	38,086	$	28,905	$	31,301
Deduct: Funds Transferred to Capital Account (Required Transfer of 1% NPPE)	$	24,879	$	34,776	$	22,302
Transfer (TO)/FROM The Rate Stabilization Fund	$	4,321	$	24,630	$	4,562
Debt Service Coverage Ratio:						
Net Revenues [4]/Total Debt Service and Other Transfers (Line 14-Line17+Line32)/ (Line23+27+Line55)		1.18		1.19		1.18
Net Revenues [4]/Revenue Bond Debt Service (Line 14-Line17+Line32)/ (Line23+27)		1.33		1.38		1.31

1) Only includes interest earnings credited to the Revenue Fund pursuant to the GBO

2) Calculated to include Project Revenues, as defined in the GBO, plus interest earnings from line 10

3) Operating Expenses excludes, pursuant to the GBO, depreciation, amortization, interest and sinking fund charges

4) As defined in GBO

CITY OF PHILADELPHIA WATER DEPARTMENT
WHOLESALE WATER AND WASTEWATER
CUSTOMER REVENUES AND CONTRACT TERMS
FISCAL YEAR ENDED JUNE 30, 2019

		Total Revenue	% Total Revenue *	Contract End Date	COA % **
Wastewater					
Bucks County Water & Sewer Authority (BCWSA)	$	9,370,113.27	1.26%	3/31/2038	N/A
BCWSA - Springfield Township - Erdenheim (1)		2,094,415	0.28%	6/30/2023	0.79%
BCWSA - Bensalem (1)		1,402,274	0.19%	6/30/2023	N/A
BCWSA - Springfield Township - Wyndmoor (1) (2)		363,734	0.05%	6/30/2023	N/A
BCWSA Total		**13,230,536**	**1.78%**		0.79%
Delcora (3)		10,080,694	1.35%	4/1/2028	9.44%
Cheltenham Township		4,103,126	0.55%	6/30/2025	2.43%
Lower Southampton Township		4,007,035	0.54%	6/30/2024	0.96%
Upper Darby Township		2,841,010	0.38%	8/8/2023	N/A
Lower Merion Township		2,545,596	0.34%	N/A	N/A
Abington Township		1,811,341	0.24%	6/30/2023	0.58%
Lower Moreland Township		896,097	0.12%	6/30/2025	0.36%
Other Municipal Revenue		-	0.00%		
Sub-total		**39,515,436**	**5.30%**		**14.56%**
Water					
Aqua Pennsylvania		3,589,560	0.48%	3/1/2026	N/A
Sub-total		**3,589,560**	**0.48%**		
Total Wholesale Revenues	**$**	**43,104,996.18**	**5.78%**		

Note: The Water Department includes capital charges within operation and maintenance charges for all customers except Bensalem, Lower Merion, and Upper Darby.

* The % of Total Revenue is the yearly revenue received by the Township divided by the total yearly revenue of the Water Operating Fund. The FY 2019 total is $745,330,463.

** Consent Order Agreement % (COA) is the Township's share of expenses for the Long Term Control Plan to mitigate combined sewer overflows (CSOs).

(1) Bucks County Water and Sewer Authority purchased the wastewater collection and disposal system of Springfield Township in December 2015 and purchased the wastewater collection system of Bensalem in September 1999.

(2) The total amount of the COA for Springfield Township – Wyndmoor is contained in the Springfield Township – Erdenheim amount.

(3) Delcora allocated capital is based on assets placed in service on or after July 4, 2011.

CITY OF PHILADELPHIA WATER DEPARTMENT
TOP 10 CUSTOMERS
FISCAL YEAR ENDED JUNE 30, 2019

	Customer	Revenue ($)	% Total Revenue **
1	City of Philadelphia*	$ 24,496,079	3.29%
2	Philadelphia Housing Authority	11,516,190	1.55%
3	School District of Philadelphia	6,178,537	0.83%
4	Veolia Energy Philadelphia	5,932,224	0.80%
5	University of Pennsylvania	4,982,622	0.67%
6	SEPTA	4,477,079	0.60%
7	AdvanSix Inc (1)	4,007,613	0.54%
8	Federal Government	3,700,472	0.50%
9	Temple University	3,157,123	0.42%
10	University of Pennsylvania Health System	2,508,615	0.34%
	TOTALS	**$ 70,956,552**	**9.52%**

*The total above for the City of Philadelphia includes, among others, charges for water and wastewater services, which include stormwater services as follows: (i) $20,103,201.88 – General Fund and (ii) $4,392,877.37 – Aviation Fund.

** The % of Total Revenue is the yearly revenue received by the Customer divided by the total yearly revenue of the Water Operating Fund. The FY 2019 total is $745,330,463.

(1) Based on the best information available as of June 30, 2017 AdvanSix was just outside PWD's top 10 customers. For FY2018, their usage increased and revenues were $4,398,889.

CITY OF PHILADELPHIA WATER DEPARTMENT
INCENTIVE AND ASSISTANCE PROGRAMS
FISCAL YEAR ENDING JUNE 30, 2019

Program	Program Type	2019	2018	2017
SMIP[(1)] and GARP[(2)(3)]	Operating Expense	$ 30,433,976	$ 21,484,429	$ 18,354,069
Phase in Program (CAP)[(4)]	Bill Reductions	2,003,238	2,011,096	2,531,367
Stormwater Credits[(4)]	Bill Reductions	17,988,320	16,038,856	13,819,758
Community Gardens	Bill Reductions	9,966	14,320	-
Tiered Assistance Program	Bill Reductions	8,992,124	2,927,221	-
Total		**$ 59,427,624**	**$ 42,475,922**	**$ 34,705,194**

(1) Stormwater Management Incentives Program.

(2) Grant and Greened Acres Retrofit Program.

(3) In Fiscal Year 2017, 2018 and 2019, SMIP and GARP were partially funded with grants.

(4) Amounts are credits against certain customers’ bills.

CITY OF PHILADELPHIA WATER DEPARTMENT

RECONCILIATION OF LEGALLY ENACTED AND GAAP BASIS OPERATING REVENUES AND EXPENSES

JUNE 30, 2019

	(Thousands of Dollars)
Legal Basis of Accounting Revenues	
Legal Basis Revenues	$ 745,867
GAAP Adjustments	
Reverse Fiscal Year 2018 Accounts Receivable Accrual	(38,509)
Record Fiscal Year 2019 Accounts Receivable Accrual	39,445
Accounts Receivable Adjustment	(40)
Allowance for Doubtful Accounts Adjustment	7,757
Reclassification of Interest Income to Nonoperating Revenue	(8,447)
Total GAAP Adjustments	206
Total GAAP Basis Operating Revenues	$ 746,073
Legal Basis of Accounting Expenses	
Legal Basis Expenses, Transfers and Debt Service	$ 776,288
GAAP Adjustments	
Expense in Fiscal Year 2019, included in Fiscal Year 2018 for Legal Basis	45,200
Encumbrances in Fiscal Year 2019, included in Fiscal Year 2018 for Legal Basis	(86,388)
Depreciation on Capital Assets, not included for Legal Basis	124,315
Payments among Water Department Funds, netted for GAAP Basis	(70,717)
Accrual of Probable Indemnities and Worker's Compensation Expenses	(427)
Reclassification of Transfers Out to Nonoperating Expenses	(29,573)
Allocation of Interfund Activity - Payment to General Fund	7,099
Allocation of Accrued Expenses	2,721
Change in Inventory Balance as of June 30, 2019	(284)
Elimination of Legal Basis Adjustments	(284)
Net Pension Expense, included in GAAP Basis	2,472
OPEB Expense, included in GAAP Basis	2,029
Removal of Debt Service Principal Payments and Transfers to the Escrow	(190,789)
Net Adjustments from Capitalization of Capital Assets	(7,005)
Removal of Legal Basis Compensated Absences Expense and Increase in Compensated Absence Liability	1,914
Amortization of Prepaid Surety Bond Insurance	55
Transfer of Expenditures Charged to FD 270 in Error	3,000
Total GAAP Adjustments	(196,662)
Total GAAP Basis Operating Expenses	**$ 579,626**

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APPENDIX II

ENGINEERING REPORT

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Mr. Rob Dubow
Director of Finance, City of Philadelphia
1401 JFK Boulevard
Municipal Services Building
Room 1330
Philadelphia, PA 19102

Arcadis U.S., Inc.
1600 Market Street
Suite 1810
Philadelphia, Pennsylvania 19103
Tel 215 625 0850
Fax 215 625 0172
www.arcadis.com

Subject:
Bring-Down Letter for the Consulting Engineer's Report for the 2020 Water and Wastewater System Revenue Refunding Bonds

Date:
July 7, 2020

Contact:
Tony Dill, PE BCEE

Phone:
215.931.4372

Email:
Anthony.Dill@arcadis.com

Our ref:
30001447

Dear Mr. Dubow:

Arcadis U.S., Inc. (Arcadis) is pleased to submit this bring-down letter for the April 1, 2019, Consulting Engineer's Report (Report) in accordance with the First Class City Revenue Bond Act and the Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended, including supplements set forth in the First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Eleventh, Twelfth, Thirteenth, Fourteenth, Fifteenth, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twentieth, and Twenty-First Amendments (altogether, comprising the "General Ordinance"). This bring-down letter is prepared on behalf of the Philadelphia Water Department (Water Department) in anticipation of the Series 2020A Water and Wastewater Revenue Bonds and the Series 2020B Water and Wastewater Revenue Refunding Bonds related to ongoing projects of the Water Department's water, wastewater, and stormwater systems (System). The purpose of this letter is to identify significant changes that have occurred since the issuance of the Report.

Arcadis staff met or corresponded with key Water Department staff in June 2019, November 2019, and in the first part of calendar year 2020 to determine any significant changes in personnel, the capital plan, and regulatory compliance status. Our findings are reported below:

Personnel Changes

Ms. Debra McCarty has retired as Water Commissioner. Mr. Randy Hayman, most recently a partner at the environmental law firm of Beveridge & Diamond PC in Washington D.C., assumed the post of Water Commissioner on June 24, 2019. Mr. Hayman has significant experience in the water industry including:

- Ten years as General Counsel for the St. Louis Metropolitan Sewer District
- Five years as General Counsel for DC Water
- Three and one-half years at Beveridge & Diamond PC, a top-tier environmental law firm

During his career, Mr. Hayman has worked to solve similar water and wastewater utility challenges to those faced by the Water Department. This includes negotiating agreements with regulatory agencies to address wastewater system issues related to combined sewer overflows; as well as implementing large water and wastewater capital improvement plans, while managing financial performance and balancing the impact on customer rates and charges.

David Katz, Deputy Commissioner of Compliance, retired in June 2019. Based on our discussions, the Water Department is in the process of determining whether to fill this position going forward. In the meantime, these responsibilities are being addressed by other key staff.

In September 2019, Glenn Abrams, a former Water Department employee, left a leadership role at the Pennsylvania Horticultural Society to replace retiring Joanne Dahme, Public Affairs General Manager. The Public Affairs Division has been reorganized with Mr. Abrams serving as the Deputy Commissioner of Communications and Engagement and reporting directly to the Water Commissioner. Mr. Abrams directs the planning, development and implementation of diversified programs designed to inform and serve water, wastewater and stormwater customers and the general public, and to increase the Water Department's credibility and accessibility to customers, the media, legislators, and civic organizations.

Sarah Stevenson, the Assistant Deputy Commissioner of Government Affairs and Policy, is leaving the Water Department to become the City of Philadelphia Chief Integrity Officer. The Water Department intends to replace Ms. Stevenson with a key staff member who will focus on strategic planning and policy.

Capital Plan

The Water Department has indicated that the $3.3B fiscal year (FY) 2020 to FY 2025 capital plan was approved by City Council in June 2019. The Water Department has prepared a $3.6B FY 2021 to FY 2026 capital budget that includes an overall increase of $29M compared to the FY 2020 to FY 2025 budget for projects associated with the Consent Order Agreement (COA). The COA projects include improvements to green stormwater infrastructure, collection system conveyance and wastewater treatment plants.

Regulatory Compliance

The Water Department staff indicates that there are no new permit conditions since the issuance of the Report, and that the status of expired National Pollutant Discharge Elimination System (NPDES) and Municipal Separate Storm Sewer System (MS4) permits has not changed. The Southwest Water Pollution Control Plant experienced violations of its NPDES effluent limits in March and April 2020 due to equipment failures, process disruptions and reduced staff in response to the City's mandate for social distancing in light of the COVID-19 Coronavirus Pandemic (Pandemic).

Arcadis reviewed the final 2018 Water Quality Report and has determined that the regulatory compliance situation has not materially changed from the draft 2018 Water Quality Report results presented in the Report. Furthermore, Arcadis received correspondence from Water Department staff in February 2020, and communicated with staff in April of 2020, indicating there have been no changes to drinking water and wastewater regulatory compliance status. However, it should be noted that on June 3, 2019, the

Water Department entered into a Consent Order and Agreement (Ferric COA) with the Pennsylvania Department of Environmental Protection (PADEP) that requires the decommissioning or repurposing of ferric chloride tanks at the Belmont and Queen Lane water treatment plants. The original Ferric COA deadline of June 30, 2020 has been extended by PADEP to December 31, 2020, in response to the Water Department's extension request and the construction and start-up schedule for the Queen Lane tanks. The Water Department will apply for an additional extension to the Ferric COA deadline before the end of the calendar year for the Queen Lane tanks, as the completion and start-up of new Queen Lane Water Treatment Plan (WTP) facilities and decommissioning or repurposing of the old tanks is now anticipated in late Spring 2021. Construction of new ferric chloride storage and feed facilities is completed at Belmont WTP and the old tanks have been decommissioned in accordance with the PADEP Underground Storage Tank permit. The Water Department has indicated that a site assessment was completed in November 2019 which indicated that there has been no release of ferric chloride from the existing concrete ferric tanks and PADEP has accepted the proposed change in service for the tanks without further investigation requirements.

The USEPA's proposed Lead and Copper Rule revisions (LCRR) include a suite of actions aimed at reducing lead exposure in drinking water. On October 10, 2019, the EPA released their proposed LCRR, and the period for public comments closed on February 12, 2020. The proposed LCRR, if made into a revised regulation as proposed, will significantly impact the Water Department's operations by requiring effort related to:

- additional public education and notification,
- education, sampling, and testing for all schools and childcare facilities every 5 years,
- provision of pitcher filters and follow-up sampling after the replacement of any lead service line,
- additional sampling for determining corrosion control and for follow-up on elevated lead samples, and
- development and maintenance of an inventory of service line materials along with annual communication to those customers who have lead lines.

The Water Department will continue evaluating the potential impacts of the LCRR on its operations, staffing needs, outreach efforts, regulatory compliance, and costs for contracting support.

The Water Department prepared a Risk and Resilience Assessment as required by the America's Water Infrastructure Act (AWIA). The assessment incorporates cybersecurity and financial infrastructure components that were not addressed in the original vulnerability assessment. The Water Department submitted the assessment on March 26, 2020, prior to the March 31, 2020 deadline. The Water Department also indicates that it is on track to review and update its Emergency Response Plan by the AWIA-established September 2020 deadline.

COVID-19 (Coronavirus)

President Trump declared a public health emergency on Jan 31, 2020, due to the Pandemic. He later issued two national emergency declarations under the Stafford Act and the National Emergencies Act on March 13, 2020 and invoked emergency powers via Executive Order under the Defense Production Act on March 18, 2020. On March 19, 2020, Pennsylvania Governor Wolf ordered non-life-sustaining businesses in Pennsylvania to close their physical locations to slow the spread of the virus. On March 23, 2020, the governor issued "stay at home" orders effective through April 6, 2020, to seven counties, including the entire Water Department service area. On June 5, 2020, these counties moved to the yellow phase of reopening, which eases some restrictions on work and social interaction while limiting large gatherings and maintaining closures of schools, gyms, and other indoor recreation centers, and hair and nail salons.

Due to the emergency situation related to the Pandemic, the Water Department has sent a letter to the PADEP notifying it that an event beyond the City's control has occurred which might impact its ability to timely comply with the COA. This is in accordance with paragraph 15 of the COA which requires the Department to notify PaDEP within five days by telephone and within 10 days by writing that such event has occurred. As the overall impact of the Pandemic is still to be determined, the Water Department will need to address any potential delay in its compliance with the COA to the PaDEP.

On March 13, 2020, the Water Department announced that it would restore water service to delinquent residential and commercial customers through May 15, 2020, and that the restoration fee would be waived. In addition, the Water Department will not shut off water for delinquent residential and commercial accounts through May 15, 2020. On March 20, 2020, the Water Department announced that all penalties and late fees for water bills are suspended until further notice for Philadelphia's residential and commercial water customers. On May 21, 2020, the Water Department announced that customers unable to pay water bills due to economic impacts from the Pandemic will not face shutoff through August 31, 2020.

Prior to the Pandemic, the Water Department had filed its general rate case with the Philadelphia Water Sewer and Storm Water Rate Board (Rate Board). The rate case was in its initial discovery phase when the Pandemic hit. With the onset of stay at home orders, the rate case was initially delayed until more certainty could be gained around how long the state and local emergency conditions would last. On May 29, 2020, the Water Department notified the rate case Hearing Officer that it was withdrawing its request to increase rates and charges as the emergency conditions persisted. The Water Department indicates that it plans to file a new case in the first quarter of calendar year 2021.

At this time the extent of the impact of Pandemic on the Water Department's operations, expenses and revenues is not fully known. Analysis of the financial impact is discussed below.

Financial Requirements

Since the preparation of the Consulting Engineer's Report in April of 2019, the Water Department has implemented rates and charges effective September 1, 2019, and also provided Arcadis with final FY 2019 financials. Additionally, the Water Department provided Arcadis with up to date refinements of its estimate of projected operation and maintenance (O&M) and capital expenditures prior to the onset of the Pandemic. In March of 2020, the onset of the Pandemic resulted in stay at home orders and disruption to the business cycle and Philadelphia economy. Arcadis has been working with the Water Department to understand the impact to its financial performance. The following Tables provide an update to our financial projection, incorporating estimated changes due to the impact of the Pandemic. The Tables are numbered to be consistent with the April 2019 Consulting Engineer's Report. As the length and severity of the Pandemic is still unknown, the actual results of financial performance could be materially different than the projection presented in this bring down letter.

Revenue

The following Table 1 presents the rates and charges effective September 1, 2019 and reflects a system-wide increase of 1.2 percent authorized during the Water Department's last rate proceeding. On February 11, 2020, the Water Department filed a new rate case with the Philadelphia Water, Sewer, and Storm Water Rate Board. The rate proceedings were expected to occur over the coming months with a rate order no later than July 10, 2020. As noted above, on May 29, 2020 the Water Department withdrew its rate increase request due to the ongoing Pandemic situation. For this financial projection, it is anticipated that the Water Department will file a new rate case in the first quarter of calendar year 2021 and begin realizing additional revenue from rates and charges in September of 2021 (FY 2022).

Table 1: General Service Rates and Charges Effective September 1, 2019

GENERAL SERVICE RATES AND CHARGES AS OF SEPTEMBER 1, 2019				
Monthly Water and Wastewater Service Charges				
	Water		Wastewater	
Line No.	Meter Size (inches)	Charge Per Bill	Meter Size (inches)	Charge Per Bill
1	5/8	$5.21	5/8	$7.01
2	3/4	$5.55	3/4	$8.93
3	1	$6.70	1	$13.07
4	1-1/2	$8.88	1-1/2	$22.97
5	2	$12.32	2	$35.42
6	3	$19.44	3	$63.82
7	4	$35.39	4	$108.49
8	6	$66.29	6	$213.81
9	8	$100.66	8	$338.27
10	10	$147.50	10	$488.25
11	12	$239.52	12	$887.22
Water and Wastewater Quantity Charges				
	Water		Wastewater	
	Monthly Usage	Unit Charge Per Mcf	Description	Unit Charge
12	First 2 Mcf	$45.51	All Usage ($ / Mcf)	$32.41
13	Next 98 Mcf	$39.27	BOD Surcharge ($ / lb.)	$0.397
14	Next 1,900 Mcf	$30.59	SS Surcharge ($ / lb.)	$0.388
15	Over 2,000 Mcf	$29.77		
Stormwater Charges				
	Residential		Non-Residential	
	Description	Monthly Charge	Description	Monthly Charge
16	Billing & Collection	$1.77	Billing & Collection	$2.30
17	SWMS	$14.03	Gross Area ($/500 s.f.)	$0.717
18			Impervious Area ($/500 s.f.)	$5.410

Notes:
Water and Wastewater Quantity Charges include TAP Rider surcharge
Mcf = Thousand Cubic Feet
BOD = Biochemical Oxygen Demand; SS = Suspended Solids
BOD and SS Surcharges for wastewater strength in excess of 250 milligrams per liter (mg/l) and 350 mg/l, respectively
SWMS = Stormwater Management Service
s.f. - square feet

Table 2 presents the projection of revenue under existing FY 2020 rates. Lines 1 through 2 and Lines 7 through 9 reflect the application of the FY 2020 rates and charges to the estimated customer billing units for the projection period. It is noted that a significant portion of the Water Department's revenue is fixed, including the water and sewer service charges and the stormwater charge. Additionally, data provided by the Water Department indicates that Residential usage and associated billings during the emergency appear to be at least consistent with pre-Pandemic levels (generally billed usage and collected revenue reflecting FY 2019 results and projected trends prior to the Pandemic). Therefore, for determining the estimated decrease in revenue during FY 2020 and FY 2021, our focus is primarily on the Non-Residential volumetric revenue, as well as the overall collection rate for Residential and Non-Residential accounts (excluding City accounts). The following summarizes the analysis used to estimate the impact of the Pandemic on revenue for the projection period:

- FY 2020 – Compared to FY 2019 collected revenue of approximately $738 million, annual FY 2020 collected revenue (excluding transfer from Debt Reserve Account) is projected to decline to approximately $710 million. This reflects approximately 9 months of financial operation at pre-Pandemic levels, followed by three months of reduced revenue due to the Pandemic conditions and associated impact on billed usage and collected revenue. The following are key assumptions to derive the FY 2020 estimate:
    - Non-Residential volumetric-related usage and associated billings are projected to be 85 percent of pre-Pandemic levels for the final three months of FY 2020 based on an estimate of decreased billed usage which is consistent with data provided by the Water Department. Residential volumetric-related usage and associated billings are projected to 100 percent of pre-Pandemic levels. The economic disruption is assumed to impact overall collections, dropping the effective collection rate from approximately 96.5 percent to approximately 87 percent for the last three months of FY 2020.
    - Revenue from City General and Aviation Funds is projected to be 90 percent of pre-Pandemic levels for the last three months of FY 2020.
    - Revenue from wholesale water and wastewater customers is projected to be 90 percent of pre-Pandemic levels for the last three months of FY 2020.
    - Other miscellaneous revenue is projected to decrease consistent with the overall impact of the Pandemic and lower interest and penalty revenue due to the moratorium on water shut-offs.
- FY 2021 – Compared to FY 2019 collected revenue of approximately $738 million, annual FY 2021 collected revenue is projected to decline to approximately $685 million. This reflects approximately 12 months (July 2020 through June 2021) of financial operation at reduced levels due to the Pandemic and associated impact to billed usage and collected revenue. The reduced levels are assumed to be more favorable compared to the last three months of FY 2020 where there was significant disruption to the economic cycle related to the Pandemic. The following are key assumptions to derive the FY 2021 estimate:
    - Non-Residential volumetric-related billings are estimated to be 90 percent of pre-Pandemic levels for FY 2021, reflecting increased re-opening of the economy at levels more favorable compared to the last three months of FY 2020. Residential volumetric-related billings are projected to be 100 percent of pre-Pandemic levels. The economic disruption is assumed to impact overall collections, dropping the overall effective collection rate from a pre-Pandemic level of approximately 96.5 percent to 93 percent for FY 2021. The shut-off moratorium for delinquent accounts ends in the first quarter of FY 2021.

- Revenue from City General and Aviation Funds is projected to be 80 percent of pre-Pandemic levels for FY 2021, reflecting reduced usage and billings during the initial summer months of FY 2021.
- Revenue from wholesale water and wastewater customers is projected to be 90 percent of pre-Pandemic levels for FY 2021.
- Other miscellaneous revenue is projected to decrease consistent with the overall impact of the Pandemic, and expected lower interest and penalty revenue due to the moratorium on water shut-offs.

- FY 2022 – At this time, Arcadis assumes that annual revenue will begin trending toward pre-Pandemic levels assuming a lessening negative impact from the Pandemic and improved economic conditions. This includes the reinstatement of shut-off policies for delinquent accounts to encourage payment of water bills. With respect to the assumption of improving economic conditions, Arcadis references June 2020 Federal Reserve projections that show improving economic and unemployment numbers into calendar year 2022.
- FY 2023 – At this time, Arcadis assumes that annual revenue will continue trending toward pre-Pandemic levels for FY 2023 assuming a continued lessening from the impact of the Pandemic and improved economic conditions. This includes the reinstatement of shut-off policies for delinquent accounts to encourage the payment of water bills and economic assumptions noted above for FY 2022.
- FY 2024 – At this time, Arcadis assumes that annual revenue will return to levels consistent with typical billing and collection rates prior to the Pandemic.

The resulting collected revenue level for FY 2020 appears consistent with data provided by the Water Department through May of 2020. For FY 2021 there is elevated uncertainty due to the status of the Water Department's shut-off moratorium for delinquent accounts and the overall impact of the Pandemic. Arcadis has assumed that Non-Residential billings and overall collected revenue will continue to be lower than pre-Pandemic levels. For FY 2022 through FY 2025, the collected revenue amount appears reasonable assuming a continued rebound from the emergency situation at the onset of the Pandemic. Arcadis notes that many variables could impact this projection, including unforeseen economic circumstances, more permanent changes to business work processes (e.g., work from home, business closure or relocation out of the City service area), policy changes, changes to collection and shut-off policies for delinquent accounts, changes in residential consumption (e.g. if City population decreases due to relocations) and other unknown factors. It is recommended that the Water Department continue to monitor its revenue as uncertainty around the Pandemic and recovery continues.

Table 2: Projected Revenue Under FY 2020 Rates and Charges ($1,000s)

Line No.	Description	2020	2021	2022	2023	2024	2025
		Fiscal Year Ending June 30,					
	Operating Revenue						
	Water Service						
1	Retail Volume Revenue	216,411	208,065	212,227	214,773	217,351	214,308
2	Retail Fixed Revenue	31,255	31,255	31,880	32,263	32,650	32,650
3	Private Fire Protection	3,575	3,500	3,570	3,612	3,656	3,656
4	Public Fire Protection	9,242	9,046	9,227	9,338	9,450	9,450
5	Wholesale Water	3,500	3,231	3,295	3,335	3,375	3,375
6	Total Water Service	263,983	255,097	260,199	263,321	266,481	263,438
	Wastewater Service						
7	Retail Volume Revenue	170,864	163,523	166,794	168,795	170,821	169,113
8	Retail Fixed Revenue	43,494	43,494	44,364	44,896	45,435	45,435
9	Stormwater	171,958	170,426	173,834	175,920	178,031	176,963
10	Wastewater Surcharge	4,669	4,570	4,662	4,718	4,774	4,774
11	Wholesale Wastewater	38,556	35,590	36,302	36,738	37,179	37,179
12	Total Wastewater Service	429,540	417,604	425,956	431,067	436,240	433,464
	Other Revenue						
13	Other Operating Revenue	15,996	12,121	12,654	13,010	13,010	13,010
14	Interest Income	745	663	676	684	692	687
15	Transfer From Debt Reserve Account	12,810	0	0	0	0	0
16	Total Other Revenue	29,550	12,783	13,330	13,694	13,702	13,697
17	**Total Water Department Revenue**	**723,074**	**685,484**	**699,485**	**708,083**	**716,423**	**710,598**

As noted previously in the April 2019 Report, the Water Department has recently been in discussions with the Delaware County Regional Water Quality Control Authority (DELCORA) (a wastewater wholesale customer) about provisions in its contract that allow for the recovery of a portion of costs related to the Water Department's COA. In 2019 Aqua Pennsylvania purchased the DELCORA wastewater system. A review of Aqua America's (parent of Aqua Pennsylvania) Third Quarter 2019 earnings call transcript indicates that Aqua Pennsylvania is planning to expand DELCORA's existing treatment plant and divert its wastewater flow away from the Water Department to its own treatment plant. The existing wholesale agreement is set to expire in calendar year 2028 and likely will not be renewed. As the projection period for the Report ends in FY 2025, the revenue projection in Table 2 above continues to include annual wholesale revenue from DELCORA of approximately $10 million.

Other operating revenue consists of miscellaneous revenue such as permit fee and penalty revenue, as well as revenue offsets related to the Water Department's Tiered Assistance Program (TAP) and stormwater Customer Assistance Program (CAP).

Nonoperating revenue consists of interest income related to the Revenue Fund and Rate Stabilization Fund. At the end of FY 2020, the Water Department anticipates a transfer of approximately $12.8 million from the Debt Reserve Account to the Revenue Fund related to an excess of funds on hand in accordance with the General Ordinance.

Operation and Maintenance Expenses

The Water Department provided FY 2019 actual O&M, as well as FY 2020 O&M data through May 2020. Arcadis used this to project O&M for the FY 2020 to FY 2025 projection period. Since the onset of the

Pandemic, the Water Department has focused on minimizing O&M expenses to those necessary for providing quality drinking water, wastewater, and stormwater service. Since its rate case has been delayed due to the Pandemic, Arcadis has assumed that the Water Department will maintain this focus for the FY 2021 through FY 2022 period until there is greater certainty around the impact from the Pandemic, and future rate cases are implemented.

O&M expenses were generally categorized into the following categories:

Table 3: Operation and Maintenance Expense Categories

Account No.	Category	Description
100	Personal Services	Expenses related to salaries, fringe benefits, pension costs, overtime and other employee cost items
200	Purchase of Services	Expenses related to contracts or services from external entities, including electricity and natural gas service
300/400	Materials Supplies and Equipment	Miscellaneous supplies and equipment, including water treatment chemicals
500	Contributions Indemnities and Taxes	Generally expenses related to lawsuits
800	Payments to Other Funds	Additional payment to the General Fund associated with the direct interdepartmental services provided to the Water Department by the City

Arcadis used the following annual inflation factors for each O&M category:

- Personal Services (Non-Fringe Benefits) - 3.0%
- Personal Services (Fringe Benefits)
  - Health Care and Other - 5.0%
  - Pension - 2.0%
  - Pension Bonds - 0.0%
- Purchase of Services (Electricity) - 3.0%
- Purchase of Services (Gas) - 1.0%
- Purchase of Services (SMIP/GARP) 0.0%
- Purchase of Services (Other) - 3.5%
- Materials Supplies and Equipment (Chemicals) - 2.0%
- Materials Supplies and Equipment (Other) - 3.0%
- Contributions Indemnities and Taxes - 2.0%
- Payment to General Fund - 2.0%

The resulting average annual inflation rate for O&M expenses during the projection period is 3.7 percent.

Table 4 presents the projected O&M for the Water Department for the period FY 2020 through FY 2025. For FY 2020 through FY 2023, projected O&M is based on the FY 2020 preliminary results, which include the last three months of FY 2020 and the emergency situation related to the Pandemic. The Water

Department expects to decrease SMIP/GARP expenditures from an annual level of $25M to $15M (reflected in Line 2) for FY 2021. Arcadis estimates that it will remain at this level through FY 2023. With the delayed rate case and the projection of lower annual revenue for FY 2021 through FY 2023, Arcadis estimates that the Water Department will maintain annual O&M at the FY 2020 level for FY 2021, and then return to gradual increases once it is able to obtain additional revenue from rates and charges beginning in FY 2022. By FY 2024 it is estimated that O&M will increase to an annual level of approximately $588M, which is similar to the projection of the April 2019 Report.

Table 4: Projected Operation and Maintenance Expense ($1,000s)

Line No.	Description	Fiscal Year Ending June 30, 2019	2020	2021	2022	2023	2024	2025
	Water Department O&M	**ACTUAL**	**ESTIMATE**					
1	Personal Services	115,175	125,201	130,798	136,044	141,431	146,971	152,667
2	Purchase of Services	159,937	157,096	147,945	152,744	167,707	192,825	198,443
3	Materials Supplies and Equipment	46,651	47,069	46,068	47,220	48,402	49,615	50,860
4	Contributions Indemnities and Taxes	0	500	510	520	531	541	552
5	Other - Payment to General Fund	7,752	9,000	9,180	9,364	9,551	9,742	9,937
6	Subtotal Water Department O&M	329,516	338,866	334,501	345,891	367,622	399,695	412,458
	Interdepartmental O&M							
7	Personal Services - Non Fringe Benefits	22,101	23,851	24,566	25,303	26,062	26,844	27,649
8	Personal Services - Fringe Benefits	133,769	140,882	145,192	149,678	154,346	159,206	164,266
9	Purchase of Services	26,672	23,992	24,831	25,701	26,600	27,531	28,495
10	Materials Supplies and Equipment	6,256	4,494	4,628	4,767	4,910	5,058	5,209
11	Contributions Indemnities and Taxes	3,816	3,817	3,893	3,971	4,050	4,131	4,214
12	Subtotal Interdepartmental Charges	192,615	197,035	203,111	209,419	215,969	222,769	229,833
	Combined O&M							
13	Subtotal Operating Expenses	522,131	535,900	537,612	555,310	583,590	622,465	642,290
14	Less: Liquidated Encumbrances	(30,421)	(30,421)	(31,333)	(32,273)	(33,241)	(34,239)	(35,266)
15	**Total Operating Expenses**	**491,710**	**505,480**	**506,279**	**523,037**	**550,349**	**588,226**	**607,025**

Capital Improvement Program and Debt Service

The Water Department has developed its proposed FY 2021 through FY 2026 capital budget and worked to refine its estimate of capital funding needed for the projection period. The following Table 5 presents the Water Department Capital Improvement Program (CIP) for the FY 2020 through FY 2025 projection period.

FY 2020 reflects amounts from the Water Department's FY 2020 through FY 2025 CIP budget. FY 2021 through FY 2025 reflects amounts from the Water Department's proposed FY 2021 through FY 2026 CIP budget. Projects related to complying with the Water Department's Consent Order Agreement are reflected on Lines 5 and 6. The CIP is inflated by annual inflation factor of 3.1 percent beyond FY 2021 to derive the inflated CIP amount shown on Line 12.

Table 5: Capital Improvement Program and Projected Capital Cash Flow ($1,000s)

Line No.	Description	Fiscal Year Ending June 30, 2020	2021	2022	2023	2024	2025
1	Water and WW Plants and Facilities	100,000	178,000	199,200	296,500	130,200	291,200
2	Sewer and CSO Improvements	58,460	57,860	57,860	57,860	57,860	57,860
3	Water Conveyance System Improvements	78,060	93,060	101,060	172,160	117,460	108,060
4	Flood Relief	10,000	25,000	25,000	25,000	25,000	25,000
5	COA - Collector System Improvements [1]	71,340	76,600	72,000	72,000	72,000	72,000
6	COA - WW Treatment Facilities CSO Related	20,000	150,000	60,000	60,000	60,000	10,000
7	Vehicles	12,000	12,000	12,000	12,000	12,000	12,000
8	Meters	35,000	5,000	5,000	5,000	5,000	5,000
9	Engineering and Admin.	16,047	13,865	13,865	13,865	13,865	13,865
10	**Total CIP**	**400,907**	**611,385**	**545,985**	**714,385**	**493,385**	**594,985**
11	Inflation Adjustment [2]	0	0	16,926	44,978	47,322	77,280
12	**Inflated Total**	**400,907**	**611,385**	**562,911**	**759,363**	**540,707**	**672,265**
13	Cash Flow to Budget Factor [3]	82.31%	58.88%	91.65%	69.07%	107.79%	85.21%
14	**Capital Improvement Plan Cash Flow**	**330,000**	**360,000**	**515,930**	**524,469**	**582,814**	**572,869**

[1] Includes Green Stormwater Infrastructure.
[2] Reflects annual inflation rate of 3.1% beyond FY 2021.
[3] Reflects annual estimate of capital cash flow to budget.

Line 14 shows the projected CIP cash flow. With the onset of the Pandemic and delay of its rate case, the Water Department has temporarily ceased bidding new projects. It does have approximately $400M in active projects that are in various stages of completion. Thus, FY 2020 reflects the estimated CIP cash spend based on data through May of 2020, and FY 2021 reflects the continued spend on active projects. For FY 2022 through FY 2025, Arcadis used annual CIP cash spend levels provided by the Water Department prior to the Pandemic. The increased levels for FY 2022 through FY 2025 reflect that new rates and charges should be in effect for FY 2022, along with additional funds from a new money bond issuance (see Series 2021 issuance below) anticipated during the first half of FY 2022.

Table 6 presents the projected CIP funding sources and uses for the projection period. Lines 1 through 6 reflect the anticipated revenue bond issuances for FY 2021 through FY 2025. FY 2020 reflects the Series 2019B issuance (par amount plus premium) which occurred in August of 2019. Line 1 presents the par amount of debt issuance with Line 2, Line 3, Line 4, and Line 5 reflecting the amounts transferred to the Construction Fund, the Debt Reserve Account, Capitalized Interest Fund, and used for issuance expenses, respectively. For FY 2021, the Series 2020A issuance is shown and provides $200M for the Construction Fund, as well as approximately $19.6M for capitalized interest. The Water Department intends to use this issuance to fund active capital projects until new rates and charges are in effect to support future revenue bond issuances.

Table 6: Construction Fund Flow of Funds ($1,000s)

Line No.	Description	2020	2021	2022	2023	2024	2025
		Fiscal Year Ending June 30,					
	Revenue Bond Proceeds						
1	Estimated Total Bond Issue [1]	305,834	220,844	511,010	459,895	544,085	523,305
	Transfers:						
2	Construction Fund [1]	300,004	200,000	483,923	442,460	504,396	484,152
3	Debt Reserve Account	4,078	0	23,638	14,331	36,016	35,621
4	Capitalized Interest Fund		19,556				
5	Bond Issuance Expenses	1,752	1,288	3,449	3,104	3,673	3,532
6	Total Transfer of Proceeds (Lines 2+3+4+5)	305,834	220,844	511,010	459,895	544,085	523,305
	Construction Fund						
7	**Beginning Balance**	**348,314**	**365,494**	**292,271**	**332,282**	**298,692**	**295,620**
	Sources:						
8	Net Revenue Bond Proceeds [1]	300,004	200,000	483,923	442,460	504,396	484,152
9	Pennvest Loan Proceeds	0	42,921	30,429	0	0	0
10	Capital Account Deposit Amount	27,065	29,230	31,569	34,094	36,822	39,767
11	Transfer from Residual Fund to Capital Account	18,293	13,171	8,368	12,839	37,053	45,308
12	Interest Income	1,818	1,454	1,653	1,486	1,471	1,460
13	**Total Sources Available (Lines 7-12)**	**695,494**	**652,271**	**848,212**	**823,161**	**878,434**	**866,307**
	Uses:						
14	Capital Projects	(330,000)	(360,000)	(515,930)	(524,469)	(582,814)	(572,869)
15	**Ending Balance (Lines 13+14)**	**365,494**	**292,271**	**332,282**	**298,692**	**295,620**	**293,437**

[1] **FY 2020 Bond Proceeds reflect the 2019B issuance. FY 2021 reflects the 2020A issuance (par amount, plus premium).**

Lines 7 through 15 present the projected flow of funds for the Construction Fund. Sources consist of the Construction Fund beginning balance; revenue bond proceeds; Pennvest loan proceeds; Capital Account deposit from the Revenue Fund; and transfer from the Residual Fund to the Capital Account. The Pennvest loan proceeds on Line 9 reflect approximately $73.35M in loan drawdowns to fund the rehabilitation of the Torresdale Pump Station. These sources are supplemented by interest income earned on amounts held in the Construction Fund.

The sources noted above are used to fund the projected annual cash capital expenditures of the Water Department seen on Line 14. The Construction Fund ending balance was targeted to be approximately $290 million to provide enough cash on hand to begin projects in a new fiscal year prior to new revenue bond issuances that would occur during the middle of the fiscal year.

Table 7 presents the existing and projected debt service for FY 2021 through FY 2025. The existing debt service on Line 1 includes the Series 2019B debt issuance, but does not include the Series 2020 Forward Delivery Refunding Bonds. Line 1 is also net of refunded debt service related to the Series 2020B Refunding. The projected debt service is seen on Line 4 through Line 12. The Series 2020A and 2020B debt service is seen on Line 4, and is offset by the planned use of capitalized interest in FY 2021 through FY 2023 seen on Line 5. Line 6 and Line 8 reflect the estimated debt service for the Pennvest loan, related to two estimated drawdowns. Both reflect 20-year repayment terms using estimated annual interest rates of 2.0 percent. The projected revenue bond issuances are estimated based on the following:

- Level annual debt payment
    - 30-year term
    - Series 2020A and 2020B, interest payments are due May 1st and November 1st

- Series 2021 through Series 2024 annual issuance in November, interest payments due April 1st and October 1st
- Series Summary
  - Series 2020A and 2020B (FY 2021) – Debt service payments and associated interest rates provided by the Water Department
    - 2020A - Par Amount of $175,510,000
    - 2020B – Par Amount of $94,985,000
  - Series 2021 (FY 2022) – Par Amount of $511,010,000 at 5.00%
  - Series 2022 (FY 2023) – Par Amount of $459,895,000 at 5.25%
  - Series 2023 (FY 2024) – Par Amount of $544,085,000 at 5.25%
  - Series 2024 (FY 2025) – Par Amount of $523,305,000 at 5.50%
- Initial semi-annual interest payment in fiscal year of issuance

Table 7: Existing and Projected Debt Service ($1,000s)

Line		Fiscal Year Ending June 30,					
No.	Description	2020	2021	2022	2023	2024	2025
1	Existing Revenue Bonds [1]	195,534	174,138	162,678	154,860	136,562	136,710
2	Existing Pennvest Loans	10,631	10,631	10,631	10,631	10,631	10,631
3	Subtotal Existing Debt Service	206,165	184,768	173,309	165,491	147,193	147,341
	Projected Debt Service						
4	FY 2021 - Series 2020A and 2020B		8,299	12,321	14,138	15,101	15,097
5	Series 2020A Capitalized Interest		(6,454)	(8,735)	(4,367)	0	0
6	FY 2021 - Pennvest Series		265	2,606	2,606	2,606	2,606
7	FY 2022 - Series 2021			9,936	32,887	32,887	32,886
8	FY 2022 - Pennvest Series			188	1,847	1,847	1,847
9	FY 2023 - Series 2022				9,054	30,445	30,446
10	FY 2024 - Series 2023					10,712	36,019
11	FY 2025 - Series 2024						11,593
12	Subtotal Projected Debt Service	0	2,110	16,316	56,166	93,597	130,493
13	**Total Debt Service**	**206,165**	**186,878**	**189,624**	**221,657**	**240,791**	**277,834**

[1] **Debt service is net of refunded debt service related to Series 2020B. Does not include Series 2020 Forward Delivery Refunding Bonds.**

As is seen on Table 7, the Water Department's annual debt service is projected to increase to approximately $278 million by FY 2025.

System Flow of Funds

Table 8 presents the projected System Flow of Funds for the projection period. With the onset of the Pandemic and delay of its rate case, the Water Department provided guidance to Arcadis to target debt service coverage on senior debt of 1.20 for FY 2020 through FY 2023, and resume targeting debt service coverage on senior debt of 1.30 for FY 2024 and FY 2025. The rate case delay will result in a drawdown of the Rate Stabilization Fund, and decrease the reserve levels for the Rate Stabilization and Residual Fund below their combined target of $150M.

Total Revenue consists of revenue under existing rates, supplemented by projected increases in revenue to the Water Department's rates and charges as seen on Lines 4 through 9. The projection includes regular, annual revenue increases that are higher than recent history to return the reserves to the targeted annual level of $150M, and achieve targeted debt service coverage levels of 1.30 by the end of FY 2025. Total revenue is projected to increase to approximately $979 million by FY 2025.

The Total Revenue is used to meet O&M expenses (Lines 15 through 17) and results in Net Revenue (Line 19) available for meeting debt service requirements. As shown, Net Revenue is projected to be adjusted by transfers to and from the Water Department's Rate Stabilization Fund (Line 18). For FY 2020 and 2021, it estimated that consecutive annual transfers from the Rate Stabilization Fund will be needed to manage through the delay of the Water Department's rate case and impact of the Pandemic.

Table 8: Projected System Flow of Funds ($1,000s)

Line No.	Description	2020	2021	2022	2023	2024	2025
		Fiscal Year Ending June 30,					
	OPERATING REVENUE						
1	Water Service Revenue	263,983	255,097	260,199	263,321	266,481	263,438
2	Wastewater Service Revenue	429,540	417,604	425,956	431,067	436,240	433,464
3	Total Service Revenue - Existing Rates	693,523	672,700	686,154	694,388	702,721	696,902
	Additional Revenue Required						
	Year / Percent Increase / Initial Increase % of Year Effective						
4	FY 2021 / 0.00% / 83.3%		0	0	0	0	0
5	FY 2022 / 9.30% / 83.3%			53,177	64,578	65,353	64,812
6	FY 2023 / 9.70% / 83.3%				61,350	74,503	73,886
7	FY 2024 / 8.60% / 83.3%					60,385	71,862
8	FY 2025 / 7.70% / 83.3%						58,229
9	Total Additional Service Revenue Required	0	0	53,177	125,928	200,241	268,788
10	Total System Service Revenue	693,523	672,700	739,331	820,316	902,962	965,690
	Other Income						
11	Other Operating Revenue	15,996	12,121	12,654	13,010	14,280	13,556
12	Interest Income	745	663	538	538	575	613
13	Transfer From Debt Reserve Account	12,810	0	0	0	0	0
14	**Total Revenues**	**723,074**	**685,484**	**752,523**	**833,864**	**917,817**	**979,859**
	OPERATING EXPENSES						
15	Water and Wastewater Operations	(308,445)	(303,168)	(313,618)	(334,380)	(365,456)	(377,192)
16	Direct Interdepartmental Charges	(197,035)	(203,111)	(209,419)	(215,969)	(222,769)	(229,833)
17	**Total Operating Expenses**	**(505,480)**	**(506,279)**	**(523,037)**	**(550,349)**	**(588,226)**	**(607,025)**
	NET REVENUES						
18	Transfer From/(To) Rate Stabilization Fund	32,971	50,000	0	(15,000)	(15,000)	(10,000)
19	**Net Revenues (L15+L18+L19)**	**250,565**	**229,205**	**229,486**	**268,515**	**314,591**	**362,834**
	DEBT SERVICE						
	Senior Debt Service						
20	Outstanding Revenue Bonds	(195,534)	(174,138)	(162,678)	(154,860)	(136,562)	(136,710)
21	Penvest Parity Loans	(10,631)	(10,631)	(10,631)	(10,631)	(10,631)	(10,631)
22	Projected Future Revenue Bonds	0	(1,845)	(13,522)	(51,713)	(89,144)	(126,039)
23	Projected Future Pennvest Parity Loans	0	(265)	(2,793)	(4,453)	(4,453)	(4,453)
24	Total Senior Debt Service	(206,165)	(186,878)	(189,624)	(221,657)	(240,791)	(277,834)
	Subordinate Debt Service						
25	Outstanding General Obligation Bonds	0	0	0	0	0	0
26	Pennvest Subordinate Bonds	0	0	0	0	0	0
27	Total Subordinate Debt Service	0	0	0	0	0	0
28	Transfer to Escrow	0	0	0	0	0	0
29	Total Debt Service + Transfer to Escrow	(206,165)	(186,878)	(189,624)	(221,657)	(240,791)	(277,834)
30	Capital Account Deposit	(27,065)	(29,230)	(31,569)	(34,094)	(36,822)	(39,767)
31	**Net For Transfer to Residual Fund (L19+L29+L30)**	**17,335**	**13,096**	**8,293**	**12,764**	**36,978**	**45,233**
32	Coverage Test 1 - 1.20X (Ln 19 / Ln 24)	1.21	1.22	1.21	1.21	1.30	1.30
33	Coverage Test 2 - 1.00X (Ln 19 / (Ln 24+Ln 27+Ln 30))	1.07	1.06	1.03	1.04	1.13	1.14
34	Coverage Test 3 - 0.90X (Ln 19-Ln 18) / Ln 24	1.05	0.95	1.21	1.27	1.36	1.34

Note 1: Minor variances in summations due to rounding.

Note 2: Line 22 reflects net debt service after application of capitalized interest for FY 2021 – FY 2023.

Net Revenue is used to meet senior and subordinate debt service requirements seen on Lines 20 through 27, as well as the Capital Account Deposit seen on Line 30. Line 31 reflects the positive remaining cash amount that is transferred to the Residual Fund.

Lines 32 through 34 reflect the Rate Covenant coverage tests as follows:

1. Coverage Test 1: 1.20 times the debt service requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds).
2. Coverage Test 2: 1.00 times (A) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (B) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (C) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (D) debt service requirements on Interim Debt payable during such Fiscal Year; and (E) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year).
3. Coverage Test 3: 0.90 times debt service requirements for such fiscal year (excluding Debt Service Requirements in respect of Subordinated Bonds); provided that, for purposes of this clause Net Revenues shall be calculated to exclude any amounts transferred from the Rate Stabilization Fund to the Revenue Fund.

As is seen, the Net Revenues are currently sufficient to comply with the Rate Covenant and are projected to be sufficient, including the projected increases in service revenue indicated in Table 8, to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the anticipated Fiscal Year 2020 and Fiscal Year 2021 revenue bonds are issued, and extending to the two Fiscal Years (FY 2024 and FY 2025) following the Fiscal Year up to which interest has been capitalized (FY 2023). As noted above, the projection period includes significant uncertainty related to the Pandemic. Actual results could be materially different, and It will be important for the Water Department to monitor the changing financial picture and make appropriate adjustments to meet the Rate Covenant coverage tests.

Reserve Fund Balances

The following Table 9 presents the projected reserve fund balance for the Residual Fund, Rate Stabilization Fund, and the Debt Reserve Account. As is seen, the Residual Fund beginning balance is supplemented by annual transfers from the Revenue Fund and interest income. Transfers are made from the Residual Fund to the Capital Account of the Construction Fund to fund a portion of the Water Department's annual capital improvements. Interest from the Debt Reserve Account is transferred to the Residual Fund, and subsequently further transferred to the City General Fund per the General Ordinance. The financial projection targets an end of year balance of $15 million.

The Rate Stabilization Fund beginning FY 2020 balance was approximately $178 million. It is projected that the Water Department will transfer funds to the Revenue Fund in FY 2020 and FY 2021 to supplement revenue resulting from the Pandemic and the delayed rate case. As the projection period progresses, it is estimated that the Water Department will pursue rate cases resulting in additional revenue that will return the Rate Stabilization Fund to a target balance of approximately $135 million.

The Debt Reserve Account of the Sinking Fund is established per the General Ordinance to maintain a reserve equal to the Debt Reserve Requirement. The Debt Reserve Requirement is the greatest amount of Debt Service Requirements payable in any one Fiscal Year, or generally the maximum annual senior debt service. As noted above, the Water Department projects that it will transfer approximately $12.8 million of excess funds from the Debt Reserve Account to the Revenue Fund per the General Ordinance at the end of FY 2020. As regular revenue bond issuances occur during the projection period to fund capital improvements, it is projected that a portion of each issuance will be transferred to the Debt Reserve Account to establish and maintain the balance equal to the projected maximum annual senior debt service. It is projected that the Debt Reserve Account end of year balance will gradually increase to approximately $303 million by FY 2025.

Table 9: Projected Reserve Fund Balances ($1,000s)

		Fiscal Year Ending June 30,					
Line No.	**Description**	**2020**	**2021**	**2022**	**2023**	**2024**	**2025**
	RESIDUAL FUND						
1	**Beginning of Year Balance**	**15,881**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**
2	Interest Income	77	75	75	75	75	75
	Transfers In						
3	From Revenue Fund	17,335	13,096	8,293	12,764	36,978	45,233
4	From Debt Reserve Account	986	967	1,026	1,121	1,247	1,426
	Transfers Out						
5	To Construction Fund	(18,293)	(13,171)	(8,368)	(12,839)	(37,053)	(45,308)
6	To City General Fund	(986)	(967)	(1,026)	(1,121)	(1,247)	(1,426)
7	To Debt Reserve Account	0	0	0	0	0	0
8	**End of Year Balance**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**
	RATE STABILIZATION FUND						
9	**Beginning of Year Balance**	**177,971**	**145,000**	**95,000**	**95,000**	**110,000**	**125,000**
10	Interest Income	445	363	238	238	275	313
	Transfers In						
11	From Revenue Fund	0	0	0	15,000	15,000	10,000
	Transfers Out						
12	To Revenue Fund - Transfer	(32,971)	(50,000)	0	0	0	0
13	To Revenue Fund - Interest	(445)	(363)	(238)	(238)	(275)	(313)
14	**End of Year Balance**	**145,000**	**95,000**	**95,000**	**110,000**	**125,000**	**135,000**
	DEBT RESERVE ACCOUNT						
15	Beginning of Year Balance	**201,099**	**193,332**	**193,332**	**216,970**	**231,301**	**267,317**
16	Interest Income	986	967	1,026	1,121	1,247	1,426
	Transfers In						
17	From Bond Proceeds	4,078	0	23,638	14,331	36,016	35,621
18	From Revenue Fund	965	0	0	0	0	0
	Transfers Out						
19	To Revenue Fund - Excess Funds	(12,810)	0	0	0	0	0
20	To Residual Fund - Interest	(986)	(967)	(1,026)	(1,121)	(1,247)	(1,426)
21	**End of Year Balance**	**193,332**	**193,332**	**216,970**	**231,301**	**267,317**	**302,938**

Conclusions

- The Water Department is dealing with an unprecedented global Pandemic that is impacting its revenue and associated collections. Additionally, the Pandemic has resulted in the postponement of its general rate case, with additional revenue from new rates and charges not expected until FY 2022. As the City begins recovering from emergency business closures and stay-at-home orders, the Water Department needs to continue to carefully monitor its revenue and collections, and manage its business operations to ensure that it appropriately meets projected payments and achieves the Rate Covenant requirements of the General Ordinance.
- Arcadis has included in its financial projection reasonable assumptions related to the duration of the Pandemic and financial impact on the Water Department. The extent and severity of the Pandemic, and the overall impact to the economy and Water Department are still unknown at this point. Therefore, the actual results may be materially different from the financial projections in this bring down letter.
- Including the information and updated financial projections prepared in this bring-down letter, the conclusions set forth in the April 2019 Report remain unchanged. Such conclusions are conditioned upon and subject to the assumptions, disclaimers and statements more particularly set forth in the Report. For a complete understanding of the assumptions upon which these opinions are based and the risks with regard to the Water Department's financial performance, the Report should be read in its entirety.

Sincerely,

Arcadis U.S., Inc.

Michael C. Borchers
Project Manager

Tony Dill, PE BCEE
Deputy Project Manager

Philadelphia Water Department

CONSULTING ENGINEER'S REPORT

For the Twenty-Second Supplemental Ordinance Authorizing the Issuance of Water and Wastewater Revenue Bonds for Fiscal Years 2020 and 2021

FINAL

April 1, 2019

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TABLES

FIGURES

1 INTRODUCTION

This Consulting Engineer's Report for the Twenty-Second Supplemental Ordinance Authorizing the Issuance of Water and Wastewater Revenue Bonds for Fiscal Years 2020 and 2021 (Report) is provided to summarize the findings and conclusions of the engineering review performed by Arcadis U.S., Inc. (Arcadis) for the water, wastewater, and stormwater systems (System) of the Philadelphia Water Department (Water Department). The Restated General Water and Wastewater Revenue Bond Ordinance of 1989 and the amendments and supplements thereto, including those set forth in the First, Second, Third, Fourth, Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Eleventh, Twelfth, Thirteenth, Fourteenth, Fifteenth, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twentieth, and Twenty-First Supplemental Ordinances (together the "General Ordinance"), require the preparation and submission of a Consulting Engineer's Report prior to the enactment of a Supplemental Ordinance authorizing the issuance of bonds under the General Ordinance. Arcadis has prepared this Report on behalf of the Water Department to satisfy this General Ordinance requirement. Capitalized terms used but not defined in this Report have the meanings set forth in the General Ordinance.

In preparation of this Report and the conclusions contained herein, Arcadis has relied on certain assumptions, information, and data (collectively, "information" for purposes herein) provided by the Water Department with respect to conditions that may exist or events that may occur in the future. Arcadis has not independently verified the accuracy of the information provided by the Water Department. While we believe such sources are reliable and the information obtained therefrom is appropriate for the analysis undertaken and the conclusions reached, as is often the case, there will likely be differences between actual and projected results. Accordingly, some of the estimates used in this Report may not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the data and results projected in this Report and actual results achieved, and those differences may be material. To the extent that the information provided to Arcadis by the Water Department is not accurate, the conclusions and recommendations contained in this Report may vary and are subject to change. Any statements in this Report involving estimates or matters of opinion, whether specifically designated or not, are intended as such, and not as representation of fact. This Report summarizes the work completed up to the date of the issuance of the Report. Changed conditions occurring or becoming known after such date could affect the material presented to the extent of such changes. Arcadis has no responsibility for updating this Report for changes that occur after the date of this Report.

For a complete understanding of the analyses undertaken and the assumptions upon which the conclusions in this Report are based, this Report should be read in its entirety.

1.1 Scope

Consistent with the General Ordinance requirements, this Report presents the results of a financial projection for the period FY 2019 through FY 2025. The financial projection is based on a review of the Water Department's historical financial data and other information, and is performed to provide an estimate of future financial operations for the Water Department. The Report also presents a review of the Water Department's organization and management; the System, including its general condition; adequacy of system capacity; general operation and maintenance (O&M) practices; and a review of the proposed Capital Improvement Program (CIP) of the Water Department. This Report does not include a review of any pending or threatened litigation against the Water Department. This Report is prepared in anticipation of the issuance of water and wastewater revenue bonds during FY 2020 and FY 2021.

The Arcadis team performed site visits and conducted visual inspections of major water and wastewater facilities during the months of January and February 2019. Arcadis reviewed the current condition and operation and maintenance of the water and wastewater systems. General observations consisted of visual examinations of above ground, selected facilities which we believe are adequate for commenting on the overall condition of the facilities. We met with key Water Department staff during January through February 2019 to discuss other facilities, regulatory compliance, staffing, and key initiatives of the Water Department. During the preparation of this Report, we also reviewed reports and information provided by the Water Department, as well as relevant, publicly-available reports and information, to supplement our field observations and discussions with Water Department staff.

The general outline of the Report is as follows:

1. Projected Financial Requirements – This includes a projection of the Water Department's revenues and revenue requirements, including necessary revenue increases needed to meet O&M expenses, existing and projected debt service related to funding the Capital Improvement Program, debt coverage targets, and transfers to reserve funds to maintain target balances.
2. Water Department Organization – This includes an overview of the Water Department's organizational structure, key operating divisions, and initiatives.
3. Water and Wastewater Systems – This provides information related to the System, including an overview of assets, regulatory issues, operating units, and planning initiatives.
4. Capital Improvement Program – This provides an overview of the Water Department's FY 2020 through FY 2025 CIP.
5. Conclusions – This provides a summary of Arcadis' major conclusions and relevant assumptions and considerations.

1.2 Arcadis Qualifications

Arcadis is a leading global Design and Consultancy firm for natural and built assets. We apply deep market sector insights and collective design, consultancy, engineering, project and management services to work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. Arcadis employs approximately 27,000 people and is active in over 70 countries. We employ specialists in every aspect of the water cycle from source of supply development, to wastewater treatment, and stormwater resiliency projects. Our technical experts are well-versed in U.S. water, wastewater, and stormwater regulations, as well as the design of water and wastewater systems. Our public sector clients range from small municipalities to large cities, state agencies and agencies of the U.S. government. Key water industry technical services include the following:

- Master planning for water and wastewater systems
- Design of water distribution and wastewater collection systems
- Design water and wastewater treatment facilities

- Operation and Maintenance assistance
- Distribution and water quality modeling
- Supervisory Control and Data Acquisition (SCADA) systems
- Asset Management

Members of Arcadis’ Water Division participated in the development of this Report. This includes conducting interviews of key managers within the Water Department and performing site visits of key Water Department facilities. These Arcadis staff members are experienced engineers that know and understand the U.S. water industry and regulatory environment.

In addition to our strong engineering and technical expertise, Arcadis brings a wide range of business advisory experience to help utilities meet their financial and management challenges. The Business Advisory practice of Arcadis focuses on the management, financial, organizational and information technology needs of municipal water and wastewater utilities. The Projected Financial Requirements section of this Report has been prepared by members of Arcadis’ Business Advisory practice. These professionals maintain significant experience with completing utility financial planning, cost of service, and rate assessments for water, wastewater, and stormwater utilities. Additionally, these professionals have participated in many similar bond engineer reports for utilities comparable to the Water Department.

2 PROJECTED FINANCIAL REQUIREMENTS

2.1 Overview

Arcadis performed a projection of the Water Department's revenue and revenue requirements for the period FY 2019 through FY 2025. The projection is performed to determine the adequacy of System revenues to meet projected revenue requirements, including O&M expenses, outstanding and projected debt service, cash funded capital, and reserve fund transfers. The projection is also performed to determine compliance with General Ordinance requirements, including the Rate Covenant. The General Ordinance Rate Covenant requires that the City charge and collect water and wastewater rents, rates, fees, and charges that yield Net Revenues which are equal to at least:

1. 1.20 times the debt service requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); and
2. 1.00 times (A) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (B) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (C) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (D) debt service requirements on Interim Debt payable during such Fiscal Year; and (E) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year).

Net Revenues, for purposes of items 1 and 2 above, include any transfers made to or from the Rate Stabilization Fund by the Water Department.

3. 0.90 times debt service requirements for such fiscal year (excluding Debt Service Requirements in respect of Subordinated Bonds); provided that, for purposes of this clause Net Revenues shall be calculated to exclude any amounts transferred from the Rate Stabilization Fund to the Revenue Fund.

The following sections provide an overview of Arcadis' work in developing the projection of System revenue requirements and determining necessary revenue increases to comply with the Rate Covenant and maintain targeted reserve fund balances. These sections present analysis and projections that are based on historical audited financial information through FY 2018, as well as FY 2019 and FY 2020 budget data provided by the Water Department.

2.2 Existing Rates and Rate Methodology

In November 2012, the City voted to amend the Home Rule Charter to allow City Council to establish an independent body defined as the Philadelphia Water, Sewer and Storm Water Rate Board (Rate Board). The Rate Board is responsible for fixing and regulating rates and charges for water, sewer and stormwater services; and establishing open and transparent processes and procedures for fixing and regulating rates and charges. The Rate Board consists of five members that are appointed by the Mayor. Members serve staggered terms and continue to serve until the Mayor appoints a replacement. The most recent rate proceeding for the Water Department established water, sewer, and stormwater rates and charges as of September 1, 2018 for FY 2019. The Rate Board also approved an additional increase of 1.2 percent to go into effect as of September 1, 2019 for FY 2020. This was the second rate proceeding for the Water Department and Rate Board. The following provides an overview of key components of the Rate Board determination for the Water Department's rates for FY 2019 and FY 2020.

- Approved increases to service revenue of 1.33% and 1.20% effective September 1, 2018 and September 1, 2019, respectively.
- Established a target of 1.30 for the senior debt service coverage ratio described in Item 1 under Section 2.1 above.
- Established a target of $150 million for combined Residual Fund and Rate Stabilization Fund balances.
- Approved a cost recovery rider for the Water Department's Tiered Assistance Program.

Each of these components is reflected in Arcadis' financial projections discussed in the following sections.

Table 2-1 presents the General Service rates and charges currently in effect resulting from the recent rate proceeding and are effective as of September 1, 2018. The term General Service refers to the core water, wastewater, and stormwater service provided by the Water Department to its primary customer base consisting of residential, commercial, industrial, and other similar customer types. There are certain customer types that have been granted a reduced rate per Water Department Regulations, including certain senior citizens, schools, and Philadelphia Housing Authority accounts. As noted above, the Water Department initiated a tiered assistance program (TAP) for certain qualifying residential customers. TAP allows residents that meet Federal Poverty Limit guidelines to pay for water, sewer, and stormwater service on a percentage of income basis in lieu of using the standard rate schedule. The Water Department requested, and the Rate Board approved, a TAP Rate Rider (TAP Rider) to recover anticipated lost revenue related to the TAP program. The water and wastewater quantity charges below include an incremental $/Mcf (Mcf = thousand cubic feet) amount for the TAP Rider program and are included as part of the Water Department's rates and charges.

In addition to General Service rates and charges noted in Table 2-1, the Water Department maintains service charges for wholesale water and wastewater customers, private fire service, public fire service, and wastewater surcharges for customers with excessive strength wastewater loadings of Biochemical Oxygen Demand (BOD) and Suspended Solids (SS). The wholesale charges are outlined by individual contracts, but generally include provisions to recover certain O&M and capital costs for system components that serve the wholesale customers. Public Fire Service is recovered via a payment from the City and reflects O&M and capital costs for water system components related to providing public fire protection such as hydrants and associated water mains. The following General Service rates and charges provide the basis for Arcadis' projection of revenue in this Report.

The Water Department utilizes a monthly service charge for water and wastewater service that is graduated by meter size. The water quantity charge reflects a declining block structure where the cost per unit of usage in Mcf decreases beyond established thresholds. The wastewater quantity charge is a uniform charge per Mcf for all billable water usage. For certain wastewater customers with higher strength wastewater, surcharges are set for BOD and SS loadings that exceed 250 milligrams per liter (mg/l) and 350 mg/l, respectively. The stormwater charges provide for a residential monthly charge per parcel and an associated billing and collection charge. For non-residential customers, the stormwater charge is based on the amount of gross and impervious area per parcel. These customers also receive a billing and collection charge. The rate and charge structures used by the Water Department for billing customers are generally common within the industry and are appropriate for effectively recovering its cost of providing service.

Table 2-1: Existing General Service Rates and Charges

Monthly Water and Wastewater Service Charges				
	Water		Wastewater	
Line No.	Meter Size (inches)	Charge Per Bill	Meter Size (inches)	Charge Per Bill
1	5/8	$5.12	5/8	$7.04
2	3/4	$5.47	3/4	$8.95
3	1	$6.62	1	$13.06
4	1-1/2	$8.83	1-1/2	$22.89
5	2	$12.26	2	$35.25
6	3	$19.39	3	$63.46
7	4	$35.27	4	$107.93
8	6	$66.12	6	$212.60
9	8	$100.48	8	$336.27
10	10	$147.20	10	$485.42
11	12	$239.66	12	$881.42
Water and Wastewater Quantity Charges				
	Water		Wastewater	
	Monthly Usage	Unit Charge Per Mcf	Description	Unit Charge
12	First 2 Mcf	$45.52	All Usage ($ / Mcf)	$31.76
13	Next 98 Mcf	$39.21	BOD Surcharge ($ / lb.)	$0.395
14	Next 1,900 Mcf	$30.54	SS Surcharge ($ / lb.)	$0.390
15	Over 2,000 Mcf	$29.72		
Stormwater Charges				
	Residential		Non-Residential	
	Description	Monthly Charge	Description	Monthly Charge
16	Billing & Collection	$1.80	Billing & Collection	$2.34
17	SWMS	$13.73	Gross Area ($/500 s.f.)	$0.701
18			Impervious Area ($/500 s.f.)	$5.304

Notes:
Water and Wastewater Quantity Charges include TAP Rider surcharge
Mcf = Thousand Cubic Feet
BOD = Biochemical Oxygen Demand; SS = Suspended Solids
BOD and SS Surcharges for wastewater strength in excess of 250 milligrams per liter (mg/l) and 350 mg/l, respectively
SWMS = Stormwater Management Service
s.f. - square feet

2.3 Projected Revenues Under Existing Rates

Arcadis developed a projection of revenue under existing rates and charges for the Water Department. The projection of revenue under existing rates provides a baseline for determining potential additional revenue increases to meet the operating and capital costs of the System. In addition to the General Service rates and charges noted above, the Water Department also includes the following service charges:

- Wholesale Service Charges – The Water Department maintains wholesale service contracts with several adjacent communities and/or utilities, including:
    - Delaware County Regional Water Quality Control Authority (DELCORA)
    - Aqua Pennsylvania
    - Cheltenham Township
    - Bucks County Water and Sewer Authority (includes Springfield and Bensalem)
    - Lower Merion Township
    - Upper Darby Township
    - Lower Southampton Township
    - Abington Township
    - Lower Moreland Township

  The contracts generally provide for the recovery of O&M and capital costs for portions of the systems that serve these customers. For several of the contracts including DELCORA, the Water Department is able to recover a portion of its costs related to its Consent Order Agreement. The Water Department notes that it has recently been in discussions with DELCORA about the COA provisions in its contract. At this time, it is not known whether any material changes will result due to these discussions with DELCORA, and for purposes of this Report wholesale revenue is projected to continue at levels consistent with the current contracts. The total wholesale water and wastewater revenue equates to approximately 5.8% of the Water Department's total operating revenue.
- Private Fire Protection – Certain customers maintain private fire systems in addition to their general service, and the Water Department maintains a monthly charge graduated by meter size to recover a portion of the water system costs related to serving these customers.
- Public Fire Protection – The Water Department maintains hydrants and capacity in its water system to support fire suppression for the public. This charge is billed and recovered on an annual basis via the City.
- Wastewater Surcharge – For certain customers with high strength wastewater, the Water Department maintains a wastewater surcharge for wastewater with pollutant loadings above established thresholds.

General Service revenue is dependent on the number of customers and associated billing units for these customers. Arcadis reviewed the historical and current levels of customers (associated monthly bills), water usage, and stormwater gross and impervious area units to determine the general trend in number of customers and billing units. Based on the review, the following conclusions and the resulting assumptions were incorporated into our projection of service revenue.

- The number of water, wastewater, and stormwater customers has been generally stable in recent years. Arcadis' projection reflects a stable number of customers and associated monthly bills for the projection period.
- The amount of billed water usage per monthly bill has been steadily declining in recent years. Based on recent trends, it is projected that annual billed usage (impacting water and wastewater quantity charge revenue) will decrease by approximately 1.2% per year for the projection period.
- For stormwater service, the Water Department maintains a credit program for certain customers that undertake parcel improvements to mitigate stormwater runoff from gross and impervious areas. The credits provide for a decrease in non-residential gross and impervious area billing units. Based on our review of recent data, it is projected that stormwater revenue will decrease approximately 0.12% per year for the projection period related to continuation of the credit program.

Table 2-2 presents the projection of revenue under existing FY 2019 rates. Lines 1 through 2 and Lines 7 through 9 reflect the application of the FY 2019 rates and charges to the estimated customer billing units for the projection period. The Water Department provided Arcadis with historical data related to annual water, wastewater, and stormwater billings and associated revenue collected by fiscal year. Using this data, Arcadis applied collection factors of 0.97 for water and wastewater billings and 0.94 for stormwater billings, respectively to derive the estimated revenue collected during the projection period.

Table 2-2: Projected Revenue Under FY 2019 Rates and Charges ($1,000s)

Line No.	Description	Fiscal Year Ending June 30, 2019	2020	2021	2022	2023	2024	2025
	Operating Revenue							
	Water Service							
1	Retail Volume Revenue	227,916	225,181	222,479	219,810	217,172	214,566	211,991
2	Retail Fixed Revenue	31,144	31,144	31,144	31,144	31,144	31,144	31,144
3	Private Fire Protection	3,211	3,211	3,211	3,211	3,211	3,211	3,211
4	Public Fire Protection	9,300	9,235	9,235	9,235	9,235	9,235	9,235
5	Wholesale Water	3,796	3,796	3,796	3,796	3,796	3,796	3,796
6	Total Water Service	275,367	272,567	269,865	267,195	264,557	261,951	259,377
	Wastewater Service							
7	Retail Volume Revenue	185,845	183,614	181,411	179,234	177,083	174,958	172,859
8	Retail Fixed Revenue	44,429	44,429	44,429	44,429	44,429	44,429	44,429
9	Stormwater	165,748	165,549	165,350	165,152	164,954	164,756	164,558
10	Wastewater Surcharge	5,703	5,703	5,703	5,703	5,703	5,703	5,703
11	Wholesale Wastewater	38,705	38,705	38,705	38,705	38,705	38,705	38,705
12	Total Wastewater Service	440,430	438,000	435,598	433,223	430,874	428,551	426,254
	Other Revenue							
13	Other Operating Revenue	16,540	12,989	9,988	9,044	9,044	9,044	9,044
14	Interest Income	621	485	480	476	473	469	466
15	Total Other Revenue	17,161	13,475	10,468	9,520	9,517	9,514	9,510
16	**Total Water Department Revenue**	**732,958**	**724,042**	**715,932**	**709,939**	**704,949**	**700,016**	**695,141**

Note: Minor variance in summations due to rounding.

Other service revenue such as Private Fire Protection (Line 3); Public Fire Protection (Line 4); Wholesale Water (Line 5); Wastewater Surcharge (Line 10); and Wholesale Wastewater (Line 11) are based on FY 2018 results and the Water Department's FY 2019 and FY 2020 budgets. These amounts are generally projected to remain stable for the projection period but are subject to increases through the Water Department's regular rate proceedings and wholesale contract management process.

Other operating revenue seen on Line 13 consists of penalty and interest revenue; miscellaneous service revenue, and revenue offsets related to the TAP program. The TAP program has anticipated revenue offsets based on an analysis provided by the Water Department, which projects that the number of customers participating in TAP will gradually increase until FY 2022. From FY 2022 and beyond, it is projected that the TAP participant level will remain stable. The following provides the Water Department's estimate of lost revenue from the TAP program by fiscal year under existing rates:

- FY 2019 - $8,949,576
- FY 2020 - $12,545,538
- FY 2021 - $15,546,517
- FY 2022 - $16,490,541
- FY 2023 - $16,490,541
- FY 2024 - $16,490,541
- FY 2025 - $16,490,541

Interest income (Line 14) consists of interest income from the Revenue Fund and Rate Stabilization Fund and is determined using projected fund balances and an annual interest rate of 0.50%. Line 16 shows the projected Water Department revenue at approximately $733 million in FY 2019 and decreasing to approximately $695 million by FY 2025. As noted above, the Rate Board approved a 1.2% increase for FY 2020. The rates for FY 2020 will go into effect September 1, 2019 and the anticipated additional revenue is reflected in the projection of System Revenue shown below in Table 2-8.

2.4 Operation and Maintenance Expenses

Operation and Maintenance expenses consist of the necessary and recurring costs to effectively operate and maintain the System so that it performs as intended. In general, O&M consists of expenses related to Water Department divisions, e.g., Operations, Planning and Environmental Services, and Finance, as well as interdepartmental expenses for support received from City General Fund units, e.g., Law, Finance, and Information Technology. Combined these reflect Water Fund O&M revenue requirements. The following reflects the general O&M expense categories incurred by the Water Department:

Table 2-3: General Description of O&M Expense Categories

Account No.	Category	Description
100	Personal Services	Expenses related to salaries, fringe benefits, pension costs, overtime and other employee cost items
200	Purchase of Services	Expenses related to contracts or services from external entities, including electricity and natural gas service
300/400	Materials Supplies and Equipment	Miscellaneous supplies and equipment, including water treatment chemicals
500	Contributions Indemnities and Taxes	Generally expenses related to lawsuits
800	Payments to Other Funds	Additional O&M payment to the General Fund associated with the direct interdepartmental services provided to the Water Department by the City

Arcadis utilized the FY 2019 and FY 2020 Water Fund budgets as a baseline for developing the O&M projection. The budgeted expenses were adjusted downward to recognize that historically, actual O&M obligations have been less than budgeted. The adjustment was made by applying a factor derived from a historical look at actual obligations to the original budget by expense category. The O&M is further reduced by liquidated encumbrances, which are anticipated O&M obligations that are ultimately not spent in the fiscal year.

Table 2-4 presents the Water Fund O&M for the projection period. The majority of O&M is related to Personal Services, including Fringe Benefits, which include employee costs related to health insurance, as well as pension costs which comprise approximately 50 percent of the annual Personal Services amount.

Table 2-4: Projected Operation and Maintenance Expenses ($1,000s)

Line		Fiscal Year Ending June 30,						
No.	Description	2019	2020	2021	2022	2023	2024	2025
	Water Department O&M							
1	Personal Services	115,526	121,053	124,564	128,176	131,893	135,718	139,654
2	Purchase of Services	153,385	154,647	159,830	165,190	170,732	176,464	182,392
3	Materials Supplies and Equipment	46,081	46,638	47,571	48,522	49,492	50,482	51,492
4	Contributions Indemnities and Taxes	6,524	6,524	6,720	6,921	7,129	7,343	7,563
5	Other - Payment to General Fund	7,819	7,319	7,466	7,615	7,767	7,923	8,081
6	Subtotal Departmental Charges	329,335	336,181	346,149	356,424	367,014	377,930	389,182
	Interdepartmental O&M							
7	Personal Services - Non Fringe Benefits	22,439	23,284	23,959	24,654	25,369	26,105	26,862
8	Personal Services - Fringe Benefits	139,089	147,427	154,798	162,538	170,665	179,198	188,158
9	Purchase of Services	26,505	26,059	26,971	27,915	28,892	29,903	30,950
10	Materials Supplies and Equipment	6,704	6,020	6,141	6,263	6,389	6,516	6,647
11	Subtotal Interdepartmental Charges	194,737	202,790	211,869	221,371	231,315	241,723	252,617
	Combined O&M							
12	Subtotal Operating Expenses	524,072	538,971	558,018	577,794	598,329	619,653	641,799
13	Less: Liquidated Encumbrances	(30,035)	(30,969)	(31,589)	(32,221)	(32,865)	(33,522)	(34,193)
14	**Total Operating Expenses**	**494,036**	**508,002**	**526,430**	**545,574**	**565,464**	**586,130**	**607,606**

Note: Minor variance in summations due to rounding.

The total O&M for the Water Department increases from approximately $494 million in FY 2019 to $608 million by FY 2025. The O&M increases are related to reasonable annual inflation factors applied as follows:

- Personal Services (Non-Fringe Benefits) - 2.9%
- Personal Services (Fringe Benefits) - 5.0%
- Purchase of Services (Electric) - 3.0%
- Purchase of Services (Gas) - 1.0%
- Purchase of Services (Other) - 3.5%
- Materials & Supplies (Chemicals) - 2.0%
- Materials & Supplies (Other) - 2.0%
- Contributions, Indemnities, Taxes - 3.0%
- Payment to General Fund - 2.0%

The aggregate annual inflation rate for the projection period beyond FY 2020 is 3.65%.

2.5 Capital Improvement Program and Funding

2.5.1 Capital Improvement Program

Table 2-5 presents the Water Department's CIP for the projection period.

Table 2-5: Capital Improvement Program and Projected Capital Cash Flow ($1,000s)

Line No.	Description	Fiscal Year Ending June 30, 2019	2020	2021	2022	2023	2024	2025
1	Water and Wastewater Plants and Facilities	120,000	120,000	120,000	336,192	369,192	165,192	159,192
2	Sewer and CSO System Improvements	56,000	67,800	73,060	68,460	68,460	68,460	68,460
3	Water Conveyance System Improvements	59,060	78,060	82,060	198,360	91,060	95,060	95,060
4	Flood Relief	10,000	10,000	15,000	15,000	15,000	15,000	15,000
5	Stream Restoration	0	0	10,000	10,000	10,000	10,000	10,000
6	Green Stormwater Infrastructure	47,000	62,000	114,700	114,700	114,700	114,700	114,700
7	Vehicles	12,000	12,000	12,000	12,000	12,000	12,000	12,000
8	Meters	30,000	35,000	5,000	5,000	5,000	5,000	5,000
9	Engineering & Admin.	19,645	16,047	16,047	16,047	16,047	16,047	16,047
10	**Total CIP** [1]	**353,705**	**400,907**	**447,867**	**775,759**	**701,459**	**501,459**	**495,459**
11	Inflation Adjustment [2]	0	12,428	28,198	74,405	91,110	82,697	99,600
12	**Inflated Total**	**353,705**	**413,335**	**476,065**	**850,164**	**792,569**	**584,156**	**595,059**
13	Cash Flow to Budget Factor [3]	80.68%	91.55%	80.90%	49.31%	57.05%	95.57%	114.01%
14	**Capital Improvement Plan Cash Flow**	**285,377**	**378,403**	**385,141**	**419,213**	**452,145**	**558,294**	**678,416**

[1] Engineering & Admin. (Line 9) excludes inflation adjustment reflected in the Water Department's CIP.
[2] Annual inflation rate of 3.1%.
[3] Reflects estimate of annual cash flow to budget (Line 14 / Line 12).

The CIP reflects planned improvements to the System, including continued work on projects related to its Consent Order Agreement. The CIP also includes projects related to its Water Master Plan, which targets a water main replacement rate of 42 miles per year by FY 2024, as well as significant renewal and replacement projects at the main Baxter, Queen Lane, and Belmont water facilities. Other projects are related to the implementation of Advanced Metering Infrastructure, Green Stormwater Infrastructure, and other wastewater treatment facility projects. The total uninflated CIP is reflected on Line 10. Arcadis applied an annual inflation adjustment of 3.1% to derive the adjusted CIP on Line 12. The 3.1% annual inflation rate is derived from an industry-recognized construction cost index using the years 2015 through 2018.

As the CIP schedule above is a budget, the Water Department also provided an estimated capital cash flow that ramps up over the projection period as CIP projects are designed, encumbered, and constructed. Line 14 presents the CIP cash flow based on the Water Department's estimates and reflects the total amount of CIP that requires funding during the projection period. Line 13 reflects the adjustment factor that is based on the Water Department's estimated fiscal year cash needed for capital projects to the fiscal year budget.

2.5.2 Capital Flow of Funds

The Construction Fund is established per the General Ordinance and provides accounting for the funding and completion of the Water Department's capital projects. It includes bond proceeds and cash transfers from the Revenue Fund and Residual Fund. The plan for funding the capital needs noted above in the CIP is shown in Table 2-6. As can be seen, Lines 1 through 5 present anticipated bond issuances and transfers to occur during the projection period. Line 1 presents the total bond issuance, including the FY 2019 bond issuance (Series 2018A) that has already occurred near the end of calendar year 2018. Additional bond issuances are projected to be needed during fiscal years 2020 through 2025 to meet the Water Department's capital needs. Lines 2 through 5 present bond proceed uses including the transfer to the Construction Fund (Line 2) for the completion of capital projects; Debt Reserve Account (Line 3); and issuance expenses (Line 4).

Table 2-6: Construction Fund Flow of Funds ($1,000s)

Line No.	Description	Fiscal Year Ending June 30, 2019	2020	2021	2022	2023	2024	2025
	Bond Proceeds							
1	Estimated Total Bond Issue [1]	301,843	255,000	246,615	375,390	391,085	516,210	643,750
	Transfers:							
2	Construction Fund [1]	300,000	245,239	244,950	354,025	380,746	486,799	595,311
3	Debt Reserve Account	0	8,040	0	18,831	7,699	25,927	44,094
4	Bond Issuance Expenses	1,843	1,721	1,665	2,534	2,640	3,484	4,345
5	Total Transfer of Proceeds (Lines 2+3+4)	301,843	255,000	246,615	375,390	391,085	516,210	643,750
	Construction Fund							
6	**Beginning Balance**	**289,580**	**367,428**	**287,275**	**207,485**	**205,700**	**203,428**	**200,977**
	Sources:							
7	Net Revenue Bond Proceeds [1]	300,000	245,239	244,950	354,025	380,746	486,799	595,311
8	Pennvest Loan Proceeds	0	0	0	0	0	0	0
9	Capital Account Deposit Amount	24,980	25,929	26,914	27,937	28,998	30,100	31,244
10	Transfer from Residual Fund to Capital Account	36,417	25,654	32,453	34,443	39,117	37,945	48,512
11	Interest Income	1,828	1,429	1,032	1,023	1,012	1,000	988
12	**Total Sources Available (Lines 6-11)**	**652,805**	**665,679**	**592,625**	**624,913**	**655,572**	**759,271**	**877,033**
	Uses:							
13	Capital Projects	(285,377)	(378,403)	(385,141)	(419,213)	(452,145)	(558,294)	(678,416)
14	**Ending Balance (Lines 12+13)**	**367,428**	**287,275**	**207,485**	**205,700**	**203,428**	**200,977**	**198,617**

[1] FY 2019 Bond Proceeds reflect the 2018A issuance. Debt service is included below in Existing Debt Service schedule.

Note: Minor variance in summations due to rounding.

2.5.2.1 Construction Fund Sources of Capital Funding

To meet the projected capital project needs over the projection period, the Water Department relies on several sources, including internally-derived cash from operations, as well as debt issuances to cover large, longer-term projects. At the beginning of FY 2019, the Water Department had approximately $289.5 million of cash on hand in the Construction Fund (Line 6). Construction Fund balances are supplemented by cash transfers from the Revenue Fund and the Residual Fund to meet the Water Department's capital needs.

Line 7 presents the projected bond proceed transfers to the Construction Fund for the projection period. During FY 2019 the Water Department completed the Series 2018A bond issuance which provided $300 million for the Construction Fund as seen on Line 7 for FY 2019. Future bond proceeds will steadily increase over the projection period as the Water Department ramps up capital project spending. Based on the Water Department's capital spending projection, it is estimated that approximately $595 million of funding from bond proceeds will be needed in FY 2025.

Line 8 presents any projected Pennvest Loan proceeds. The Water Department has used this funding source in the past but indicates that currently all of its Pennvest loans are closed out. While the Water Department could potentially use Pennvest Loans in the future, for purposes of this Report Arcadis is assuming that projected bond proceeds for the projection period will be from traditional revenue bonds.

Line 9 presents the Capital Account Deposit. The Capital Account is an established account within the Construction Fund. Per the General Ordinance, the Water Department is required to transfer an amount equal to one percent of the depreciated value of property, plant, and equipment as sufficient to make renewals, replacements, and improvements to the System. Arcadis determined the deposit amount by projecting the depreciated value of property, plant, and equipment. We used a one percent value for each fiscal year to determine the annual Capital Account Deposit for the projection period. The annual transfers from the Revenue Fund to the Construction Fund are seen on Line 9 of Table 2-6 and are available for use by the Water Department for capital projects to maintain adequate service to customers.

As noted above, the Water Department is targeting a 1.30 debt coverage ratio which generates additional cash from operations that is transferred to the Residual Fund. Per the General Ordinance, the Water Department may make transfers from the Residual Fund to the Construction Fund for the purpose of funding capital projects. Line 10 of Table 2-6 reflects the projected transfers from the Residual Fund to the Construction Fund. As is shown, it is projected that the Water Department will increase cash funding of capital from approximately $51 million in FY 2020 to approximately $80 million in FY 2025 (sum of Lines 9 and 10).

The main sources described above are supplemented by interest income (Line 11) to yield the total sources available on Line 12. The total sources available in the Construction Fund is projected to increase to approximately $877 million by FY 2025.

2.5.2.2 Uses of Capital Funds

The Construction Fund is used for the payment of capital project design and construction costs. Table 2-6, Line 13 reflects the anticipated cash capital needs of the Water Department as previously described in Section 2.5.1. This cash capital amount is also seen on Line 14 of Table 2-5.

Table 2-6, Line 14 shows the projected ending balance for each fiscal year of the projection period. The ending balance for each fiscal year is projected to average just above $200 million, although the Construction Fund balance will be higher or lower than this amount during the course of a given fiscal year as funds are transferred and spent.

2.6 Existing and Projected Debt Service

As of December 31, 2018, the Water Department currently has approximately $2.0 billion in outstanding debt, including revenue bonds and Pennvest loans outstanding. Lines 1 through 3 of Table 2-7 provide a summary of the existing debt service by Fiscal Year for the projection period. The revenue bonds and Pennvest debt service are both treated as senior debt for purposes of determining compliance with the Rate Covenant of the General Ordinance. The existing debt service includes the Water Department’s recent Series 2018A and Series 2019A issuances.

As noted above, the Water Department will rely on regular issuances of revenue bonds to fund a portion of its capital needs over the projection period. Lines 4 through 10 of Table 2-7 present the projected debt service related to future revenue bond issuances by fiscal year. The projected debt service is determined using the following assumptions:

- Level annual debt payment
    - 30-year term

- o Series 2019B issuance in August 2019; Series 2020 through Series 2024 annual issuance in November, interest payment dates of April 1st and October 1st
- o 5.30 percent average annual interest rate based on the following interest rates and par value amounts:
  - ▪ Series 2019B – Par Value of $255,000,000 at 5.00 percent
  - ▪ Series 2020 - Par Value of $246,615,000 at 5.00 percent
  - ▪ Series 2021 - Par Value of $375,390,000 at 5.25 percent
  - ▪ Series 2022 - Par Value of $391,085,000 at 5.25 percent
  - ▪ Series 2023 - Par Value of $516,210,000 at 5.50 percent
  - ▪ Series 2024 - Par Value of $643,750,000 at 5.50 percent
- o Initial, semi-annual interest payment in fiscal year of issuance

Table 2-7: Existing and Projected Debt Service ($1,000s)

Line		Fiscal Year Ending June 30,						
No.	Description	2019	2020	2021	2022	2023	2024	2025
1	Existing Revenue Bonds [1]	179,908	186,545	164,642	154,497	148,501	118,956	119,117
2	Existing Pennvest Loans	10,679	10,631	10,631	10,631	10,631	10,631	10,631
3	Subtotal Existing Debt Service	190,587	197,176	175,273	165,128	159,132	129,587	129,748
	Projected Debt Service							
4	FY 2020 - Series 2019B		8,040	14,973	16,590	16,587	16,579	16,574
5	FY 2021 - Series 2020			4,795	15,568	15,972	15,967	15,962
6	FY 2022 - Series 2021				7,664	24,426	25,009	25,001
7	FY 2023 - Series 2022					7,699	25,376	26,060
8	FY 2024 - Series 2023						10,647	34,504
9	FY 2025 - Series 2024							14,261
10	Subtotal Projected Debt Service	0	8,040	19,768	39,822	64,684	93,578	132,362
11	**Total Debt Service**	**190,587**	**205,216**	**195,041**	**204,949**	**223,816**	**223,165**	**262,110**

[1] Includes existing debt service related to Water Department's Series 2018A and Series 2019A Refunding issues. Does not include Series 2020 Forward Refunding Bonds.

Note: Minor variance in summations due to rounding.

As Table 2-7 reflects, the total debt service is expected to grow during the projection period as the Water Department ramps up spending on capital projects. By FY 2025 annual debt service is projected to be approximately $262 million. As noted above, the full debt service payment for FY 2025 – Series 2024 issuance would impact the Water Department in FY 2026.

2.7 System Flow of Funds and Rate Covenant Test

Table 2-8 presents Arcadis' consolidated projection of the System financial performance for the projection period FY 2019 to FY 2025. Lines 1 through Line 3 reflect operating revenue consistent with the current FY 2019 rates and charges recently established as of September 1, 2018. Lines 4 through 10 reflect projected increases in service revenue for FY 2020 through FY 2025 (including the already approved increase of 1.2% in FY 2020) to meet O&M, debt service, and Capital Account deposit requirements, plus provide additional coverage per the Rate Covenant and the Water Department's desire to cash fund more of its capital projects. For FY 2024 and FY 2025, revenue increases of approximately 5.02 percent are projected to smooth annual increases.

Line 12 presents other operating revenue related items such as permit fees, penalty and interest revenue, and other miscellaneous items. It also includes revenue offsets related to the Water Department's TAP program noted above. Lines 13 and 14 reflect nonoperating revenue including interest income and any transfers of excess funds from the Debt Reserve Account to the Revenue Fund per the General Ordinance. The Total Revenue for the projection period is seen on Line 15 and is projected to grow from approximately $735 million in FY 2020 to $932 million by FY 2025.

The Total Revenue is used to meet O&M expenses (Lines 16 through 18) and results in Net Revenue available for meeting debt service requirements. As is seen on Line 19, Net Revenue is projected to be adjusted by transfers to and from the Rate Stabilization Fund during the projection period. The transfers generally adjust the Rate Stabilization Fund to a target balance of approximately $135 million and provide additional funds to meet debt service and associated Rate Covenant coverage requirements.

Net Revenue is used to meet senior and subordinate debt service requirements seen on Lines 21 through 27, as well as the Capital Account Deposit seen on Line 30. Line 31 reflects the positive remaining cash amount that is transferred to the Residual Fund.

Table 2-8: Projected System Flow of Funds ($1,000s)

Line No.	Description	Fiscal Year Ending June 30, 2019	2020	2021	2022	2023	2024	2025
	OPERATING REVENUE							
1	Water Service Revenue	275,367	272,567	269,865	267,195	264,557	261,951	259,377
2	Wastewater Service Revenue	440,430	438,000	435,598	433,223	430,874	428,551	426,254
3	Total Service Revenue - Existing Rates	715,797	710,568	705,463	700,418	695,432	690,503	685,631
	Additional Revenue Required							
	Year / Percent Increase / Initial Increase % of Year Effective							
4	FY 2020 1.20% 83.3%		7,106	8,466	8,405	8,345	8,286	8,228
5	FY 2021 8.15% 83.3%			48,497	57,780	57,368	56,962	56,560
6	FY 2022 5.75% 83.3%				36,757	43,794	43,484	43,177
7	FY 2023 6.54% 83.3%					43,890	52,295	51,926
8	FY 2024 5.02% 83.3%						35,622	42,445
9	FY 2025 5.02% 83.3%							37,165
10	Total Additional Service Revenue Required	0	7,106	56,962	102,942	153,398	196,649	239,502
11	Total System Service Revenue	715,797	717,673	762,426	803,360	848,830	887,152	925,132
	Other Income							
12	Other Operating Revenue	16,540	12,989	9,988	9,044	8,055	7,181	6,263
13	Interest Income	621	485	418	423	435	432	502
14	Transfer From Debt Reserve Account	2,284	0	7,931	0	0	0	0
15	**Total Revenues**	**735,241**	**731,148**	**780,763**	**812,828**	**857,320**	**894,765**	**931,898**
	OPERATING EXPENSES							
16	Water and Wastewater Operations	(299,299)	(305,212)	(314,561)	(324,203)	(334,149)	(344,408)	(354,989)
17	Direct Interdepartmental Charges	(194,737)	(202,790)	(211,869)	(221,371)	(231,315)	(241,723)	(252,617)
18	**Total Operating Expenses**	**(494,036)**	**(508,002)**	**(526,430)**	**(545,574)**	**(565,464)**	**(586,130)**	**(607,606)**
	NET REVENUES							
19	Transfer From/(To) Rate Stabilization Fund	10,300	33,577	0	0	0	(17,500)	17,500
20	**Net Revenues (L15+L18+L19)**	**251,505**	**256,723**	**254,333**	**267,254**	**291,856**	**291,135**	**341,792**
	DEBT SERVICE							
	Senior Debt Service							
21	Outstanding Revenue Bonds	(179,908)	(186,545)	(164,642)	(154,497)	(148,501)	(118,956)	(119,117)
22	Penvest Parity Bonds	(10,679)	(10,631)	(10,631)	(10,631)	(10,631)	(10,631)	(10,631)
23	Projected Future Revenue Bonds	0	(8,040)	(19,768)	(39,822)	(64,684)	(93,578)	(132,362)
24	Total Senior Debt Service	(190,587)	(205,216)	(195,041)	(204,949)	(223,816)	(223,165)	(262,110)
	Subordinate Debt Service							
25	Outstanding General Obligation Bonds	0	0	0	0	0	0	0
26	Pennvest Subordinate Bonds	0	0	0	0	0	0	0
27	Total Subordinate Debt Service	0	0	0	0	0	0	0
28	Transfer to Escrow	0	0	0	0	0	0	0
29	Total Debt Service + Transfer to Escrow	(190,587)	(205,216)	(195,041)	(204,949)	(223,816)	(223,165)	(262,110)
30	Capital Account Deposit	(24,980)	(25,929)	(26,914)	(27,937)	(28,998)	(30,100)	(31,244)
31	**Net For Transfer to Residual Fund (L20+L29+L30)**	**35,939**	**25,579**	**32,378**	**34,368**	**39,042**	**37,870**	**48,437**
32	Coverage Test 1 - 1.20X (Ln 20 / Ln 24)	1.31	1.25	1.30	1.30	1.30	1.30	1.30
33	Coverage Test 2 - 1.00X (Ln 20 / (Ln 24+Ln 27+Ln 30))	1.16	1.11	1.14	1.14	1.15	1.14	1.16
34	Coverage Test 3 - 0.90X (Ln 20-Ln 19) / Ln 24	1.26	1.08	1.30	1.30	1.30	1.38	1.23

Note: Minor variance in summations due to rounding.

Lines 32 through 34 present the results of the Rate Covenant coverage tests noted above. The results show that Net Revenues, including Rate Stabilization Fund transfers to the Revenue Fund, provide coverage on senior lien debt service that is greater than 1.20. The Net Revenues, including any Rate Stabilization Fund transfers, provide coverage on senior and subordinate debt service, and the Capital Account Deposit that is greater than 1.00. Finally, Net Revenues, excluding any Rate Stabilization Fund transfers, provide coverage on senior lien debt service that is greater than 0.90.

Table 2-8 shows that the Water Department's projected revenues, including the required service revenue increases seen on Lines 4 through 10, are adequate to meet the Rate Covenant requirements of the General Ordinance. The Water Department has set a target coverage ratio for its senior debt service of 1.30, which is above the required 1.20 requirement. This additional coverage will provide positive, end of year balances for the Residual Fund that can ultimately be transferred to the Construction Fund to fund a portion of the Water Department's annual capital projects.

2.7.1 Reserve Fund Balances

This section presents the projected flow of funds for the Residual Fund, Rate Stabilization Fund, and Debt Reserve Account. In general, the Residual and Rate Stabilization Funds are available to meet the cash needs of the Water Department. The Rate Stabilization Fund can transfer or receive funds from the Revenue Fund at the direction of the Water Commissioner. The Residual Fund can be used per the General Ordinance to generally pay operating expenses; fund transfers to any other account established by the General Ordinance (excluding the Revenue and Rate Stabilization Funds); pay principal and interest on senior and subordinate debt service; pay amounts due under capitalized leases or other similar obligations; and fund a transfer to the City's General Fund up to a maximum, in any Fiscal Year, of $4,994,000. The Debt Reserve Account is generally restricted to provide funds in the event the Water Department is not able to meet a debt service payment that is due.

2.7.1.1 Residual Fund

Table 2-9, Lines 1 through 8 presents the flow of funds for the Residual Fund. The remaining cash flow from the Revenue Fund is deposited into the Residual Fund as shown on Line 3. This annual deposit combined with beginning balances and interest income is projected to be used for several purposes including a transfer to the Construction Fund (Line 5) to fund a portion of the Water Department's capital projects. As seen on Line 6, a transfer is also made to the City's General Fund in accordance with Section 4.12 (viii) of the General Ordinance which states that a transfer in an amount not to exceed the lower of A) all Net Reserve Earnings or B) $4,994,000. Net Reserve Earnings is the amount of interest earnings earned on funds deposited in the Debt Reserve Account. After these transfers, the projected ending balance for the Residual Fund is approximately $15 million.

2.7.1.2 Rate Stabilization Fund

Table 2-9, Lines 9 through 14 presents the flow of funds for the Rate Stabilization Fund. The Rate Stabilization Fund provides the Water Department with reserve cash funds to mitigate the impact of necessary revenue increases and ensure adequate coverage ratios. Transfers between the Rate Stabilization Fund and Revenue Fund are made at the direction of the Water Commissioner. As is seen, it is projected that transfers will be made to and from the Rate Stabilization Fund in FY 2019, FY 2020, FY 2024, and FY 2025.

As noted above, in the recent rate proceeding, the Rate Board set forth a combined reserve fund target balance of $150 million for the Residual Fund and Rate Stabilization Fund. The tables above reflect that with the projected service revenue increases in Table 2-8, the Water Department will be able to maintain a combined $150 million target reserve balance for the Residual Fund and Rate Stabilization Fund (Line 8+Line 14).

Table 2-9: Flow of Funds for Residual Fund, Rate Stabilization Fund, and Debt Reserve Account ($1,000s)

		Fiscal Year Ending June 30,						
Line No.	Description	2019	2020	2021	2022	2023	2024	2025
	RESIDUAL FUND							
1	**Beginning of Year Balance**	**15,402**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**
2	Interest Income	76	75	75	75	75	75	75
	Transfers In							
3	From Revenue Fund	35,939	25,579	32,378	34,368	39,042	37,870	48,437
4	From Debt Reserve Account	992	1,006	1,006	1,034	1,100	1,184	1,359
	Transfers Out							
5	To Construction Fund	(36,417)	(25,654)	(32,453)	(34,443)	(39,117)	(37,945)	(48,512)
6	To City General Fund	(992)	(1,006)	(1,006)	(1,034)	(1,100)	(1,184)	(1,359)
7	To Debt Reserve Account	0	0	0	0	0	0	0
8	**End of Year Balance**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**	**15,000**
	RATE STABILIZATION FUND							
9	**Beginning of Year Balance**	**178,877**	**168,577**	**135,000**	**135,000**	**135,000**	**135,000**	**152,500**
10	Interest Income	531	421	338	338	338	338	381
	Transfers In							
11	From Revenue Fund	0	0	0	0	0	17,500	0
	Transfers Out							
12	To Revenue Fund - Transfer	(10,300)	(33,577)	0	0	0	0	(17,500)
13	To Revenue Fund - Interest	(531)	(421)	(338)	(338)	(338)	(338)	(381)
14	**End of Year Balance**	**168,577**	**135,000**	**135,000**	**135,000**	**135,000**	**152,500**	**135,000**
	DEBT RESERVE ACCOUNT							
15	Beginning of Year Balance	**199,460**	**197,176**	**205,216**	**197,285**	**216,117**	**223,816**	**249,743**
16	Interest Income	992	1,006	1,006	1,034	1,100	1,184	1,359
	Transfers In							
17	From Bond Proceeds	0	8,040	0	18,831	7,699	25,927	44,094
18	From Revenue Fund	0	0	0	0	0	0	0
	Transfers Out							
19	To Revenue Fund - Excess Funds	(2,284)	0	(7,931)	0	0	0	0
20	To Residual Fund - Interest	(992)	(1,006)	(1,006)	(1,034)	(1,100)	(1,184)	(1,359)
21	**End of Year Balance**	**197,176**	**205,216**	**197,285**	**216,117**	**223,816**	**249,743**	**293,837**

2.7.1.3 Debt Reserve Account

The Debt Reserve Account of the Sinking Fund is established per the General Ordinance to maintain a reserve equal to the Debt Reserve Requirement. The Debt Reserve Requirement is the greatest amount of Debt Service Requirements payable in any one Fiscal Year, or generally the maximum annual senior debt service. Table 2-9 presents the projected flow of funds for the Debt Reserve Account. Transfers from Bond proceeds (Line 17) are anticipated to be needed to meet the Debt Reserve Requirement in certain years. If there are funds in excess of the Debt Reserve Requirement, they are transferred to the Revenue Fund per the General Ordinance as seen on Line 19. Interest earnings on amounts deposited in the Debt Reserve Account are credited to this account until it is fully funded, and then transferred to the Residual Fund for subsequent transfer to the City's General Fund in accordance with the General Ordinance, as seen on Line 20. The end of year balance is consistent with the maximum annual debt service in each fiscal year for both outstanding and projected senior lien bonds.

2.8 Conclusions

Arcadis has performed an analysis of the estimated future financial operations of the Water Department. As outlined in this Section and subject to the assumptions outlined herein, it is Arcadis' opinion that:

1. The Water Department plans to increase capital spending significantly through FY 2025; and regular bond issuances are anticipated to fund a portion of the capital expenditures. This will require consistent revenue increases to the Water Department's service charges to meet revenue requirements, target debt coverage levels, and reserve fund balances.
2. The System will yield pledged Project Revenues, including the projected increases in service revenue indicated in the Report, over the amortization periods of the water and wastewater revenue bonds anticipated to be issued in FY 2020 and FY 2021, sufficient to meet the projected payments or deposit requirements of:
    - all projected operation, maintenance, repair and replacement expenses of the System;
    - all reserve funds required to be established out of such Project Revenues; and
    - the principal or redemption price of and interest on anticipated Bonds, as the same become due and payable, for which the Project Revenues are pledged.
3. The Net Revenues are currently sufficient to comply with the Rate Covenant and are projected to be sufficient, including the projected increases in service revenue indicated in the Report, to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the anticipated Fiscal Year 2020 and Fiscal Year 2021 revenue bonds are issued. This includes the requirement to yield Net Revenues that are at least:
    - 1.20 times the Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); and
    - 1.00 times (A) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (B) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (C) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (D) debt service requirements on Interim Debt payable during such Fiscal Year; and (E) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year).
    - 0.90 times Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); provided that, for purposes of this clause Net Revenues shall be calculated to exclude any amounts transferred from the Rate Stabilization Fund to the Revenue Fund.

3 WATER DEPARTMENT ORGANIZATION

3.1 Organizational Structure

The City of Philadelphia (City) owns and manages the System via the Water Department. The Water Department is an enterprise fund utility that relies on service revenue generated from customer rates, fees, and charges. The main functions of the Water Department are outlined in Article V, Chapter 8 of the Philadelphia Home Rule Charter, and its general functions and focus areas include:

- Operation of the City's water supply system, as well as construction, maintenance, repair and improvements to City water supply facilities, including fire hydrants and water meters;
- Preparation of plans and estimates looking towards the acquisition by the City of new and better sources of water supply, as well as the investigation and adoption of methods for improving the quality of the water supply;
- Operation, maintenance, repair and improvement of the City's sewage system and sewage disposal plants, as well as the acquisition, design and construction of additional sewage disposal plants and sewage facilities;
- Fix and regulate rates and charges for providing water and sewer service; and
- Enter into contracts for supplying water and sewer service to users outside of the City.

In addition to these core functions, the Water Department performs detailed financial management and accounting, and other administrative functions to properly manage the System.

The Water Department is structured into multiple operating divisions that focus on operations, planning and engineering, finance, public affairs, and other support and administrative functions that are discussed in subsequent sections of this Report. The Water Commissioner, who is appointed by the Mayor, leads the Water Department. In January 2016, the City appointed Ms. Debra McCarty as Water Commissioner. Prior to her appointment as Commissioner, Ms. McCarty served in multiple positions during her 34 years at the Water Department, including Deputy Commissioner of Operations. Ms. McCarty is expected to retire in the spring of 2019 and the City is currently conducting a search for a new Commissioner to succeed Ms. McCarty. An interim appointment will be made if an appointment has not been made upon her retirement.

The Water Commissioner is assisted by an experienced staff of senior managers, including the Deputy Commissioner of Operations; Deputy Commissioner of Finance; Deputy Commissioner of Planning and Environmental Services; Deputy Commissioner of Compliance; Deputy Commissioner of Administration and Human Resources; Deputy Commissioner of Public Affairs; and Engineering and Construction General Manager. These senior managers are experienced in their particular field of expertise and assist the Water Commissioner with management of critical utility functions. Other key managers include the; Information Services & Technology (IS&T) General Manager and the Assistant Deputy Commissioner of Government Affairs & Policy. The Water Commissioner is also supported by a General Counsel (Divisional Deputy City Solicitor) who manages and coordinates the legal issues of the Water Department.

The Water Department provided Arcadis with its overall organizational structure which is seen below in Figure 3-1. It provides the key divisions and operating units, as well as management and staff responsible for each divison or unit. Based on our discussions with management, and Arcadis' experience with other well-managed water and wastewater utilities, the Water Department's organizational structure is appropriately focused to manage its key functions and responsibilities, and is capably led by a well-qualified and professional staff.

The City also supports the Water Department via several other City departments. The Water Revenue Bureau (WRB), which is a division within the City's Revenue Department, is responsible for billing, collection, and customer accounting for the water and wastewater systems. The WRB and Water Department cooperate to provide customer service and support, as well as enforcement of payment collection from delinquent customer accounts. The WRB is ultimately responsible to the City Finance Director. The City Controller is responsible for the Water Department's audit functions, and the City Solicitor's office has a Divisional Deputy City Solicitor that is assigned directly to the Water Department. As noted on the Water Department's organizational chart, the IS&T General Manager reports to the Water Commissioner, but also has dual reporting responsibility to the City's Office of Innovation & Technology (OIT).

Data provided by the Water Department as of January 25, 2019 indicates that the Water Department has a total of 2,134 employees. There are two labor unions that represent a portion of employees, including the American Federation of State, County, and Municipal Employees Union District Councils 33 and 47. These two Councils represent approximately 1,539 and 392 employees, respectively. The other 203 employees are management, supervisory, senior engineering, or part-time employees that are not eligible for union membership.

In addition to the Water Department direct employees noted above, dedicated support staff for the WRB, IS&T, Law, Finance, and other City departments are funded through the Water Fund, which accounts for the overall costs of the System. The personal services costs related to these staff are included in the Projected Financial Requirements (Section 2) section of this Report.

The following sections provide a general overview for several of the Water Department's key divisions.

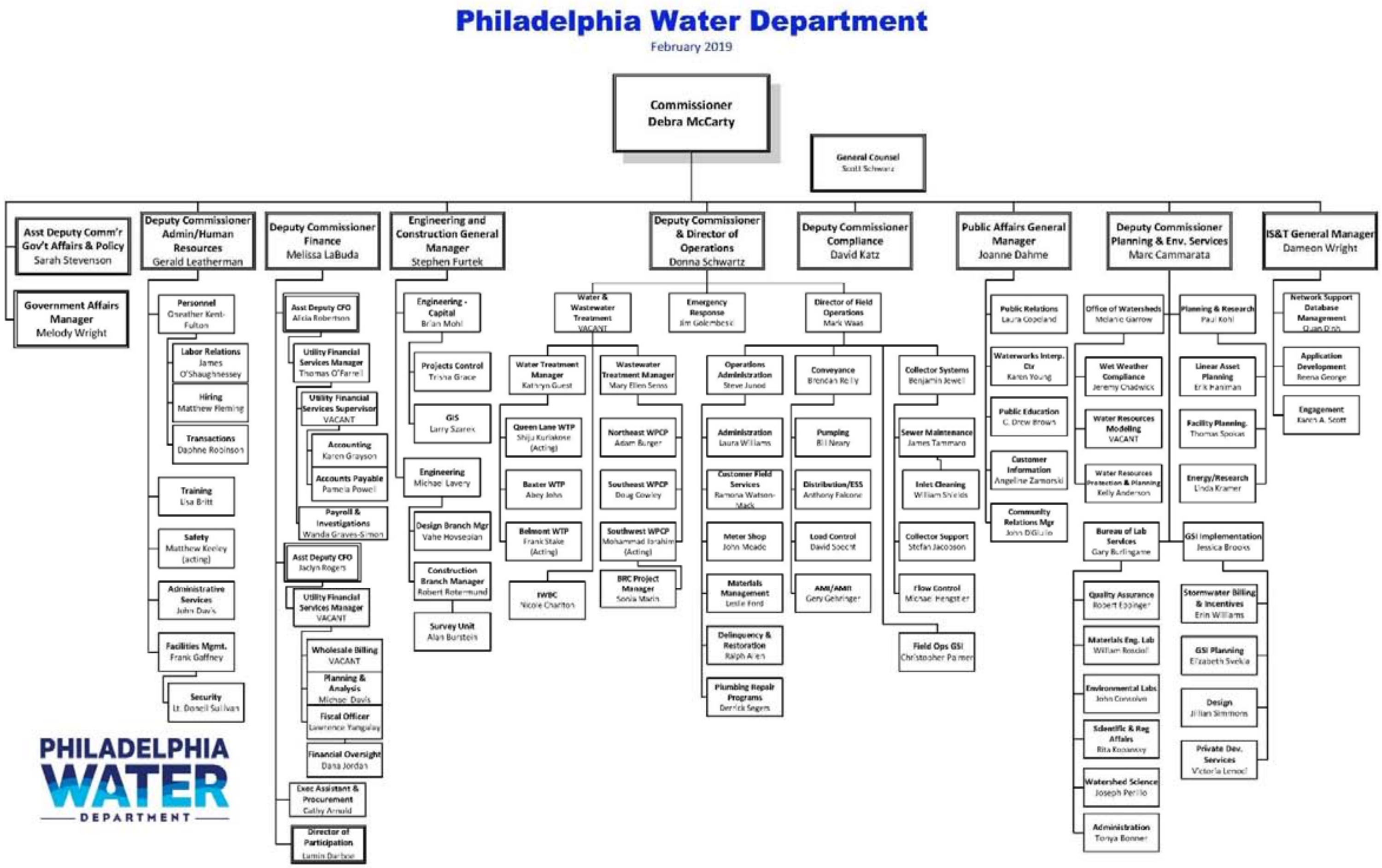

Figure 3-1. Organizational Chart

3.1.1 Operations Division

The Operations Division provides the core O&M functions of the Water Department, including water treatment and delivery; wastewater collection and treatment; stormwater conveyance; and disposal of sewage sludge and residuals remaining from the drinking water treatment process.

The Operations Division is supported by the Planning and Environmental Services Division, and the Engineering and Construction Division to plan, design, and construct System improvements that provide for the efficient and reliable delivery of services. Members of this division participate in industry Associations such as the American Water Works Association and Water Environment Federation. The Operations Division is also responsible for complying with key regulatory permits, and thus interacts regularly with the Pennsylvania Department of Environmental Protection (PaDEP) and U.S. Environmental Protection Agency (USEPA).

The Deputy Commissioner of Operations reports to the Water Commissioner. This Division is organized into units that focus on the following key areas for the day-to-day operation and maintenance of the systems:

- Water Treatment – This unit focuses primarily on the operation and management of the Baxter, Belmont, and Queen Lane drinking water treatment plants.
- Wastewater Treatment – This unit focuses primarily on the operation and management of the Northeast, Southeast, and Southwest Water Pollution Control Plants (WPCPs). This unit includes a sub-unit for Industrial Waste & Backflow Compliance that focuses on certain water and wastewater customers that must comply with regulations to protect drinking water system quality (regulation of backflow devices) or the operation of the WPCPs (regulation of significant strength industrial customers).
- Water Conveyance – This unit focuses on the pumping and conveyance of drinking water to customers and maintains the water transmission and distribution systems.
- Collector Systems – This unit focuses on operating and maintaining the collection systems, including sanitary, storm, and combined sewer mains and associated pumping assets. This unit includes a sub-unit for Field Operations Green Stormwater Infrastructure (GSI) that focuses on maintaining GSI so that it remains effective for capturing and retaining runoff during wet weather events.
- Operations Administration – This unit focuses on operational and customer facing elements such as field services, meter repair and inspection, customer delinquency and restoration, and the plumbing repair program.

As of January 2019, there are approximately 1,365 employees in the Operations Division. Based on our discussions with staff, there are vacancies that occur on a regular basis, similar to other large, U.S. utilities and that there are hiring processes in place to adequately maintain staffing. With the expansion of GSI and shifting from contractor-based maintenance to internal maintenance, staffing levels for this division are anticipated to increase slightly in the future.

3.1.2 Planning and Environmental Services Division

The Planning and Environmental Services Division includes four primary units that are focused on planning to meet short and long term System needs, while maintaining compliance with applicable regulatory requirements. The four primary units of this division are the Planning and Research Unit; Office of Watersheds; Green Stormwater Infrastructure Implementation Unit; and Bureau of Laboratory Services Unit. The Deputy Commissioner of Planning and Environmental Services leads this division and reports directly to the Water Commissioner. The following provides a brief overview of these core units.

3.1.2.1 Planning and Research Unit

This unit focuses on strategic planning and research around the Water Department's core System focus areas with particular emphasis on linear assets planning; facilities planning; and strategic energy management planning.

- Linear Asset Planning – There are two groups, including Water/Sewer and Flood Risk Management. Water/Sewer focuses on horizontal water, sewer, and stormwater assets with a key focus on asset management, including the assessment and prioritization of linear assets into a replacement program. The unit seeks to identify priority mains both through their physical condition (material, age, condition) as well as the potential risk should failure occur. Through this process, the Water Department is able to prioritize preventative maintenance, or identify which linear pipe segments should be prioritized for replacement. Flood Risk Management focuses on areas of the System that are prone to flooding during wet weather events. This unit performs analyses to identify
- Facilities Planning – This group focuses on the long-range planning for the Water Department's treatment plants, pump stations, and other above ground assets. This includes focusing on the facilities' ability to meet future demands, as well as current and potential new regulatory requirements.
- Energy/Research - Water and wastewater utilities are significant users of energy. This group is focused on developing system configurations that could result in more efficient energy utilization, as well as alternative sources of energy that can provide savings or energy redundancy. The Water Department has a strategic energy plan that was developed by the Energy/Research group. This group is also responsible for a climate change mitigation program as further described in Section 3.2.

3.1.2.2 Office of Watersheds

The Office of Watersheds Unit is focused on several planning areas, including the implementation of the Long-Term Control Plan Update in response to the Water Department's Consent Order Agreement with PaDEP. There are four primary sub-units including:

- Wet Weather Compliance – This group focuses on implementing the Long-Term Control Plan Update (LTCPU) to meet the requirements of the Consent Order Agreement (COA), as well as planning to maintain compliance with the Water Department's Municipal Separate Storm Sewer System (MS4) permit. As noted in other sections of this Report, the Water Department is constructing a significant amount of Green Stormwater Infrastructure to meet the requirements of the COA. This group manages and tracks progress toward greened acre targets included in the COA, as well as analysis around how well the Green Stormwater Infrastructure performs.

- Water Resources Modeling – To achieve compliance with the COA, the Water Department undertakes system improvements to reduce the impact of wet weather runoff on its system and local waterways. This group utilizes hydraulic and hydrologic models to understand the impact that improvements have on reducing runoff and pollutant loadings to local waterways.
- Water Resources Protection and Planning – This group focuses on several planning elements related to improving the water quality of local waterways. A key focus area in recent years has been on the issue of climate change. This group focuses on understanding the potential risks related to climate change and their impact on the Water Department's assets and operations.

3.1.2.3 Green Stormwater Infrastructure Implementation Unit

The Water Department's COA includes greened acre implementation targets that must be met over the 25-year term of the COA. The Green Stormwater Infrastructure Implementation Unit is responsible for coordinating and implementing greened acres that will capture and mitigate the amount of runoff that enters the collector system and ultimately impacts the quality of local waterways. This unit works to plan, design, and implement the construction of greened acres on public properties. This includes developing design standards for Green Stormwater Infrastructure and overseeing the implementation of greened acre projects. It also includes providing oversite to private developers that need to comply with the City's stormwater regulations, including development standards.

As noted in Section 2 of this Report, the Water Department maintains a stormwater charge for residential and non-residential customers. The GSI Implementation Unit manages the stormwater billing database that includes parcel billing information, the amount of pervious and impervious areas for non-residential customers, and applicable billing credits for non-residential customers. The database provides the basis for the stormwater charge that is part of each customer's monthly bill. This unit also manages the Water Department's Stormwater Management Incentives Program and Greened Acre Retrofit Program which provide financial incentives for customers to undertake projects that mitigate stormwater runoff from their parcels.

3.1.2.4 Bureau of Laboratory Services

The Bureau of Laboratory Services (BLS) provides a variety of analytical services to support the Water Department's water quality requirements and environmental research initiatives. The Water Department provides drinking water, wastewater, and stormwater services. Each of these services requires regular monitoring to ensure that the Water Department maintains compliance with applicable regulatory requirements. Additionally, the BLS provides analytical services to help the Water Department develop solutions that will allow it to more effectively and efficiently treat water so as to improve the quality of drinking water delivered to customers, as well as the quality of wastewater returned to the environment. The BLS manages a state-accredited laboratory, as well as process control laboratories at the Water Department's three wastewater treatment plants.

Arcadis visited the BLS main laboratory on January 29, 2019. We met with key laboratory staff, including the Director of BLS. The following provides an overview of BLS responsibilities and initiatives:

BLS is organized into the following sub-units which include the Administrative; Water Analysis and Metals Laboratory; General Analysis and Nutrients Laboratory; Organics Analysis Laboratory; Aquatic Biology

Laboratory; Scientific and Regulatory Affairs; Quality Assurance & Support Services; and Watershed Sciences. The following provides an overview of BLS responsibilities and initiatives:

- Testing – BLS conducts regular testing throughout its water and wastewater systems. This includes process testing to ensure treatment processes are working effectively, as well as compliance testing to ensure that water quality meets applicable regulatory requirements. In addition to the testing at water and wastewater treatment plants, BLS conducts sampling of the drinking water distribution system to ensure that water quality remains high. It also conducts testing of local waterways as part of the implementation of Green City, Clean Waters program that seeks to reduce instances of combined sewer overflows and improve regional water quality.
- Materials Engineering Laboratory – BLS conducts testing of materials and equipment used by the Water Department. An example of this is the compressive strength testing of concrete cylinder samples on certain Water Department projects to ensure that the concrete pour is in compliance with construction specifications.
- Drinking Water Quality – BLS collects approximately 2,500 drinking water samples each month from the treatment plants and distribution system. This includes 85 routine sample locations, and 40 real-time monitoring panels that are part of the Water Department's Surveillance and Response System. BLS also monitors customer water quality complaints and responds to these instances to ensure water quality remains high.
- Interagency Cooperation – BLS has been an active participant in the review and development process for regulatory changes contemplated by (USEPA) and PaDEP. An example of this is its participation with USEPA in developing proposed changes to the Long-Term Lead and Copper Rule. BLS also recently assisted PaDEP with the development of the Disinfection Requirements Rule.

3.1.3 Engineering and Construction Division

The Engineering and Construction Division is responsible for effectively designing and constructing System improvements per the Water Department's CIP. This includes working closely with the Operations Division and the Planning and Environmental Services Division to implement project solutions that provide safe and reliable service to the Water Department's customers. The primary units of this division include the Design Branch, Projects Control Unit, and the Construction Branch. The following provides a brief description of these units.

- Design Branch – The Design Branch performs all engineering functions related to the design of the Water Department's capital projects. Generally, project concepts are developed by the Operations Division or Planning and Environmental Services Division. The Design Branch works closely with these divisions to develop capital projects that can be implemented and included on the Water Department's overall CIP.

  The Design Branch has 89 positions budgeted for FY 2020. These positions are supplemented by outside engineering consultants as needed. Other significant responsibilities of the Design Branch include providing input to operations and maintenance staff; review of shop drawings; provide engineering expertise to Operations Division during emergencies; and coordinate and ensure use of Water Department engineering standards by outside consultants or developers.

- Projects Control Unit – The Projects Control Unit manages, coordinates, and tracks the Water Department's CIP. This includes prioritizing projects within the CIP and ensuring that projects are properly evaluated and budgeted to result in successful completion. This unit coordinates with the Planning and Research Unit to evaluate larger, more complex projects to ensure that they are vetted by the various stakeholders within the Water Department. Other responsibilities for this unit include coordinating the successful integration of private development projects, including compliance with Act 537 requirements, as well as management of the Water Department's Geographical Information System (GIS) that stores much of the Water Department's engineering records.
- Construction Branch – The Construction Branch works to ensure that capital projects are successfully implemented according to Water Department specifications. This includes monitoring contractors, evaluating change orders, handling payment requests from contractors, and preparation of as-built drawings. The Water Department FY 2020 budget will request 192 budgeted positions for the Construction Branch, including 47 in the Survey group, which provides site surveying assistance for the various Water Department projects.

3.1.4 Finance Division

The Finance Division is responsible for the Water Department's budgeting and accounting functions, and also leads the obtainment of capital financing for the CIP and the setting of rates and charges for customers. The Deputy Commissioner of Finance leads this division and reports directly to the Water Commissioner. As of January 2019, the Finance Division has 58 authorized positions with 6 vacancies.

The following provides key aspects of the Finance Division's activities:

- Capital Management – The Water Department's capital needs are substantial, and the Finance Division leads debt issuance activities to obtain the necessary capital financing. Working with other divisions and its external team of advisors, the Finance Division recently completed the Series 2018A and Series 2019A issuances.
- Rates and Charges – The Finance Division leads the Water Department's rate filings to the Philadelphia Water, Sewer, and Storm Water Rate Board. This includes assembling testimony and relevant exhibits documenting the Water Department's request for rate and charges that meet its revenue requirements.

Other significant responsibilities for this division include the preparation of annual financial reports; inventory control; procurement of equipment and services; long-term financial planning; and preparation of bills for wholesale customers.

3.1.5 Human Resources and Administration Division

The Human Resources and Administration Division provides administrative and human resources support to the entire Water Department. Arcadis met with the Deputy Commissioner of Administration and Human Resources to understand the organization and initiatives of the division. Key responsibilities of this division include:

- Administering traditional personnel functions with initiatives in manpower and management training.

- Ensuring that personnel recruitment, placement, training, career development and safety programs are consistent with the Water Department's long-term human resources needs and support its diversity and inclusion goals.
- Initiating policy development related to administration and human resources management.
- Ensuring the effective communication of policies and procedures generated by management throughout the Water Department.
- Coordinating labor management initiatives and employee relations programs with the Water Department's long-range operational plans.
- Overseeing facilities management operations for administrative and certain water facilities.

There are five major units that perform the abovementioned responsibilities, including the Personnel, Safety, Training, Administrative Services, and Facilities Management units. FY 2020 authorized staff for the division is 184, and there are 26 vacancies as of January 2019.

A key responsibility for this division is the filling of vacant positions for the other Water Department divisions and their associated units. To accomplish this, this division works with the City's Office of Human Resources to hire new personnel. This includes attracting, vetting, and hiring a well-qualified and diverse workforce. The Water Department conducts outreach events to identify and attract talent, and indicates that total overall vacancies are around 10 percent.

The Training Unit manages the Water Department's Apprentice Program. Through this program, the Water Department finds high school students that are interested in technical trades. It then hires them as apprentices where they complete high school and then the required training for their particular trade. Once the required training has been completed, the Water Department hires them on a full-time basis as regular, civil service employees.

The Safety Unit builds training programs and supports Water Department safety committees in their goal to promote a safe work environment. The number of paid days lost was provided by the Water Department and is reflected in Table 3-1, and reflects a recent, increasing trend. Injured Water Department employees are managed in the worker's compensation program via a third-party administrator retained by the City. The Water Department plans to meet with its third-party administrator in the near future to discuss how to more effectively ensure the safe return of injured workers to the active workforce. Given the increasing trend in paid days lost, the Water Department should continue to monitor and proactively implement measures to mitigate this trend.

Table 3-1. Paid Days Lost Record

Fiscal Year	Paid Days Lost
2015	2,059
2016	2,117
2017	3,608
2018	4,364

The Administrative Services unit is primarily focused on managing the Water Department's space at Aramark Tower. This unit recently facilitated the completion of renovations of the third and sixth floors of Aramark Tower. It is now working to design renovations for the fourth floor and work is scheduled to begin in calendar year 2019. This unit also manages the contracts for office equipment such as copiers, phones, and other miscellaneous office supplies.

The Facilities Management Unit generally focuses on maintaining the Water Department's administrative buildings, including general maintenance activities and maintenance of heating, ventilation, and air conditioning (HVAC) systems. It also plays a role in maintaining certain water system facilities with respect to pump repairs and other general maintenance activities.

3.1.6 Public Affairs Division

The Public Affairs Division develops comprehensive communication strategies and education programs to support the Water Department's outreach efforts to the public. This division engages regularly with the media, advocacy groups, community groups, businesses, and other entities to represent the Water Department's ongoing work and initiatives, as well as to listen and convey public feedback to management. The Public Affairs Division consists of the following nine units that focus on public education, communications, and customer interaction.

- Public Education
- Fairmount Waterworks Interpretive Center
- Public Relations
- Community Relations
- Creative Team
- Digital Communications
- Watersheds Programs
- Green City Clean Waters Public Engagement
- Customer Contact Center

3.1.6.1 Public Education

Educating the public about the various Water Department initiatives is a key focus area for Public Affairs. Public Affairs utilizes several methods for informing the public. This includes forging relationships with community groups, media, schools, and other agencies to provide information on the Water Department's ongoing initiatives, particularly related to the urban watershed and the provision of water, sewer, and stormwater services to City residents and businesses.

Public Affairs also manages the Fairmount Waterworks Interpretive Center (FWWIC). This venue, which is located adjacent to the historical Fairmount Waterworks, is open to the public and provides education on the urban watershed, innovative management techniques, and how people can participate in the promotion of clean watersheds. The FWWIC is staffed by educators and communications specialists that develop educational programs for students and visitors, as well as conduct educational tours that inform visitors about the water system and watershed. The Water Department notes that FWWIC has served approximately 50,000 visitors in recent years.

3.1.6.2 Community Relations

The Water Department's water, sewer, and stormwater services touch each City resident. Therefore, it is important that it effectively communicate to inform customers of the various, ongoing initiatives to improve water quality and overall service. The Digital Team and Creative Team work to provide informative materials and websites that are available for use by the average citizen or for community groups. This includes looking for more creative ways to disseminate information through email, text, and other digital methods.

Public Affairs uses several units to engage community groups and other organizations to promote the Water Department's work and initiatives. The Public Relations Unit focuses on working with the media to provide customers with important information on system conditions (main breaks or drought conditions) or Water Department initiatives such as customer assistance programs. The Community Relations Unit focuses on the use of public meetings to keep the public informed, particularly related to longer-term capital projects that can significantly impact customers. The Watersheds Programs Unit provides support to the various community outreach and public education initiatives to ensure that they are consistent with the Water Department's regulatory requirements and commitments.

3.1.6.3 Customer Communication

In recent years Public Affairs has assumed responsibility for the combined Water Department and Water Revenue Bureau customer call centers. Call center staff field customer inquiries related to a variety of issues such as billing inquiries; service issues (e.g., flooding or taste and odor); service requests, requests for information on Water Department initiatives; or other similar requests. Public Affairs works to cross train staff to be able to handle all types of issues. The call center tracks key service metrics such as number of calls received; call abandonment rate; average wait time; and average call duration. In recent years the call center has fielded approximately 150,000 calls per year.

3.1.7 The Office of Compliance

All public water and wastewater systems are subject to certain regulatory requirements related to the provision of drinking water, treatment of wastewater, and the management of stormwater and its impact on local waterways. The Office of Compliance coordinates the various permits and agreements that the Water Department maintains with its regulators and wholesale customers.

Arcadis met with the Deputy Commissioner of Compliance on January 24, 2019. The following provides a brief overview of the work performed by the Office of Compliance.

- Permitting – The Water Department maintains various permits including its National Pollutant Discharge Elimination System (NPDES) permits, Municipal Separate Storm Sewer System stormwater permit, and its Title V Clean Air permit. The Office of Compliance coordinates with the other operating divisions to track compliance and negotiate updates to permits as they become due.

- Regulatory Communication – The Office of Compliance works with regulators to address or respond to any alleged violation by regulators. It provides testimony on proposed rules or regulations that can impact the Water Department and responds to regulator formal and informal requests for information. It played a key role in the negotiation of the Consent Order Agreement and continues to play a key role during the implementation.
- Policy and Strategy – The Office of Compliance helps the Water Department develop policies and strategies to meet the potential, future changes to water quality or other regulatory standards. This includes helping the other divisions develop effective solutions to current and potential environmental and regulatory challenges.
- Contracts – The Office of Compliance helps negotiate the Water Department's contracts with wholesale water and wastewater customers. This includes working to ensure the contracts are consistent with the Water Department's regulatory requirements and ongoing environmental initiatives. It also includes contract management, including communication with wholesale customers if terms of the contract are not being met.

A key focus of the Office of Compliance is the current renegotiation of the Water Department's expired NPDES and MS4 permits. The Water Department continues to administratively work under the parameters of the expired permits until new ones are issued by PaDEP.

3.1.8 Information Services & Technology

The Information Services & Technology Unit is dedicated to serving the Water Department, but organizationally is a part of the City's Office of Innovation and Technology. Currently, there are approximately 79 positions dedicated to serving the Water Department, with another 27 positions supported by the water fund through service to the City's Law Department and Water Revenue Bureau.

IS&T is led by a General Manager who reports directly to OIT, but who is located and works closely with the Water Commissioner to coordinate the technology needs for business and administrative functions of the Water Department. IS&T does not manage the operational or engineering technology functions of the Water Department such as SCADA and GIS.

3.1.8.1 Key IS&T Units

IS&T consists of three key units. The following provides a brief description of their focus areas:

- System Team: This team is responsible for the operations, maintenance and planning activities associated with the physical network and server environment, database management and new technologies for the Water Departments business and administrative systems.
- Business Team: This team focuses on IS&T portfolio management (historical, current, and planned applications), development and management of business requirements and documentation; and project management.
- Applications Team: This team is responsible for applications development, maintenance, and production support.

3.1.8.2 Key IS&T Initiatives

IS&T has been working on several important initiatives pertaining to the future technology needs and security of the Water Department's systems. The following provides a description of key recent initiatives that are led by IS&T.

- Physical to Virtual Migration – Currently, the Water Department's business and administrative information is stored on many different physical servers for safekeeping and to provide access to staff. IS&T is currently undertaking this initiative to provide a new network architecture that will allow for the consolidation and access of data on a much smaller number of physical servers. Another part of the initiative is to establish a firewall between the Water Department and City systems. The benefits include enhanced security of information, as well as less manhours and cost outlays for server-related maintenance and recurring replacement outlays.
- Consolidation of Active Directory – Currently, Water Department employees have separate authentication permissions for both Water Department and City systems. This requires them to use separate authentication depending on the information that they need to access. IS&T is consolidating the Water Department's active directory into the City's active directory. This will provide for one authentication for Water Department staff to access the information they need. It will simplify login procedures and enhance security so when employees turnover, there will only be one access point to eliminate. Another benefit is the elimination of a significant number of helpdesk work orders, as IS&T indicates that approximately 60 percent of its current tickets are related to password and authentication issues.
- OIT Cybersecurity Initiative – Currently, OIT performed an assessment of its systems with respect to security from external parties for its network, firewall, and active directory. A second phase will look at the Water Department's networks as well to assess their security. IS&T is working to incorporate the operational technology systems of the Water Department, i.e., SCADA, into the assessment as well. The assessment should be completed in calendar year 2019.

Each of the initiatives above will be key to positioning the Water Department to operate effectively and more securely in the coming years. Current planning is looking at ultimately moving the Water Department's backup data to the cloud environment. This would provide for greater security and the ability for the Water Department to access and recover key data in the event that an emergency event results in the loss of data that is currently held on more local servers.

3.1.9 Water Revenue Bureau

The Water Revenue Bureau provides all billing and collection functions for the Water Department. The WRB ultimately is responsible to the City's Director of Finance, however, its annual budget is primarily funded from the Water Fund. The FY 2019 Budget reflects 232 budgeted positions for WRB focused on Water Department billing and collection functions. The key functions of the WRB include:

- Billing – WRB manages the billing system and generates monthly water, sewer, and stormwater bills.
- Collection – WRB collects payment from customers and manages and tracks delinquent accounts. This includes determining interest and penalty assessments, as well as shut off for non-payment if necessary.

- Assistance Programs – WRB manages the water assistance programs and associated discounts that certain customers are eligible for. This includes the Water Department's Tiered Assistance Program and discounts for senior citizens.

The WRB and Water Department work closely together to ensure the accurate billing and collection of water, sewer, and stormwater revenue. Both the WRB and Water Department monitor billings and collections and coordinate to address any specific issues. The Water Department is responsible for installing and testing meters. The Water Department is currently beginning the implementation of a new Advanced Metering Infrastructure (AMI) program which will allow for access to real time meter data from customers. WRB and the Water Department must work together on this project to ensure a successful implementation, including coordination with customers on modifications to metering equipment and how AMI can be utilized by the customer.

3.2 Key Management Initiatives

During our discussions with Water Department staff and management, Arcadis learned about the variety of ongoing initiatives that will continue to be focused on in the coming years. Several of these ongoing initiatives include:

- Consent Order Agreement – The Water Department will continue to work toward meeting the requirements outlined in the COA. This includes a variety of projects in the CIP such as Green Stormwater Infrastructure and other capacity expansion projects to reduce the instances of combined sewer overflows or excessive runoff that reduces regional water quality.
- Security – Since the original vulnerability assessment completed in the early 2000s, the Water Department has been undertaking projects to enhance the physical security at its facilities. Additionally, the Water Department is aware of the new USEPA regulation to revisit the vulnerability assessment as part of the newly enacted requirements of America's Water Infrastructure Act (AWIA). By March 31, 2020 the Water Department will need to revisit the vulnerability assessment to look at resiliency, cyber security and emergency response and the assessment must be certified as complete by DEP at that time. The Water Department is positioned to meet the requirements of the AWIA; however, they are currently awaiting the guidance materials from USEPA. As part of the AWIA there were requirements placed on USEPA to develop guidance materials, including baseline threat information for utilities by August 1, 2019. The USEPA is also required to provide information on how to submit the certifications.

These ongoing initiatives will continue to be focus areas in the coming years. Other initiatives that will gain greater focus in the near term include:

Water and Wastewater Master Planning – The Water Department is in the process of completing master plans for its water and wastewater systems. The Water Master Plan is substantially complete, and the Water Department is incorporating project cost estimates into its FY 2020 CIP. Key aspects of the Water Master Plan include projects such as the rehabilitation of the Torresdale and Lardner's Point pump stations, as well as upgrades and improvements at its water treatment plants. The implementation of these projects will result in increased capital spending compared to historical levels.

The Wastewater Master Plan is also substantially complete. Applicable projects are included in the CIP; however, this master plan also includes many projects that are beyond the timeline of the CIP and are part of long-range planning efforts. These master plans provide the Water Department with a basis for evaluating future CIP needs and position the Water Department to make sound decisions about future capital investments. As part of a regular planning process, the Water Department plans to revisit these master plans every five years.

Climate Change Adaptation and Mitigation - Impacts from climate change in Philadelphia include more rain, extreme storms, higher air temperatures, rising sea levels and possibly increased drought. While climate change presents new challenges to managing water resources, the Water Department has many of the necessary systems and programs in place to monitor, understand and respond to climate impacts. The Water Department is taking a three-fold approach to addressing the global issue of climate change:

- **Mitigate**, or lessen, the Water Department's contribution to climate change by saving energy and using renewable energy sources;
- **Study** climate science and perform comprehensive risk assessments to understand what impacts climate change will have on drinking water, wastewater and stormwater systems;
- **Adapt** to the expected changes by implementing proactive, cost-effective strategies that include incorporating climate considerations into the planning and design of infrastructure projects.

Through the Energy Group within the Planning and Research Unit and the Climate Change Adaptation Program within the Office of Watersheds, the Water Department has programs dedicated to addressing climate change mitigation and adaptation, respectively. The Water Department is committed to working with other City agencies, local and regional partners, stakeholders, scientists, industry experts and officials from all levels of government to address climate change. In addition to these targeted efforts, the Water Department continues to build system resiliency through the implementation of green stormwater infrastructure, long-term water and wastewater master plans, and the efficient operation and management of infrastructure systems.

Advanced Metering Infrastructure

The Water Department is beginning the implementation of AMI for its system and customers. The AMI program will provide the Water Department and customers with the ability to view customer meter information in real time. Over the next several years, contractors and staff will begin installing the necessary equipment on customer meters, as well as establishing the Meter Data Management System. The AMI system should provide for enhanced meter read capability for billing operations, as well as useful data for Water Department operators and engineers to better understand system conditions and plan for the future.

Tiered Assistance Program

The Tiered Assistance Program has been in place for almost two years and provides an expanded approach by the Water Department to provide bill payment assistance to low-income customers. In lieu of paying for water, sewer, and stormwater service based on their meter size, usage, and parcel information, which are typical billing units, the customer pays for service based on a percentage of their annual income. Customers do not have to be delinquent on a bill payment to be eligible, however, they must qualify by providing evidence of their annual income. If the annual income is less than 150 percent of the federal poverty level, the customer can be eligible to pay 2 percent to 3 percent of their annual income. Certain customers with special hardships can pay 4 percent of their annual income.

The program is still in its early stages and the Water Department has been working to educate the public about the program and enroll qualifying customers. By enrolling certain customers in TAP, the Water Department hopes to achieve more stable and predictable payments from low-income customers and avoid instances where customers fall behind on their payments and eventually become delinquent.

Since TAP provides a discount to customer bills, there is a revenue impact that is discussed in Section 2 of this Report. The Water Department estimates that by FY 2022 the impact to revenue will be approximately $16.5 million per year. The Water Department has also developed a surcharge that was approved during its recent rate proceeding to collect additional revenue to offset the impact of the TAP program.

3.3 Conclusions

It is our opinion that:

- The Water Department has an organizational structure that facilitates accomplishing its mission of reliably delivering high quality water; treating wastewater to high standards; and effectively managing stormwater for its customers. Water Department divisions are appropriately focused on the operational, planning, engineering, and administrative functions that are common to effective water and wastewater utilities.
- Divisions are led by experienced managers capable of leading staff to provide effective system operations, maintenance, and administrative management to maintain adequate and reliable service levels.
- The Commissioner and the General Manager of Public Affairs are scheduled to retire in 2019. The experienced senior managers and staff noted above are capable of providing the necessary leadership, operational, and administrative continuity until a new Commissioner is appointed.

4 WATER SYSTEM

4.1 Introduction

The major elements of the water system include three supply intakes located on the Schuylkill and Delaware Rivers, three treatment plants, storage facilities, and a conveyance and distribution system. Figure 4-1 shows the major water system facilities and general service area. As is shown, the Belmont and Queen Lane water treatment plants rely on the Schuylkill River for supply, while the Baxter Water Treatment Plant's source of supply is the Delaware River. The water system has been providing service to customers since the year 1801. Currently, the general service area consists of City limits. The Water Department also has one wholesale water agreement with Aqua Pennsylvania. Based on the 2017 U.S. Census estimate, the Water Department estimates that it serves approximately 1,580,863 persons. The following sections provide an overview of the major water system assets, as well as current Water Department initiatives and key operating units.

4.2 Water Supply

The Water Department relies on the Delaware River and Schuylkill River for its water supply via permits from PaDEP and the Delaware River Basin Commission (DRBC). Per the average day treatment plant production rates noted in this Report, the Water Department obtains approximately 58 percent of its supply from the Delaware River, with the remaining 42 percent from the Schuylkill River supply. Water supply permit capacities are reflected in Table 4-1.

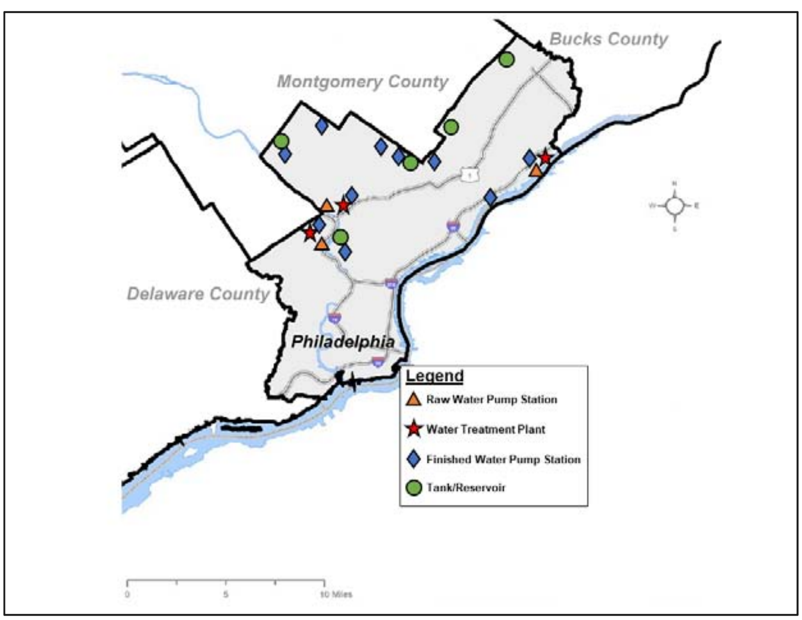

Figure 4-1. Overview Map of Major Water System Facilities

4.2.1 System Capacity

The water system must be sized to meet the average day and peak demands of the system. Over the years the Water Department has designed and built the water system to provide a reliable, redundant supply of water to customers during peak demands. The following Table 4-1 presents the Water Department's water system capacities for raw water withdrawal, treatment, and storage facilities. The Water Department operates these assets to provide water service during average and peak demand periods. The total rated capacity of the three water treatment plants is 546 mgd. The capacities of other elements within the water supply system appear in Table 4-1.

As noted in Section 2 of this Report, in recent years the Water Department has been experiencing declining billed usage from its customers, as well as stable growth in its customer base. The Water Department estimates that its current served population is approximately 1.6 million per the 2017 Census. As noted on the annual water audit shown in this Report, the total water supplied for FY 2018 was approximately 223 mgd, which is well within the capacities listed in Table 4-1. The combined peak production rates for the three treatment plants are reflected in subsequent sections and are also well within the Table 4-1 capacities. In Arcadis' opinion, the water treatment, storage, and distribution facilities are of adequate capacity to provide for the present and foreseeable future customer demand requirements.

Table 4-1. Water System Capacities

Facility	Raw Water Pumping Capacity (mgd)	Maximum Daily Withdrawal (mgd)	Hydraulic Treatment Capacity (mgd)	Treatment Capacity, Partnership for Safe Water (mgd)	Total Raw Water Storage (mg)	Total Finished Water Storage (mg)
Queen Lane Plant	200		150	140	207	85
Belmont Plant	170		110	86	83	42
Schuylkill Supply		258				
Baxter Plant	480		420	320	170	207**
Delaware Supply		423***				
Distribution System*						154**
System Totals	**850**	**681*** **	**680**	**546**	**460**	**488**

mg – million gallons
mgd – million gallons per day

* Includes treated water stored at the East Park, Roxborough, Somerton, Fox Chase, and Oak Lane storage facilities.
** Reflects current treated water capacity. See Sections 4.4 and 4.5 for explanation of projects that will increase storage capacity.
*** Per PaDEP

4.3 Water Quality Compliance

Arcadis reviewed information related to the Water Department's drinking water compliance and associated initiatives. The following sections provide an overview of compliance with current regulations, as well as ongoing initiatives and actions to meet anticipated future regulations and water quality goals.

4.3.1 Partnership for Safe Water

The Water Department participates in the Partnership for Safe Water Program (Partnership), through a voluntary agreement with USEPA initially signed in January 1996. The treatment plant segment of the Partnership includes a commitment by utilities that treat surface water to use practices and procedures that significantly reduce the turbidity of treated water. The Water Department's participation in the Partnership has resulted in substantially better water quality. Data provided by the Water Department shows finished water turbidity levels that are approximately 0.05 NTU compared to the regulatory limit of 0.30 NTU. The Partnership treatment practices limit the total maximum treatment capacities for the three treatment plants to 546 mgd. This is still well over recent average day and maximum day system demands. There are four phases to the treatment segment of the Partnership program including:

1. Commitment – The utility commits itself to the Partnership program.
2. Baseline and Annual Data Collection
3. Self-Assessment
4. Fully Optimized System

In 2013, the Water Department received the 15-year Director's Award marking fifteen consecutive years achieving Partnership Phase III goals. This includes completing a treatment plant self-assessment and submitting turbidity data that reflects consistent production of high-quality water. The self-assessment and turbidity data are peer reviewed by treatment plant experts to ensure it meets or exceeds all Phase III requirements. The Water Department has been able to consistently demonstrate lower turbidity levels, and this performance has helped it comply with other regulatory requirements such as the Interim Enhanced Surface Water Treatment Rule and the Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR).

The Water Department has also been a charter member of the Partnership distribution system optimization program. This Partnership program is for utilities that add a disinfectant to finished water and seeks to optimize the management of distribution systems to realize benefits including:

- Improved water quality
- Recognition within the water industry
- Regulator confidence
- Consumer confidence and community support
- Employee support

Similar to the Partnership treatment program, the Partnership distribution system program consists of four phases that begin with Commitment and drive toward the goal of achieving a fully optimized system. By striving towards a fully optimized system, utilities can achieve consistently better overall water quality within their distribution systems. The Water Department indicates that it has completed Phase II: Baseline and Annual Data Collection, as well as Phase III: Self-Assessment. The self-assessment phase includes a performance assessment that focuses on water quality, pressure levels, and the number of main breaks. It also includes the use of an optimization assessment tool that helps utilities identify Performance Limiting Factors (PLFs) and where opportunities for improvement exist. The Water Department indicates that Partnership distribution program elements were recently used in the evaluation of impacts of PaDEP's new Disinfectant Requirements Rule.

4.3.2 Water Quality Compliance

Arcadis reviewed the Water Department's annual Consumer Confidence Report for the calendar year 2017. Additionally, the Water Department provided preliminary data for the Water Department's 2018 Consumer Confidence Report. The following Table 4-2 presents the results of our review of the data provided. The Table reflects the key drinking water requirements, a brief description of the Water Department's practices for achieving compliance, and our assessment of their current compliance with the applicable requirement.

4.3.3 Surveillance and Response System

The Bureau of Laboratory Services is primarily responsible for monitoring the Water Department's Surveillance and Response System (SRS). This system includes sensors placed in the distribution system that allow the Water Department to conduct online monitoring of certain water quality parameters. This system provides the ability to detect, confirm, respond to, and remediate contamination of the distribution system. The Surveillance and Response System (SRS) has five core components, including:

- On-line water quality monitoring
- Enhanced response sampling and analysis procedures
- Customer complaint surveillance
- Enhanced security monitoring
- Public health surveillance

BLS monitors the SRS and has developed associated plans and training to be ready in the event that an incident is detected and requires response.

Table 4-2. Summary of Drinking Water Quality Regulations and Compliance

Rule	Key Requirements	Water Department Activities	Compliance
Lead and Copper Rule (LCR)	90% of samples collected in a monitoring round must be below the action levels of 0.015 mg/L for lead and 1.3 mg/L for copper. Systems serving more than 50,000 people were required to install corrosion control treatment (CCT) and must perform routine monitoring for a defined list of water quality parameters (WQPs)	The Water Department practices active CCT at all three plants by adding zinc orthophosphate at a dose of 1.5 mg/L as phosphate and maintaining finished water pH in the range of 6.8 and 7.8, and performs the required WQP monitoring at each point of entry and in the distribution system. By PaDEP request, an additional round of LCR compliance sampling will take place during 2019 to align the Water Department sampling schedule with other Pennsylvania water systems.	The Water Department is in compliance with the LCR.
Revised Total Coliform Rule (RTCR)	Requires routine sampling for total coliform from representative sites throughout the distribution system	The Water Department collects and analyzes samples for total coliforms and *E. coli* from over 70 representative locations throughout the distributions systems.	The Water Department is in compliance with the RTCR.
Stage 1 and Stage 2 Disinfectants and Disinfection Byproducts Rules (DBPRs)	Established maximum contaminant levels (MCLs) and operational evaluation levels (OELs) for total trihalomethanes (TTHMs) and the sum of five haloacetic acids (HAA5) and maximum residual disinfectant levels (MRDLs) for chlorine, chloramines, chlorine dioxide, chlorite, and bromate.	The Water Department collects and analyzes samples in accordance with the Stage 1 and Stage 2 DBPR monitoring requirements.	The Water Department is in compliance with the Stage 1 and Stage 2 DBPRs.
PaDEP Disinfectant Requirements Rule (DRR)	Requires reporting of individual disinfectant residuals from RTCR monitoring locations and establishes a minimum disinfectant residual of 0.20 mg/L in 95% of water distribution samples collected each month. Requires a Sample Siting Plan and Nitrification Control Plan to be developed and submitted to PaDEP.	In anticipation of the finalization of this rule, the Water Department utilized the information developed as part of the Partnership Distribution System Optimization Program to evaluate potential impacts of this proposed rule. The evaluation determined that the Water Department should be able to meet the rule as proposed without major capital investments.	The Water Department monitors and reports chlorine residual data in accordance with a Sample Siting Plan prepared by the Water Department and on file with PaDEP. The Water Department is expected to be in compliance with the minimum disinfectant residual concentration requirement when it fully goes into effect on April 29, 2019. They are also in the process of developing a Nitrification Control Plan, which the Water Department intends to submit to PaDEP on or before April 29, 2019.

Rule	Key Requirements	Water Department Activities	Compliance
Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)	Requires additional treatment based on the concentration of Cryptosporidium or *E. coli* in source water.	Queen Lane and Baxter Plants are designated as Bin 2 under the rule, requiring an additional 1.0-log removal/inactivation of *Cryptosporidium*. The Water Department meets this requirement through very low turbidity levels in the combined filter effluent (CFE) and individual filter effluent (IFE) at both plants. The Queen Lane Plant also achieved a back-up 0.5-log treatment credit by implementing a Watershed Control Program Plan. In October 2018, a letter was submitted to PaDEP indicating the Water Department's intent to expand the Watershed Control Program Plan into the Delaware River Watershed to achieve a 0.5 log back-up credit to Baxter's IFE and CFE requirements. The updated Watershed Control Program Plan will be submitted to PaDEP in 2020.	The Water Department is in compliance with the LT2ESWTR.
Consumer Confidence Report (CCR) Rule	Requires a CCR to be provided to Water Department consumers annually	The Water Department electronically delivered the 2017 CCR in the spring of 2018. The 2018 CCR is expected to be released in spring 2019. The annual report meets and exceeds the USEPA requirements and includes educational information regarding source water protection, water treatment processes, research, and outreach initiatives.	The Water Department is in compliance with the CCR rule.
Unregulated Contaminant Monitoring Rule (UCMR)	Requires sample analysis for a specified list of unregulated compounds.	The Water Department is currently monitoring for the required contaminants as part of the Fourth UCMR, which occurs between 2018 and 2020.	The Water Department is in compliance with the UCMRs.

4.3.4 Annual Water Audit

The Water Department was a leading contributor to the water industry's current standard for performing water audits. The water audit provides utilities with an assessment of the utilization of water delivered to the distribution system. It accounts for water that is metered and billed to customers, as well as water that not accounted for due to real and apparent system losses. Real losses consist of unmetered water due to main breaks, leaks, or other physical losses. Apparent losses consist of unmetered water due to inaccurate metering or billing, or unauthorized usage.

The Infrastructure Leakage Index (ILI) provides a performance indicator for utilities to assess their management of real losses compared to unavoidable real losses. Generally, an ILI greater than 8.0 reflects that more efficient utilization of water can be achieved. The Water Department's annual water audit for FY 2015 through FY 2018 is presented below in Table 4-3. As can be seen, the ILI is above 8.0. As noted in this Report, the Water Department is working to improve the instances of non-revenue water through main replacement, leakage reduction, and pursuit of unauthorized usage among other measures. As these initiatives move forward, the annual water audit results should help to assess the effectiveness of these initiatives over time.

Table 4-3. Water Audit Results

Component	FY 2015	FY 2016	FY 2017	FY 2018
Water Supplied, mgd	230.8	223.2	223.1	223.2
Billed Consumption, mgd (may include some unmetered consumption)	136.5	133.0	131.4	128.8
Non-Revenue Water, mgd	94.2	90.2	91.7	94.3
Percent Non-Revenue Water by volume	40.8	40.4	41.1	42.3
Percent Non-Revenue Water by cost	22.0	20.2	16.9	16.2
Unbilled Authorized Consumption, mgd	3.6	3.7	4.0	4.2
Unbilled Authorized Consumption Costs million	$1.39	$1.32	$1.32	$1.34
Apparent Losses, mgd	16.2	15.7	17.3	15.4
Apparent Losses costs, million	$41.5	$39.1	$45.0	$42.3
Real Losses, mgd	74.3	70.8	70.4	74.7
Real Losses costs, million	$11.9	$9.9	$7.5	$8.0
Infrastructure Leakage Index, dimensionless	10.4	9.9	9.9	10.4

Source: Philadelphia Water Department Annual Water Audit Summary

4.3.4.1 Leakage Management

The Leak Detection Survey program has been managed successfully within the Water Conveyance Section for many years. Using a combination of approaches and applications including;

- Traditional leak detection and repair activities (find and fix approach)
- Advanced technologies such as pressure management (predict and prevent approach)
- Highly sensitive leak detection applications for large water mains.

Leak detection crews use leak detection technology (leak correlators and correlating leak loggers) to proactively survey the water distribution system for hidden leaks. In FY 2018, the Water Department surveyed 742 miles of small diameter mains and abated approximately 46.6 mgd of leakage. Summary results of this program are presented in Table 4-4.

Table 4-4. Leak Survey

Service Parameter	FY 2015	FY 2016	FY 2017	FY 2018(1)
Leak Survey (miles of pipeline)	851	799	1,052	742
Leakage Abated (mgd)	21.1	14.1	14.0	46.6

(1) During FY 2018 the number of leaks abated increased by 158 from FY 2017. Also, in FY 2018 corrections to reporting methodologies were developed and implemented by Leakage Management staff. Per discussion with staff, it will take several fiscal years to establish trending with this improved reporting.

The Water Department has recently revised its reporting methodologies related to tracking and measuring the amount of leakage abated. The revised methodology incorporates the full monthly reporting period whereas previously portions of the monthly reporting period were truncated and not included in report totals for leakage abated.

Since the completion of a pilot District Metered Area (DMA) study in 2007, the Water Department has sought to optimize operations of the DMA for leakage control. This includes using and integrating programs such as acoustic leak detection and water main replacement. Flow modulated pressure control is also used to reduce the potential for leakage. This includes using pressure reducing valves to maintain more optimal system pressures as a means for reducing small leaks or seepage, as well as monitoring the system for change in flows to identify new instances of leaks.

The Water Department has been performing inline acoustic leak detection (contracted through Sahara®) for its large diameter transmission water mains since 2007. This program has scanned approximately 64.5 miles of large piping and identified 94 leaks, which have almost all been repaired. The Water Department performs inline acoustic surveys twice per year via a contractor, and identified leaks are repaired as needed.

4.3.5 Water System Planning

Arcadis met with Water Department staff to discuss several ongoing planning initiatives. The following sections provide an overview of the recent Water Master Plan and associated planning related to linear assets.

4.3.5.1 Water Master Planning

As noted above, the Water Department has been providing water service to City residents since the 1800s. The City experienced significant growth in the 1900s and much of the facilities in service were placed into service during this period, making them almost 100 years old in many instances. The Water Department provided Arcadis with an overview of its Drinking Water Master Plan, which provides a plan for addressing the needs of the water system.

The Water Department's Water System Master Plan charts the course for a comprehensive 25-year program to upgrade these critical water system facilities. The plan evaluated system needs over the long term and proactively plans for major upgrades, and in some cases complete reconstruction to upgrade the City's drinking water treatment, pumping and storage facilities.

The three water treatment plants are aging and will require significant repairs to prepare them for long term service. The Water Master Plan anticipates upgrades to the Baxter Water Treatment Plant, an expansion and upgrade to the Belmont Water Treatment Plant and reconstruction of the Queen Lane Water Treatment Plant. These improvements are planned over the next 25 years and are deemed necessary by the Water Department to maintain a sufficient, safe, and reliable supply of water for the citizens of the City.

The Water Master Plan identified approximately 400 projects focused on the rehabilitation of existing facilities, complete reconstruction of several existing facilities, and construction of several new facilities. The combined estimate of these projects over the next 25 years is $2.5 billion.

The following is a high-level list of the major facility project focus areas listed in the master plan:

- Baxter Water Treatment Plant Upgrades
- Belmont Water Treatment Plant Expansion and Upgrade
- Queen Lane Water Treatment Plant Reconstruction
- East Oak Lane Reservoir and Pump Station Reconstruction
- Fox Chase Pump Station
- Torresdale Pump Station Rehabilitation
- Lardner's Point Pump Station
- Georges Hill Pump Station
- Various Transmission Main Improvements

Several of key projects are in the planning or design stages and will be included in the six-year CIP that will go to City Council for approval in the spring of 2019.

4.3.5.2 Linear Asset Planning

As shown in Figure 4-2, over the past 20 years the Water Department has seen a slight increasing trend in water main breaks. To maximize the benefit of its investment in water main replacement, the Water Department uses Innovyze's® CapPlan Water to prioritize main replacements using a risk-based approach that considers both likelihood and consequence of failure.

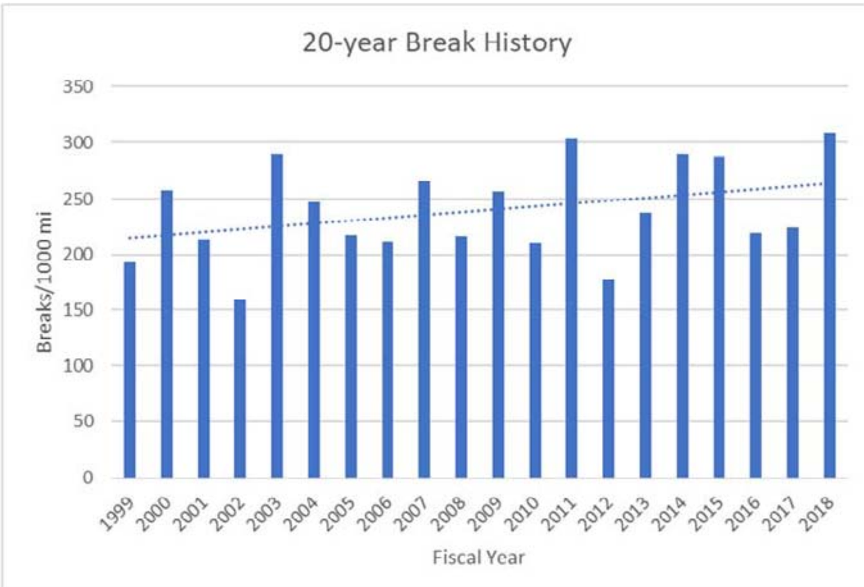

Figure 4-2. 20-year Break History

The Water Department is increasing its planned water main replacements to levels significantly above recent rates of replacement, which were limited by available funding and other system priorities. Table 4-5 shows the actual recent and planned future quantity of water mains to be replaced. This increasing rate of replacement is being performed with the goal of reducing the frequency of water main breaks. At the 42 miles per year target rate of replacement in FY2024, the entire system would be replaced in approximately 75 years. This planned increase in main replacements is an improvement over recent replacement rates and the effectiveness of the program (e.g. impact on main break rates) should be monitored over time to determine if future adjustments to the replacement rate are warranted. The additional cost related to the higher replacement rate is included in the CIP and in the financial projections in Section 2 of this Report.

Table 4-5. Water Main Rate of Replacements

Fiscal Year	Water Mains Replaced (mi)	Notes
2017	19.27	Actual
2018	19.01	Actual
2019	21	Estimated

Fiscal Year	Water Mains Replaced (mi)	Notes
2020	34	Budgeted
2021	36	Budgeted
2022	38	Budgeted
2023	40	Budgeted
2024	42	Budgeted
2025	42	Budgeted

Note: Provided by Water Department 1/29/2019.

4.4 Water Treatment Plants

In late January/early February 2019 Arcadis staff visited the three water treatment facilities. Interviews with key staff were held and a walkthrough of the facilities was conducted to develop a general condition assessment.

The facilities are located, and were designed, to provide system flexibility and redundancy. Two of the plants, Queen Lane and Belmont draw water from the Schuylkill River. The Baxter Plant uses the Delaware River for water supply. By having these multiple sources this creates redundancy in supply as well as each of the plants having redundant equipment for treatment and pumping. The treatment at each facility is similar and consists of sedimentation, coagulation, flocculation, clarification, anthracite and sand media filtration, disinfection, fluoridation and corrosion control.

The Water Department has an active capital improvement replacement program. This was evident when Arcadis toured the facilities, viewing multiple projects that were either in on-going construction phases or were recently completed. The capital improvement plan was reviewed and projects in the planning design and contracting phases were discussed. A partial list of the major projects and their status in the project pipeline is included later in the report.

The Water Department evaluates upcoming facility needs and develops the capital improvement plan for funding the design and construction of improvements. The water master plan sets forth the long-term road map for major rehabilitation or replacement of the water treatment facilities. The plans are flexible, realizing that priorities change, and the Water Department reprioritizes to meet the needs of the facilities and maintain compliance. In addition to the capital replacement projects, regular preventative maintenance is scheduled using a centralized program to prioritize preventative and corrective actions. The facilities visited appeared to be adequately maintained and the projects in the pipeline for planning, design and construction provide additional evidence that the Water Department plans projects as necessary to continue to maintain their facilities in good working order.

In order to develop long range plans for continued compliance and improved operations, the Water Department has performed pilot studies, bench scale testing and full-scale tests to evaluate various potential changes to the treatment processes. These studies were then incorporated into the recommendations for upgrades, repairs or reconstruction of facilities included in the Water System Master

Plan. This plan includes major repairs and, in some cases, full replacement of facilities over the next 25 years and will serve as the roadmap for the Water Department.

4.4.1 Baxter Water Treatment Plant

The Delaware River serves as the source of supply for the Baxter Plant has a design capacity of 320 mgd and a peak hydraulic rate of 420 mgd. By comparison the total system usage for FY2018 was 223 mgd. Table 4-6 shows daily output from the plant for the past five fiscal years.

Table 4-6. Baxter Treatment Plant Production

Fiscal Year	Average Daily Output (mgd)	Max Daily Output (mgd)
2015	132	162
2016	135	161
2017	136	193
2018	132	169

The major capital improvement project underway at the Baxter Plant is the replacement of the 100-year old 40 MG clearwell basin with four 5 MG tanks, interconnecting piping and valves and associated site work. Construction for the first two 5 MG tanks is underway and the planning has begun for the installation of two additional tanks under a future contract. Construction of this project is expected to continue for the next two years.

As part of the work to construct the new clearwell tanks, excavation near the existing finished water storage basins was required to install a new gate house and series of valves. After the excavation was performed, the tanks were inspected and some cracking in the walls of the finished water storage basin became evident. These cracks were injected and repaired, however, after the new isolation valves were added, the tanks were re-inspected and cracking was still observed. A consultant is monitoring the cracks to assess if this is condition is static or worsening over time. The Water Department is considering three possible options to address the cracks including the possibility to take the unit out of service, repair, or continue to monitor.

Since the vulnerability assessments were conducted in 2002, the Water Department has completed projects identified to enhance security both through physical improvements (e.g., fences, cameras) and cyber security enhancements. A SCADA system is used to monitor system components and water quality throughout the treatment process. Additional projects to install more security cameras, speakers and access control to internal areas are proposed as part of the new clearwell basin project.

The following major projects are ongoing at the Baxter Plant (Work No. included in parentheses for contracted projects):

- New clearwell basins 1 and 2 (discussed above). (61106, 61107, 61108)
- Installation of new backwash valves on the south-side filters. (61095)

- The replacement of filter effluent and flow valve packages on filters was an internal initiative and in early FY 2019 staff completed the replacement of the valve packages on the final two filters. In total Water Department staff had replaced 94 valve packages on the filters.
- Automation of the sedimentation basin effluent gate valves using in-house staff was completed in early FY 2019. Work for the sedimentation basin influent gate value automation is currently underway and is targeted for completion in early FY 2020.
- The repair and replacement of intake valves, gates, and rotating screen is scheduled for completion by the fall of 2019. (61116)
- Baxter HVAC system upgrades. (61097)
- Replacement of post-treatment building switchgear. (61114)
- Replacement and downsizing of the fluoride storage tanks in keeping with the reduced dosing standard (0.7 ppm as compared to 1.0 ppm). Replacement of the chemical feed system. (61098)

Major projects currently in the Design/ Projects Control/bidding pipeline include:

- Improvements to the hydrated lime system. (61090)
- New zinc orthophosphate (corrosion control chemical) storage and feed system. (61122)
- Replacement of the carbon feed system, tanks, mixers and pumps. (61120)
- Flocculator rehabilitation including bearing and shaft replacements. (61111)
- The design of raw water basin outlet gates, and inspection and repair of existing concrete is currently underway. Staff is coordinating construction with an emergency intake upgrade project at Torresdale Raw Water Pump Station, as both will require a temporary plant shutdown for underwater inspection. The project is scheduled in FY 2020. (61080)
- Dredging and disposal of raw water basin solids. (61113)
- Establishment of a new process control laboratory and sample collection lines. (61110)
- Upgrade of filter surface wash to air-scour technology. (61092)
- Filter rebuilds/rehabilitation (61118, 61125, 61132)
- New clearwell basins 3 and 4 (discussed above). (61126)
- Sodium hypochlorite tanks rehabilitation/replacement. (61133)

4.4.2 Queen Lane Treatment Plant

The Schuylkill River serves as the source of supply for the Queen Lane Plant and has a rated capacity of 140 mgd. Table 4-7 shows daily output from the plant for the past five fiscal years.

Table 4-7. Queen Lane Treatment Plant Production

Fiscal Year	Average Daily Output (mgd)	Max Daily Output (mgd)
2015	61	90
2016	51	71
2017	49	88
2018	50	102

Residuals from the flocculation and sedimentation basins along with the filter backwash water are sent to the Southeast WPCP.   If necessary, the plant has the capability to use the Northeast WPCP or Southwest WPCP for disposal as well.

Since the vulnerability assessments were conducted in 2002 the Water Department has implemented most of the recommendations. All internal plant measures are complete. Construction of new fencing and lighting around the clearwell basin, a new driveway, and new maintenance entrance are expected to be completed as part of contracted work in calendar year 2019.

In December 2018 PaDEP notified the Water Department that previously unregulated field constructed underground concrete ferric chloride storage tanks will need to be registered. The Water Department has three of these tanks located at the Queen Lane Plant. The Water Department has had ongoing discussions with PaDEP and is working cooperatively to meet the new tank registration requirements. Pending the outcome of the discussions the Water Department will consider options to either register or repurpose these tanks.

The following major projects are ongoing at the Queen Lane Plant (Work No. included in parentheses for contracted projects):

- Distributed Control System software upgrade is complete. Hardware upgrades are expected to be made during the next three years (one cabinet is complete there are 3 remaining).
- Rehabilitation of Filters #7 and #16 with new media, underdrains, and surface wash systems.
- Drinking water system security improvements are expected to be completed in calendar year 2019.
- Low voltage distribution equipment in the filter building will be completed by the end FY 2019. (63053)
- Masonry repair at the filter building and replacement of the truck scale in the pre-treatment building is currently in progress.
- Replacement of two fluoride tanks is complete and installation of the five new ferric tanks is in progress and expected to be completed during FY 2020. (63090)
- The replacement of windows in the pump house building has been awarded and work is expected to be completed in calendar year 2019. (63067)

Major projects in Design or Projects Control pipeline include:

- Replacement of butterfly backwash valves and actuators on the north filters is in Projects Control. A prior contract handled the replacement of the corresponding valves in the south filters. (63079)
- Replacement of the backwash pumps, valves, actuators and vacuum breakers in is Design. (63082)
- Phases I and II of design for the renovation of the pretreatment building are complete. Phase I involves the removal of old chemical storage tanks. Phase II consists of a layout for future use as office space, a conference room, and storage areas. The project is currently on hold as staff addresses structural concerns. (63068, 63086)
- Dredging of the raw water basins to remove accumulated sediment is currently in Projects Control and expected to be bid in FY 2019. (63072)
- Repair of cracks in the north and south clearwells, expanded to include roof replacement, is in Projects Control awaiting the completion of the installation of new tanks at East Park Reservoir. (63078)
- Hydrated lime feed storage system upgrade is in Design undergoing scope review. (63077)
- The rehabilitation of plant sewers is in Design, the Water Department had performed the initial inspections and are currently awaiting third-party inspection and evaluation. (63087)
- Replacement of North and South Clearwell Roofs is in Design. (63083)
- Replacement of Surface Wash system with Air/Water Wash System for 40 filters is in Design. (63095)
- Design for Flocculation/Sedimentation Basins Concrete Repairs and the Replacement of Drain Valves. (63099)

4.4.3 Belmont Treatment Plant

The Schuylkill River serves as the source of supply for the Belmont Plant and has a rated capacity of 86 mgd. Table 4-8 shows daily output from the plant for the past five fiscal years.

Table 4-8. Belmont Treatment Plant Production

Fiscal Year	Average Daily Output (mgd)	Max Daily Output (mgd)
2015	45	52
2016	44	48
2017	44	50
2018	45	62

The residuals from Belmont's flocculation and sedimentation basins, as well as the filter backwash, are sent to the Water Department's Southwest WPCP for processing.

As part of the investigation into various methods to reduce disinfection byproduct production the plant is conducting trials for switching to post-filtration chlorine contact. Part of the clearwell was converted to a post-filter chlorine contactor in 2008 and full-scale trials of post-filter chlorination were promising. Trials were discontinued in 2013 as the rehabilitation of the raw water basin had limited the plant's operational flexibility. Since completion of this work in 2017, the trials have restarted and are expected to continue through July 2019. The plant is in compliance with the requirements for disinfection byproducts. The trials are being conducted to see if further reductions are feasible.

In December 2018 PaDEP notified the Water Department that previously unregulated, field constructed, underground concrete ferric chloride storage tanks will need to be registered. The Water Department has two of these tanks located at the Belmont Plant. The Water Department has a current project to replace these tanks with above ground tanks and new ferric chloride pumps. Even though the notice to proceed has been issued for the proposed project, PaDEP may require the existing tanks be registered in the interim. The Water Department is continuing to discuss the new requirements with PaDEP and is working cooperatively to meet the new tank registration requirements.

The following are major projects recently completed at the Belmont Plant (Work No. included in parentheses for contracted projects):

- Dredging of the Schuylkill River at the intake was substantially completed in FY 2019. (62119)

The following major projects are ongoing at the Belmont Plant:

- Finished water basin crack repair and roof replacement: The North Basin, Monument Road Basin and South Basin are complete; the final stages of clearwell basin work and slope repairs are planned for completion in FY 2019. (62107)
- Installation of a new ferric storage system has been initiated and is expected to be operational in the fall of calendar year 2019. This project will address PaDEP's 30-day supply and chemical building spill containment requirements and includes drain replacement. (62106, 62140, 62141, 62142)
- The rehabilitation of four filters with new media, troughs and underdrains was completed early in FY 2018. This was the first phase of the planned rehabilitation of all 26 filters. The Water Department intends to do several filters each year.
- Demolition of the old powdered activated carbon feed system, pending continued testing of the newly installed pumps, controls, and piping, is planned for FY 2019.
- In-house upgrades to the zinc phosphate dosing system, replacement of chemical feed pumps and addition of flow meters, are expected to be completed in FY 2019.
- Preliminary work for major security upgrades, installation of security lighting and cameras, access control, fencing, access card system, cameras, and portal hardening, began in late FY 2018.
- Chemical Building boiler replacements are expected to be completed in FY 2019. (62136)
- ABB replaced one of three DCS Harmony Area Controller Cabinets; the remaining two cabinets are scheduled for replacement in FY 2019 and FY 2020. (62155)
- Symphony Plus software upgrades to the DCS system have been substantially completed, completion is pending completion of automated reports and continued system testing.

- Rehabilitation of flocculation/sedimentation basins, contractor issued notice to proceed. (62112)
- Motor control center replacement commenced construction in FY 2019. (62114)

Major projects in Design or Projects Control pipeline include:

- Replacement Filter Building HVAC has been bid.
- Carbon system rehabilitation (including replacement of carbon mixers and dust collection system) is in Projects Control after a scope change and in-house work. (62105)
- Replacement Filter Building windows is in Projects Control. (62144)
- Replacement of Washwater Pumps and Motors is in Design. (62127)
- Replacement of combined South Filter effluent sluice gates and rapid mix isolation valves is in Design. (62129)
- Installation of Airwash System for Backwashing 26 Filters. (62146)

Future projects at the Belmont Water Treatment Plant include the continuation of underwater conduit inspections (to date two of the four inspections have been performed), repairs to building masonry and steel pipe and the final two phases of the filter rehabilitation.

4.5 Storage and Pumping Facilities

As noted above, the Water Department uses the Belmont, Baxter, and Queen Lane treatment plants to produce water for the system. The delivery of the finished water to customers is accomplished using several key assets that discussed below.

The major reservoir storage facilities and their current capacities consist of:

East Park –	30.0 MG
Oak Lane –	72.8 MG
Roxborough (Upper and Lower) –	28.5 MG

The Water Department maintains additional distribution storage that is available for meeting peak customer and public fire service demands. Distribution storage consists of the Fox Chase elevated storage tank (1.5 MG); the two Somerton standpipes (10 MG); and the two Roxborough standpipes (11 MG) which provide a total of 22.5 MG of distribution system storage.

The Water Department is currently in the process of replacing the East Park reservoir with three, 30 MG concrete storage tanks. Currently one of the 30 MG tanks is complete and in service. The configuration of three separate tanks provides additional flexibility and redundancy for operations. The project also replaces the old reservoir configuration that included a floating cover which had reached the end of its useful life.

The major pumping facilities are presented in Table 4-9 by their respective division, and consist of both raw water and finished water pump stations. The divisions reflect the general source of supply and treatment facilities that supply the pump stations.

Table 4-9. Water System Pumping Stations

Delaware Division	Schuylkill Division
East Oak Lane	Belmont High Service
Fox Chase Booster	Belmont Raw Water
Lardner's Point	Chestnut Hill
Torresdale Low Service	East Park Booster
Torresdale High Service	Queen Lane High Service
Torresdale Raw Water	Queen Lane to Roxborough
West Oak Lane	Queen Lane Raw Water
	Roxborough High Service
	Navy Pumping Station

The recent master planning process took into account the current and future needs of the storage and pumping facilities. The master plan has identified several improvements to existing facilities that are planned to be completed in the near future, including:

- Torresdale Pump Station Rehabilitation – Update aging, critical infrastructure and enhance redundancy
- Lardner's Point Pump Station Reconstruction - Update aging, critical infrastructure and enhance redundancy
- Fox Chase Pump Station – Improvements to transmission mains adjacent to the pump station to enhance supply and redundancy
- Somerton Tank Transmission – Improvements to the transmission mains adjacent to the Somerton storage tank to enhance long-term regulatory compliance and water quality

Other improvements are scheduled to be completed over the 25-year master plan timeline via phased implementation. The Lardner's Point Pump Station improvements are currently in design.

4.6 Water Conveyance Operations

The Water Conveyance unit is focused on the provision of drinking water to the Water Department's customers via transmission, distribution, and pumping assets. This unit works to provide drinking water at superior quality and pressures to meet customer demands. Additionally, the unit performs functions related to customer disconnection and reconnections. Water Conveyance operates via the Distribution, Pumping, and Load Control units which are described in the following sections.

4.6.1 Distribution Unit

The Distribution Unit focuses on maintaining the integrity of the distribution system. This includes surveying mains for leaks, repairing breaks, assuring fire hydrants operate properly and are available for fire protection, and performing customer connection or disconnection jobs. The Water Department tracks the performance of the Distribution Unit in several key areas as reflected in Table 4-10 for the last four fiscal years.

Table 4-10. Repair Record

Service Parameter	FY 2015	FY 2016	FY 2017	FY 2018
Breaks Repaired	916	699	715	984
Discontinuance Orders Completed	309	480	387	311
Valves Repaired	155	183	66	56
Connections	91	75	88	88
Leak Survey (miles of pipeline)	637	799	1,053	742
Hydrants Repaired	4,141	4,812	3,077	2,584 [1]

Source: PWD Cityworks Report No. 510 used for all data except main breaks. Main breaks data taken from 55-Year Main Break trend report.

[1] The Water Department notes that the FY 2018 number of hydrants repaired seen in the Table above may be inaccurate due to a clerical issue. The hydrant availability rate for FY 2018 was 99.6% reflecting strong availability.

The break rate has averaged 260 breaks/1,000 miles over the past four fiscal years. As shown in Figure 4-2., the Water Department's break rate has been trending slightly upwards over the past 20 years and is currently higher than that of New York City (~66/1,000 miles), but in line with WSSC (~264/1,000 miles) and lower than that of DC Water (~346/1,000 miles). A preventive maintenance program that involves both field investigations as well as systematic scheduling of repairs and replacements is in place for the pipeline infrastructure. The Distribution Unit conducts leak surveys, examinations of portions of repaired mains to determine if corrosion played a role in a main break failure, and corrosion control studies as part of the preventative maintenance program.

The Distribution Unit also tracks distribution system valves to ensure that they are properly maintained, repaired, or replaced to ensure they perform as expected to manage and control the delivery of water. The distribution system has approximately 93,140 valves which are tracked by this unit. Table 4-11 below summarizes the valve maintenance program for FY 2018.

Table 4-11. Valve Maintenance

Valves	Total	Small (12" Or Smaller)	Large (16" Or Larger)
Operated	15,099	13,930	1,168
Found defective	238	227	11
Repair/Replace	217	211	6

Source: PWD Cityworks Report #403

4.6.2 Pumping Unit

The Pumping Unit is responsible for operating and maintaining the Water Department's drinking water pumping stations. It also is responsible for maintaining distribution system finished water storage reservoirs and standpipes. A key metric for this unit is availability of pumping assets to provide service. The Water Department provided the following metrics seen in Table 4-12.

Table 4-12. Pumping Unit Activity

Performance Measure	FY 2015	FY 2016	FY 2017	FY 2018
% Pump Availability	95.6	91.8	90.3	92.3
% Station Efficiency (wire to water)	77.6	77.9	76.7	77.5
% Planned Work (a productivity measurement)	91.8	94.4	96.3	97.6

Source: FY 2015 and FY 2016 confirmed by Water Department correspondence to Arcadis. FY 2017 and FY 2018 based on the Water Department's Monthly Manager's Report for period ending June 30, 2018.

As is shown, pump availability has remained at over 90 percent for the last several years, indicating a proactive approach to maintenance and readiness. This proactive approach is also reflected in the percentage of planned work conducted as opposed to reactive maintenance. The percentage of station efficiency measures the relationship between electrical input and mechanical output for the station pumps and provides the unit with a measure of efficiency. This metric has also remained stable for the last several years, which is commendable given the average age of the pumping equipment is more than 60 years old.

4.6.3 Load Control Unit

The Load Control Unit manages the hydraulic delivery of finished drinking water to its customers. This includes conducting planning through the use of a water system-wide hydraulic model that allows the unit to estimate the impact of operational changes or changes to facility assets. The information from this unit is used in planning initiatives such as the Water Master Plan and planning for capital projects.

This unit utilizes the SCADA system to control the delivery of water to customers. The unit seeks to find the most efficient delivery method that limits the use of electricity, including the management of storage levels to minimize pump usage during peak periods where electricity is more expensive. Table 4-13 presents the metrics used by the unit to measure its annual performance.

Table 4-13. Load Control Unit – Water Conveyance Unit Electrical Demand

Performance Measure	FY 2015	FY 2016	FY 2017	FY 2018
Average Daily Delivered Water, mgd	230.8	223.2	223.1	223.2
Total Power Consumption, million kilowatt-hours	118.2	110.5	109.6	113.0
Total Peak Billing Demand, Kilowatts	161,156	158,376	160,109	154,008

Performance Measure	FY 2015	FY 2016	FY 2017	FY 2018
Total Expenditures for Power	$9,846,800	$8,827,200	$6,691,036	$6,028,366
Cost per million gallons pumped (raw & treated water)	$116.89	$107.77	$82.20	$74.00

Source: Load Control Unit Annual Report

The metrics show that the Water Department has been able to achieve a stable delivery of water to its customers. The overall amount of water delivered slightly decreased from FY 2015 to FY 2016, and then leveled off. Over the same period, total power demand has remained consistent. The Unit has reduced total demand as much as possible during peak billing period but has also benefited from reduced electrical costs now that the City is able to negotiate generation costs with electrical suppliers. The total expenditure for power for water delivery decreased on a per unit basis with total power costs at approximately $6.0 million in FY 2018.

4.7 Operations Administration

The Operations Administration unit coordinates the various field services activities of the Water Department. This includes responding to customer water and sewer issues, managing and maintaining customer meters, performing water shut off and turn on as required, and other distribution and collection system activities. As of January 2019, the unit has 201 budgeted positions and 11 vacancies.

The unit relies on the Cityworks® maintenance management system to track and record the completion of its various customer and service work orders. Cityworks® incorporates the Water Department's street side assets for the water and sewer systems, and provides for coordination of service requests between the call center and field services staff. The maintenance management system is a useful tool that provides managers with the ability to track service requests and provide a more proactive approach for responding to maintenance issues and customer complaints.

The following sections provide an overview of several key units and initiatives within Operations Administration.

4.7.1 Meters

Water meters are critical assets for all utilities as they provide the means for accurately billing and collecting revenue from customers. The Meter Shop unit manages the maintenance and replacement of approximately 486,000 meters across its service area. Key aspects of meter management include:

- Testing – Meters are regularly tested to ensure that they record within acceptable accuracy parameters
- Replacement – Faulty meters are removed and replaced, and large-sized meters (greater than 1- inch), which measure a significant amount of the Water Department's billed usage, are replaced on a regular basis to ensure a greater level of accuracy.
- Automatic Meter Reading (AMR) – The Water Department currently uses AMR equipment which includes Encoder Receiver Transmitter (ERT) equipment and associated batteries. AMR allows for

the transmission of meter reads to an adjacent receiver in lieu of having staff physically access, read the meter, and transcribe the results for billing. The Meter Shop unit is responsible for maintenance and replacement of this equipment.

- Sizing – The Meter Shop unit analyzes the usage and operations of commercial and industrial customers. As necessary, meters are changed to better align the meter size with customer usage. This improves the accuracy of recorded data for these customers.

The Water Department is currently in the process of converting its metering system to Advanced Metering Infrastructure. AMI will allow for regular, consistent transmission of meter data to a Meter Data Management System that will allow the Water Department and customers real-time access to customer water usage. AMI will be implemented system-wide and will provide certain benefits including, identification of customers with leaking plumbing, better understanding if meter tampering is occurring, and a better understanding of customer usage for specific areas that can help narrow areas of the distribution system where significant leakage may be occurring.

The AMI project is included in the current CIP and is just beginning. A vendor will be responsible for implementing the majority of the project, with the Water Department implementing approximately 10 percent. The Water Department will also look to install tamper-proof equipment on certain meters that have been flagged, as well a remote shut-off valve to allow for a quick response to identified instances of tampering.

4.7.2 Revenue Protection

With a large number of customer accounts across its system, the Water Department experiences ongoing instances of tampering and unauthorized usage, as well as account delinquencies due to inability to pay. These instances result in lost revenue. The Water Department takes a proactive approach to identifying instances where shut-offs need to occur to facilitate payment and revenue recovery.

Working in concert with WRB, the Water Department tracks the estimated amount of water billings that are recovered due to its activities of identifying and correcting instances of unauthorized usage or delinquencies. Table 4-14 presents the estimated recovered billings for FY 2015 through FY 2018. The table shows that approximately $4.5 million per year in billings are recovered due to its efforts. As noted above, the implementation of AMI will help the Water Department better identify unauthorized usage and quickly shut-off service. This should help enhance the current process and result in better revenue recovery once AMI is implemented and up and running.

Table 4-14. Water Department and Water Revenue Bureau Annual Water Audit Summary

Fiscal Year	Water Recovered, mgd	Recovered Billings
2015	1.35	$4,446,222
2016	2.76	$4,423,024
2017	3.10	$4,976,896
2018	2.81	$4,507,116
Total	**10.02**	**$18,353,258**

Operations Administration's ongoing activities continue to build on past efforts. Future program initiatives include:

- Utilize the full potential of the billing system to enhance the management of customer account data.
- Increase staff levels to enhance revenue collections.
- Identify opportunities to improve efficiency and timeliness in addressing leakage on customer services connection piping.
- Continue to leverage the Cityworks® maintenance management system to better track leak occurrences, pipeline failure modes, and response and repair times. The Department has retained a consulting firm to help improve the utilization of Cityworks®.
- Establish a process to reliably track the period when leaks are identified to the completion of repairs and improve practices to minimize this lag period.
- Investigate opportunities for additional DMAs with enhanced pressure management capabilities.

4.8 Conclusions

Based upon our site visits to each of the treatment facilities, discussions with Water Department personnel, and our experience with other water utilities, we find the general condition of these major water facilities to be in good condition, or adequate steps are being taken to return the facilities to good condition. The Water Department is able to provide reliable levels of service and meet regulatory requirements due to its proactive approach to operations and maintenance. The Water Department regularly reviews its capital improvement needs and prioritizes to maintain compliance. Maintenance of facilities appears adequate to sustain equipment in reliable working order.

Arcadis reviewed the proposed six-year capital program for FY 2020 through FY 2025 and it appears in line with identified capital needs. We have discussed with the Water Department preliminary information that is part of the Water System Master Plan, which outlines proactive improvements to address both short-term and long-term needs of the water system.

5 WASTEWATER SYSTEM

5.1 Overview of Service Area

Figure 5-1 on the following page provides a general overview of the Water Department's wastewater system. The overall system is separated into three distinct areas, including the Northeast, Southeast, and Southwest service areas. Wastewater volumes for each of these areas is collected and conveyed to a major treatment that is owned and operated by the Water Department. The Water Department serves the residents of the City on a retail basis and also services portions of Delaware, Bucks, and Montgomery counties via 10 wholesale service agreements. Based on the 2017 U.S. Census estimate, the Water Department estimates that it serves approximately 1,580,863 persons within its City limits, plus the population served by the utilities that convey wastewater to the Water Department via the wholesale agreements. The service area consists of 364 square miles, with 230 square miles in suburban communities and 134 square miles in the City. The wastewater system includes approximately:

- 3,716 miles of total collector system piping (including force mains)
- 15 wastewater pumping stations (includes 1 owned by police department)
- 3 stormwater pumping stations (includes 2 owned by PennDOT)
- 94,399 manholes
- 26 storm relief chambers
- 175 combined sewer regulating chambers
- 72,690 stormwater inlets

Approximately 55 percent of the collection system consists of combined sanitary/stormwater mains.

The Water Department provides wholesale wastewater service to the following communities. The wholesale volumes in million gallons for FY 2018 are reflected in parentheses.

- Abington (708)
- Bensalem (1,292)
- Bucks County (6,724)
- Cheltenham (2,931)
- DELCORA (7,815)
- Lower Merion (2,473)
- Lower Moreland (453)
- Lower Southampton (1,912)
- Springfield Erdenheim (996)

- Springfield Wyndmoor (158)
- Upper Darby (3,173)

The flow from these wholesale customers comprises approximately 20 percent of the wastewater volumes treated at the Water Department's three treatment plants. Annual revenue from these customers in included in Section 2 of this Report and is approximately 5.8% of the Water Department's operating revenue.

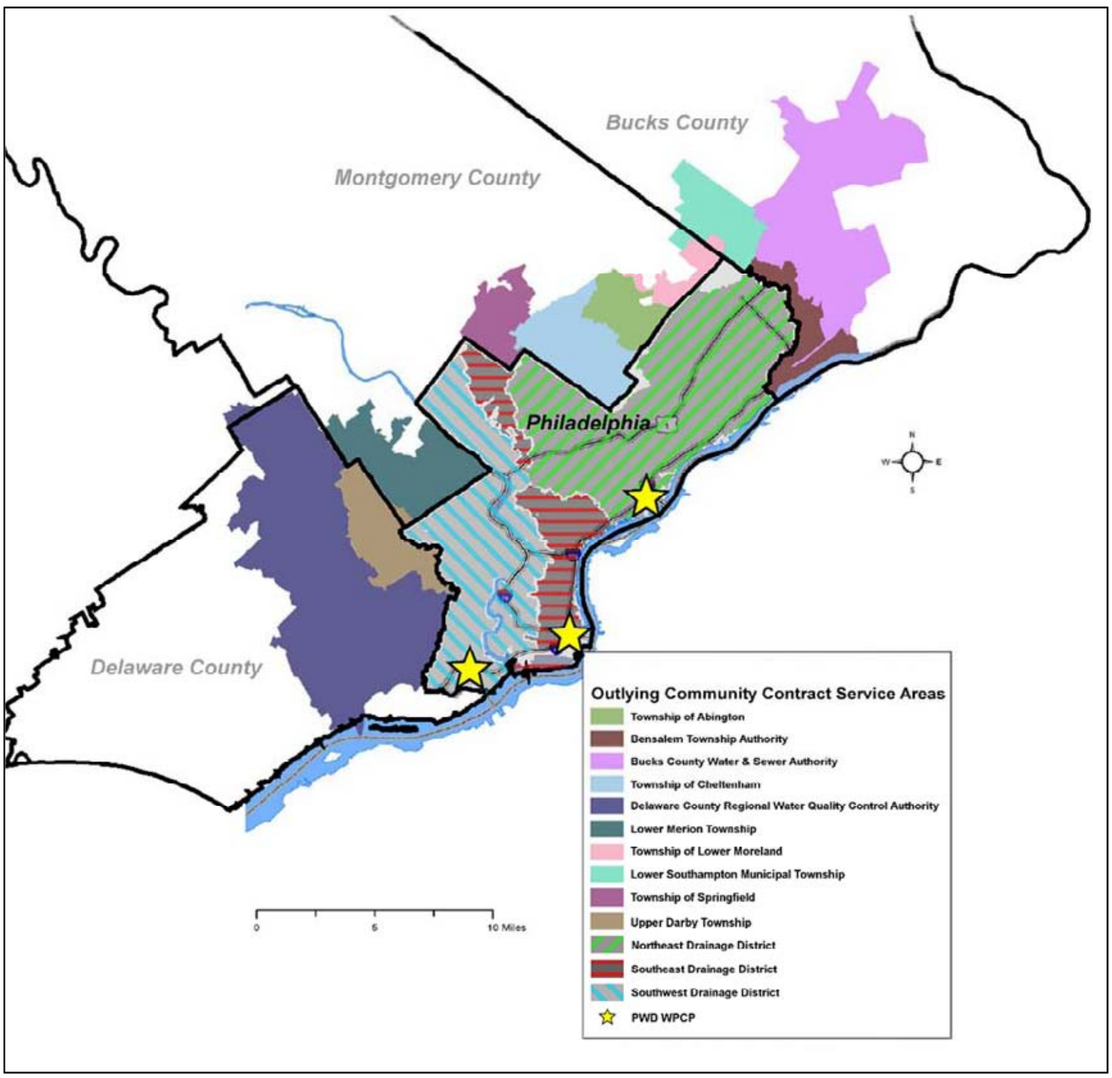

Figure 5-1. Overview Map of Wastewater Service Areas

5.2 Relevant Regulatory Permits and Obligations

The following sections provide an overview of Arcadis' review of the Water Department's major regulatory obligations.

5.2.1 Consent Order Agreement

Arcadis reviewed the Consent Order Agreement between the City and PaDEP. The City entered into the COA with PaDEP in 2011 and an Administrative Order for Compliance on Consent with the USEPA in 2012. The COA requires the Water Department to implement the Long-Term Control Plan Update, also known as the Green City, Clean Waters (GCCW) program, and provide annual reporting on progress. The goal of the GCCW program is to achieve 85% capture of pollutants (BOD, Total Suspended Solids (TSS), and fecal coliform bacteria) discharged from the combined sewer system on a system-wide basis on an annual average basis. The COA also requires the submittal of an Evaluation and Adaptation Plan (EAP) at least once every five years. The EAP includes an assessment of progress made, description of program elements for the upcoming 5-year period, and adaptive strategies for any performance standards that are not met. In the 2016 EAP, the Water Department reported that it had met or exceeded all of the 5-year performance standards. The performance standards of the COA are shown below in Table 5-1.

Table 5-1. COA Performance Standards

Metric	Units	Baseline value	Cumulative amount as of Year 5	Cumulative amount as of Year 10	Cumulative amount as of Year 15	Cumulative amount as of Year 20	Cumulative amount as of Year 25
[plant name] WPCP upgrade: Design	percent complete	0	see note (1)	see note (1)	see note (1)	100%	100%
[plant name] WPCP upgrade: Construction	percent complete	0	see note (1)	see note (1)	see note (1)	100%	100%
Miles of Interceptor Lined	miles	0	2	6	14.5	14.5	14.5
Overflow Reduction Volume (2)	million gallons per year	0	600	2,044	3,619	5,985	7,960
Total Greened Acres	Greened Acres	0	744	2,148	3,812	6,424	9,564
Equivalent Mass Capture - TSS	percent	62%	Report value	Report value	Report value	Report value	85%
Equivalent Mass Capture - BOD_5	percent	62%	Report value	Report value	Report value	Report value	85%
Equivalent Mass Capture - Coliform Bacteria	percent	62%	Report value	Report value	Report value	Report value	85%

(1) Performance Standards for "percent complete" for the WPCP upgrade design and construction projects were not available at the time of the COA. The City shall provide these targets to the DEP along with the Facility Concept Plan for the WPCP. The Facility Concept Plan is due on a specific date given in the COA. After the DEP approves the Facility Concept Plan, the targets for "percent complete" will be entered into COA Table 1. The formal modification of COA Table 1 may be accomplished by the DEP by issuing a revised NPDES permit.

(2) Overflow Reduction Volume means the difference between the volume of overflow in million gallons per year for the condition prevailing at the time of the report and the volume of overflow in million gallons per year for the baseline year. The baseline year is represented by Philadelphia's physical systems as they were configured on January 1, 2006. Both volumes will be determined from modeling, using climatic data representing the same "typical year" for Philadelphia as determined in the LTCPU development process, and a hydrologic/hydraulic model calibrated with flow data collected for verification of actual performance.

As shown in Table 5-1, the GCCW program relies on a combination of interceptor lining, WPCP upgrades, and implementing 9,564 greened acres over a 25-year period. A greened acre is an expression of the volume of stormwater managed by green stormwater infrastructure, based on the design for the project. One greened acre is equivalent to one inch of managed stormwater runoff from one acre of drainage area, or 27,158 gallons of managed stormwater. At 7.5 years into the program, the

Water Department has implemented 1,355 greened acres (270 acres on public property, 570 acres associated with private development /redevelopment, and 515 acres through incentivized retrofits on private property). The Water Department currently has $47 million budgeted in FY 2019 and $62 million in FY 2020 for construction of green infrastructure that will be within the public right-of-way. Other, future greened acres will be achieved through retrofits and redevelopment of private property.

The COA includes penalties for failing to achieve the Water Quality-Based Effluent Limits (WQBEL) performance standards outlined above. The penalties range from $25,000 per month per violation for the first six months; $50,000 per month per violation for months 7 through 12; and $100,000 per month per violation for the thirteenth month and beyond. There are also penalties for failing to submit timely reports as required that range from $1,500 per day per violation to $2,500 per day per violation.

The Water Department's CIP includes significant capital expenditures on projects to implement the LTCPU and comply with the COA. The Water Department's current estimates are that the 25-year program will cost a total of $4.5 billion, including $3.5 billion of capital expenditures and $1.0 billion of O&M expenditures. The CIP for FY 2020 through FY 2025 reflects an increase in COA capital expenditures from approximately $91 million in FY 2020 to $145 million for FY 2023, FY 2024, and FY 2025. Through the EAP process, the Water Department will continue to evaluate its strategy for compliance with the COA in a cost-effective manner. The COA includes provisions that should the cost of implementing the LTCPU exceed 2.27% of the median household income, the Water Department may request a modification to the implementation schedule.

The Water Department notes that the USEPA has directed, via an information request, that the Water Department analyze the controls necessary to achieve 85 percent capture in each of its CSO receiving streams, rather than 85 percent capture based on a City-wide average, as stated in the Water Department's approved COA. The Water Department believes that this is inconsistent with the COA and sent a letter to the Acting Administrator for USEPA Region III to reconsider its information request. On April 10, 2017, the USEPA agreed to stay the obligation to respond to the information request and scheduled a meeting with the Water Department to discuss the issue further, which meeting took place on June 26, 2018. Based on the meeting, the Water Department anticipates a favorable resolution of the matter. In the meantime, the information request remains stayed. If there are changes to the Water Department's COA obligations, the cost of implementing the COA could increase beyond the $4.5 billion total estimate noted above.

5.2.2 National Pollutant Discharge Elimination System Permits and Compliance

Arcadis reviewed the NPDES permits for the Northeast, Southeast, and Southwest WPCPs that were provided by the Water Department. The permits became effective in September of 2007 and expired five years later in August of 2012. The Water Department notes that it submitted a renewal application that has been certified by PaDEP as administratively complete. It continues to operate under the parameters of the NPDES permits and is in the process of reviewing and revising draft versions of proposed NPDES permits with PaDEP. The Water Department notes that the elements of the negotiated Consent Order Agreement are included in the draft NPDES permits.

The NPDES permits regulate the discharges of these three WPCPs. The following table presents the main monthly discharge limits currently applicable to the Water Department.

Table 5-2. Average Monthly NPDES Permit Effluent Discharge Limitations

Description	Northeast WPCP	Southeast WPCP	Southwest WPCP
$CBOD_5$ (mg/l)	25		25
$CBOD_5$ (lbs./day)	36,430		19,800
$CBOD_5$ % Removal [1]	>= 86		>= 89.25
BOD_5 (mg/l)		30	
BOD_5 (lbs./day)		19,650	
BOD_5 % Removal [2]		>= 86	
TSS (mg/l)	30	30	30
TSS (lbs./day)	52,540	28,025	50,400
TSS % Removal [3]	>= 85	>= 85	>= 85
Fecal Coliform (# / ml)	200	200	200

[1] Also use these values for days when daily flow exceeds the WPCPs maximum daily flow capacity for calculating $CBOD_5$ average monthly percent removal.

[2] Also use these values for days when daily flow exceeds the WPCP maximum daily flow capacity for calculating BOD_5 average monthly percent removal.

[3] Also use these values for days when daily flow exceeds the WPCPs maximum daily flow capacity for calculating TSS average monthly percent removal.

Based on Arcadis' experience, the above effluent discharge limits are common for wastewater treatment facilities in the industry. It is noted that the NPDES permits for each WPCP also include monitoring and reporting requirements for several other parameters including total phosphorous, nitrogen parameters (ammonia, nitrate, nitrite), and other parameters that could be of concern.

Arcadis reviewed data provided by the Water Department related to regulatory effluent parameters that are measured per the Table above, and it is noted that the Water Department has not had any significant permit effluent violations for FY 2016, FY 2017, or FY 2018. The only violations of effluent parameters were at the Northeast WPCP where the weekly effluent solids loading and the weekly effluent solids concentration limits were exceeded for the second week of June 2018.

Arcadis also reviewed the USEPA's Enforcement and Compliance History Online (ECHO) database for the WPCPs. The ECHO database lists the Water Department's WPCPs as having significant noncompliance issues for non-receipt of sludge quantities and this issue is listed as unresolved. The Water Department has stated that they have submitted the requested reports in hard copy format for 2017 and then electronically for 2017 and 2018. The reports for 2017 were not submitted electronically by the USEPA's deadline of February 17, 2018, which may account for the non-compliance issue. The 2017 reports have since been submitted electronically in February 2019 along with the 2018 reports.

From an industry perspective, the three WPCPs maintain high levels of treatment efficiency and have been recognized by the National Association of Clean Water Agencies (NACWA) with either Silver, Gold, or Platinum awards over the past decades. The Northeast, Southwest and Southeast WPCPs met all permit requirements in calendar year 2017 and received their 13th, 7th, and 18th NACWA platinum awards, respectively. The platinum award is given to facilities that are in complete compliance with NPDES requirements for five consecutive calendar years.

The NPDES permits also include requirements related to monitoring and protecting stormwater outfalls, as well as managing a pretreatment program to monitor and regulate significant industrial users that have the potential to discharge significant strength wastewater that could upset the normal operation of the WPCPs.

5.2.3 Municipal Separate Storm Sewer System Permit

Stormwater in the Water Department's service area is managed in part through a network of separate storm sewers which are regulated under PaDEP's MS4 program. The Water Department is currently operating under a 2005 MS4 permit (which expired in 2010) and continuing to submit a Stormwater Management Program Annual Report under the terms of the expired permit until PaDEP issues a new permit. The annual report includes progress towards reducing sediment load in the Wissahickon Creek, minimizing PCBs in the MS4, watershed monitoring, identification and abatement of illicit discharges, monitoring and control of pollutants from industrial sources and construction sites, public education and implementation of various stormwater best management practices. The timeframe for issuance of a new MS4 permit is not known.

5.2.4 Title V Major Source Operating Permits

The Northeast WPCP and the BRC are currently regulated under Title V Permits as major sources of emissions of VOCs and nitrogen oxides. The Southeast WPCP does not have a Title V air permit because its sludge is pumped to the Southwest WPCP for treatment.

In January 2013, the Water Department entered into a Title V consent order agreement to address odor issues from the Northeast WPCP by installing gravity thickeners and related odor control. The gravity thickeners are under construction and anticipated to be operational in 2019.

Effective March 4, 2019 the Southwest WPCP is permitted as a minor facility that is no longer subject to Title V because Philadelphia Biosolids Services, LLC (PBS) is responsible for operation of the BRC, which is the primary source of emissions. The BRC continues to have a Title V air permit separate from the Southwest WPCP.

Since 2008, no odor violations have been reported at the Northeast WPCP, Southeast WPCP, or Southwest WPCP.

5.3 Wastewater System Initiatives

5.3.1 Wastewater Master Planning

The Water Department completed a draft Wastewater System Master Plan in 2016. The purpose of the plan was fourfold:

- Wet Weather – Develop a plan for wet weather capacity improvements that may be needed to comply with the CSO Long Term Control Plan Update
- Asset Replacement – Determine the need for asset replacement at the three wastewater treatment plants and for nonlinear assets in the collection system
- Regulatory Compliance – Develop strategies to plan for potential future needs for regulatory issues
- Utility of the Future – Develop strategies for improving efficiency, investigating resource recovery and creating resilient wastewater facilities

The long-range Wastewater Master Plan is intended to serve a broad adaptive road map to anticipate and plan for the City's future wastewater system needs. The wastewater system master plan incorporates elements of the COA and LTCPU that have already been agreed to with PaDEP as well as forward looking objectives. The plan was divided into five components:

1. Understanding and analyzing the Water Department's basic data
2. Evaluating wet weather capacity improvements
3. Preparing for asset replacement
4. Planning for potential future regulations
5. Moving towards the utility of the future

The Water Department summarized the Wastewater Master Plan as achieving the following goals:

- Determination that no expansion of the existing WPCP and collection system facilities are required to meet the projected dry weather needs through 2066.
- Identification of strategies including a combination of green and traditional (gray) infrastructure may be needed to accommodate treatment of additional wet weather flows.
- Identification of when wastewater treatment assets may need to be replaced and determined planning level capital replacement costs.
- Considered future and potential regulatory requirements.

Estimated costs for the replacement of assets were developed and the document considered the impacts and costs for potential future regulatory concerns (Greenhouse Gas (GHG) emissions, nutrient pollution and wet weather). Costs developed in the Wastewater Master Plan help to shape the budget for capital improvements that are incorporated into the Water Department's overall CIP.

The plan is a living document that the Water Department utilizes to assist in their decision-making process and is updated every five years, or sooner if a trigger scenario has occurred (changes to population, regulatory environment, etc.)

5.3.2 Utility Wide Strategic Energy Plan

The Water Department updated their Utility Wide Strategic Energy Plan in 2017. This plan recognized that an innovative energy management approach is essential to the Water Department's commitment to sustainable utility operations.

The scale of the Water Department's water and wastewater treatment, distribution, and collection services requires a large annual energy expenditure of approximately 1.7 trillion BTUs. Recognizing the interdependency of water and energy infrastructure, the Water Department manages the large-scale energy requirements for its operations by carefully monitoring and evaluating energy usage and pursuing resource recovery projects that increase their energy independence. Operational staff have demonstrated a long history of leadership in energy management via strategic load shifting, demand management, the installation of energy efficient equipment, and, more recently, power generation. The Water Department's Utility Wide Strategic Energy Plan is stated to be supported by four core goals:

I. Strive to maintain a stable energy footprint by increasing energy efficiency.
II. Reduce greenhouse gas emissions 50% by 2030.
III. Continue to pursue renewable energy generation and resource recovery.
IV. Maintain or reduce energy costs and provide budget certainty to the ratepayer.

The City of Philadelphia is pursuing aggressive greenhouse gas reductions goals – 80% reductions by 2050—and the Water Department has adopted a parallel approach. To achieve the GHG emissions targets noted above, the Utility Wide Strategic Plan includes the following strategies:

Strategy 1: Increase Energy Efficiency

- Performing energy audits at various facilities.
- Maximizing off-peak pumping – note the Load Control Unit works to maximize off-peak pumping in its delivery of water.
- Incorporating GHG impact and energy reduction into the capital planning process.

Strategy 2: Pursue Energy and Resource Recovery

- Maximizing the production and use of biogas – note the Northeast WPCP, Southwest WPCP, and BRC all use biogas for reuse purposes. The Northeast WPCP powers a cogeneration unit that supplies up to 85 percent of the plant's energy needs. The Southwest WCPC utilizes biogas to heat the digesters and for campus heating. The BRC utilizes biogas from the Southwest WPCP digesters for its drying facility to produce Class A biosolids.
- Increasing the amount of energy used from alternative sources – note currently the Water Department has a solar panel array located at the Southeast WPCP.
- Continued investigation for using food waste and airport deicer fluid to enhance the production of biogas at the Southwest WPCP.
- Evaluation of additional renewable energy projects.

The Water Department will continue to pursue the above strategies and actions as a means for conserving energy, reducing GHG emissions, and realizing financial savings.

5.4 Northeast WPCP

As seen in Figure 5-1, the Northeast WPCP serves northeast Philadelphia and suburban areas in southeast Bucks and eastern Montgomery counties. The Northeast WPCP is designed to handle an average day flow of 210 mgd and a peak flow of 435 mgd. Per the Long-Term Control Plan Update and COA, the Water Department is expanding the wet weather capacity of this facility by approximately 215 mgd. The plan includes the construction of a 215 mgd secondary treatment bypass, which when combined with other projects, will allow the Northeast WPCP to provide primary treatment and disinfection of the peak wet weather flow. It is noted that the secondary treatment bypass was recently completed.

The Water Department notes that for FY 2018, the Northeast WPCP treated approximately 175 mgd and 526 mgd average day and peak flows, respectively. A review of data provided by the Water Department indicates that monthly effluent concentrations for suspended solids and $CBOD_5$ are generally well below NPDES permit effluent limits.

5.4.1 Site Visit

Arcadis visited the Northeast WPCP on January 31, 2019. The general process configuration for the treatment plant consists of screening, influent pumping and grit removal, primary clarification, aeration, final clarification and disinfection. The sludge generated is further treated using dissolved air flotation units, and anaerobic digestion for the combined primary and thickened waste activated sludge. Digested sludge is discharged to barges which transport the sludge to the BRC for final processing.

The facility is staffed 24 hours per day and 7 days per week with an authorized staffing level of 132, of which five are certified operators. Most unit processes are computer automated and monitored to capture various process trends. Currently this includes the raw influent pumps, bar screen rakes and conveyors, influent flow splitting to the primary settling tanks, scum gates, dissolved oxygen and air flow controls for the aeration tanks, return sludge system components, hypochlorite disinfection, digester feeding, and dissolved air flotation (DAF) thickening system. Automation of final settling tank scum collection is currently under design. Dedicated operator stations have computer monitors which are used to assist the operator in making process control decisions. Process and lab data are available via web-based reporting which has improved the analysis and trending of data collected. The on-site process control laboratory is used to check and optimize plant operation.

5.4.2 Major Projects in Construction, Design or Projects Control

Arcadis reviewed with the Water Department the major projects that are either recently completed or currently underway at the Northeast WPCP (Work No. included in parenthesis for contracted projects):

- Frankford High Level lining project and sealing of a diversion chamber (71079)
- New high flow management conduit from Set 1 to effluent conduit – completed in July 2018 (71090)
- Replacement of aeration tank diffusers (being completed in-house)
- Painting of aeration tanks process air headers (71095)
- Installation of a new plant entrance gate (71104)
- Replacement of interior and exterior doors throughout the plant being performed with in-house resources (71096)
- New Gravity Sludge Thickeners, expect to be completed by June 2019 (71086, 71087, 71105, 71106)

- Rehabilitation of Pier 217 North (71110)
- Gas storage tank bladder replacement (71111)
- Replacement of digester roof (71115)

Major Projects in the Design/Projects Control/Bidding Process:

- Final Sedimentation Tank Set 2 return sludge piping replacement (71112, 71118)
- Replacement of emergency lighting throughout the plant (71085)
- Acquisition of properties for siting of new Pretreatment Building (71088)
- Replacement of sludge gas piping (71116)
- Replacement of boilers and chillers (71113)
- New Preliminary Treatment Facility; this project includes a land acquisition element. (71107, 71108, 71109, 71088)
- Replacement of DAF Mechanisms
- Update of Control Systems (PLCs)

5.5 Southeast WPCP

As seen in Figure 5-1 the Southeast WPCP serves the east central part of the City, including portions of Center City, South Philadelphia, the Philadelphia Naval Base, and a small portion of Springfield Township in Montgomery County. The Southeast WPCP is designed to handle an average daily flow of 112 mgd and a peak flow of 224 mgd. A review of the Water Department's 2016 Wet Weather Facility Plan notes that the plan is to increase peak flow capacity to 274 mgd. This will be accomplished through process and hydraulic improvements, including the replacement of the influent bar rack system to allow for the treatment of additional wet weather flow.

The Water Department notes that for FY 2018 the Southeast WPCP treated approximately 77 mgd and 317 mgd average day and peak flows, respectively. A review of data provided by the Water Department indicates that monthly effluent concentrations for suspended solids and $CBOD_5$ are generally well below NPDES permit effluent limits.

5.5.1 Site Visit

Arcadis visited the Southeast WPCP on January 30, 2019. The general process configuration for the treatment plant consists of bar racks, influent pumping, bar screens, grit removal, flocculation, primary clarification, aeration, final clarification, disinfection with chlorine, and effluent pumping. The Water Department trucks screenings, scum, and grit removed from the process to the Southwest WPCP for processing and ultimate disposal to a landfill.

In addition, the Southeast WPCP receives residuals discharged from the Queen Lane Water Treatment Plant. These residuals reduce the amount of phosphorus available for the activated sludge process which requires the addition of phosphoric acid to maintain proper nutrient levels. The primary and waste activated sludge have separate sludge transfer pumping systems and two eight-inch force mains convey the sludge to the Southwest WPCP for processing including digestion. The digested sludge is then transferred to the BRC and pelletized for beneficial reuse. Scum and grease collected from the primary and secondary clarifiers is concentrated and then trucked to the Southwest WPCP for separate processing and disposal.

The facility is staffed 24 hours per day and 7 days per week with an authorized staffing level of 67, including three certified operators.

The Process Control Center (PCC) provides automation and control for the plant. The PCC operator has unit process graphic displays available at the Central Computer Console. The system can control the influent and effluent pumping stations, primary sludge pumping, final clarifier scum collection, return and waste activated sludge and disinfection systems.

5.5.2 Major Projects in Construction, Design, or Projects Control

Listed below are the major projects that are either recently completed or currently ongoing at the Southeast WPCP: (Work No. included in parenthesis for contracted projects):

- Bar screen system rehabilitation – expect to use in-house staff and complete in calendar year 2019. Parts are being ordered for rehabilitation as needed.
- Concrete repairs and replacement of flights and chains in the 12 Final Sedimentation Tanks is in construction, one tank is currently complete. (72075)

Major Projects in the Design/Projects Control/Bidding Process:

- Replacement of sludge return piping (72072)
- Replace sludge force main (portion under the river) (72069)
- Scum Concentration process modifications and rehabilitation. (72070, 72071)
- Replace/refurbish railings throughout the plant. (72081)
- Repaving of roads within plant. (72086)
- Recoat water tower (72088)
- Building enclosure for grit handling (72089)

5.6 Southwest WPCP

As seen in Figure 5-1, the Southwest WPCP serves the western portions of the City and wholesale service areas located in eastern Delaware and southeastern Montgomery counties.

The Southwest WPCP was designed to handle an average daily flow of 200 mgd and a peak flow of 400 mgd. Per the LTCPU the Water Department has committed to implementing improvements to improve the conveyance and treatment of wastewater during wet weather events. The Water Department is currently undertaking several studies to determine how to effectively increase the Southwest WPCP plant capacity to 540 mgd.

The Water Department notes that for FY 2018 the Southwest WPCP treated approximately 162 mgd and 499 mgd of average day and peak day flows, respectively. A review of data provided by the Water Department indicates that monthly effluent concentrations for suspended solids and $CBOD_5$ are generally well below NPDES permit effluent limits.

5.6.1 Site Visit

Arcadis visited the Southwest WPCP on January 30, 2019. The general process configuration for the treatment plant consists of influent pumping, screening, grit removal, pre-aeration/flocculation, primary clarification, secondary treatment using pure oxygen aeration, secondary clarification, effluent pumping, and disinfection. The Southwest WPCP receives water plant residuals from the Belmont water treatment plant and is the only plant to receive septage from haulers.

The Waste Activated Sludge (WAS) from the Southwest WPCP is combined with the WAS from the Southeast WPCP is sent to the DAF tanks for thickening. The DAF-thickened WAS is then combined with primary sludge from both the Southwest and Southeast WPCPs and pumped to digesters. After digestion, the sludge is pumped to the BRC for final processing. The gas from the digesters is used to heat approximately 22 buildings at the Southwest WPCP, and Synagro Technologies, Inc. (Synagro) uses some of the digester gas to offset natural gas consumption for its sludge drying operations at the BRC.

The facility is staffed 24 hours per day and 7 days per week with an authorized staffing level of 127, including five certified operators. Plant operators have assigned responsibility for key plant facilities with dedicated operator stations equipped with computer monitors to assist in making process control decisions. The system monitors all unit processes and currently controls; aeration tank oxygen feed, return sludge pumping, activated sludge wasting, secondary scum collection, effluent hypochlorite dosing, effluent pumping station, digester tank feeding, dissolved air flotation thickening and primary sludge pumping. Future unit processes to be automated include the primary scum collection system.

An on-site process control laboratory is used to check operating parameters and in coordination with the Industrial Waste Unit monitor the septage receiving program.

5.6.2 Major Projects in Construction, Design, or Projects Control

Listed below are the major projects that are either recently completed or currently ongoing at the Southwest WPCP: (Work No. included in parenthesis for contracted projects):

- Installation of a sixth effluent pump was completed in August 2018 (73071)
- Replacement of return sludge piping (73073)
- Concrete repairs and coating of aeration tank (73064)
- Projects under construction:
- Installation of high efficiency lighting: Internal forces have completed areas where lighting fixtures were reasonably accessible, the process buildings lighting fixtures will be replaced as part of capital project.

- Replace North and South Digester Buildings roofing including replacement of piping on the roof. The piping is currently complete with the roof to be finalized in the Spring when weather conditions are favorable (73058, 73088)
- Replacement and right-sizing of underground gas lines and elevator in PTB. (73075)
- Rehabilitation of DAF tanks. (73066)

Major Projects in the Design/Projects Control/Bidding Process:

- Inspect, repair and paint Gallery Tunnel (73063)
- New Truck Scale Facility (73082)
- Scum Building switchgear placement (73061)
- Additional Primary Sedimentation Tank. (73096)
- Replacement of Maintenance Building boilers (73076)
- Replacement and automation of Primary Settlement Tank scum gate actuators (73085)
- Coating of Final Sedimentation Tank interiors (73065)
- Replace switchgear in Influent Pump Station, Effluent Pump Station, and Access Buildings (73078, 73079, 73080)
- Disinfection system upgrade (73092)
- Scum concentration and collection system upgrade. (73085)
- Replace Digested Sludge Underground Piping. (73097)
- Replacement of Aeration Tank mixers (73087)
- Centrate Side Stream Treatment Pilot Project (73067)
- Additional centrate line for redundancy (73081)
- Replacement of process air piping and blowers (73089)
- Automation of the oxygen generation system (73086)
- Replacement of underground oxygen piping (73083)
- Automation of screenings conveyance and collection (73084)

5.6.3 Biosolids Recycling Center

Arcadis visited the Biosolids Recycling Center (BRC) on January 30, 2019 and toured the facilities with a site representative from PBS and the Water Department's onsite engineer that monitors performance and compliance with the biosolids service contract. The Water Department sends biosolids from its three WPCPs to the BRC which is located adjacent to the Southwest WPCP. The BRC is capable of producing Class A biosolids which can be used as a soil amendment.

The BRC is operated by PBS under a 20-year service contract that ends on October 13, 2028 and contains the potential for a five-year renewal term at the City's option. PBS designed and built the thermal drying facility onsite and has been producing Class A biosolids pellets since 2012. The Water Department's operating expenses include annual payments to PBS for its operation of the BRC, and the FY 2020 proposed amount is $25,705,000. The Water Department indicates that the biosolids services contract with PBS has been a success with helping to effectively manage and reuse its wastewater biosolids.

5.7 Wastewater Collection and Pumping

As noted above, the Water Department operates and maintains a significant number of collection system and pumping assets. This includes sanitary, stormwater, and combined sanitary/stormwater sewers that collect and convey wastewater from City residents and wholesale customers. The Water Department manages these assets through its Collector Systems Unit, which includes the following operational units that are described in more detail below and reflected in Figure 5-2. The following sections provide a brief overview of these units, as well as key performance metrics that the units use to track their ongoing progress.

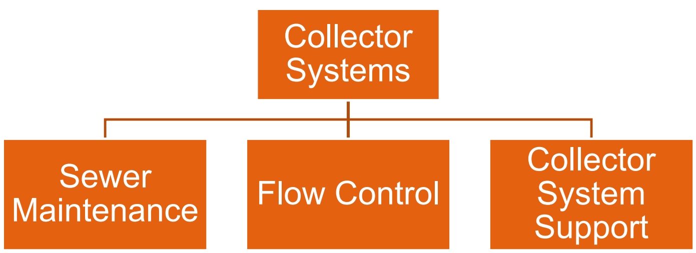

Figure 5-2. Collector Systems Organization

5.7.1 Sewer Maintenance Unit

This unit has several focus areas for which there are dedicated groups or teams, including sewer maintenance; waterways restoration; defective connection; and inlet cleaning. These teams are focused on maintaining the integrity of collection and conveyance systems for both sanitary and stormwater flows. The following provides a brief description of the Sewer Maintenance Unit groups and associated O&M metrics that are used to track their performance on an annual basis.

<u>Sewer Maintenance</u> – This team leads the inspection and maintenance of sewer mains, inlets and manholes for the wastewater system. The teams perform inspections on an ongoing basis, and also pre-inspects segments prior to repairs. Pipe inspections by this team are performed as man-entry inspections. Inspections requiring use of a crawler camera are referred to the Flow Control Unit. This team also performs inlet maintenance (resets and repairs), excavation for repair of sewers and inlet pipes, dye testing, and sewer cleaning. The authorized staff level for the unit is 219 (excluding Inlet Cleaning as discussed below). As of February 2019, there are 31 vacancies, including critical vacancies for sewer inspectors. Table 5-3 provides a summary of work orders for Sewer Maintenance.

Table 5-3. Sewer Maintenance Unit Work Order History

Category	FY 2015	FY 2016	FY 2017	FY 2018
Sewers Laterals Examined	5,496	5,933	4,875	4,092
Inlets Reset and Reconstructed	7,295	8,344	7,118	7,371
Sewer Excavations/Repairs	224	229	204	238

Waterways Restoration – This team focuses on the inspection of and debris removal from local streams and waterways to ensure proper operation and conveyance of stormwater. A key maintenance focus of this team is the removal of bulk debris from local waterways. Table 5-4 presents the amount of debris removal as reported by the Water Department for FY 2015 through FY 2018.

Table 5-4. Waterways Restoration Team O&M Metrics

Category	FY 2015	FY 2016	FY 2017	FY 2018
Tons of debris removed	915	1,130	817	1,582

Defective Connection Group – This group focuses on finding and disconnecting instances of illicit connections to the stormwater system. Illicit connections result in the unwanted discharge of sanitary waste to the separate storm sewer system. When illicit discharges are found, this group works with the Plumbing Repair Unit to correct connections when outside the home. This involves the use of dye testing to narrow the search area. When the origin of the illicit discharge is discovered, the Plumbing Repair Unit is responsible for enforcing and correcting the illicit connection. Table 5-5 presents the number of properties tested and illicit connections found for FY 2015 through FY 2018. The Water Department estimates that approximately 208 million gallons have been prevented from discharging into local streams and waterways by this group.

Table 5-5. Defective Connections Group O&M Metrics

Category	FY 2015	FY 2016	FY 2017	FY 2018
Properties Tested	2,608	2,337	2,093	1,968
Illicit Connections Found	44	42	39	136

Inlet Cleaning – This group is responsible for the inspection and maintenance of the Water Department's stormwater inlets, including removal of debris from inlets and the relieving of choked inlets. An additional area of focus for this group is on maintenance of green stormwater infrastructure. The unit is responsible for the maintenance of pretreatment (filter bag) maintenance for all 815 street inlets serving green stormwater infrastructure. Currently the unit is authorized a staff of 111 and has seven vacancies. The unit currently has five dedicated staff to green stormwater infrastructure but anticipates that this will increase over the coming years as more green stormwater infrastructure is constructed. Table 5-6 provides an overview of the O&M activities for this group. The Water Department indicates that approximately 90 percent of this group's work is proactive instead of reactive.

Table 5-6. Inlet Cleaning O&M Metrics

Fiscal Year	Inlets Cleaned	Response Time (Days)
2015	94,776	2.1
2016	98,147	1.2
2017	107,638	1.3
2018	107,915	1.2

5.7.2 Flow Control Unit

The Flow Control Unit is focused on O&M activities related to the combined sewer overflow system, sewer assessments and GSI inspections, remote wastewater and stormwater pump stations, remote odor control facilities, wastewater metering chambers, and a rain gauge network. Each of these areas is discussed below.

CSO Program – The Flow Control Unit supports the CSO program and minimizing dry-weather overflows through inspections and maintenance of CSO locations and monitoring of flow data.

Sewer Assessments and GSI Inspections – Through a combination of in-house services and contractors, the Flow Control Unit provides CCTV inspections of sewers and GSI. Post-construction inspections are performed in order to determine acceptability of construction and in-service inspections are conducted to facilitate maintenance activities. Pipe inspection data is evaluated to assist in the prioritization of sewer rehabilitation projects. Table 5-7 shows the sewer and GSI inspections performed by the Flow Control Unit over the past four years. The demand for television inspections is expected to increase as the Water Department's capital spending increases.

Table 5-7. Sewer Inspection Miles

Fiscal Year	2015	2016	2017	2018
Miles of CCTV Sewer Inspections	36.1	41.7	43.7	51.4
GSI Inspections Completed[1]				1,140

[1] Flow Control inspection of GSI began during FY2018

Wastewater and Stormwater Pump Stations – The Flow Control Unit is responsible for operation and maintenance of 15 sanitary pump stations and 3 stormwater pump stations. Main pump availability over the past four years is provided in Table 5-8.

Table 5-8. Main Pump Availability

Fiscal Year	2015	2016	2017	2018
% Main Pump Availability	98.1	98.1	100.0	98.9

Remote Odor Control Facilities - The Flow Control Unit provides O&M of two odor control facilities that use sodium hypochlorite solution to eliminate odors

Wastewater Metering Chambers - Flows from surrounding communities are metered as they enter the Water Department's collection system. The Flow Control Unit maintains the meter chambers and calibrates the flow meters. Operational availability of metering chambers over the past four years is provided in Table 5-9.

Table 5-9. Percent Metering Chambers Operational

Fiscal Year	2015	2016	2017	2018
% Metering Chambers Operational	89.9	92.4	93.6	90.6

Rain Gauge Network – The Flow Control Unit maintains a system of rain gauges that are used to support hydraulic modeling efforts and to estimate combined sewer overflow volumes.

5.7.3 Collector System Support Unit

The Collector System Support Unit is divided into three groups (Investigations, Operations and Systems) which support the evaluation and analysis of the collection system. The primary focus of these groups is described below.

- Investigations Group – This group provides analyses of sewer failures to determine root cause, evaluates inspection data to provide input into linear asset capital planning, and supports updating of GIS data for the Water Department's buried infrastructure.
- Operations Group – This group provides analyses of flow meters and level sensors in the collection system to determine maintenance requirements for instrumentation and the collection system. This group also provides input to capital projects for pump stations and flow management structures.
- Systems Group – This group provides support for data acquisition and analysis to assure that systems are correctly configured and functioning. This group also supports analysis of past work practices to inform organizational change.

5.7.4 Capital Projects

Arcadis met with Water Department staff and reviewed ongoing collection system and pumping capital projects. The following provides a brief update of ongoing projects.

- The Inlet Cleaning Waste Dewatering Facility project has been completed. The facility dewaters collected inlet waste prior to disposal, reducing the weight of materials for hauling and disposal.
- A new maintenance headquarters for Sewer Maintenance's West Philadelphia division is substantially complete and is occupied, with final punchlist work ongoing. This facility is anticipated to have a Leadership in Energy and Environmental Design (LEED) certification and includes a green roof, geothermal heating and porous pavement.
- Rehabilitation of the Lockart, Ford Road, Belfry Drive, Rennard and Linden Avenue wastewater pumping stations, which are in design.
- Rehabilitation of the 26th and Vare (in construction) and Broad St. and Boulevard (in design) stormwater pumping stations.
- The Central Schuylkill Pumping Station is undergoing a rehabilitation project including replacement of switchgear, pump controls, installation of all new pumps and motors. This project is expected to be completed during the 2019 calendar year.
- Under a series of large projects, the Water Department is lining 14.5 miles of streamside interceptors consistent with its LTCPU. The overall effort is more than 50% complete.

5.8 Green Stormwater Operations Unit

The Green Stormwater Operations Unit is responsible for the operations and maintenance of GSI. This work is being largely performed via contract services. The Water Department has increased staffing within Green Stormwater Operations, Flow Control, Inlet Cleaning and Sewer Maintenance to reduce its reliance on contracted services to operate and maintain GSI and will continue to do so in the future.

Green Stormwater Operations is performing administrative oversight of maintenance service contracts and developing internal capacity, policies and procedures to provide these services internally. In addition, this unit manages a group of field staff responsible for grounds maintenance activities associated with the surface features of GSI. Currently there are 21 staff in this unit, with plans to add one 4-person grounds maintenance crew annually as the amount of the Water Department's GSI continues to grow.

The amount of GSI assets in operation is expected to grow substantially over the next five years, however, the operating budget for this unit is planned to remain relatively flat. The Water Department plans to achieve operating efficiencies (e.g. moving from calendar-based maintenance to need-based maintenance) and reductions in costs of contracted services (which comprise ~ 70% of the budget) to allow more GSI to be maintained with little or no increase in budget. Because GSI operation and maintenance is a relatively new function for the Water Department, the costs of GSI operation and maintenance will need to be monitored and future budgets may need to be adjusted accordingly based on actual cost performance.

5.9 Toxics Reductions and Control

The Industrial Waste & Backflow Compliance (IWBC) unit's mission is to prevent contamination and reduce pollution. Its primary focus is conducting field-based inspections of primarily private facilities for compliance purposes. Currently, there are 26 budgeted positions in IWBC and two vacancies as of January 2019.

5.9.1 Industrial Waste

The Industrial Waste Unit is responsible for protecting the City's freshwater resources and WPCPs through enforcement of regulations governing wastewater discharges to the Water Department's wastewater collection and stormwater conveyance systems. This unit issues significant industrial user (SIU) permits to regulate industrial discharges to the wastewater collection system. As of June 30, 2018, there were 128 SIUs with the Water Department's service area. SIU facilities are inspected on a calendar year cycle. SIU permit applications require documentation of the raw materials and chemicals used at the facility. The SIU permits require pretreatment based on the type of activities occurring at the facility. This unit issues a periodic newsletter to permittees reminding them of proper disposal methods and documenting award winners for pretreatment compliance.

In addition to administering the industrial waste discharge permit program, this unit also issues permits associated with the discharge of groundwater to the sewer system. These permits are issued for construction projects and remediation projects. In 2017, 12 such permits were issued. The Water Department requires sampling of groundwater discharged via a groundwater discharge permit for PCBs on a monthly basis. In 2017, the results indicated PCBs levels that were non-detectable by USEPA Method 608.

Authorized haulers of septage may discharge at the Southwest WPCP after obtaining a hauled wastewater discharge permit. The Industrial Waste Unit oversee the hauled waste program and sampling of hauled waste.

The Industrial Waste Unit administers a surcharge program that allows the Water Department to recover the costs from treating wastewater that exceeds the characteristics of a normal residential customer. Surcharges are applied for wastewater streams that exceed 250 mg/L BOD or 350 mg/L TSS. Table 5-10 presents the surcharge revenues for the past 4 years. Surcharge revenue varies from year to year based on changes in industrial customer wastewater volumes and strengths. Surcharge revenue for FY 2019 is expected to meet the $5 million target.

Table 5-10. Surcharge Revenues

Fiscal Year	Surcharge Revenue
2015	$3,406,894
2016	$7,374,873
2017	$5,908,824
2018	$5,645,475

The Industrial Waste unit also receives and processes applications for sewer rental factors (SRF). The SRF is a billing credit for commercial and industrial customers that can demonstrate they have on-site water loss of at least 5% or 225,000 cubic feet per year (whichever is less). On-site water loss may be due to evaporative losses or use of water in producing products. The "lost" water results in wastewater discharges that are lower than the amount of water consumed and thus results in a credit to the customer.

The Industrial Waste administers PCB PMP to identify sources of and reduce the discharge of PCBs into the wastewater and stormwater collection systems. The unit maintains an online information sheet and survey regarding property use to determine if PCBs may be a concern on a given property. The Water Department has reported that significant reductions in WPCP effluent PCB loadings have been seen over the course of implementing the PMP.

Industrial Waste also samples dry weather flows from the Water Department's 434 stormwater outfalls to identify defective laterals or illicit connections. In FY 2018 94 outfalls were sampled for fecal coliform bacteria and 63 abatements completed. This unit also works to identify the source of the illicit connection if sewage or fecal coliform is detected.

5.9.2 Backflow Compliance

The Backflow Compliance group is responsible for enforcement of the Water Department's Regulation 403 (which requires adequate backflow protection for any connections to the water system) and Cross Connection Control Program to prevent the backflow of contaminants into the potable water system. This group is also responsible for public education regarding prevention of backflows and cross connections, inspection of backflow preventers, and tracking of backflow preventer third-party inspection reports.

This group provides useful information to the public via a website that includes a list of approved backflow prevention assemblies, a list of certified backflow prevention technicians, cross-connection prevention information for homeowners, frequently asked questions, and various other useful and related documents.

5.10 Conclusions

Based upon our site visits to each of the treatment facilities, discussions with Water Department personnel, and our experience with other water and wastewater utilities, we find the general condition of these major wastewater facilities to be in good condition, or adequate steps are being taken to return the facilities to good condition. The Water Department is able to provide reliable levels of service and meet regulatory requirements due to its proactive approach to operations and maintenance. The Water Department regularly reviews its capital improvement needs and prioritizes to maintain compliance. The maintenance of these facilities appears adequate to sustain equipment in reliable working order.

Arcadis reviewed the proposed six-year capital program for FY 2020 through FY 2025 and it appears in line with identified capital needs.

Arcadis also discussed the draft Wastewater System Master plan with Water Department staff. The Master Plan lists timelines and anticipated costs for replacement of wastewater assets. Significant expenditures are anticipated, however, many of the projects identified are projected to be beyond the timeline of the current capital program. This long-term plan provides further evidence of the Water

Department's commitment to being proactive in addressing system needs and maintaining reliable service levels.

6 CAPITAL IMPROVEMENT PROGRAM

As part of its regular budgeting process, the Water Department provides the City Council with a CIP budget on an annual basis. Currently, the Water Department has developed the CIP for the FY 2020 through FY 2025 period and expects that it will be approved by City Council in May of 2019. This CIP provides the basis for estimated capital needs of the Water Department in Section 2 of this Report. The following provides an overview of the FY 2020 through FY 2025 CIP.

6.1 FY 2020 – FY 2025 CIP

The Water Department provided Arcadis with information related to the FY 2020 through FY 2025 CIP. Arcadis also met with Engineering and Construction Division staff to discuss the general components of the CIP. Table 6-1 provides a summarized list of capital project categories and the associated annual budget. As can be seen, the CIP contemplates a significant increase in capital project spending during the projection period. Elements of the CIP are discussed below in the following sections.

Table 6-1. FY 2020 to FY 2025 CIP ($1,000s)

Line No.	Description	2020	2021	2022	2023	2024	2025
1	Water and WW Plants and Facilities	120,000	120,000	336,192	369,192	165,192	159,192
2	Sewer and CSO System Improvements	67,800	73,060	68,460	68,460	68,460	68,460
3	Water Conveyance System Improvements	78,060	82,060	198,360	91,060	95,060	95,060
4	Flood Relief	10,000	15,000	15,000	15,000	15,000	15,000
5	Stream Restoration	0	10,000	10,000	10,000	10,000	10,000
6	Green Stormwater Infrastructure	62,000	114,700	114,700	114,700	114,700	114,700
7	Vehicles and Equipment	12,000	12,000	12,000	12,000	12,000	12,000
8	Meters	35,000	5,000	5,000	5,000	5,000	5,000
9	Engineering and Admin.	16,047	16,528	17,024	17,535	18,061	18,603
10	**Total CIP**	**400,907**	**448,348**	**776,736**	**702,947**	**503,473**	**498,015**

Note: Reflects uninflated CIP with the exception of Engineering & Admin. which is inflated at an average annual rate of 3.0 percent.

6.1.1 Water and Wastewater Plants and Facilities

These capital projects focus on improvements and upgrades primarily to water and wastewater treatment plants and pumping facilities. As can be seen, there is a significant increase in FY 2022 and FY 2023 which reflects planned improvements to the water system as identified in the Water Master Plan. These improvements reflect upgrades to several pump stations, as well as treatment plant improvements.

Also included in this category are projects related to the wastewater treatment plants, including treatment plant improvements related to the Water Department's compliance with the Consent Order Agreement.

6.1.2 Sewer and CSO System Improvements

This category focuses primarily on sanitary, stormwater, and combined sewer system improvements. The Water Department maintains a significant system of collector mains throughout its service area. Many of these mains have been in service and are in need of reconstruction or replacement. Additionally, this category focuses on expanding the capacity of existing mains to enhance the capture of wastewater and stormwater, particularly during wet weather events. Approximately $10 million of the annual budget for this category is dedicated for combined sewer system improvements to reduce the instances of combined sewer overflows in accordance with the COA.

6.1.3 Water Conveyance System Improvements

Water conveyance capital projects are primarily geared toward the replacement of aging water mains. As noted above in Section 4, the Water Department plans to increase the annual water replacement rate from the current level of approximately 20 miles per year to 42 miles per year by FY 2025. This will require a significant increase in capital spending which is reflected for this category in Line 3 of Table 6-1. The potential benefits of increasing the water main replacement rate include reduction in the number of main breaks, resulting in improved system reliability, and the reduction of non-revenue water from system leaks and breaks.

6.1.4 Flood Relief and Stream Restoration

Table 6-1, Lines 4 and 5 reflect the capital budget for Flood Relief and Stream Restoration. Certain sections of the City are relatively more prone to significant flooding during wet weather events. These projects focus on improvements to mitigate or eliminate flooding in these areas. Stream Restoration includes improvements to urban streams that convey stormwater during wet weather events, including preventing erosion and improving their overall water quality of the City and region.

6.1.5 Green Stormwater Infrastructure

The implementation of Green Stormwater Infrastructure will continue to be a significant focus as the Water Department continues to implement the Green City, Clean Waters program in accordance with COA requirements. As noted above in Section 5, the COA includes requirements to steadily increase the number of greened acres installed. This portion of the CIP focuses on greened acres to be designed and constructed by the Water Department, including public rain gardens and other projects to effectively capture stormwater and prevent it from entering the combined sewer or storm sewer systems.

6.1.6 Vehicles and Equipment

This category includes $12 million per year of capital expenditures for the replacement of vehicles and heavy equipment required by the Water Department. This includes the replacement of trucks and heavy equipment such as backhoes, dump trucks, vactor trucks, and other similar equipment that is required for water and wastewater utilities to effectively perform their work.

6.1.7 Meters

This category reflects capital expenditures for the Water Department's meters and associated meter read equipment. FY 2020 includes a budget installment related to the Water Department's AMI project which is referenced earlier in this Report. Additional annual amounts are for ongoing replacement of meters and equipment.

6.1.8 Engineering and Administration

This category reflects capital budget amounts for Water Department staff involved in the design and construction of the CIP projects noted above in other categories. It includes salaries and wages for staff focused on project design, contractor oversight, construction monitoring, and other work required to complete capital projects.

6.2 Conclusions

The Water Department plans to undertake a significant number of capital improvements in the coming years. The capital projects are focused on all aspects of the System, including continued implementation of the COA and proactive improvements to the water system per the Water Master Plan. The CIP indicated in this Section reflects budgeted amounts that are expected to be approved by City Council in spring 2019. The CIP appears in line with identified capital needs and is reviewed and updated on an annual basis to reflect changes in conditions and priorities. Section 2 of this Report provides a capital cash flow estimate by Fiscal Year associated with this CIP, as well as a financial projection that outlines additional bond issuances and revenue increases necessary for completing these capital improvements.

7 REPORT CONCLUSIONS

7.1 Considerations and Assumptions

In preparation of this Report, Arcadis performed our due diligence with respect to visiting major facilities, interviewing key Water Department staff, and reviewing information and documents provided by the Water Department. Arcadis has made a number of principal considerations and assumptions (as provided throughout this Report); some of the most notable are as follows:

1. The Water Department will implement improvements in general accord with the capital improvements plan. The Water Department will make adjustments to its planned schedule for implementation of capital improvements in order to accommodate changes in project budgets that may occur as the projects move from the concept stage, to preliminary design, and ultimately to construction and implementation. It is anticipated that the Water Department will adjust its capital plan as needed to address any unforeseen needs in a reasonable manner.
2. The Water Department will issue debt of similar magnitude and timing to the projections in this Report.
3. The Water Department will implement the rate and charge increases and initiatives described in this Report to achieve increases in revenue and to manage expenses as presented in the financial projections.
4. If additional funds are required for the management, operation, and maintenance of the System, the Water Department will either seek the necessary rate and charge increases to increase revenue, or embark upon cost reduction measures, such as reducing nonessential programs. Unforeseen expenses that are not currently anticipated may result from a change of law or regulation, uninsured catastrophic event, previously unidentified capital improvements, unanticipated increases in utilities, chemicals, sludge disposal costs, or other expenses, deferred capital improvements that must be accelerated or currently undefined or unanticipated additional regulatory enforcement actions.

This Report was prepared solely for the benefit of and use by the City for the discrete purposes set forth herein. The City did not request Arcadis to provide, and the Report does not provide any advice to or on behalf of the City with respect to municipal financial products or the issuance of municipal securities, including advice with respect to the structure, timing, terms, and other similar matters concerning such financial products or issues. Therefore, in providing the Report to the City, Arcadis is not a "municipal advisor" as defined in Section 15B of the Securities and Exchange Act of 1934. Accordingly, Arcadis is not registered or regulated as a municipal advisor by the U.S. Securities and Exchange Commission or the Municipal Securities Rulemaking Board.

In the performance of its services on behalf of the City, Arcadis did not intend to create, and hereby expressly denies the creation of, any right on the part of any third party to rely upon this Report. All such reliance shall be at the third party's sole discretion and upon its own, independent review of any and all facts contained herein. Distribution of this Report to a third party is solely for informational purposes, and may not be relied upon by such third party for any other purpose.

Arcadis' effort in the construction and preparation of this Report is consistent with (i) the degree of care and skill ordinarily exercised by members of the same profession currently practicing under same or similar circumstances and (ii) the time and budget available for its work in its endeavor to ensure that the data contained in the Report is accurate as of the date of its preparation. This analysis was based on estimates, assumptions and other information developed by Arcadis from its independent research effort, general knowledge of the industry, and information provided by, and consultations with, the City and its agents, representatives, and consultants. While we believe such sources are reliable, and the information obtained to be accurate and appropriate for the analysis undertaken and the conclusions reached herein, as is often the case, there may be differences between actual and projected results. Accordingly, some of the estimates used in this Report will not be realized, and unanticipated events and circumstances may occur. To the extent the information provided to Arcadis by the City and others is not accurate, or not inclusive of all details, the conclusions and recommendations contained in this Report may vary, and are subject to change. Moreover, there are likely to be differences between the data and results projected in this Report and actual results achieved, and those differences may be material. Arcadis assumes no responsibility or liability for inaccuracies in Reporting and data provided by the City and its agents, representatives and consultants, or in any third-party data source used in preparing or presenting this Report.

Additionally, Arcadis relied on assumptions, forecasts, data and statistics provided by the City and others. Forward-looking statements included in this Report, which may be identified by the use of words like "anticipate", "believe", "estimate", "expect", "intend", "may", "plan", "project", "will", "should", "seek", and similar expressions , refer to Arcadis' views and assumptions with respect to future events as of the date of this document, and are subject to future economic conditions, results, and other risks and uncertainties. Actual and future results and trends could differ materially from those set forth in such statements due to various factors, including, without limitation, those mentioned in this Report. These factors are beyond Arcadis' ability to control or predict. Accordingly, Arcadis makes no warranty or representation that any of the projected values or results contained in this Report will actually be achieved.

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This Report is qualified in its entirety by, and should be considered in light of, these limitations, conditions and considerations.

7.2 Conclusions

Set forth below is a summary of the conclusions which Arcadis has reached regarding its review of the Water Department. For a complete understanding of the assumptions upon which these opinions are based, the analyses undertaken, and the risks with regard to the Water Department's financial performance, the Report should be read in its entirety.

1. The Water Department plans to increase capital spending significantly through FY 2025; and regular bond issuances are anticipated to fund a portion of the capital expenditures. This will require consistent revenue increases to the Water Department's service charges to meet revenue requirements, target debt coverage levels and reserve fund balances.

2. The System will yield pledged Project Revenues, including the projected increases in service revenue indicated in the Report, over the amortization periods of the water and wastewater revenue bonds anticipated to be issued in FY 2020 and FY 2021, sufficient to meet the projected payments or deposit requirements of:
   - all projected operation, maintenance, repair and replacement expenses of the System;
   - all reserve funds required to be established out of such Project Revenues; and
   - the principal or redemption price of and interest on anticipated Bonds, as the same become due and payable, for which the Project Revenues are pledged.

3. The Net Revenues are currently sufficient to comply with the Rate Covenant and are projected to be sufficient, including the projected increases in service revenue indicated in the Report, to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the anticipated Fiscal Year 2020 and Fiscal Year 2021 revenue bonds are issued. This includes the requirement to yield Net Revenues that are at least:
   - 1.20 times the Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); and
   - 1.00 times (A) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (B) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (C) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (D) debt service requirements on Interim Debt payable during such Fiscal Year; and (E) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year).
   - 0.90 times Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); provided that, for purposes of this clause Net Revenues shall be calculated to exclude any amounts transferred from the Rate Stabilization Fund to the Revenue Fund.

4. Based upon Arcadis' site visits consisting of visual observations to each of the treatment facilities in January and February 2019, discussions with Water Department personnel, and Arcadis' experience with other water and wastewater utilities, Arcadis finds the System to be in good operating condition, or adequate steps are being taken to return it to good operating condition. The Water Department has demonstrated that it is able to provide reliable levels of service and meet regulatory requirements due to its proactive approach to operations and maintenance. The Water Department regularly reviews its capital improvement needs and prioritizes capital expenditures to address the most critical

issues to maintain compliance and preserve water quality. Maintenance of facilities appears adequate to sustain equipment in reliable working order. The proposed six-year capital program for FY 2020 through FY 2025 appears in line with identified capital needs.

5. The Water Department has an organizational structure that facilitates accomplishing its mission of reliably delivering high quality water; treating wastewater to high standards; and effectively managing stormwater for its customers. Water Department divisions are appropriately focused on the operational, planning, engineering, and administrative functions that are common to effective water and wastewater utilities. The overall organizational structure is generally consistent with other water and wastewater utilities providing similar services. Divisions are currently led by experienced managers capable of leading staff to provide effective system operations, maintenance, and administrative management to maintain adequate and reliable service levels. The Commissioner and the General Manager of Public Affairs are scheduled to retire in 2019. The Water Department's experienced senior managers and staff are capable of providing the necessary leadership, operational, and administrative continuity until a new Commissioner is appointed.

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APPENDIX III-A

SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS

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APPENDIX III-A

SUMMARIES OF CERTAIN AUTHORIZATIONS FOR THE BONDS

The following are summaries of certain provisions of The First Class City Revenue Bond Act (the "Act"), the Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended (the "General Ordinance") and as supplemented by the Eighteenth Supplemental Ordinance to the General Ordinance approved by the Mayor on December 8, 2015 (the "Eighteenth Supplemental Ordinance") and the Twentieth Supplemental Ordinance to the General Ordinance approved by the Mayor on April 18, 2018, (the "Twentieth Supplemental Ordinance" and, collectively with the Eighteenth Supplemental Ordinance, the "Authorizing Supplemental Ordinances"). The summaries are not, and should not be regarded as, complete statements of the provisions of these documents and legislation. Reference is made to the Act, the General Ordinance and the Authorizing Supplemental Ordinances, copies of which are available from the Office of the Director of Finance, 1300 Municipal Services Building, 1401 John F. Kennedy Boulevard, Philadelphia, Pennsylvania 19102, for the complete terms and provisions thereof.

THE FIRST CLASS CITY REVENUE BOND ACT (Act 234 of the General Assembly of the Commonwealth, approved October 18, 1972, *P.L. 955; 53 P.S. §§ 15901-15924)*

The City of Philadelphia Water and Wastewater Revenue Bonds and Refunding Bonds, Series 2020A and Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B (collectively, the "Series 2020 Bonds") are being issued under the terms of the Act, the General Ordinance and pursuant to the Authorizing Supplemental Ordinances. The following summarizes the terms of the Act. All capitalized terms used in the following summary of the Act are defined as in the Act and may be differently referenced in other portions of this Official Statement.

General Authorization; Definition of Project; Bonds to be Special Obligations

The Act is intended to provide a comprehensive authorization to the City of Philadelphia (the "City") and any other Pennsylvania cities of the first class to issue revenue bonds ("Bonds") to finance various types of projects.

The Act defines "Project" to include, among other things, any buildings, structures, facilities or improvements of a public nature, the related land, rights or leasehold estates in land and the related furnishings, machinery, apparatus or equipment of a capital nature, which the City is authorized to own, construct, acquire, improve, lease, operate, maintain or support; any item of construction, acquisition or extraordinary maintenance or repair thereof, the City's share of the cost of any of the foregoing or any combination thereof undertaken jointly with others; and any combination of any of or all of the foregoing or any undivided portion of the cost of any of the foregoing as may be designated as a "Project" by the City for financing purposes and in respect of which the City may reasonably be expected to receive Project Revenues.

Bonds issued under the Act are required to be payable solely from Project Revenues and to be secured solely by such revenues and by any reserve funds which may be created or funded in connection with the Bonds. The Bonds are not permitted to pledge the credit or taxing power of the City to create any debt or charge against the tax or general revenues of the City, or create any lien against any of the City property other than the Project Revenues pledged therefore and reserve Funds established in respect of the Bonds. The Bonds do not constitute a debt of the City, and are excluded from the calculation of the City's debt-incurring capacity under the Pennsylvania Constitution.

Estimates of Future Revenues

To establish that Project Revenues will be sufficient to amortize all Bonds outstanding, the Act requires a finding to be made in the ordinance authorizing the issuance of the Bonds that the pledged Project Revenues will be sufficient to pay any prior parity charges thereon and the principal of and interest on the Bonds. This finding is to be based on a report of the chief fiscal officer of the City filed with the City Council and supported by appropriate schedules and summaries. The report of the chief fiscal officer of the City may be based on a report of consulting engineers employed by the City to evaluate the project.

For the purpose of estimating future Project Revenues, the Act provides that only the following shall be included: (i) those rents, rates, tolls or charges to the general public which, under existing authorizations, will be reasonably collectible in such year under the schedule or rate of rents, rates or charges which are or will be in effect during such year in accordance with such ordinance, resolutions or rate schedule or which may be imposed by administrative action without further legislation; (ii) those bulk payments which may be imposed under subsisting legislation or which are provided under subsisting agreements or which are the subject of an expression of intent by the prospective obligor deemed reliable by the chief fiscal officer of the City; and (iii) those governmental subsidies or payments which, under subsisting legislation, are subject to reasonably precise calculation and, unless stated in such legislation or authorization to be of an annually or more frequently recurring nature, are payable in such year.

Detail of Bonds and City Covenants

The Act provides that the ordinance authorizing the issuance of the Bonds shall fix the aggregate amounts of the Bonds to be issued from time to time and determine, or designate officers of the City to determine, the form and details of the Bonds. The City may include in its Bond ordinance various covenants with Bondholders, including covenants governing the imposition, collection and disbursement of Project Revenues, Project operation and maintenance, the establishment, segregation, maintenance, custody, investment and disbursement of sinking funds and reserves, the issuance of additional priority or parity bonds, the redemption of the Bonds and such other provisions as the City deems necessary or desirable in the interest or for the protection of the City or of such Bondholders. Under the Act the covenants, terms and provisions of the Bond ordinance made for the benefit of Bondholders constitute contractual obligations of the City, but such covenants (within limitations, if any, fixed by the Bond ordinance) may be modified by agreement with a majority in interest of the Bondholders or such larger portion thereof as may be provided in the Bond ordinance.

Sinking Fund

The Act requires that the Bond ordinance shall provide for the establishment of a sinking fund for the payment of the principal of and interest (including Qualified Swap payments) on the Bonds. Payment into such sinking fund shall be made in annual or more frequent installments and shall be sufficient to pay or accumulate for payment all principal of and interest on the Bonds for which the sinking fund is established as and when the same shall become due and payable. The sinking fund shall be managed by the chief fiscal officer of the City and moneys therein to the extent not currently required, shall be invested, subject to limitations established by the Bond ordinance and the Act. Interest and profits from investment of moneys in the sinking fund shall be added to such fund and may be applied in reduction of or to complete required deposits into the sinking fund. Excess moneys in the sinking fund shall be repaid to the City for its general purposes or may be applied as may be provided in the Bond ordinance. All moneys deposited in the sinking fund are subjected to a perfected security interest for the benefit of the holders of the Bonds, for which the fund is established, until property disbursed. This perfected security interest also applies, under the terms of the Act, to moneys in the sinking fund reserve created as part of the sinking fund by the General Ordinance.

Refunding

Any outstanding Bonds issued under the Act or other bonds issued for purposes for which Bonds are issuable under the Act, whether issued before or after the effective date of the Act, may from time to time be refunded by Bonds issued under the Act and are subject to the same protections and provisions required for the issuance of an original issue of Bonds. The last stated maturity date of the refunding Bonds may not be later than ten years after the last stated maturity date of the Bonds to be refunded. If outstanding Bonds are refunded in advance of their maturity or redemption date, the principal thereof and interest thereon to payment or redemption date, and redemption premium payable, if any, will no longer be deemed to be outstanding obligations when the City shall have deposited with a bank, bank and trust company or trust company, funds irrevocably pledged to the purpose, which are represented by demand deposits, interest-bearing time accounts, savings deposits, certificates of deposit (insured or secured as public funds) or specified obligations of the United States or of the Commonwealth of Pennsylvania sufficient to effect such redemption or payment or, if interest on the deposited funds to the time of disbursement is also pledged, sufficient, together with such interest, for such purpose and, in the case of redemption, shall have duly called the Bonds for redemption or given irrevocable instructions to give notice of such call.

Validity of Proceedings; Suits and Limitations Thereon

Prior to the delivery of any Bonds, the City is required to file with the Court of Common Pleas of Philadelphia County (the "Court") a transcript of the proceedings authorizing the issuance of the Bonds. If no action is brought on or before the twentieth day following the date of recording of the transcript, or when the proceedings have been approved finally by the Court, then notwithstanding any defect or error in such proceedings, the validity of the proceedings, the City's right to issue the Bonds, the lawful nature of the purpose for which the Bonds are issued, and the validity and enforceability of the Bonds in accordance with their terms may not thereafter be inquired into judicially, in equity, at law, or by civil or criminal proceedings, or otherwise, either directly or collaterally except where a constitutional question is involved.

Negotiable Instruments

The Act provides that Bonds issued thereunder shall have the qualities and incidents of securities under Article 8 of the Uniform Commercial Code of the Commonwealth and shall be negotiable instruments.

Exemption from State Taxation

The Commonwealth pledges with the holders from time to time of Bonds issued under the Act that such Bonds, and interest thereon, shall at all times be free from taxation within and by the Commonwealth, but this exemption does not extend to underwriting profits or to gift, succession or inheritance taxes or any other taxes not levied directly on the Bonds and the receipt of interest thereon.

Defaults and Remedies

If the City should fail to pay the principal of or interest on any Bond when the same shall be due and payable, the remedy provisions of the Act permit the holder of such Bond, subject to the limitations described below, to recover the amount due in an action in Philadelphia Common Pleas Court; but a judgment rendered in favor of the Bondholder in such an action is collectible only from Pledged Amounts. The holders of 25% or more in aggregate principal amount of the Bonds of such series then outstanding which are in default, whether because of failure of timely payment which is not cured in 30 days, or failure of the City to comply with any other provisions of the Bonds or any Bond ordinance, may appoint a trustee to represent them. On being appointed, the trustee shall be the exclusive representative for the affected

Bondholders and the individual rights of action described above shall no longer be available. The trustee may, and upon written request of the holders of 25% or more in aggregate principal amount of Bonds in default, and on being furnished with indemnity satisfactory to it, shall, take one or more of the following actions, which, if taken, shall preclude similar action, whether previously or subsequently initiated, by individual holders of Bonds; enforce, by proceedings at law or in equity, all rights of the holders of the Bond; bring suit on the Bonds; bring in suit in equity to require the City to make an accounting for all pledged Project Revenues received and to enjoin unlawful action or action in violation of the holders' rights; and, after 30 days' written notice to the City, and subject to any limitations in the Bond ordinance, declare the unpaid principal of the Bonds to be immediately due and payable, together with interest thereon at the rates stated in the Bonds until final payment, and upon the curing of all defaults, to annul such declaration. In any suit, action or proceeding by or on behalf of holders of defaulted Bonds, trustee fees and expenses, including operating costs of a project and reasonable counsel fees, shall constitute taxable costs, and all such costs and expenses allowed by the Court shall be deemed additional principal due on the Bonds and shall be paid in full from any recovery prior to any distribution to the holders of the Bonds. The General Ordinance limits any such recovery to Pledged Amounts. The trustee shall make distribution of any sums so collected in accordance with the Act.

Refunding with General Obligation Bonds

Upon certification by the City's chief fiscal officer that Project Revenues pledged for the payment of Bonds have become insufficient to meet the requirements of the ordinance or ordinances under which the Bonds were issued, the City Council is empowered, but not required, subject to applicable Pennsylvania constitutional debt limitations, to authorize the issuance and sale of general obligation refunding bonds of the City, without limitation as to rate of interest and in such principal amount (subject to the aforesaid limitations on indebtedness) as may be required, together with other available funds, to pay and redeem such Bonds including principal, interest to the date fixed for redemption or payment and premium, whether or not the principal of or interest on the refunding bonds shall exceed the principal of or interest on the bonds to be refunded.

THE RESTATED GENERAL WATER AND WASTEWATER REVENUE BOND ORDINANCE OF 1989

(Ordinance of the City Council approved June 24, 1993 - Bill No. 544)

The following is a summary of certain terms defined in the Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended (the "General Ordinance"), used in this Official Statement. Reference should be made to the General Ordinance for a full and complete statement of its terms and any capitalized terms used herein but not otherwise defined. The Series 2020 Bonds are being issued under the terms of the General Ordinance, as supplemented by the Authorizing Supplemental Ordinances. The Authorizing Supplemental Ordinances (see below) set forth the specific terms of the Series 2020 Bonds. All capitalized terms used in the following summary of the General Ordinance are defined as in the General Ordinance and may be differently referenced in other portions of this Official Statement.

Certain Definitions*

Accreted Value means, with respect to Capital Appreciation Bonds, the amount to which, as of any specified time, the Original Value of any such Bond has been increased by accretion, all as may be provided in an applicable Supplemental Ordinance.

Act means The First Class City Revenue Bond Act, approved October 18, 1972 (Act No. 234, 53 P.S. §15901 to 15924), as from time to time amended.

Bond or *Bonds* means, upon and after issuance of the first series of bonds under the General Ordinance, if and to the extent Outstanding at any time, (i) the Existing Bonds and (ii) all series of bonds authorized and issued under one or more Supplemental Ordinances amending and supplementing the General Ordinance.

Bond Committee means the Mayor, City Controller and City Solicitor or a majority thereof.

Bond Counsel means a firm of nationally recognized bond counsel selected by the City.

Bondholder or *Holder* means any registered owner of Bonds or holder of Bonds issued in coupon form at the time Outstanding.

Capital Account means the Capital Account within the Construction Fund.

Capital Account Deposit Amount means an amount equal to one percent (1%) of the depreciated value of property, plant and equipment of the System or such greater amount as shall be annually certified to the City in writing by a Consulting Engineer as sufficient to make renewals, replacements and improvements in order to maintain adequate water and wastewater service to the areas served by the System.

Capital Appreciation Bonds means any Bonds issued under the General Ordinance which do not pay interest either until maturity or until a specified date prior to maturity, but whose Original Value increases periodically by accretion to a final Maturity Value.

Charges Account means the Charges Account within the Sinking Fund established to provide for the payment of fees under any Credit Facility to the extent payment of such fees are not otherwise provided.

City Controller means the head of the City's auditing department as provided by the Philadelphia Home Rule Charter.

City Solicitor means the head of the City's law department as provided by the Philadelphia Home Rule Charter.

Code means the Internal Revenue Code of 1986, as amended.

Construction Fund means the Construction Fund established pursuant to the General Ordinance.

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* See APPENDIX III-B – "Twenty-First Supplemental Ordinance" for definitional modifications and additions contained in the Springing Amendments set forth in the Twenty-First Supplemental Ordinance (Bill No. 171110-A) approved on April 24, 2018 (the "Twenty-First Supplemental Ordinance"). The Springing Amendments will not become effective until at least 67% of Holders of outstanding Bonds have consented to such amendments.

Consulting Engineer means a nationally recognized Independent registered consulting engineer or a nationally recognized Independent firm of registered consulting engineers, in either case having experience in the design and analysis of the operation of water and wastewater systems of the magnitude and scope of the System.

Credit Facility[*] means any letter of credit, standby bond purchase agreement, line of credit, surety bond, insurance policy or other insurance commitment or similar agreement (other than a Qualified Swap or an Exchange Agreement) that is provided by a commercial bank, insurance company or other institution, with a current long term rating (or whose obligations thereunder are guaranteed by a financial institution with a long term rating) from Moody's and S&P not lower than the credit rating of any Series of Bonds which has no Credit Facility, to provide support for a Series of Bonds or for any issue of Subordinated Bonds, and shall include any Substitute Credit Facility.

Debt Reserve Account means the Debt Reserve Account within the Sinking Fund established pursuant to the General Ordinance.

Debt Reserve Facility means a surety bond, insurance policy or irrevocable letter of credit deposited to the Debt Reserve Account pursuant to the provisions of the General Ordinance.

Debt Reserve Requirement[†] means (i) with respect to all Bonds outstanding (regardless whether interest thereon may be excluded from the gross income of the holder thereof for federal income tax purposes) (a) whose Debt Service Requirements are payable from the Sinking Fund (i.e., excluding Subordinated Bonds) and (b) that are of a Series for which the City has not created a Series Debt Reserve Subaccount, an amount equal to the greatest amount of Debt Service Requirements on such Bonds payable in any one Fiscal Year (except that such Debt Service Requirements will be computed as if any Qualified Swap did not exist and the Debt Service Requirements attributable to any Variable Rate Bonds may be based upon the fixed rate of interest as set forth in the Supplemental Ordinance or Determination for such Bonds) determined as of any particular date, and (ii) with respect to the amount to be deposited in the Debt Reserve Account, pursuant to the General Ordinance, in connection with the issuance of such a Series of Bonds, the lesser of (x) the amount necessary to comply clause (i) and (y) the maximum amount permitted to be financed with proceeds of Bonds permitted by Section 148(d)(1) of the Code (or any successor provision).

Debt Service Account means the Debt Service Account within the Sinking Fund established pursuant to the General Ordinance.

Debt Service Requirements[‡], with reference to a specified period, means:

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[*] See APPENDIX III-B – "Twenty-First Supplemental Ordinance" for definitional modifications and additions contained in the Springing Amendments, including modifications to the definition of Credit Facility.

[†] This definition was amended pursuant to the Twenty-First Supplemental Ordinance upon its enactment.

The Springing Amendments include provisions that will allow the City to establish a Series Debt Reserve Subaccount and a related Series Debt Reserve Requirement. See APPENDIX III-B – "Twenty-First Supplemental Ordinance" attached to this Official Statement.

[‡] See APPENDIX III-B – "Twenty-First Supplemental Ordinance" for definitional modifications and additions contained in the Springing Amendments, including modifications to the definition of Debt Service Requirements.

(a) amounts required to be paid into any mandatory sinking fund established for the benefit of Bonds during the period;

(b) amounts needed to pay the principal or redemption price of Bonds maturing during the period and not to be redeemed at or prior to maturity through any sinking fund established for the benefit of Bonds;

(c) interest payable on Bonds during the period, with adjustment for capitalized interest or redemption through any sinking fund established for the benefit of Bonds; and

(d) all net amounts, if any, due and payable by the City under a Qualified Swap during such period.

For purposes of estimating Debt Service Requirements for any future period, (i) any Option Bond outstanding during such period shall be assumed to mature on the stated maturity date thereof, except that the principal amount of any Option Bond tendered for payment and cancellation before its stated maturity date shall be deemed to accrue on the date required for payment pursuant to such tender; and (ii) Debt Service Requirements on Bonds for which the City has entered into a Qualified Swap shall be calculated assuming that the interest rate on such Bonds shall equal the stated fixed or variable rate on the Qualified Swap or, if applicable and if greater than such stated rate, the applicable rate for any Bonds issued in connection with the Qualified Swap adjusted, in the case of a variable rate obligation, as provided in the General Ordinance.

The calculation of Debt Service Requirements with respect to Variable Rate Bonds shall be subject to adjustment as permitted by the General Ordinance.

Debt Service Withdrawal means the aggregate amount withdrawn from the Capital Account during a Fiscal Year and applied toward the payment of principal or redemption price of or interest on Bonds or toward the elimination of a deficiency in any reserve fund established for the benefit of Bonds.

Determination means a determination by the Bond Committee regarding certain matters relating to the issuance of a Series of Bonds, made pursuant to the General Ordinance or the Supplemental Ordinance providing for the issuance of such Series of Bonds.

Director of Finance means the chief financial officer of the City as established by the Philadelphia Home Rule Charter.

Effective Date means when (but only when) all Prior Bonds issued under the Prior Ordinance have been paid or defeased as set forth in Section 10 of the Act.

Exchange Agreement means, to the extent from time to time permitted by applicable law, any interest exchange agreement, interest rate swap agreement, currency swap agreement or other contract or agreement, other than a Qualified Swap, authorized, recognized and approved by a Supplemental Ordinance or Determination as an Exchange Agreement and providing for (i) certain payments by the City from the Residual Fund and (ii) payments by an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability, or whose obligations under an Exchange Agreement are guaranteed by an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability are rated not less than “A3” by Moody’s, “A-” by S&P or “A-” by Fitch, or the equivalent thereof by any successor thereto as of the date the Exchange Agreement is entered into; which payments by the City and counterparty are calculated by reference to fixed or variable rates and constituting a financial accommodation between the City and such counterparty.

Existing Bonds means the bonds originally issued under the Prior Ordinance other than Prior Bonds, which Existing Bonds shall be specified in a certificate of the Director of Finance on the Effective Date and thereafter shall be secured by the General Ordinance.

Financial Consultant means a firm of investment bankers, a financial consulting firm, a firm of certified public accountants or any other firm which is qualified to calculate amounts required to be rebated to the United States pursuant to Section 148(f) of the Code.

Fiscal Agent means a bank or other entity designated as such pursuant to the General Ordinance or its successor.

Fiscal Year means the fiscal year of the City.

Fitch means Fitch Ratings and any successor thereto.

General Obligation Bonds means the general obligation bonds of the City issued and outstanding from time to time to finance improvements to the System and adjudged, pursuant to the Constitution and laws of the Commonwealth of Pennsylvania, to be self-sustaining on the basis of expected Project Revenues.

General Ordinance means the Restated General Water and Wastewater Revenue Bond Ordinance of 1989.

Government Obligations means direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America, including but not limited to interest obligations of the Resolution Funding Corporation or any successor thereto.

Independent means a person who is not a salaried employee or elected or appointed official of the City; provided, however, that the fact that such person is retained regularly by or transacts business with the City shall not make such person an employee within the meaning of this definition.

Initial Deposit means the initial, one time, deposit to be made by the City from any source into the Rate Stabilization Fund upon the establishment of such Rate Stabilization Fund.

Interdepartmental Charges means the proportionate charges for services performed for the Water Department by all officers, departments, boards or commissions of the City which are required by the Philadelphia Home Rule Charter to be included in the computation of operating expenses of the Water Department.

Interim Debt means any bond anticipation notes or other temporary borrowing which the City anticipates permanently financing with Bonds or other long term indebtedness under the General Ordinance or otherwise.

Kroll means Kroll Bond Rating Agency, Inc. and any successor thereto.

Maturity Value with respect to Capital Appreciation Bonds means the amount due on the maturity date.

Moody's means Moody's Investors Service and any successor thereto.

Net Revenues for any period means the Project Revenues collected during such period and deposited into the Revenue Fund plus (x) the amounts, if any, transferred from the Rate Stabilization Fund into the Revenue Fund during, or as of the end of, such period and (y) interest earnings during such period on moneys in any of the funds or accounts established under the General Ordinance to the extent such interest earnings are credited to the Revenue Fund pursuant to the General Ordinance minus the sum of (a) Operating Expenses incurred during such period and (b) the amounts, if any, transferred from the Revenue Fund to the Rate Stabilization Fund during, or as of the end of, such period; provided, however that in determining such Net Revenues the Initial Deposit shall not reduce such Net Revenues.

Operating Expense Withdrawal means the aggregate amount withdrawn from the Capital Account during a Fiscal Year and applied toward the payment of Operating Expenses.

Operating Expenses for any period means all costs and expenses of the Water Department necessary and appropriate to operate and maintain the System in good operating condition, and shall include, without limitation, salaries and wages, purchases of services by contract, costs of materials, supplies and expendable equipment, maintenance costs, costs of any property or the replacement thereof or for any work or project, related to the System, which is not properly chargeable to property, plant and equipment, pension and welfare plan and worker's compensation requirements, provisions for claims, refunds and uncollectible receivables and for Interdepartmental Charges, all in accordance with generally accepted accounting principles consistently applied, but Operating Expenses shall exclude depreciation, amortization, interest and sinking fund charges.

Option Bond means any Bond which by its terms may be tendered by and at the option of the Holder thereof for payment by the City prior to its stated maturity date or the maturity date of which may be extended by and at the option of the Holder thereof.

Ordinance means the General Ordinance, as amended from time to time in accordance with the provisions of the General Ordinance.

Original Value with respect to Capital Appreciation Bonds means the principal amount paid by the initial purchasers on the date of original issuance.

Outstanding, when used with reference to Bonds, means, as of any date, all Bonds theretofore or thereupon being authenticated and delivered under the General Ordinance except (i) any Bonds cancelled by the Fiscal Agent at or prior to such date; (ii) Bonds (or portion of Bonds) for the payment or redemption of which moneys, equal to the principal amount, Accreted Value or redemption price thereof, as the case may be, with interest (except to the extent of any Capital Appreciation Bonds) to the date of maturity or redemption date, shall be held in trust under the General Ordinance and set aside for such payment or redemption (whether at or prior to the maturity or redemption date), provided that if such Bonds (or portions of Bonds) are to be redeemed, notice of such redemption shall have been given as provided in the General Ordinance or provision satisfactory to the Fiscal Agent shall have been made for the giving of such notice; (iii) Bonds in lieu of or in substitution for which other Bonds shall have been authenticated and delivered pursuant to the General Ordinance; and (iv) Bonds deemed to have been paid as provided in the General Ordinance.

Philadelphia Home Rule Charter means the Philadelphia Home Rule Charter, as amended or superseded by any new home rule charter, adopted pursuant to authorization of the First Class City Home Rule Act approved April 21, 1949, P.L. 665 §l, *et seq*. (53 P.S. §13101, *et seq*.).

Prior Bonds means the bonds issued under the Prior Ordinance designated as Water and Sewer Revenue Bonds (i) the First Series through Ninth Series, and the Eleventh Series and Twelfth Series, and

(ii) to the extent the following bonds are defeased on the Effective Date, the Tenth Series and the Thirteenth Series through Sixteenth Series.

Prior Ordinance means the General Water and Sewer Revenue Bond Ordinance of 1974 approved May 16, 1974, as amended and supplemented from time to time.

Project Revenues means all rents, rates, fees and charges imposed or charged for the connection to, or use or product of or services generated by the System to the ultimate users or customers thereof, all payments under bulk contracts with municipalities, governmental instrumentalities or other bulk users, all subsidies or payments payable by Federal, State or local governments or governmental agencies on account of the cost of operation of, or the payment of the principal of or interest on moneys borrowed to finance costs chargeable to the System, all grants, payments and contributions made in aid or on account of the System exclusive of grants and similar payments and contributions solely in aid of construction and all accounts, contract rights and general intangibles representing the foregoing.

Qualified Escrow Securities means funds which are represented by (a) demand deposits, interest-bearing time accounts, savings deposits or certificates of deposit, but only to the extent such deposits or accounts are fully insured by the Federal Deposit Insurance Corporation or any successor United States governmental agency, or to the extent not insured, fully secured and collateralized by Government Obligations having a market value (exclusive of accrued interest) at all times at least equal to the principal amount of such deposits or accounts, (b) if at the time permitted under the Act, obligations of any state or political subdivision thereof or any agency or instrumentality of such state or political subdivision for which cash, Government Obligations or a combination thereof have been irrevocably pledged to or deposited in a segregated escrow account for the payment when due of principal or redemption price of and interest on such obligations, and any such cash or Government Obligations pledged and deposited are payable as to principal or interest in such amounts and on such dates as may be necessary without reinvestment to provide for the payment when due of the principal or redemption price of and interest on such obligations, and such obligations are rated by any Rating Agency in the highest rating category assigned by each such rating service to obligations of the same type, or (c) noncallable Government Obligations. In each case such funds (i) are subject to withdrawal, maturing or payable at the option of the holder, at or prior to the dates needed for disbursement, provided such deposits or accounts, whether deposited by the City or by such depository, are insured or secured as public deposits with securities having at all times a market value exclusive of accrued interest equal to the principal amount thereof, (ii) are irrevocably pledged for the payment of such obligations and (iii) are sufficient, together with the interest to disbursement date payable with respect thereto, if also pledged, to meet such obligations in full.

Qualified Rebate Fund Securities means either:

(a) Government Obligations; or

(b) rights to receive the principal of or the interest on Government Obligations through (i) direct ownership, as evidenced by physical possession of such Government Obligations or unmatured interest coupons or by registration as to ownership on the books of the issuer or its duly authorized paying agent or transfer agent, or (ii) purchase of certificates or other instruments evidencing an undivided ownership interest in payments of the principal of or interest on Government Obligations.

Qualified Swap or *Swap Agreement* means, with respect to a Series of Bonds, any financial arrangement that (i) is entered into by the City with an entity that is a Qualified Swap Provider at the time the arrangement is entered into; (ii) provides that (a) the City shall pay to such entity an amount based on the interest accruing at a fixed rate on an amount equal to the principal amount of the Outstanding Bonds of such Series, and that such entity shall pay to the City an amount based on the interest accruing on a principal amount initially equal to the same principal amount as such Bonds, at either a variable rate of interest or a fixed rate of interest computed according to a formula set forth in such arrangement (which need not be the same as the actual rate of interest borne by the Bonds) or that one shall pay to the other any net amount due under such arrangement or (b) the City shall pay to such entity an amount based on the interest accruing on the principal amount of the Outstanding Bonds of such Series at a variable rate of interest as set forth in the arrangement and that such entity shall pay to the City an amount based on interest accruing on a principal amount equal to the Outstanding Bonds of such Series at an agreed fixed rate (which shall not be the same as the rate on the Bonds) or that one shall pay to the other any net amount due under such arrangement; and (iii) which has been designated in writing to the Fiscal Agent by the City as a Qualified Swap with respect to the Bonds.

Qualified Swap Provider means, with respect to a Series of Bonds, an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability, or whose payment obligations under a Qualified Swap are guaranteed by an entity whose senior long term debt obligations, other senior unsecured long term obligations or claims paying ability, are rated (at the time the subject Qualified Swap is entered into) at least as high as Aa by Moody's, and AA by S&P, or the equivalent thereof by any successor thereto.

Rate Covenant means the rate covenant contained in the General Ordinance.

Rate Stabilization Fund means the Rate Stabilization Fund established pursuant to the General Ordinance.

Rating Agency[*] means Moody's, S&P or Fitch, to the extent that any of such rating services have issued a credit rating on the Bonds or, upon discontinuance of any of such rating services, such other nationally recognized rating service or services if any such rating service has issued a credit rating on the Bonds.

Rebate Bond Year, for purposes of the General Ordinance and in order to facilitate compliance with the arbitrage rebate requirements of the Code, shall mean the period or periods specified in a Supplemental Ordinance or Determination for a Series of Bonds.

Rebate Fund means the Rebate Fund established pursuant to the General Ordinance.

Remarketing Agent means a Remarketing Agent appointed in the manner provided in the applicable Supplemental Ordinance or Determination authorizing the issuance of Variable Rate Bonds.

Remarketing Agreement means an agreement providing for the remarketing of tendered Variable Rate Bonds by a Remarketing Agent, as more fully set forth and defined in the Supplemental Ordinance authorizing any Series of Variable Rate Bonds.

Residual Fund means the Residual Fund established pursuant to the General Ordinance.

Revenue Fund means the Revenue Fund established pursuant to the General Ordinance.

S&P means S & P Global Ratings and any successor thereto.

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[*] See APPENDIX III-B – "Twenty-First Supplemental Ordinance" for definitional modifications and additions contained in the Springing Amendments, including modifications to the definition of Rating Agency.

Series when applied to Bonds means, collectively, all of the Bonds of a given issue authorized by Supplemental Ordinance, as provided in the General Ordinance, and may also mean, if appropriate, a subseries of any Series if, for any reason, the City should determine to divide any Series into one or more subseries of Bonds.

*Series Debt Reserve Requirement** means, for any Series of Bonds, the amount, if any, required pursuant to a Supplemental Ordinance or Determination to be reserved and (if such amount is greater than zero dollars ($0)) deposited or maintained in the Series Debt Reserve Subaccount established for such Series of Bonds; provided that such amount may equal zero dollars ($0); and provided further that such amount may not exceed the lesser of (i) the greatest amount of Debt Service Requirements payable on such Series of Bonds in any one Fiscal Year and (ii) the maximum amount permitted to be financed with proceeds of such Series of Bonds permitted by Section 148(d)(1) the Code (or any successor provision).

*Series Debt Reserve Subaccount** means any subaccount of the Debt Reserve Account created, pursuant to a Supplemental Ordinance or Determination for a particular Series of Bonds, which Series of Bonds will not otherwise be secured by the Debt Reserve Account and for which a Series Debt Reserve Requirement applies.

Sinking Fund means the Sinking Fund established pursuant to the General Ordinance.

Sinking Fund Installment means an amount so designated which is established pursuant to the General Ordinance.

Special Water Infrastructure Account means the Special Water Infrastructure Account of the Residual Fund established in the General Ordinance.

Standby Agreement with respect to a Series of Bonds, means an irrevocable letter of credit and related reimbursement agreement, line of credit, standby bond purchase agreement or similar agreement providing for the purchase of all or a portion of the Bonds of such Series, as amended, supplemented or extended from time to time.

Standby Purchaser, with respect to a Series of Bonds, means the provider of the Standby Agreement for such Series of Bonds.

Subordinated Bond means any Bond referred to in, and complying with the provisions of the General Ordinance with respect to Subordinated Bonds.

Subordinated Bond Fund means the Subordinated Bond Fund established in the General Ordinance.

Substitute Credit Facility† means any letter of credit, standby bond purchase agreement, line of credit, surety bond, insurance policy or other insurance commitment or similar agreement (other than a Qualified Swap or an Exchange Agreement) that replaces a Credit Facility and is provided by a commercial

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* See APPENDIX III-B – "Twenty-First Supplemental Ordinance" attached to this Official Statement for definitional modifications and additions contained in the Springing Amendments, including adding this defined term. The Springing Amendments include provisions that will allow the City to establish a Series Debt Reserve Subaccount and a related Series Debt Reserve Requirement.

† See APPENDIX III-B – "Twenty-First Supplemental Ordinance" for definitional modifications and additions contained in the Springing Amendments, including modifications to the definition of Substitute Credit Facility.

bank, insurance company or other financial institution with a current long term credit rating (or whose obligations thereunder are guaranteed by a financial institution with a long term rating) from Moody's and S&P not lower than the credit rating of any Series of Bonds which has no Credit Facility.

Supplemental Ordinance means an ordinance supplemental to the General Ordinance enacted pursuant to the Act and the General Ordinance by the Council of the City.

System means the entire combined water system and wastewater system of the City, now existing and hereafter acquired by lease, direct control, purchase or otherwise or constructed by the City, including any interest or participation of the City in any facilities in connection with said System, together with all additions, betterments, extensions and improvements to said System or any part thereof hereafter constructed or acquired and together with all lands, easements, licenses and rights of way of the City and all other works, property or structures of the City and contract rights and other tangible and intangible assets of the City now or hereafter owned or used in connection with or related to said System.

Tender Agent, with respect to a Series of Bonds, means any commercial bank or trust company organized under the laws of any state of the United States or any national banking association designated as a tender agent for such Series of Bonds, and its successor or successors hereafter appointed in the manner provided in the applicable Supplemental Ordinance or Determination.

Uncertificated Bond means any Bond which is fully registered as to principal and interest and which is not represented by an instrument.

Variable Rate Bond means any Bond, the rate of interest on which is subject to change prior to maturity and cannot be determined in advance of such change.

Water and Wastewater Funds means, collectively, the Revenue Fund, the Sinking Fund, the Subordinated Bond Fund, the Rate Stabilization Fund, the Residual Fund and the Construction Fund.

Water Commissioner means the head of the Water Department as provided by the Philadelphia Home Rule Charter.

Water Department means the Water Department of the City created pursuant to Section 3-100 of the Philadelphia Home Rule Charter.

SUMMARY OF OPERATIVE PROVISIONS OF THE GENERAL ORDINANCE

The following is a summary of certain operative provisions of the General Ordinance. Reference should be made to the General Ordinance for a full and complete statement of its provisions and the meaning of any capitalized terms used herein but not otherwise defined.

Form and Terms of Bonds

All Bonds shall be in substantially such form as may be approved by the City and set forth in the Supplemental Ordinance or Determination providing for the issuance thereof. Bonds shall be generally designated as Water and Wastewater Revenue Bonds of the City and shall be issued in such Series and within such Series in such subseries as the City may from time to time determine. The aggregate principal amount of Bonds which may be issued, authenticated and delivered under the General Ordinance is unlimited, but prior to the issuance of such Series of Bonds, the City shall enact a Supplemental Ordinance authorizing such Series and the maximum aggregate principal amount of such Series.

The Bonds shall be issued in fully registered form, except as provided in the General Ordinance and, such Bonds shall be issued upon and contain such additional terms as may be set forth in the Supplemental Ordinance and Determination providing for the issuance of the Bonds in question. As required by Section 5 of the Act, all Bonds shall contain a brief statement of the Project Revenues pledged as security therefor and the priority or priorities, if any, in the application of such pledged Project Revenues and shall contain a covenant of the City to pay from the pledged Project Revenues on the respective due dates the amounts required to pay the interest on and principal or redemption price of the Bonds. Bonds may be designated as of such Series by date, number, letter or otherwise and may also have such individual letters, identifying numbers or other marks, and such descriptive panels, registration panels, legends or endorsements placed thereon as may, consistent with the General Ordinance and the Act, be determined by a Supplemental Ordinance, Determination or the Director of Finance. The Bonds may also have printed thereon or on the reverse thereof the text of an approving legal opinion with respect thereto. Any portion of the text of any Bond may be set forth on the reverse thereof with an appropriate reference on the face of the Bond.

The Bonds of each Series shall be issued in such aggregate principal amount, shall be in such denominations, shall mature or be subject to mandatory redemption in such principal amounts, on such dates and at such places, shall have such Sinking Fund Installments for Bonds of like maturity and interest rate, shall bear interest from such date or dates and at such rate or rates (including variable, adjustable, convertible or other rates), shall be subject to optional redemption at such times and upon such terms, shall (if such Bonds are Option Bonds) be subject to optional or mandatory tender, and shall contain such other terms and conditions not inconsistent with the General Ordinance or the Act, all as shall be determined by the City and set forth in the Supplemental Ordinance or Determination under which such Bonds are issued, or as shall be determined by a designated officer or officers of the City thereunto authorized by the Supplemental Ordinance, or in the absence of such provisions or designation, as shall be determined by the Director of Finance as specified below.

If permitted by applicable law, any Series of Bonds may be issued as Uncertificated Bonds and the foregoing provisions specifying the form of Bonds shall be inapplicable to such Series.

A Series of Bonds may be secured by a Credit Facility meeting the requirements of the General Ordinance and the applicable Supplemental Ordinance. In connection with the issuance of its Bonds or at any time thereafter so long as a Series of Bonds remains Outstanding, the City also may enter into Qualified Swaps or Exchange Agreements if the Bond Committee determines that such Qualified Swap or Exchange Agreement will assist the City in more effectively managing its interest costs. The City's payment obligation under any Qualified Swap shall be made from the Sinking Fund and its payment obligation under any such Exchange Agreement shall be made from the Residual Fund created pursuant to the General Ordinance. Unless otherwise acknowledged by each Rating Agency by virtue of its confirmation of the existing credit ratings on the City's Outstanding Bonds, the City will not enter into any Qualified Swap or Exchange Agreement unless it gives at least fifteen (15) day's advance notice of its intention to do so to each of the Rating Agencies, which notice shall specify the identity of the Qualified Swap Provider or Exchange Agreement counterparty, as the case may be.

Sale of Bonds; Taxes Not to be Assumed; Authority of Director of Finance

Bonds may be sold by the City at public, private, or invited sale upon such terms not inconsistent with the Act and at such prices as the City may determine. To the extent that the Supplemental Ordinance authorizing any Series of Bonds and the Determination relating to such Series shall not otherwise provide:

(a) all Bonds shall be sold at competitive public sale to the purchaser or purchasers submitting the highest and best bid upon such terms and conditions of the bidding as shall be specified in an official notice of sale issued in the name of the City by the Director of Finance;

(b) no covenant to pay or assume any taxes shall be included in such Bonds; and

(c) subject to the foregoing, the terms upon which are the prices for which the Bonds are to be sold or exchange, and the form, terms or provisions of the Bonds including, without limitation, the matters referred to in Section 5 of the Act, shall be determined by the Director of Finance who is designated in the General Ordinance as the officer of the City authorized to make such determinations based, to the extent applicable, on the prices, interest rates or other terms set forth in the highest and best proposal conforming to the bidding specifications, as ascertained and accepted on behalf of the City by the Director of Finance.

Payments of Principal, Redemption Price and Interest; Date of Bonds

Unless otherwise provided in any Bond or the Supplemental Ordinance or Determination relating thereto:

(a) The principal or redemption price of each Bond shall be payable upon surrender thereof at the principal Philadelphia office of the Fiscal Agent in Philadelphia, Pennsylvania or at the principal office of a paying agent designated in such Bonds.

(b) The interest due on any Bond in fully registered form shall be payable by check or draft mailed to the Holder thereof, or at the request of a Holder of $1,000,000 or more in principal amount or maturity value of Bonds by wire transfer to an account at a financial institution in the United States, designated in writing to the Fiscal Agent or the paying agent, subject to such provisions concerning record dates as may be contained in such Bond and in the Supplemental Ordinance and Determination providing for the issuance and terms thereof.

(c) The principal or redemption price of and the interest on each Bond shall be payable in any coin or currency of the United States of America which, at the time of payment, is legal tender for the payment of public and private debts, or Bonds of a Series may be payable in such foreign currency as may be specified in the Supplemental Ordinance authorizing such Series of Bonds, if applicable law permits.

(d) Fully registered Bonds of each Series shall be dated as of the date six months preceding the interest payment date next following the date of execution thereof by the Fiscal Agent, unless such date of execution shall be an interest payment date, in which case they shall be dated as of such date of execution; provided, however, that if, as shown by the records of the Fiscal Agent, interest on the Bonds of any Series shall be in default, fully registered Bonds of such Series issued in lieu of Bonds surrendered for transfer or exchange may be dated as of the date to which interest has been paid in full on the Bonds surrendered. Fully registered Bonds of each Series shall bear interest from their date.

Notwithstanding any other provision in The General Ordinance to the contrary, the foregoing provisions are subject to the express understanding that the principal of and interest on all Bonds issued under the General Ordinance and the premium, if any, payable on redemption thereof, shall be payable only from Project Revenues and other funds provided for the payment of Bonds. The Bonds are not general obligations of the City and do not pledge the general credit or taxing power or create any debt or charge against the general revenues of the City, or create any lien against any property of the City other than pledged Project Revenues.

Execution of Bonds

The Bonds shall be executed on behalf of the City by the Fiscal Agent by the manual signatures of two of its duly authorized officers or signers, under the seal of the City which shall be either affixed or reproduced thereon in facsimile and shall be countersigned and attested by the manual or facsimile signature of the City Controller, or in such other manner as shall be authorized by law and prescribed by Supplemental Ordinance. Any such Bonds may be executed, issued and delivered notwithstanding that one or more of the officers or signers signing such Bonds or whose facsimile signature shall be upon such Bonds shall have ceased to be such officers or signers at the time when such Bonds shall actually be delivered, and although at the nominal date of the Bond any such person shall not have been such officer or signer.

Bond Registrar and Bond Register

The City shall designate one or more persons to act as "Bond Registrar" for the Bonds provided that the Bond Registrar appointed for the Bonds shall be either the Fiscal Agent or a person which would meet the requirements for qualification as a Fiscal Agent imposed by the General Ordinance. Any person other than the Fiscal Agent undertaking to act as Bond Registrar shall first execute a written agreement, in form satisfactory to the City and the Fiscal Agent, to perform the duties of a Bond Registrar under the General Ordinance, which agreement shall be filed with the Fiscal Agent.

The Bond Registrar shall act as registrar and transfer agent for the Bonds. The City shall cause the Bond Registrar to designate, by a written notification to the Fiscal Agent, a specific office location at which the Bond Register is kept. The principal corporate trust office of the Fiscal Agent shall be such office in respect of the Bonds for which the Fiscal Agent is acting as Bond Registrar.

The Bond Registrar shall, in any case where it is not also the Fiscal Agent, forthwith following each regular record date and at any other time as reasonably requested by the Fiscal Agent, certify and furnish to the Fiscal Agent and any paying agent as the Fiscal Agent shall specify, the names, addresses, and holdings of Bondholders and any other relevant information reflected in the Bond Register, and the Fiscal Agent and any such paying agent shall for all purposes be fully entitled to rely upon the information so furnished to it and shall have no liability or responsibility in connection with the preparation thereof.

Interchangeability of Bonds

Fully registered Bonds, upon surrender thereof at the office of Bond Registrar with a written instrument of transfer satisfactory to the Bond Registrar, duly executed by the registered owner or his duly authorized attorney may at the option of the registered owner thereof, and upon payment by such registered owner of any charges, which the City or Bond Registrar may make, be exchanged for an equal aggregate principal amount of fully registered Bonds of the same Series, maturity and interest rate of any other authorized denominations.

Negotiability, Transfer and Registry

Fully registered Bonds shall be transferable only by the registered owner thereof in person or by his attorney duly authorized in writing, upon surrender thereof together with a written instrument of transfer satisfactory to the Bond Registrar duly executed by the registered owner or his duly authorized attorney. Upon the transfer of any such fully registered Bonds the City shall issue and the Bond Registrar shall execute in the name of the transferee a new fully registered Bond or Bonds of the same aggregate principal amount and Series, maturity and interest rate as the surrendered Bonds.

The City, the Fiscal Agent and any paying agent designated in the Bonds may deem and treat the person in whose name any Bond shall be registered in the Bond Register as the absolute owner of such Bond, whether such Bond shall be overdue or not, for the purpose of receiving payment of, or on account of, the principal and redemption price of and interest on such Bond and for all other purposes, and all such payments so made to any such registered owner or upon his order shall be valid and effectual to satisfy and discharge the liability upon such Bond to the extent of the sum or sums so paid, and neither the City, the Fiscal Agent nor any paying agent designated in the Bond shall be affected by any notice to the contrary.

Any consent, waiver or other action taken by the registered owner of any Bond pursuant to the provisions of the General Ordinance shall be conclusive and binding upon such Holder, his heirs, successors or assigns, and upon all transferees of such Bond whether or not notation of such consent, waiver or other action shall have been made on such Bond or on any Bond issued in exchange therefor.

Regulations With Respect to Exchanges and Transfers

In all cases in which the privilege of exchanging Bonds or transferring registered Bonds is exercised, the City shall execute and deliver Bonds in accordance with the General Ordinance. All Bonds surrendered in any such exchanges or transfers shall forthwith be delivered to the Bond Registrar and cancelled or retained by the Bond Registrar. For every such exchange or transfer of Bonds, whether temporary or definitive, the City or the Bond Registrar may make a charge sufficient to reimburse it for any tax, fee or other governmental charge imposed by a governmental unit other than the City in connection with said exchange, transfer or registration and for any charge of insuring Bonds during the delivery thereof. Neither the City nor the Bond Registrar shall be required to transfer or exchange Bonds of any Series for a period of 20 days next preceding any selection of Bonds to be redeemed or thereafter until after the first mailing of any notice of redemption, or to transfer, exchange or register any Bonds called for redemption.

Credit Enhancement; Exchange Agreements; Qualified Swaps

As provided by Supplemental Ordinance or Determination relating to any Series of Bonds and subject to the requirements of the General Ordinance, the City may provide for a Credit Facility, Exchange Agreement or Qualified Swap with respect to any Series of Bonds.

Purpose of Bonds; Combination or Projects for Financing Purposes

The Bonds issued under the General Ordinance shall be issued for the purpose (i) of paying the costs of Projects (as such term is defined in the Act) relating to the System, (ii) of reimbursing any fund of the City from which such costs shall have been paid or advanced, (iii) of funding any of such costs for which the City shall have outstanding bond anticipation notes or other obligations, (iv) of refunding any Bonds or bonds of the City issued for the foregoing purposes or (v) of financing anything else relating to the System permitted under the Act. The water and wastewater systems of the City (referenced in the definition of "System" above) are combined as a Project for the purpose of capital financing but the separate accounts or subaccounts required by the Philadelphia Home Rule Charter shall be maintained within the funds and accounts established under the General Ordinance in accordance with the Philadelphia Home Rule Charter.

Pledge or Revenues; Grant of Security Interest; Limitation on Recourse

The City pledges, and assigns to the Fiscal Agent, its successors in trust and its assigns, for the security and payment of all Bonds (other than Subordinated Bonds) and grants to said Fiscal Agent, its successors in trust and its assigns, a lien on and security interest in (i) all Project Revenues and (ii) all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established in the General Ordinance together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund). The Fiscal Agent shall hold and apply the security interest granted in the General Ordinance and the pledged revenues and funds described therein, in trust, for the equal and ratable benefit and security of all present and future Holders of Bonds (other than Subordinated Bonds) issued pursuant to the provisions of the General Ordinance and each Supplemental Ordinance, without preference, priority or distinction of any one Bond over any other Bond (other than Subordinated Bonds); provided however, that the pledge of the General Ordinance may also be for the benefit of a Credit Facility and Qualified Swap, or any other person who undertakes to provide moneys for the account of the City for the payment of principal or redemption price of and interest on any Series of Bonds (other than Subordinated Bonds), on an equal and ratable basis with Bonds, to the extent provided by any Supplemental Ordinance or Determination.

For the purpose of compliance with the filing requirements of the Uniform Commercial Code in order to perfect the security interest granted by the General Ordinance, the Fiscal Agent shall be deemed to be, and the City recognizes the Fiscal Agent as, the representative of Bondholders to execute financing statements as the secured party.

Neither the Bonds nor the City's reimbursement or other contractual obligations under any Credit Facility, Qualified Swap or Exchange Agreement shall constitute a general indebtedness or a pledge of the full faith and credit of the City within the meaning of any constitutional or statutory provision or limitation of indebtedness. No Bondholder or beneficiary of any of the foregoing agreements shall ever have the right, directly or indirectly, to require or compel the exercise of the ad valorem taxing power of the City for the payment of the principal and redemption price of or interest on the Bonds or the making of any payments under the General Ordinance. The Bonds and the obligations evidenced thereby and by the foregoing agreements, shall not constitute a lien on any property of or in the City, other than the Project Revenues and amounts on deposit in or standing to the credit of the Water and Wastewater Funds and interest earnings on amounts in such funds.

Parity Bonds

All Bonds issued under the General Ordinance (other than Subordinated Bonds) shall be parity Bonds equally and ratably secured by the pledge of and grant of the security interest in the Project Revenues and the amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund), together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund) without preference, priority or distinction as to lien or otherwise, except as otherwise provided, of any one Bond over any other Bond or as between principal and interest.

The City reserves the right, and nothing in the General Ordinance shall be construed to impair such right, to finance improvements to the System by the issuance of its general obligation bonds or by the issuance, under ordinances other than Supplemental Ordinances, of water and/or wastewater revenue bonds or notes for the payment of which Project Revenues may be used or pledged subject and subordinate to the payment from such Project Revenues of the payments described below under "Transfers From Revenue Fund" and subject to the elimination of any deficiency in any fund or account established under the General Ordinance or under any Supplemental Ordinance.

Establishment of Funds and Accounts

The following funds and accounts are established by the General Ordinance and shall be held by the Fiscal Agent:

(a) Revenue Fund;

(b) Sinking Fund and within such Fund a Debt Service Account, a Charges Account and a Debt Reserve Account;

(c) Subordinated Bond Fund;

(d) Rate Stabilization Fund;

(e) Residual Fund and within such Fund a Special Water Infrastructure Account;

(f) Construction Fund, and within the Construction Fund, separate accounts designated as follows:

(i) the Existing Projects Account, into which existing proceeds, if any, of revenue bonds heretofore issued under the Act in respect of the System shall be deposited,

(ii) the Bond Proceeds Account, into which proceeds of Bonds issued under the General Ordinance shall be deposited, and

(iii) the Capital Account;

(g) Rebate Fund.

Nothing in the General Ordinance shall be construed to prevent the City from establishing, in connection with the issuance of one or more Series of Bonds, additional funds or accounts to be held for the benefit of one or more Series of Bonds issued under the General Ordinance, as set forth in Supplemental Ordinances; provided that, no such additional funds or accounts shall be established unless, in the opinion of Bond Counsel, establishment of additional funds or accounts would not adversely affect the exclusion of interest on Bonds, if any, from gross income for federal income tax purposes.

Segregation of Water and Wastewater Funds; Deposit of Project Revenues into Revenue Fund

(a) The Water and Wastewater Funds shall be held separate and apart from all other funds and accounts of the City and the Fiscal Agent and the funds and accounts therein shall not be commingled with, loaned or transferred among themselves or to any other City funds or accounts except as expressly permitted by the General Ordinance.

(b) The City shall cause all Project Revenues received by it on any date to be deposited into the Revenue Fund upon receipt thereof by the City and the Fiscal Agent shall, upon receipt of Project Revenues, deposit such Project Revenues into the Revenue Fund. The City and Fiscal Agent also shall cause to be deposited into the Revenue Fund such portion of proceeds of Bonds as designated by Supplemental Ordinance or Determination and any other funds directed to be deposited into the Revenue Fund by the City. The Fiscal Agent shall, at the written direction of the City, disburse from the Revenue Fund the amounts and at the times specified below under “Transfers From Revenue Fund.”

(c) If at any time sufficient moneys are not available in the Revenue Fund to pay Operating Expenses and to make transfers required pursuant to the General Ordinance, then amounts on deposit in the Construction Fund, Rate Stabilization Fund and Residual Fund may be loaned temporarily, at the written direction of the City, to the Revenue Fund for the payment of such Operating Expenses to the extent of the deficiency, until such loaned amounts are required by the Water Department for purposes of the Fund making the loan. If a similar deficiency exists in the Construction Fund, amounts on deposit in the Revenue

Fund, Rate Stabilization Fund and Residual Fund may be loaned temporarily, at the written direction of the City, to the Construction Fund, to the extent of the deficiency, until required by the Water Department for purposes of the Fund making the loan.

Transfers From Revenue Fund

Amounts on deposit in the Revenue Fund shall be applied by the Fiscal Agent, at the written direction of the City, in the following manner and in the following order of priority:

(a) to the City or its designees to pay such sums as are necessary to meet Operating Expenses in a timely manner;

(b) (i) on or before the dates that the principal or redemption price of and interest on Bonds (other than Subordinated Bonds) or payments under a Swap Agreement or Credit Facility are due, to deposit in the Debt Service Account of the Sinking Fund the amount necessary to provide for the timely payment of the principal or redemption price of and interest on such Bonds (other than Subordinated Bonds), any payments under any Swap Agreement and any amounts under a Credit Facility to repay advances thereunder to pay any of the foregoing, and (ii) on or before the dates that other payments are due under any Credit Facility with respect to Bonds (other than Subordinated Bonds) to deposit in the Charges Account of the Sinking Fund the amount necessary to make such payments;

(c) if the transfers in paragraphs (a) and (b) above are being made according to schedule, for deposit in the Debt Reserve Account, the amount, if any, required to eliminate any deficiency therein;

(d) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer required pursuant to paragraph (c) above, to deposit in any debt reserve account established within the Sinking Fund and not held for the equal and ratable benefit of all Bonds (other than Subordinated Bonds), the amount, if any, required to eliminate any deficiency therein;

(e) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c) and (d) above, to deposit in the Subordinated Bond Fund the amount necessary to provide for the timely payment of the principal or redemption price of and interest on Subordinated Bonds, and forward to the paying agent in respect of bond anticipation notes (payable by exchange for, or out of the proceeds of the sale of Subordinated Bonds) the amount necessary to provide for the timely payment of interest thereon (to the extent not capitalized);

(f) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c), (d) and (e) above to pay to the City the amount necessary to provide for the timely payment of the principal or redemption price of and interest on General Obligation Bonds;

(g) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c), (d), (e) and (f) above, to transfer to the Rate Stabilization Fund such amount as the Water Commissioner may determine, the first such determination to be made on the Effective Date and to include the balance on that date in the Renewal and Replacement Fund created under the Prior Ordinance and the unencumbered operating balance of the Water Department as of the end of the Fiscal Year immediately preceding the Effective Date;

(h) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c) , (d) , (e), (f) and (g) above, to transfer to the Capital Account of the Construction Fund on June 20, of each Fiscal Year (or the first business day following June 20 if June 20 is not a business day) an amount equal to the sum of (i) the Capital Account Deposit Amount, (ii) the Debt Service Withdrawal for the preceding Fiscal Year and (iii) the Operating Expense Withdrawal for the preceding Fiscal Year, less any amounts transferred during the Fiscal Year to such Capital Account from the Residual Fund; and

(i) if the transfers in paragraphs (a) and (b) above are being made according to schedule, and following any transfer then required to be made pursuant to paragraphs (c), (d), (e), (f), (g) and (h) above and after providing for the repayment of any inter-Fund loans, to transfer as of June 30 of each year all remaining amounts to the Residual Fund.

Notwithstanding the foregoing, nothing in the General Ordinance shall prevent the City from directing the transfer of amounts on deposit in any fund or account established under the General Ordinance into the Rebate Fund in the amounts and at the times specified below under "Funds and Accounts — Rebate Fund."

Sinking Fund

The Sinking Fund is to be a consolidated fund for the equal and proportionate benefit of the Holders of all Bonds (other than Subordinated Bonds) from time to time Outstanding and each account therein may be invested and reinvested on a consolidated basis.

The Fiscal Agent, as directed by the City by Supplemental Ordinance, Determination or other written direction, shall pay out of the Debt Service Account of the Sinking Fund to the designated paying agent or agents (i) on or before each interest payment date for any of the Bonds (other than Subordinated Bonds) the amount required for the interest payable on such date; and (ii) on or before each principal, redemption or prepayment date for any Bonds (other than Subordinated Bonds), the amount required for the principal, redemption or prepayment payable on such date, and (iii) on or before the respective due dates the amounts, if any, due under any Swap Agreements. Such amounts shall be applied by the designated paying agent or agents on the due dates thereof. The Fiscal Agent shall also pay out of the Debt Service Account of the Sinking Fund the accrued interest included in the purchase price of Bonds purchased for retirement and on or before the due dates any amounts owing by the City under any Credit Facility on account of advances to pay principal of or interest or redemption premium on Bonds (other than Subordinated Bonds).

Amounts accumulated in the Debt Service Account with respect to any Sinking Fund Installment (together with amounts accumulated therein with respect to interest on the Bonds for which such Sinking Fund Installment was established) if so directed by the City, shall be applied by the Fiscal Agent, on or prior to the 60th day preceding the due date of such Sinking Fund Installment, to the purchase of Bonds of the Series, maturity and interest rate within each maturity for which such Sinking Fund Installment was established. All purchases of Bonds pursuant to this provision shall be made at prices not exceeding the applicable sinking fund redemption price of such Bonds plus accrued interest, and such purchases shall be made by the Fiscal Agent as directed by the City. As soon as practicable after the 42nd day preceding the due date of any such Sinking Fund Installment, the Fiscal Agent shall proceed to call for redemption, by giving notice as provided in the General Ordinance, on such due date Bonds of the Series, maturity and interest rate within each maturity for which such Sinking Fund Installment was established (except in the case of Bonds maturing on a Sinking Fund Installment date) in such amount as shall be necessary to complete the retirement of the unsatisfied balance of such Sinking Fund Installment after making allowance for any Bonds purchased with moneys held in the Subordinated Bond Fund which the City has directed the Fiscal Agent to apply as a credit against such Sinking Fund Installment. The Fiscal Agent shall pay out of the Sinking Fund to the appropriate paying agent or agents, on or before such redemption date (or maturity date) the amount required for the redemption of the Bonds so called for redemption (or for the payment of such Bonds then maturing) and such amount shall be applied by such paying agent or agents to such redemption (or payment). All expenses in connection with the purchase or redemption of Bonds shall be paid by the City from Project Revenues.

In the event of the refunding of any Bonds, the Fiscal Agent shall, if the City so directs, withdraw from the Sinking Fund all, or any portion of, the amounts accumulated therein with respect to principal or interest on the Bonds being refunded and deposit such amounts with itself or another financial institution serving as escrow agent to be held for the payment of the principal or redemption price, if applicable, and interest on the Bonds being refunded; provided that such withdrawal shall not be made unless immediately thereafter the Bonds being refunded shall be deemed to have been paid as described below under "Deposit of Funds for Payment of Bonds." In the event of a refunding, the City may also direct the Fiscal Agent to withdraw from the Sinking Fund all, or a portion of, the amounts accumulated therein with respect to principal and interest on the Bonds being refunded and deposit such amounts in any fund or account established under the General Ordinance.

If any Bond shall not be presented for payment when the principal thereof becomes due, either at maturity or otherwise or at the date fixed for redemption thereof, if moneys sufficient to pay such Bond shall have been deposited with the Fiscal Agent, it shall be the duty of the Fiscal Agent to hold such moneys, without liability to the City, any Bondholder or any other person for interest thereon, for the benefit of the owner of such Bond. Notwithstanding the foregoing, any moneys in the Sinking Fund for the payment of the interest, principal or redemption premium of Bonds unclaimed for two (2) years after the due date shall be repaid to the City but such repayment shall not discharge the obligation, if any, for which such moneys were previously held in the Sinking Fund; provided, however, that such repayment shall not be made unless, at the time of such repayment, there shall exist no deficiency in any fund or account established under the General Ordinance or any Supplemental Ordinance.

The Fiscal Agent shall pay out of the Charges Account to the appropriate payees any fees, expenses and other amounts due under any Credit Facility with respect to Bonds (other than Subordinated Bonds), to the extent such amounts are not paid from the Debt Service Account.

Credits Against Sinking Fund Installments

If at any time Bonds of any Series or maturity for which Sinking Fund Installments shall have been established are purchased or redeemed other than (i) from amounts accumulated in the Debt Service Account or (ii) Bonds deemed to have been paid as described under "Deposit of Funds for Payment of Bonds" below, and, with respect to such Bonds which have been deemed paid, irrevocable instructions have been given to the Fiscal Agent to redeem or purchase the same on or prior to the due date of the Sinking Fund Installment to be credited under this paragraph, the City may from time to time and at any time by written notice to the Fiscal Agent specify the portion, if any, of such Bonds so purchased, redeemed or deemed to have been paid and not previously applied as a credit against any Sinking Fund Installment which are to be credited against future Sinking Fund Installments. Such notice shall specify the amounts of such Bonds to be applied as a credit against such Sinking Fund Installment or Installments and the particular Sinking Fund Installment or Installments against which such Bonds are to be applied as a credit; provided, however that none of such Bonds may be applied as a credit against a Sinking Fund Installment to become due less than 42 days after such notice is delivered to the Fiscal Agent. All such Bonds to be applied as a credit shall be surrendered to the Fiscal Agent for cancellation on or prior to the due date of the Sinking Fund Installment against which they are being applied as a credit. The portion of any such Sinking Fund Installment remaining after the deduction of any such amounts credited toward the same (or the original amount of any such Sinking Fund Installment if no such amounts shall have been credited toward the same) shall constitute the unsatisfied balance of such Sinking Fund Installment for the purpose of calculation of Sinking Fund Installments due on a future date.

Debt Reserve Account*

Unless otherwise provided in the applicable Supplemental Ordinance, the City is required, under direction of the Director of Finance, to deposit in the Debt Reserve Account from the proceeds of sale of each Series of Bonds issued under the General Ordinance, an amount which, when added to the existing balance in the Debt Reserve Account, will be equal to the Debt Reserve Requirement immediately after the issuance of such Series of Bonds. The money and investments in the Debt Reserve Account shall be held and maintained in an amount equal at all times to the Debt Reserve Requirement provided that if the Supplemental Ordinance authorizing a Series of Bonds shall authorize the accumulation from Project Revenues of a reserve of such amount in respect of such Bonds over a period of not more than three Fiscal Years after the issuance and delivery of such Bonds, then the full payment of the annual deposits required under such Supplemental Ordinance will meet the Debt Reserve Requirements of the General Ordinance in respect of such Bonds.

If at any time and for any reason, the moneys in the Debt Service Account of the Sinking Fund are insufficient to pay as and when due, the principal of (and premium, if any) or interest on any Bond or Bonds or other obligations payable from the Debt Service Account then due (including under Swap Agreements and Credit Facilities), the Fiscal Agent is authorized and directed to withdraw from the Debt Reserve Account and pay over the amount of such deficiency for deposit in the Debt Service Account. If by reason of such withdrawal or for any other reason there shall be a deficiency in the Debt Reserve Account, the City covenants to restore such deficiency promptly from Net Revenues.

Any moneys in the Debt Reserve Account in excess of the Debt Reserve Requirement is required to be transferred to the Revenue Fund at the written direction of the City.

Notwithstanding the foregoing provisions, in lieu of the required deposits into the Debt Reserve Account, the City may cause to be deposited into the Debt Reserve Account a surety bond or an insurance policy payable to the Fiscal Agent for the account of the Bondholders and any Qualified Swap or an irrevocable letter of credit in an amount equal to the difference between the Debt Reserve Requirement and the remaining sums, if any, then on deposit in the Debt Reserve Account. The surety bond, insurance policy or letter of credit shall be payable (upon the giving of notice as required thereunder) on any interest payment date on which moneys will be required to be withdrawn from the Debt Reserve Account and applied to the payment of debt service on the Bonds and such withdrawal cannot be met by amounts on deposit in the Debt Reserve Account or provided from any other Fund under the General Ordinance. The insurer providing such surety bond or insurance policy shall be an insurer whose municipal bond insurance policies insuring the payment, when due, of the principal of and interest on municipal bond issues results in such issues being rated in not lower than the second highest rating category (without regard to rating subcategories) by either Moody's or S&P. The letter of credit issuer shall be a bank or trust company which is rated not lower than the second highest rating category (without regard to ratings sub-categories) by either Moody's or S&P. If a disbursement is made pursuant to a surety bond, an insurance policy or a letter of credit provided pursuant to this paragraph, the City shall be obligated either (i) to reinstate the maximum limits of such surety bond, insurance policy or letter of credit or (ii) to deposit into the Debt Reserve Account, funds in the amount of the disbursement made under such surety bond, insurance policy or letter of credit, or a combination of such alternatives, as shall provide that the amount in the Debt Reserve Account equals the Debt Reserve Requirement within a time period not longer than would be required to restore the Debt Reserve Account by operation of this provision and from the same source of funds as

* The provisions described under this heading will be amended upon the consent to the Springing Amendments of 67% of Holders of the outstanding Bonds. See APPENDIX III-B – "Twenty-First Supplemental Ordinance" attached to this Official Statement.

provided in the General Ordinance. Upon the occurrence of any reduction or suspension or any credit rating with respect to such surety bond, insurance policy or letter of credit (or the provider thereof) required by the General Ordinance, the City shall so notify the provider of the surety bond, insurance policy or letter of credit and prior to the effective date of such cancellation shall either provide a substitute surety bond, insurance policy or letter of credit meeting the above-described requirements or shall deposit cash in the Debt Reserve Account so that the amount in such Account shall equal the Debt Reserve Requirement. The Director of Finance may use funds already held in the Debt Reserve Account to purchase appropriate surety bonds or insurance policies for deposit in the Debt Reserve Account in lieu of some or all of the current cash or other deposits therein, which surety bonds or insurance policies shall satisfy the requirements described in this paragraph.

Subordinated Bond Fund

Subject to the third paragraph under this heading, the Fiscal Agent shall apply amounts in the Subordinated Bond Fund to the payment of the principal of, redemption premium, if any, and interest on Subordinated Bonds of a Series and to payments due under any Credit Facilities and Exchange Agreements with respect to Subordinated Bonds in accordance with the provisions of, and subject to the priorities and limitations and restrictions provided in, the Supplemental Ordinance and Determination authorizing such Series of Subordinated Bonds.

At any time and from time to time the City may deposit in the Subordinated Bond Fund for the payment of the principal of, redemption premium, if any, and interest on Subordinated Bonds amounts received from any source other than Project Revenues which is not inconsistent with the General Ordinance or any Supplemental Ordinance or Determination.

If at any time the amounts in the Sinking Fund shall be less than the current requirement of such fund pursuant to paragraphs (b) and (c) under “Transfers from Revenue Fund” above and there shall not be on deposit in the Debt Reserve Account, the Capital Account or the Residual Fund available moneys sufficient to cure such deficiency, then the Fiscal Agent shall withdraw from the Subordinated Bond Fund and deposit in the Sinking Fund the amount necessary (or all the moneys in said fund, if less than the amount necessary) to eliminate such deficiency.

Any moneys in the Subordinated Bond Fund for the payment of the interest, principal or redemption premium of Subordinated Bonds unclaimed for two years after the due date are to be repaid to the City but such repayment shall not discharge the obligation, if any, for which such moneys were previously held in the Subordinated Bond Fund; provided, however, that such repayment shall not be made unless, at the time of such repayment, there shall exist no deficiency in any fund or account established under the General Ordinance or any Supplemental Ordinance.

Construction Fund

Proceeds of Bonds issued for capital purposes are to be deposited into the Bond Proceeds Account of the Construction Fund and disbursed according to established procedures of the City.

The Fiscal Agent shall on the Effective Date deposit in the Existing Projects Account proceeds of Prior Bonds as directed by a Supplemental Ordinance or Determination; deposit in the Bond Proceeds Account the proceeds of Bonds as directed by a Supplemental Ordinance or Determination; and deposit in the Capital Account any amounts transferred pursuant to paragraph (h) under “Transfers from Revenue Fund” above. Amounts in the Existing Projects Account and Bond Proceeds Account shall be applied as directed in writing by the City for purposes permitted by the Act and the Bonds and such other purposes as are permitted under the General Ordinance.

Amounts deposited in the Capital Account may be applied at the written direction of the City to (i) payments for the cost of renewals, replacements and improvements to the System; (ii) payments into the Sinking Fund or into the Subordinated Bond Fund to cure a deficiency in one of the foregoing; or (iii) the purchase of Bonds if a Consulting Engineer shall first have certified to the City that amounts remaining on deposit in the Capital Account following the proposed purchase of Bonds will be sufficient to pay the cost of renewals, replacement and improvements to the System projected to be payable during such Fiscal Year; provided, however, that no Bond shall be purchased at a price in excess of the principal amount and redemption price which would be applicable if the Bond were redeemed at the time such Bond was first subject to redemption.

As described the section titled "Segregation of Water and Wastewater Funds; Deposit of Project Revenues into Revenue Fund" , the General Ordinance requires that, if at any time sufficient moneys are not available for the payment of Operating Expenses, then amounts on deposit in the Capital Account may be used for the payment of Operating Expenses to the extent of the deficiency.

Residual Fund

Amounts on deposit in the Residual Fund may be used at the written direction of the City (i) to pay Operating Expenses; (ii) to fund transfers to any fund or account established under the General Ordinance or under a Supplemental Ordinance (other than the Revenue Fund and the Rate Stabilization Fund); (iii) to make payments required under any Exchange Agreement; (iv) for the payment of principal, redemption premium, if any, and interest on any revenue bonds or notes (the proceeds of which were applied in respect of the System) issued under the Act but not under the General Ordinance; (v) for the payment of principal, redemption premium, if any, and interest on any General Obligation Bonds; (vi) for the payment of principal, redemption premium, if any, and interest on other general obligation debt issued in respect of the System; (vii) for the payment of amounts due under capitalized leases or similar obligations relating to the System; and (viii) to fund a transfer to the City's "General Fund" in an amount not to exceed the lower of (A) all "Net Reserve Earnings" as defined below or (B) $4,994,000. "Net Reserve Earnings" shall mean the amount of interest earnings during the Fiscal Year on amounts in the Debt Reserve Account and the Subordinated Bond Fund less the amount of interest earnings during the Fiscal Year on amounts in any such reserve funds and accounts giving rise to a rebate obligation pursuant to Section 148(f) of the Code.

The General Ordinance provides that the City establish expenditure authority from the Residual Fund to enable it to pay Operating Expenses and the other items permitted by the General Ordinance. In the event that there is a substitution of appropriate surety bonds or insurance policies from some or all of the deposits held in the Debt Reserve Account, a transfer of resulting excess money in the Debt Reserve Account to the Revenue Fund and, following compliance with the provisions described under "Transfers From Revenue Fund" above, a transfer of remaining amounts of such excess to the Residual Fund, such remaining amount shall be deposited into the Special Water Infrastructure Account. Any amounts deposited in the Special Water Infrastructure Account may be used to finance water-related infrastructure projects.

Rate Stabilization Fund

Pursuant to the General Ordinance, as of the effective date of the General Ordinance and as of June 30 of each Fiscal Year, the City may transfer (i) from the Rate Stabilization Fund to the Revenue Fund or (ii) from the Revenue Fund to the Rate Stabilization Fund, the amount determined by the Water Commissioner to be transferred for such Fiscal Year.

Rebate Fund

The General Ordinance provides that the Rebate Fund shall be maintained for so long as any Series of Bonds is Outstanding, and for 60 days thereafter (or such other period as may be specified by the Code and applicable regulations), for the purpose of paying to the United States Treasury the amount required to be rebated pursuant to Section 148(f) of the Code. All amounts in the Rebate Fund, including income earned from investment of amounts in the Rebate Fund, shall be held by the City free and clear of the lien created by the General Ordinance.

Management of Funds and Accounts

The General Ordinance provides that the moneys on deposit in the funds and accounts established under the General Ordinance, to the extent not currently required, shall be invested and secured as required by Section 9 of the Act, all at the direction and under the management of the Director of Finance or such other chief fiscal officer of the City as may hereinafter be established.

Investment of Funds and Accounts

All moneys deposited in any fund or account established under the General Ordinance or under any Supplemental Ordinance may be invested by the City or by the Fiscal Agent, at the oral or written direction of the City, in any investments permitted by law (except as otherwise provided in the General Ordinance with respect to the Debt Reserve Account and Rebate Fund); provided that any investments with respect to amounts on deposit in the funds (other than the Debt Reserve Account) and accounts established under the General Ordinance shall mature or shall be subject to redemption by the holder thereof upon demand at par no later than the date when such amounts are needed for the purposes of such funds or accounts. Interest earnings on amounts on deposit (i) in the Revenue Fund are to be credited to the Revenue Fund; (ii) in the Sinking Fund (except as provided in (iii) below) are to be credited to the Sinking Fund to the extent needed to meet Debt Service Requirements in respect of Bonds (other than Subordinated Bonds) and additional interest earnings shall be credited to the Revenue Fund; (iii) in the Debt Reserve Account shall be credited to the Debt Reserve Account until such account is fully funded and shall then be credited to the Residual Fund up to the maximum amount to be transferred to the City's General Fund and any excess is to then be transferred to the Revenue Fund; (iv) in the Subordinated Bond Fund are to be credited to the Subordinated Bond Fund to the extent needed to meet Debt Service Requirements in respect of Subordinated Bonds and additional interest earnings shall be credited to the Revenue Fund or to such other fund or account established under the General Ordinance as the City may direct pursuant to a Supplemental Ordinance; (v) in the Residual Fund, shall be credited to the Residual Fund; (vi) in the Rate Stabilization Fund shall be credited to the Revenue Fund; (vii) in the Construction Fund shall be credited to the appropriate account of the Construction Fund or to the Revenue Fund, as the City shall direct; and (viii) in the Rebate Fund shall be credited to the Rebate Fund.

Valuation of Funds and Accounts

In computing the assets of any fund or account established under the General Ordinance, investments and accrued interest thereon are to be deemed a part thereof. Such investments shall be valued on June 30 of each Fiscal Year at the lower of the cost or current market value thereof if the applicable maturity is more than one year and at par if the applicable maturity is equal to or less than one year plus accrued interest, or at the redemption price thereof, if then redeemable at the option of the holder; provided that investments in any reserve fund or reserve account of the Sinking Fund established pursuant to a Supplemental Ordinance may be valued as provided in the Supplemental Ordinance establishing it. The annual valuation is to apply for all purposes of the General Ordinance except if Bonds are issued or a fund deficit occurs based on the annual valuation, in which cases a valuation is to be made on the date Bonds are issued or the deficit is eliminated, as the case may be.

Covenants of the City

Rate Covenant*. Pursuant to the General Ordinance, the City covenants with the Bondholders that it will, at a minimum, impose, charge and collect in each Fiscal Year such water and wastewater rents, rates, fees and charges as shall yield Net Revenues which shall be equal to at least: (i) 1.20 times the Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); and (ii) 0.90 times Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); provided that, for purposes of this clause (ii), Net Revenues shall be calculated to exclude therefrom any amounts transferred from the Rate Stabilization Fund to the Revenue Fund in, or as of the end of, such Fiscal Year; and (iii) 1.00 times (A) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (B) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (C) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (D) debt service requirements on Interim Debt payable during such Fiscal Year; and (E) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year).

In estimating Debt Service Requirements on any Interim Debt for the purposes of projecting compliance with this covenant, the City is entitled to assume that such Interim Debt will be amortized over a period of up to the maximum term permitted by the Act, provided, however, such period shall not be in excess of the useful life of the assets to be financed, on an approximately level debt service basis and bear interest at the average interest rate on bonds of a similar maturity and credit rating (without any credit enhancement) as the Bonds outstanding under the General Ordinance. Promptly upon any material change in the circumstances which were contemplated at the time such rents, rates, fees and charges were most recently reviewed, but not less frequently than once in each Fiscal Year, the City is required to review the rents, rates, fees and charges as necessary to enable the City to comply with the foregoing requirements; provided that such rents, rates, fees and charges shall in any event produce moneys sufficient to enable the City to comply with its covenants in the General Ordinance.

In estimating Debt Service Requirements on any Variable Rate Bonds for purposes of projecting compliance with this covenant or funding the Reserve Account, the City is entitled to assume that such Variable Rate Bonds will bear interest at a rate equal to (i) the average interest rate on the Variable Rate Bonds during the period of 24 consecutive calendar months preceding the date of calculation or (ii) if the Variable Rate Bonds were not Outstanding during the entire 24-month period, the average interest rate on the Variable Rate Bonds since their date of issue or (iii) such other rate as may be specified in a Supplemental Ordinance or Determination.

Pursuant to the General Ordinance, the City represents that it has, by its Code of General Ordinances, as amended, authorized the imposition of rents, rates, fees and charges by the Water Department sufficient from time to time to comply with the Rate Covenant and covenants with the Holders of Bonds that it will not repeal or materially adversely dilute or impair such authorization.

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* The provisions described under this heading will be amended upon the consent to the Springing Amendments of 67% of Holders of the outstanding Bonds. See APPENDIX III-B – "Twenty-First Supplemental Ordinance" attached to this Official Statement.

Timely Payment of Principal, Redemption Premium and Interest. Pursuant to the General Ordinance, the City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as such Bonds shall remain Outstanding it will pay or cause the Fiscal Agent or a paying agent to pay from the Project Revenues deposited in the Sinking Fund and the Subordinated Bond Fund the principal of, redemption premium, if any, and interest on all Bonds as the same shall become due and payable and as more particularly set forth in the Bonds and to pay the amounts due with respect to any and all Credit Facilities (including the reimbursement agreement or similar related agreement) and Qualified Swaps.

Operation of System. Pursuant to the General Ordinance, the City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as such Bonds shall remain Outstanding it will continuously maintain the System or cause the System to be maintained in good condition and will continuously operate the System or cause the System to be operated.

Conditions of and Provisions Relating to Issuing Bonds. The City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as any such Bonds shall remain Outstanding it will not issue any Series of Bonds under the General Ordinance without first complying with certain conditions stated in the General Ordinance including, without limitation, (a) the enactment of a Supplemental Ordinance, (b) the filing with the Fiscal Agent of a transcript of the proceedings relating to the issuance of such Series of Bonds, (c) the delivery to the City Council of a Consulting Engineer's Report, (d) the filing with the Fiscal Agent of certain opinions of counsel and (e) the execution of appropriate documents.

The Consulting Engineer's Report referred to in the preceding paragraph shall state that the Net Revenues are currently sufficient to comply with the Rate Covenant and are projected to be sufficient to comply with the Rate Covenant for each of the two Fiscal Years following the Fiscal Year in which the Bonds are to be issued; provided that if interest on such Bonds or a portion thereof has been capitalized, the projection shall extend to the two Fiscal Years following the Fiscal Year up to which interest has been capitalized on the Bonds or a portion thereof.

The General Ordinance provides that upon compliance with the conditions enumerated in the preceding paragraph and unless otherwise provided in the applicable Supplemental Ordinance or Determination, accrued interest on Bonds (other than Subordinated Bonds) shall be deposited in the Sinking Fund, accrued interest on Subordinated Bonds shall be deposited in the Subordinated Bond Fund, an amount sufficient to satisfy the requirements concerning the Debt Reserve Account shall be deposited in the Debt Reserve Account and the balance of the proceeds of the Bonds shall be deposited in the Bond Proceeds Account of the Construction Fund and shall be disbursed therefrom, in accordance with established procedures of the City; provided, however, that if such Bonds shall be issued for the purpose of funding or refunding Bonds previously issued by the City such proceeds shall, unless otherwise directed by the Supplemental Ordinance, be deposited in a special fund or account to be established with and held by the Fiscal Agent or another entity acting as an escrow agent and invested (if appropriate) and disbursed under the direction of the Director of Finance for the purpose of retiring the Bonds being funded or refunded.

Refunding Bonds

If the City shall, by Supplemental Ordinance, authorize the issuance of refunding Bonds pursuant to Section 10 of the Act, in the absence of specific direction or inconsistent authorization in the Supplemental Ordinance, the Director of Finance is authorized in the name and on behalf of the City to take all such action, including the irrevocable pledge of proceeds and the income and profit from the investment thereof for the payment and redemption of the funded or refunded Bonds, bonds or notes and, if there shall have been provided a Qualified Swap with respect to the Bonds to be refunded, provision for the payment, if any, of all amounts due and payable by the City under such Qualified Swap, and including the publication of all required redemption notices or the giving of irrevocable instructions therefor, as may be necessary or appropriate to accomplish the funding or refunding and to comply with the requirements of Section 10 of the Act.

Subordinated Bonds

The City may, at any time, or from time to time, issue Subordinated Bonds for any purpose permitted under the General Ordinance and under the Act. Subordinated Bonds shall be payable out of, and may be secured by a security interest in and a pledge and assignment of, Project Revenues and amounts on deposit in the Subordinated Bond Fund; provided, however, that any such security interest in and pledge and assignment of Project Revenues and amounts on deposit in the Subordinated Bond Fund shall be, and shall be expressed to be, subordinate in all respects to the security interest in, and pledge and assignment of, the Project Revenues and the amounts on deposit in the funds and accounts (other than the Rebate Fund but including the Subordinated Bond Fund) established under the General Ordinance for the security of the Bonds (other than Subordinated Bonds).

Annual Reports

The City covenants with the Holders of all Bonds Outstanding under the General Ordinance that so long as such Bonds shall remain Outstanding it will, within 120 days following the close of each Fiscal Year of the City or as soon thereafter as is practicable (not exceeding 150 days following the close of each Fiscal Year), file with the Fiscal Agent a report of the operation of the System, setting forth, among other things, in reasonable detail financial data concerning, and consolidated for, the water and wastewater components of the System for such Fiscal Year, including a balance sheet and a statement of income, expenses, and surplus (in each case not inconsistent with the statement of income, expenses, and other accounts of the City audited by the City Controller) prepared by the Water Department in accordance with generally accepted accounting principles consistently applied, showing compliance with the Rate Covenant, accompanied by a certificate of the Water Commissioner that the water and wastewater components of the System are in good operating condition and by a certificate of the Director of Finance that as of the date of such report the City has complied with all of the covenants in the General Ordinance and in all Supplemental Ordinances on its part to be performed. Such report shall be furnished to the Fiscal Agent in such reasonable number of copies as shall be required to meet the written requests of Bondholders therefor on a first come first served basis.

Disposition of Insurance Proceeds and Proceeds from the Sale of Assets

In the event that any assets of the System are destroyed or the City shall sell any assets of the System (except in the event of the sale or transfer of all or substantially all of the assets of the System to a municipal authority), the City shall, if the insurance proceeds or the proceeds from the sale of assets exceed 1.5% of the depreciated value of property, plant and equipment of the System, as shown on the financial statements of the City for the preceding Fiscal Year, apply such amounts, at the direction .of the Director of Finance or such other chief fiscal officer of the City as may hereinafter be established (i) to the retirement of the principal amount of debt incurred in respect to the System; (ii) to the reconstruction, repair or replacement of assets of the System; or (iii) to the making of capital additions or improvements to the System.

Bonds Not to Become Arbitrage Bonds

The General Ordinance provides that the City covenants for the benefit of the Bondholders that, notwithstanding any other provision of the General Ordinance or any other instrument, it will neither make nor instruct the Fiscal Agent to make any investment or other use of amounts on deposit in the funds and accounts established by the General Ordinance or other proceeds of the Bonds which would cause any Series of Bonds issued under the General Ordinance as tax-exempt to be arbitrage bonds under Section 148 of the Code and the regulations thereunder to the extent that the same are applicable at the time of such investment; it will file any reports required to be filed pursuant to the Code; and it will not take or fail to take any action so as to render any Series of Bonds issued under the General Ordinance as tax-exempt to be arbitrage bonds under Section 148 of the Code.

Prohibition Against Certain Uses of Funds; Enforcement

The City covenants that while any Bonds are Outstanding under the General Ordinance, it will not direct the Fiscal Agent to transfer, loan or advance proceeds of the Bonds or Project Revenues from the Water and Wastewater Funds to any City account for application other than for Water Department purposes.

If, on any date when a deposit is required to be made of the Project Revenues, the City fails to comply with any provision of the General Ordinance, the Fiscal Agent is authorized to and shall seek, by mandamus or other suit, action or proceeding at law or in equity, the specific enforcement or performance of the obligation of the City to cause the Project Revenues to be transferred to the Revenue Fund, and shall have any and all other rights and remedies of a fiscal agent under the General Ordinance, any Supplemental Ordinance, the Act or otherwise at law or in equity.

Credit Facilities and Qualified Swaps

All or any of the foregoing covenants of the City for the benefit of the Bondholders may also be for the benefit of the providers of any Credit Facility and any Qualified Swap to the extent provided in a Supplemental Ordinance or Determination.

Bonds May Be Subject to Redemption

Bonds of any Series may be subject to either optional or mandatory redemption at the times, in the order, in the amounts, at the redemption prices, and under such terms, conditions and restrictions, ail as may be set forth in the Supplemental Ordinance authorizing the issuance of such Series of Bonds or in the Determination relating to such Series of Bonds or, in the absence of such provisions, as may be set forth in the Bonds of such Series, at the direction of the Director of Finance. Notwithstanding or in limitation of the foregoing, a Supplemental Ordinance or Determination for a Series of Bonds may contain provisions for optional redemption of a Series of Bonds which may be retained by the City as a call option or may be held by the City or sold simultaneously with such Series of Bonds or at future dates as determined by such Supplemental Ordinance or Determination.

Effect of Redemption, Payment

Upon compliance with certain notice requirements stated in the General Ordinance, or upon irrevocable instructions to give such notice having been delivered to the Fiscal Agent, irrevocable instruction having been delivered to the Fiscal Agent to pay said Bonds or portions thereof and to pay the amount, if any, due and payable under any Qualified Swap related to said Bonds, and funds having been deposited in the Sinking Fund or the Subordinated Bond Fund (as the case may be) prior to the date fixed for redemption, the Bonds or portions thereof so called for redemption shall become due and payable on the redemption date so designated, and interest on such Bonds or portions thereof shall cease from such redemption date, whether such Bonds be presented for redemption or not. The principal amount of all Bonds or portions thereof so called for redemption, together with the premium, if any, and accrued interest thereon, shall be paid by the Fiscal Agent or any other paying agent designated in the Bonds, upon presentation and surrender thereof in negotiable form.

Partial Redemption

Upon presentation of any Bond which is to be redeemed in part only, the City and the Fiscal Agent shall execute and deliver to the Holder thereof, at the expense of the City, a new Bond or Bonds of authorized denominations in a principal amount equal to and of the same Series and maturity as the unredeemed portion of the Bond or Bonds so presented.

Fiscal Agent

The Fiscal Agent under the Prior Ordinance or its successor, shall be Fiscal Agent as of the Effective Date for the General Ordinance. The City may appoint a successor Fiscal Agent by Supplemental Ordinance to act as Fiscal Agent under the General Ordinance, and in connection with the Bonds issued under the General Ordinance. The Fiscal Agent shall also act as depository of the Sinking Fund and the Subordinated Bond Fund, and may act as paying agent and bonds registrar.

Nothing in the General Ordinance is to be construed to prevent the City, in accordance with law, from engaging other Fiscal Agents from time to time or to engage other paying agents of the Bonds or any Series thereof in addition to, or as a successor to the Fiscal Agent. Any entity appointed by the City as Fiscal Agent under the General Ordinance shall be a trust company or national or state bank having trust powers and combined capital and surplus of at least $50,000,000 and be qualified to serve pursuant to the Act. Any entity appointed by the City as Fiscal Agent under the General Ordinance as a successor to the Fiscal Agent shall assume all rights and obligations of the Fiscal Agent under the General Ordinance.

Subject to the foregoing, the General Ordinance provides that the proper officers of the City are authorized to enter into contracts or to confirm existing agreements governing the maintenance of funds and accounts and records, the disposal of cancelled Bonds, the rights, duties, privileges and immunities of the Fiscal Agent, and such other matters as are authorized by the Act and as are customary and appropriate and to confirm the agreement of the Fiscal Agent, in its several capacities, to comply with the provisions of the Act and of the General Ordinance.

The Fiscal Agent shall keep on file a copy of each report and its accompanying certificates delivered to it pursuant to the General Ordinance for a period of ten years and shall exhibit the same to, and permit the copying thereof by, any Bondholder or his authorized representative at all reasonable times.

Resignation of Fiscal Agent

The Fiscal Agent may resign and be discharged of the duties created by the General Ordinance by written resignation filed with the Director of Finance not less than 60 days before the date when such resignation is to take effect. Such resignation shall take effect on the day specified in such notice provided that a successor Fiscal Agent is appointed. If a successor Fiscal Agent is appointed prior to the date specified in the notice, the resignation shall take effect immediately on the appointment of such successor, and the City shall give the required notices described under “Appointment of Successor Fiscal Agent” below.

Appointment of Successor Fiscal Agent

If the Fiscal Agent or any successor Fiscal Agent resigns, is replaced, or is dissolved or if its property or business is taken under the control of any state or federal court or administrative body, a vacancy shall exist in the office of the Fiscal Agent, and the City shall appoint a successor within 30 days of such vacancy and shall mail notice of such appointment to the Bondholders and to the registered depositories at their registered addresses by first class mail, postage prepaid, within 30 days of such appointment.

Defaults and Statutory Remedies; Notice to Bondholders

If the City shall fail or neglect to pay or to cause to be paid the principal of, redemption premium, if any, or interest on any Bond or any Series of Bonds issued under the General Ordinance, whether at stated maturity or upon call for prior redemption, or if the City, after written notice to it, shall fail or neglect to make any payment owed by it as a result of a Credit Facility or Qualified Swap entered into with respect to Bonds and the provider of the Credit Facility or the Qualified Swap Provider provides written notification to the Fiscal Agent of such failure or neglect, or if the City shall fail to comply with any provision of any Bonds or with any covenant of the City contained in the General Ordinance, then, under and subject to the terms and conditions stated in the Act, the Holder or Holders of any Bond or Bonds shall be entitled to all of the rights and remedies, including the appointment of a trustee, provided in the Act; provided, however, that the remedy provided in Section 20(b)(4) of the Act may be exercised only upon the failure of the City to pay, when due, principal and redemption price (including principal due as a result of a scheduled mandatory redemption) and interest on a Series of Bonds.

Upon the occurrence of the event of default described above, or if an event occurs which could lead to a default with the passage of time and of which the Fiscal Agent has notice, the Fiscal Agent is required to, within 30 days, give written notice thereof by first-class mail to all Bondholders.

Remedies Not Exclusive; Effect of Delay in Exercise of Remedies

No remedy contained in the General Ordinance or in the Act conferred upon or reserved to the trustee, if any, or to the Holder of any Bond is intended to be exclusive (except as specifically provided in the Act) of any other remedy or remedies, and each and every such remedy shall be cumulative, and shall be in addition to every other remedy given under the General Ordinance or now or hereafter existing at law or in equity or by statute.

No delay or omission of a trustee, if one be appointed pursuant to Section 20 of the Act, or of any Holder of the Bonds to exercise any right or power accruing upon any default shall impair any such right or power or shall be construed to be a waiver of any such default, or an acquiescence therein; and every power and remedy provided with respect to an event of default under the General Ordinance, by the Act or otherwise may be exercised from time to time, and as often as may be deemed expedient.

Remedies to be Enforced Only Against Project Revenues

Any decree or judgment for the payment of money against the City by reason of default under the General Ordinance shall be enforceable only against the Project Revenues and the investments thereof and amounts on deposit in the funds and accounts (other than the Rebate Fund) established under the General Ordinance, and no decree or judgment against the City upon an action brought under the General Ordinance shall order or be construed to permit the occupation, attachment, seizure, or sale upon execution of any other property of the City.

Conveyance of System and Assignment, Assumption and Release

The General Ordinance provides that nothing in the General Ordinance is to prevent the City from conveying and assigning to a municipal authority created pursuant to the Municipality Authorities Act of 1945, as amended, or an authority created pursuant to any other applicable statute or to another entity (the "Authority") all or substantially all (or less than substantially all, as provided below) of its right, title and interest in the System and thereupon becoming released from all of its obligations under the General Ordinance, under any Supplemental Ordinance and under the Bonds and related obligations, including, but not limited to, Credit Facilities, Qualified Swaps and Exchange Agreements, (i) if the Authority assumes in writing the City's obligations (1) to operate or cause the System to be operated and to maintain or cause the System to be maintained in good condition; and (2) to pay the principal, redemption premium, if any, and interest on all Bonds issued, and all payments due under Credit Facilities, Qualified Swaps and Exchange Agreements entered into, pursuant to the General Ordinance and then outstanding according to the terms thereof; and (ii) if the instrument of assumption provides the Bondholders or the trustee or entity serving in a similar capacity and acting on behalf of the Bondholders with the substantial equivalent of all of the rights and remedies provided in the General Ordinance and the Act; provided, however, that before the City may consummate such a conveyance and assignment and obtain a release of its obligations under the General Ordinance, under any Supplemental Ordinance and under the Bonds, certain conditions are required to have been satisfied, including, without limitation, (a) the receipt by the City and the Fiscal Agent of certain opinions of counsel, (b) the granting of a security interest by the Authority to the trustee or entity serving in a similar capacity on behalf of the Bondholders, (c) a report of a Consulting Engineer detailing, among other things, continued compliance with covenants relating to Debt Service Requirements and (d) the conveyance and assignment to the Authority of amounts in the funds and accounts established under the General Ordinance. Upon a conveyance of all or substantially all of the assets of the System to the Authority, the General Ordinance provides that the provisions of the General Ordinance are to cease being enforceable against the City.

Amendments and Modifications*

In addition to the enactment of Supplemental Ordinances supplementing or amending the General Ordinance in connection with the issuance of successive Series of Bonds, the General Ordinance provides that the General Ordinance and any Supplemental Ordinance may be further supplemented, modified or amended: (a) to cure any ambiguity, formal defect or omission therein or to make such provisions in regard to matters or questions arising thereunder which shall not be inconsistent with the provisions thereof and which shall not adversely affect the interests of Bondholders; (b) to grant to or confer upon Bondholders, or a trustee, if any, for the benefit of Bondholders any additional rights, remedies, powers, authority, or security that may be lawfully granted or conferred; (c) to incorporate modifications requested by any Rating Agency to obtain or maintain a credit rating on any Series of Bonds; (d) to comply with any mandatory provision of state or federal law or with any permissive provision of such law or regulation which does not substantially impair the security or right to payment of the Bonds but no amendment or modification shall be made with respect to any Outstanding Bonds to alter the amount, rate or time of payment, respectively, of the principal thereof or the interest thereon or to alter the redemption provisions thereof without the written consent of the Holders of all affected Outstanding Bonds; and (e) except as aforesaid, in such other respect as may be authorized in writing by the Holders of 67% in principal amount or Original Value in the case of Capital Appreciation Bonds of the Bonds Outstanding and affected. In the case of a Credit Facility or Qualified Swap, if and to the extent provided in the Supplemental Ordinance and Determination of Bonds related thereto, the provider thereof may be the representative of the Bondholders of such Series or portion of such Series for purposes of Bondholder consent, approval or authorization. The written authorization of Bondholders of any supplement to or modification or amendment of the General Ordinance or any Supplemental Ordinance need not approve the particular form of any proposed supplement, modification or amendment but only the substance thereof. Bonds, the payment for which has been provided for upon the redemption thereof, are to be deemed to be not Outstanding.

* The provisions described under this heading will be amended upon the consent to the Springing Amendments of 67% of Holders of the outstanding Bonds. See APPENDIX III-B – "Twenty-First Supplemental Ordinance" attached to this Official Statement.

Deposit of Funds for Payment of Bonds

When interest on, and principal or redemption price (as the case may be) of, all Bonds issued under the General Ordinance, and all amounts owed under any Credit Facility, Qualified Swap and Exchange Agreement entered into under the General Ordinance, have been paid, or there shall have been deposited with the Fiscal Agent or an entity which would qualify as a Fiscal Agent under the General Ordinance an amount, evidenced by moneys or Qualified Escrow Securities the principal of and interest on which, when due, will provide sufficient moneys to fully pay the Bonds at the maturity date or date fixed for redemption thereof, and all amounts owed under any Credit Facility, Qualified Swap and Exchange Agreement entered into under the General Ordinance, the pledge and grant of a security interest in the Project Revenues made under the General Ordinance shall cease and terminate, and the Fiscal Agent and any other depository of funds and accounts established under the General Ordinance shall turn over to the City or to such person, body or authority as may be entitled to receive the same all balances remaining in any such funds and accounts established under the General Ordinance.

If the City deposits with the Fiscal Agent or such other qualified entity moneys or Qualified Escrow Securities sufficient to pay the principal or redemption price of any particular Bond or Bonds becoming due, either at maturity or by call for redemption or otherwise, together with all interest accruing thereon to the due date, interest on the Bond or Bonds shall cease to accrue on the due date and all liability of the City with respect to such Bond or Bonds shall likewise cease, except as provided in the following paragraph. Thereafter such Bond or Bonds shall be deemed not to be outstanding under the General Ordinance and shall have recourse solely and exclusively to the funds so deposited for any claims of whatsoever nature with respect to such Bond or Bonds, and the Fiscal Agent or such other qualified entity shall hold such funds in trust for such Holder or Holders.

Moneys deposited with the Fiscal Agent or such other qualified entity pursuant to the preceding paragraphs which remain unclaimed two years after the date payment thereof becomes due shall, upon written request of the City, if the City is not at the time to the knowledge of the Fiscal Agent or such other qualified entity (the Fiscal Agent having no responsibility to independently investigate), in default with respect to any covenant in the General Ordinance or the Bonds contained, be paid to the City; and the Holders of the Bonds for which the deposit was made shall thereafter be limited to a claim against the City; provided, however, that before making any such payment to the City, the Fiscal Agent or such other qualified entity shall, at the expense of the City, publish in a newspaper of general circulation published in Philadelphia, Pennsylvania, a notice that said moneys remain unclaimed and that, after a date named in said notice, which date shall be not less than 30 days after the date of publication of such notice, the balance of such moneys then unclaimed will be paid to the City.

The provisions regarding the deposit of funds for the payment of Bonds stated above are not be construed to limit the procedure set forth in Section 10 of the Act for calculating the principal or redemption price of and interest on any Bonds for the purpose of ascertaining the sufficiency of revenues for the purpose of Sections 7(a)(5) and 8(a)(iii) of the Act and for the purpose of determining the outstanding net debt of the City if General Obligation Bonds of the City are refunded pursuant to the Act.

Maintenance of Tax Exempt Status of Bonds

No deposit of funds for the payment of bonds shall be made if, in the opinion of Bond Counsel, such action shall cause the interest on any Series of Bonds initially issued as tax exempt Bonds, to become subject to Federal income tax.

Nothing contained in the General Ordinance shall require any Series of Bonds to be structured so that interest on such Bonds will be excluded from income of the Holders thereof for the purpose of calculating Federal income tax; provided that the provisions contained in the General Ordinance are satisfied.

Interested Parties

The General Ordinance provides that nothing in the General Ordinance expressed or implied is intended or is to be construed to confer upon, or to give to, any person or corporation, other than the City, the Owners of the Bonds, the Fiscal Agent, each provider of a Credit Facility, and Qualified Swap, Standby Agreement and Remarketing Agreement, any right, remedy or claim under or by reason of the General Ordinance or any covenants, condition or stipulation thereof; and all the covenants, stipulations, promises and agreements in the General Ordinance contained by and on behalf of the City shall be for the sole and exclusive benefit of the City, the Fiscal Agent, the Owners of the Bonds, each provider of a Credit Facility, Qualified Swap, Standby Agreement and Remarketing Agreement.

Ordinances are Contracts With Bondholders

The General Ordinance and Supplemental Ordinances adopted pursuant to the General Ordinance are contracts with the Holders of all Bonds from time to time Outstanding thereunder and are enforceable in accordance with the provisions of the General Ordinance and the laws of Pennsylvania.

Effectiveness

The General Ordinance provides that it is to become effective as to the holders of Bonds only upon consent in writing of the owners of not less than 67% in principal amount of all Bonds outstanding at the time of such consent.

THE EIGHTEENTH SUPPLEMENTAL ORDINANCE

A portion of the Series 2020 Bonds (the "Series 2020A New Money Bonds") will be issued under and subject to the Eighteenth Supplemental Ordinance, which supplements the provisions of the General Ordinance. Reference is made below to the Eighteenth Supplemental Ordinance and the General Ordinance, which provide more complete details of the terms of the Series 2020A New Money Bonds. All capitalized and defined terms used in the following summary of the Eighteenth Supplemental Ordinance that are not otherwise defined in this Official Statement are defined as in the General Ordinance.

Authorization, Scope and Purpose

The Eighteenth Supplemental Ordinance was enacted pursuant to the Act and constitutes a Supplemental Ordinance enacted for the purpose of authorizing one or more Series of Bonds within the meaning of the General Ordinance.

The Eighteenth Supplemental Ordinance authorizes the Bond Committee on behalf of the City, to borrow, by the issuance and sale of one or more series or subseries of Bonds, a sum or sums which in the aggregate principal amount shall not exceed $600,000,000 (the "New Money Bonds"), exclusive of original issue discount; and in the event such Bonds are issued with original issue discount, the Bond Committee is authorized to increase the aggregate principal amount of such Bonds so issued, by the amount of such original issue discount. The New Money Bonds shall be expended for the purposes of (a) constructing, acquiring, reconstructing and renovating wastewater treatment plants and related facilities and equipment for the sewer system; (b) constructing, acquiring, reconstructing and renovating water treatment plants and related facilities and equipment for the water system; (c) constructing, acquiring, reconstructing and replacing water, wastewater and stormwater pipes, pumping stations and related facilities; (d) purchasing equipment and apparatus of a capital nature for the water and wastewater systems; (e) constructing, acquiring, reconstructing and renovating stormwater management and mitigation improvements and facilities and other improvements and facilities in furtherance of the City's Combined Sewer Overflow (CSO) Long Term Control Plan Update (referred to as the Green City, Clean Waters Program) dated September 1, 2009, as permitted under the Act and the General Ordinance; and (f) purchasing vehicles that serve the water and wastewater system, all as included in capital budgets of the City; (g) paying any other Project Costs as such term is defined in the Act; (h) making the certain deposits with the Fiscal Agent; and (i) paying the issuance costs of such Bonds.

In accordance with the General Ordinance, the Bond Committee shall approve the final terms of Bonds issued under the Eighteenth Supplemental Ordinance (including the Series 2020A New Money Bonds) in one or more Determinations of the Bond Committee (each a "Determination") prior to, and as a condition of, the issuance of any series of such Bonds. Any such Determination shall be deemed a supplement to the Eighteenth Supplemental Ordinance.

The Bond Committee is authorized on behalf of the City to enter into agreements specified in a Determination (the "Enhancement Agreements") with any bank, insurance company or other appropriate entity providing credit enhancement or payment or liquidity sources (collectively a "Provider") for the account of the City for any Series of Bonds issued under the Eighteenth Supplemental Ordinance (including the Series 2020A New Money Bonds), including, without limitation, letters of credit and bond insurance. Such Enhancement Agreements may provide for payment of the principal or purchase price of or interest on such Bonds if the City does not pay such Bonds when due and may provide for repayment with interest to the Provider from the date of such payment.

The Eighteenth Supplemental Ordinance authorizes the Bond Committee or the Director of Finance, as appropriate, to make all such covenants and to take any and all such other actions on behalf of the City as may be necessary or appropriate in connection with the consummation of the transactions contemplated in the Eighteenth Supplemental Ordinance.

Terms of the Bonds

The Eighteenth Supplemental Ordinance provides that Bonds issued thereunder (including the Series 2020A New Money Bonds) shall be sold either at public competitive sale to the highest bidder or bidders or at a private negotiated sale, as the Bond Committee shall determine to be in the best interest of the City. Such Bonds may be sold in one or more Series or, as authorized by the General Ordinance and as specified by the Determination, in one or more subseries, each of which shall be deemed a Series for purposes of the General Ordinance and shall be designated by letter as a Series of Bonds of the year in which such Series is issued, and may include serial bonds, terms bonds, Capital Appreciation Bonds or derivative financial instruments as specified in the Determination.

The Eighteenth Supplemental Ordinance provides that the Bonds issued thereunder (including the Series 2020A New Money Bonds) shall not pledge the credit or taxing power of the City, or create any debt, charge or lien against the tax, general revenues or property of the City other than the revenues pledged by the General Ordinance.

Deposit of Bond Proceeds

As provided in the General Ordinance, accrued interest, if any, on Bonds issued under the Eighteenth Supplemental Ordinance (including the Series 2020A New Money Bonds) shall be deposited in the Sinking Fund. Remaining proceeds of such Bonds shall be deposited first in the Debt Reserve Account in an amount equal to the Debt Reserve Requirement to the extent that such requirement is not satisfied in whole or in part by available funds of the City or by a surety bond, insurance policy or letter of credit in accordance with the General Ordinance; all other proceeds and other moneys currently on deposit under the General Ordinance, including current reserves and construction funds, shall be deposited or transferred as provided in a certificate of the Director of Finance.

Requirements of the Act

Under the Eighteenth Supplemental Ordinance, in accordance with the Act, it is determined that the pledged Project Revenues will be sufficient to: (a) comply with the Rate Covenant and (b) pay all costs, expenses and payments required to be paid from pledged Project Revenues in the order and priority stated in the General Ordinance.

Prior to enactment of the Eighteenth Supplemental Ordinance by City Council, an opinion of the City Solicitor was filed with the City Council pursuant to the Act.

Payments from the Sinking Fund

The City covenants in the Eighteenth Supplemental Ordinance that, so long as any Bonds issued thereunder (including the Series 2020A New Money Bonds) shall remain outstanding, it will make payments or cause payments to be made out of the Sinking Fund established pursuant to the General Ordinance or any of the other Water and Wastewater funds available therefor, at such times and in such amounts as shall be sufficient for the payment of the interest (including the Qualified Swap payments if any) on such Bonds and the principal thereof when due.

Tax Covenants

The Eighteenth Supplemental Ordinance authorizes the Director of Finance and any other applicable City officer to make such additional covenants and to take such other action with respect to the use and investment of the proceeds of the Bonds issued thereunder (including the Series 2020A New Money Bonds) as may be necessary or advisable in order that such Bonds shall not be “arbitrage bonds” as defined in Section 148 of the Internal Revenue Code of 1986, as amended (the “Code”), that the City will comply with the requirements of Section 148 throughout the terms of such Bonds as described in the Determination and in order to otherwise effect or maintain the exclusion of interest on such Bonds from gross income of the holders thereof for federal income tax purposes, and further to establish such sub-accounts within the Sinking Fund and terms or restrictions to permit issuance of such Bonds.

Continuing Disclosure

The Eighteenth Supplemental Ordinance authorizes the Director of Finance to execute and deliver a Continuing Disclosure Agreement (the “Continuing Disclosure Agreement”) meeting the requirements of Rule 15c2-12 promulgated under Securities Exchange Act of 1934. The City covenants and agrees that it will comply with and carry out all of the provisions of the Continuing Disclosure Agreement.

THE TWENTIETH SUPPLEMENTAL ORDINANCE

A portion of the Series 2020 Bonds (the “Series 2020 Refunding Bonds”) will be issued under and subject to the Twentieth Supplemental Ordinance, which supplements the provisions of the General Ordinance. Reference is made below to the Twentieth Supplemental Ordinance and the General Ordinance, which provide more complete details of the terms of the Series 2020 Refunding Bonds. All capitalized and defined terms used in the following summary of the Twentieth Supplemental Ordinance that are not otherwise defined in this Official Statement are defined as in the General Ordinance.

Authorization, Scope and Purpose

The Twentieth Supplemental Ordinance was enacted pursuant to the Act and constitutes a Supplemental Ordinance enacted for the purpose of authorizing one or more Series of Bonds within the meaning of the General Ordinance.

The Twentieth Supplemental Ordinance authorizes the Bond Committee on behalf of the City to borrow, by the issuance and sale of one or more series or subseries of refunding Bonds of the City, a sum or sums which in the aggregate principal amount shall not exceed $200,000,000, exclusive of original issue discount; and in the event such Bonds are issued with original issue discount, the Bond Committee is authorized to increase the aggregate principal amount of such Bonds so issued by the amount of such original issue discount. Proceeds of such refunding Bonds may be expended to refund and redeem, at any time, all or any portion of then outstanding Bonds; (b) if applicable, pay the costs of Enhancement Agreements; (c) pay any other Project Costs as such term is defined in the Act; (d) make certain deposits with the Fiscal Agent; and (e) pay the issuance costs of such refunding Bonds

In accordance with the General Ordinance, the Bond Committee shall approve the final terms of Bonds issued under the Twentieth Ordinance (including the Series 2020 Refunding Bonds) in one or more Determinations of the Bond Committee prior to, and as a condition of, the issuance of any series of Twentieth Ordinance Bonds. Any such Determination shall be deemed a supplement to the Twentieth Supplemental Ordinance.

The Bond Committee is authorized on behalf of the City to enter into Enhancement Agreements (as specified in a Determination) with any Provider for the account of the City for any Series of Bonds issued under the Twentieth Supplemental Ordinance (including the Series 2020 Refunding Bonds), including, without limitation, letters of credit and bond insurance. Such Enhancement Agreements may, including, without limitation, letters of credit and bond insurance. Such Enhancement Agreements may provide for payment of the principal or purchase price of or interest on such Bonds if the City does not pay such Bonds when due and may provide for repayment with interest to the Provider from the date of such payment.

The Twentieth Supplemental Ordinance authorizes the Bond Committee or the Director of Finance, as appropriate, to make all such covenants and to take any and all such other actions on behalf of the City as may be necessary or appropriate in connection with the consummation of the transactions contemplated in the Twentieth Supplemental Ordinance.

Terms of the Bonds

The Twentieth Supplemental Ordinance provides that Bonds issued thereunder (including the Series 2020 Refunding Bonds) shall be sold either at public competitive sale to the highest bidder or bidders or at a private negotiated sale, as the Bond Committee shall determine to be in the best interest of the City. Such Bonds may be sold in one or more Series or, as authorized by the General Ordinance and as specified by the Determination, in one or more subseries, each of which shall be deemed a Series for purposes of the General Ordinance and shall be designated by letter as a Series of Bonds of the year in which such Series is issued, and may include serial bonds, terms bonds, Capital Appreciation Bonds or derivative financial instruments as specified in the Determination.

The Twentieth Supplemental Ordinance provides that Bonds issued thereunder (including the Series 2020 Refunding Bonds) shall not pledge the credit or taxing power of the City, or create any debt, charge or lien against the tax, general revenues or property of the City other than the revenues pledged by the General Ordinance.

Deposit of Bond Proceeds

As provided in the General Ordinance, accrued interest, if any, on Bonds issued under the Twentieth Supplemental Ordinance (including the Series 2020 Refunding Bonds) shall be deposited in the Sinking Fund. Remaining proceeds of such Bonds shall be deposited first in the Debt Reserve Account in an amount equal to the Debt Reserve Requirement to the extent that such requirement is not satisfied in whole or in part by available funds of the City or by a surety bond, insurance policy or letter of credit in accordance with the General Ordinance; all other proceeds and other moneys currently on deposit under the General Ordinance, including current reserves and construction funds, shall be deposited or transferred as provided in a certificate of the Director of Finance.

Requirements of the Act

Under the Twentieth Supplemental Ordinance, in accordance with the Act, it is determined that the pledged Project Revenues will be sufficient to: (a) comply with the Rate Covenant and (b) pay all costs, expenses and payments required to be paid from pledged Project Revenues in the order and priority stated in the General Ordinance.

Prior to enactment of the Twentieth Supplemental Ordinance by City Council, an opinion of the City Solicitor was filed with the City Council pursuant to the Act.

Payments from the Sinking Fund

The City covenants in the Twentieth Supplemental Ordinance that, so long as any Bonds issued thereunder (including the Series 2020 Refunding Bonds) shall remain outstanding, it will make payments or cause payments to be made out of the Sinking Fund established pursuant to the General Ordinance or any of the other Water and Wastewater funds available therefor, at such times and in such amounts as shall be sufficient for the payment of the interest (including the Qualified Swap payments if any) on such Bonds and the principal thereof when due.

Tax Covenants

The Twentieth Supplemental Ordinance authorizes the Director of Finance and any other applicable City officer to make such additional covenants and to take such other action with respect to the use and investment of the proceeds of the Bonds issued thereunder (including the Series 2020 Refunding Bonds) as may be necessary or advisable in order that such Bonds shall not be "arbitrage bonds" as defined in Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), that the City will comply with the requirements of Section 148 throughout the terms of such Bonds as described in the Determination and in order to otherwise effect or maintain the exclusion of interest on such Bonds from gross income of the holders thereof for federal income tax purposes, and further to establish such sub-accounts within the Sinking Fund and terms or restrictions to permit issuance of such Bonds.

Continuing Disclosure

The Twentieth Supplemental Ordinance authorizes the Director of Finance to execute and deliver a Continuing Disclosure Agreement meeting the requirements of Rule 15c2-12 promulgated under Securities Exchange Act of 1934. The City covenants and agrees that it will comply with and carry out all of the provisions of such Continuing Disclosure Agreement.

APPENDIX III-B

TWENTY-FIRST SUPPLEMENTAL ORDINANCE

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City of Philadelphia

(Bill No. 171110-A)

AN ORDINANCE

Constituting the Twenty-First Supplemental Ordinance to the Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended and supplemented (the "General Ordinance"), providing for certain amendments to the General Ordinance under certain terms and conditions.

THE COUNCIL OF THE CITY OF PHILADELPHIA HEREBY ORDAINS:

SECTION 1. *Amendment of Section 2.01 of the General Ordinance*. Section 2.01 of the Restated General Water and Wastewater Revenue Bond Ordinance of 1989, as amended and supplemented (the "General Ordinance"), entitled *Definitions* is hereby amended, as follows.

(a) The defined term "Balloon Bonds" is added after "Act" as set forth below.

> "Balloon Bonds" means any Series of Bonds, or any portion of a Series of Bonds, designated by a Determination as Balloon Bonds, (a) 25% or more of the principal payments (including mandatory sinking fund payments) of which are due in a single year, or (b) 25% or more of the principal of which may, at the option of the holder or holders thereof, be redeemed at one time; provided, however that a Variable Rate Bond that is able to be redeemed at the option of the Holder shall not constitute a Balloon Bond.

(b) The definition of "Credit Facility" is restated in its entirety as set forth below.

> "Credit Facility" means any letter of credit, standby bond purchase agreement, line of credit, surety bond, insurance policy or other insurance commitment or similar agreement (other than a Qualified Swap or an Exchange Agreement) that is provided by a commercial bank, insurance company or other institution.

(c) The defined term “Debt Reserve Facility” is added after “Debt Reserve Account” as set forth below.

“Debt Reserve Facility” has the meaning set forth in Section 4.09(e) hereof.

(d) The definition of “Debt Reserve Requirement” is restated in its entirety as set forth below.

“Debt Reserve Requirement” means (i) with respect to all Bonds outstanding (regardless whether interest thereon may be excluded from the gross income of the holder thereof for federal income tax purposes) (a) whose Debt Service Requirements are payable from the Sinking Fund (i.e., excluding Subordinated Bonds) and (b) that are of a Series for which the City has not created a Series Debt Reserve Subaccount, an amount equal to the greatest amount of Debt Service Requirements on such Bonds payable in any one Fiscal Year (except that such Debt Service Requirements will be computed as if any Qualified Swap did not exist and the Debt Service Requirements attributable to any Variable Rate Bonds may be based upon the fixed rate of interest as set forth in the Supplemental Ordinance or Determination for such Bonds) determined as of any particular date, and (ii) with respect to the amount to be deposited in the Debt Reserve Account, pursuant to the first paragraph of Section 4.09 hereof, in connection with the issuance of such a Series of Bonds, the lesser of (x) the amount necessary to comply clause (i) and (y) the maximum amount permitted to be financed with proceeds of Bonds permitted by Section 148(d)(1) the Code (or any successor provision).

(e) The definition of “Debt Service Requirements” is restated in its entirety as set forth below.

“Debt Service Requirements,” with reference to a specified period, means:

A. amounts required to be paid into any mandatory sinking fund established for the benefit of Bonds during the period;

B. amounts needed to pay the principal or redemption price of Bonds maturing during the period and not to be redeemed at or prior to maturity through any sinking fund established for the Bonds;

C. interest payable on Bonds during the period, with adjustments for capitalized interest or redemption through any sinking fund established for the benefit of Bonds; and

D. all net amounts, if any, due and payable by the City under a Qualified Swap during such period.

For purposes of estimating Debt Service Requirements for any future period, (i) any Option Bond outstanding during such period shall be assumed to mature on the stated maturity date thereof, except that the principal amount of any Option Bond tendered for payment and cancellation before its stated maturity date shall be deemed to accrue on the date required for payment pursuant such tender; and (ii) Debt Service Requirements on Bonds for which the City has entered into a Qualified Swap shall be calculated assuming that the interest rate on such Bonds shall equal the stated fixed or variable rate on the Qualified Swap or, if applicable and if greater such stated rate, the applicable rate for any Bonds issued in connection with the Qualified Swap adjusted, the case of a variable rate obligation, as provided in Section 5.01 hereof. Calculation of Debt Service Requirements with respect to Variable Rate Bonds and Balloon Bonds shall be subject to adjustment as permitted by Section 5.01(c) hereof.

(f) The defined term “Kroll” is added after “Interim Debt” as set forth below.

“Kroll” means Kroll Bond Rating Agency, Inc. and any successor thereto.

(g) The definition of “Rating Agency” is restated in its entirety as set forth below.

“Rating Agency” means any rating service that has issued a credit rating on the Bonds which is in effect at the time in question or, upon discontinuance of any of such

> rating services, such other nationally recognized rating service or services if any such rating service has issued a credit rating on the Bonds at the request of the City and such credit rating is in effect at the time in question."

(h) The defined term "Series Debt Reserve Requirement" is added after "Series" as set forth below.

> "Series Debt Reserve Requirement" means, for any Series of Bonds, the amount, if any, required pursuant to a Supplemental Ordinance or Determination to be reserved and (if such amount is greater than zero dollars ($0)) deposited or maintained in the Series Debt Reserve Subaccount established for such Series of Bonds; provided that such amount may equal zero dollars ($0); and provided further that such amount may not exceed the lesser of (i) the greatest amount of Debt Service Requirements payable on such Series of Bonds in any one Fiscal Year and (ii) the maximum amount permitted to be financed with proceeds of such Series of Bonds permitted by Section 148(d)(1) the Code (or any successor provision).

(i) The defined term "Series Debt Reserve Subaccount" is added after "Series Debt Reserve Requirement" as set forth below.

> "Series Debt Reserve Subaccount" means any subaccount of the Debt Reserve Account created, pursuant to a Supplemental Ordinance or Determination for a particular Series of Bonds, which Series of Bonds will not otherwise be secured by the Debt Reserve Account and for which a Series Debt Reserve Requirement applies.

(j) The definition of "Substitute Credit Facility" is restated in its entirety as set forth below.

> "Substitute Credit Facility" means any letter of credit, standby bond purchase agreement, line of credit, surety bond, insurance policy or other insurance commitment or similar agreement (other than a Qualified Swap or an Exchange Agreement) that replaces a Credit Facility and is provided by a commercial bank, insurance company or other financial institution."

SECTION 2. *Amendment of Section 4.09 of General Ordinance*. Section 4.09 of the General Ordinance is restated in its entirety as set forth below.

Section 4.09. *Debt Reserve Account*.

(a) Unless otherwise provided in the applicable Supplemental Ordinance in compliance with this Section 4.09, the City shall, under direction of the Director of Finance, deposit in the Debt Reserve Account from the proceeds of sale of each Series of Bonds issued hereunder, an amount which, when added to the existing balance in the Debt Reserve Account, will be equal to the Debt Reserve Requirement immediately after the issuance of such Series of Bonds. The money and investments in the Debt Reserve Account shall be held and maintained in an amount equal at all times to the Debt Reserve Requirement; provided that if the Supplemental Ordinance authorizing a Series of Bonds shall authorize the accumulation from Project Revenues of a reserve of such amount in respect of such Bonds over a period of not more than three (3) Fiscal Years after the issuance and delivery of such Bonds, then the full payment of the annual deposits required under such Supplemental Ordinance will meet the Debt Reserve Requirements of this Ordinance in respect of such Bonds.

(b) Notwithstanding any provision of subsection (a) of this Section 4.09 to the contrary, a Supplemental Ordinance may provide for the establishment of a Series Debt Reserve Requirement for each Series of Bonds issued pursuant to such Supplemental Ordinance, and a separate Series Debt Reserve Subaccount (if such Series Debt Reserve Requirement is greater than zero dollars ($0)) within the Debt Reserve Account in respect of such Series of Bonds. The City shall not designate a Series Debt Reserve Requirement for a Series of Bonds unless (i) such Series of Bonds will be refunding Bonds issued pursuant to Section 5.04(g) hereof, or (ii) the City first obtains written confirmation from any one Rating Agency then rating the Bonds that such action, in and of itself, will not result in a downgrade, suspension or withdrawal of the credit rating on any Bonds Outstanding hereunder. The City shall deposit in the Series Debt Reserve Subaccount created pursuant to any Supplemental Ordinance, the Series Debt Reserve Requirement for such Series of Bonds. The money and investments in each Series Debt Reserve Subaccount shall be held and maintained in an amount equal at all times to the Series Debt Reserve Requirement for such Series secured thereby, as provided in the Supplemental Ordinance authorizing such Series of Bonds. All amounts in each Series Debt Reserve Subaccount shall be available solely to secure and pay the Debt Service Requirements of the Bonds for which such subaccount was created pursuant to such Supplemental Ordinance; and the Holders of such Bonds shall otherwise have no interests in or rights to amounts in the Debt Reserve Account.

(c) If at any time and for any reason, the moneys in the Debt Service Account of the Sinking Fund shall be insufficient to pay, as and when due, the principal of (and premium, if any) or interest on any Bond or Bonds or other obligations payable from the Debt Service Account then due (including under Swap Agreements and Credit Facilities), the Fiscal Agent is hereby authorized and directed to withdraw from the Debt Reserve Account or, as applicable, any Series Debt Reserve Subaccount, and pay over the amount of such deficiency for deposit in the Debt Service Account to pay such obligations. If by reason of such withdrawal or for any other reason there shall be a deficiency in the Debt Reserve Account or a Series Debt Reserve Subaccount, the City hereby covenants to restore such deficiency promptly from Net Revenues; provided that in the event that there simultaneously shall be deficiencies in the Debt Reserve Account and one or more Series Debt Reserve Subaccounts, the City hereby covenants to restore such deficiencies from Net Revenues on a pari passu basis, based on the Debt Reserve Requirement and the Series Debt Reserve Requirement(s) outstanding; and provided further, that notwithstanding the preceding proviso, the Supplemental Ordinance or Determination pursuant to which a Series Debt Reserve Requirement is established may provide for the restoration of such a deficiency in the related Series Debt Reserve Subaccount from Net Revenues on a less than pari passu basis for the related Series of Bonds.

(d) (i) Subject to the provisions of Section 4.09(d)(ii) and Section 4.09(e), any moneys in the Debt Reserve Account or any Series Debt Reserve Subaccount in excess of, respectively, the Debt Reserve Requirement or the Series Debt Reserve Requirement, shall be transferred and applied, at the written direction of the City, to any of the following purposes:

(A) to the Debt Service Account, to pay the Debt Service Requirements on Bonds secured by such account or subaccount, including without limitation redemption price in connection with the optional redemption of any such Bonds; or

(B) to an escrow fund or account established to facilitate the payment of Bonds pursuant to Section 11.01 hereof, to pay the Debt Service Requirements on Bonds secured by such account or subaccount, including without limitation redemption price in connection with the optional redemption of any such Bonds; or

(C) if such moneys do not constitute tax-exempt bond proceeds, to the Residual Fund for the purposes thereof.

(ii) In connection with the issuance of refunding Bonds pursuant to Section 5.04(g) hereof, the City may transfer amounts from the Debt Reserve Account or a Series Debt Reserve Subaccount held by the Fiscal Agent in respect of the Bonds being refunded to the Debt Reserve Account or a Series Debt Reserve Subaccount to satisfy any debt reserve requirements in respect of such refunding Bonds.

(e) Notwithstanding the foregoing provisions, in lieu of the required deposits into the Debt Reserve Account or any Series Debt Reserve Subaccount thereof, the City may cause to be deposited therein a surety bond or an insurance policy payable to the Fiscal Agent for the account of the Bondholders and any Qualified Swap or an irrevocable letter of credit to be benefitted thereby in an amount equal to the difference between the Debt Reserve Requirement or the Series Debt Reserve Requirement and the remaining sums, if any, then on deposit in the Debt Reserve Account or Series Debt Reserve Subaccount. The surety bond, insurance policy or letter of credit (hereinafter referred to, collectively, as the “Debt Reserve Facility”) shall be payable (upon the giving of notice as required thereunder) on any interest payment date on which moneys will be required to be withdrawn from the Debt Reserve Account or Series Debt Reserve Subaccount and applied to the payment of Debt Service Requirements of the Bonds secured thereby if such withdrawal cannot be met by amounts on deposit in the Debt Reserve Account or Series Debt Reserve Subaccount, or provided from any other Fund under this Ordinance.

If a disbursement is made pursuant to a surety bond, an insurance policy or a letter of credit provided pursuant to this subsection, the City shall be obligated either (i) to reinstate the maximum limits of the surety bond insurance policy or letter of credit or (ii) to deposit into the Debt Reserve Account or applicable Series Debt Reserve Subaccount, funds in the amount of the disbursement made under such surety bond insurance policy or letter of credit, or combination of such alternatives, as shall provide that the amount in the Debt Reserve Account or applicable Series Debt Reserve Subaccount equals the Debt Reserve Requirement or the Series Debt Reserve Requirement within a time period not longer than would be required to restore the Debt Reserve Account or the Series Debt Reserve Requirement by operation of this Section 4.09 and from the same source of funds as provided herein.

The insurer providing a surety bond or insurance policy pursuant to this subsection (e) shall be an insurer whose municipal bond insurance policies insuring the payment, when due, of the principal of and interest on municipal bond issues results in such issues being rated in not lower than the “A” category (without regard to gradations) by any one Rating Agency. The letter of credit issuer providing a letter of credit pursuant to this subsection (e) shall be a bank or trust company that is rated not lower than the “A” category (without regard to gradations) by any one Rating Agency; and the letter of credit itself shall be rated in at least “A” category of such Rating Agency. Upon the occurrence of any reduction or suspension of any credit rating with respect to such bond insurance policy or letter of credit or the provider thereof) required by this Section 4.09, the City shall so notify the provider of the surety, bond insurance policy or letter of credit and prior to the effective date of any cancellation of such surety, bond insurance policy or letter of credit, shall either provide a substitute surety bond, insurance policy or letter of credit rating requirements of this Section 4.09 or shall deposit cash in the Debt Reserve Account or applicable Series Debt Reserve Subaccount so that the amount in such account or subaccount shall equal the Debt Reserve Requirement or Series Debt Reserve Requirement, respectively.

In the event that after the City has deposited cash as required in connection with a Debt Reserve Facility rating reduction or suspension, but prior to any cancellation thereof, such Debt Reserve Facility meets the rating criteria set forth in this subsection for deposit, no excess of the Debt Reserve Requirement shall result for purposes of Section 4.09(d) hereof.

SECTION 3. *Amendment of Section 5.01 of General Ordinance*. Section 5.01 of the General Ordinance is restated in its entirety as set forth below.

Section 5.01. *Rate Covenant*.

(a) The City covenants with the Bondholders that it will, at a minimum, impose, charge and collect in each Fiscal Year such water and wastewater rents, rates, fees and charges as shall yield Net Revenues which shall be equal to at least:

(i) 1.20 times the Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); and

(ii) 0.90 times Debt Service Requirements for such Fiscal Year (excluding Debt Service Requirements in respect of Subordinated Bonds); provided that, for purposes of this clause (ii), Net Revenues shall be calculated to exclude therefrom any amounts transferred from the Rate Stabilization Fund to the Revenue Fund in, or as of the end of, such Fiscal Year; and

(iii) 1.00 times (A) the Debt Service Requirements for such Fiscal Year (including Debt Service Requirements in respect of Subordinated Bonds); (B) amounts required to be deposited into the Debt Reserve Account during such Fiscal Year; (C) the principal or redemption price of and interest on General Obligation Bonds payable during such Fiscal Year; (D) debt service requirements on Interim Debt payable during such Fiscal Year; and (E) the Capital Account Deposit Amount for such Fiscal Year (less any amounts transferred from the Residual Fund to the Capital Account during such Fiscal Year).

(b) In estimating Debt Service Requirements on any Interim Debt for the purposes of projecting compliance with this Section, the City shall be entitled to assume that (i) such Interim Debt will be amortized over a period of up to the maximum term permitted by the Act, provided, however, such period shall not be in excess of the useful life of the assets to be financed, on an approximately level debt service basis and bear interest at the average interest rate on bonds of a similar maturity and credit rating (without any credit enhancement) as the Bonds outstanding under this Ordinance. Promptly upon ·any material change in the circumstances which were contemplated at the time such rents, rates, fees and charges were most recently reviewed, but not less frequently than once in each Fiscal Year, the City shall review the rents, rates, fees and charges as necessary to enable the City to comply with the foregoing requirements; provided that such rents, rates, fees and charges shall in any event produce moneys sufficient to enable the City to comply with its covenants in this Ordinance.

(c) In estimating Debt Service Requirements on any Variable Rate Bonds for purposes of projecting compliance with this Section or funding the Reserve Account, the City shall be entitled to assume that such Variable Rate Bonds will bear interest at a rate equal to (i) the average interest rate on the Variable Rate Bonds during the period of twenty-four (24) consecutive calendar months preceding the date of calculation or (ii) if the Variable Rate Bonds were not Outstanding during the entire twenty-four (24) month period, the average interest rate on the Variable Rate Bonds since their date of issue or (iii) such other rate as may be specified in a Supplemental Ordinance or Determination.

(d) The City represents that it has, by its Code of General Ordinances, as amended, authorized the imposition of rents, rates, fees and charges by the Water Department sufficient from time to time to comply with the Rate Covenant and covenants with the Holders of Bonds that it will not repeal or materially adversely dilute or impair such authorization.

SECTION 4. *Amendment of Section 5.01(c) of General Ordinance*. Section 5.01 of the General Ordinance is further amended by restating subsection (c) thereof in its entirety as set forth below.

(c)(i) In the event that any Bonds Outstanding are, or any proposed Series of Bonds are to be, Balloon Bonds, then Debt Service Requirements on such Balloon Bonds shall be calculated for purposes of projecting compliance with this Section and Section 5.04, or for purposes of determining the Debt Reserve Requirement or Series Debt Reserve Requirement (as applicable) for a particular Series of Balloon Bonds, whether for any period prior to or after the date of calculation, as follows.

(A) If such Balloon Bonds are not Capital Appreciation Bonds, then, for purposes of determining Debt Service Requirements, each maturity that constitutes Balloon Bonds shall, unless otherwise provided in a Supplemental Ordinance under which such Balloon Bonds are issued, be treated as if it were to be amortized over a period of no more than 30 years and with substantially level annual debt service funding payments commencing not later than the year following the year in which such Balloon Bonds were issued, and extending not later than the stated or deemed, as the case may be, final maturity of such Balloon Bonds, but in no event later than 30 years from the date such Balloon Bonds were originally issued; and the interest rate used for such computation shall be that rate quoted in The Bond Buyer 25 Revenue Bond Index, or its successor or replacement index, for the last week of the month preceding the date of calculation as published by *The Bond Buyer,* or if that index is no longer published, another similar index designated in a Determination, or if a Determination fails to select a replacement index, that rate determined by a banking institution or an investment banking institution as the interest rate or rates at which the City could reasonably expect to borrow by incurring indebtedness with the same term as assumed above, with no credit enhancement and taking into consideration whether such Bonds bear interest which is or is not excluded from gross income for federal income tax purposes; with respect to any Bonds only a portion of which constitutes Balloon Bonds, the remaining portion shall be treated as described in such other provision of the definition of Debt Service Requirements as shall be applicable and, with respect to any Bonds or that portion of a series thereof which constitutes Balloon Bonds, all Debt Service Requirements becoming due prior to the year of the stated maturity of the Balloon Bonds shall be treated as described in such other provision of Debt Service Requirements as shall be applicable; and

(B) If such Balloon Bonds are Capital Appreciation Bonds, by assuming that the Accreted Value of such Bonds for purposes of determining Debt Service Requirements, each maturity that constitutes Balloon Bonds shall, unless otherwise provided in a Supplemental Ordinance under which such Balloon Bonds are issued, be treated as if it were to be amortized over a period of no more than 30 years and with substantially level annual debt service funding payments commencing not later than the year following the year in which such Balloon Bonds were issued, and extending not later than the stated or deemed, as the case may be, final maturity of such Balloon Bonds, but in no event later than 30 years from the date such Balloon Bonds were originally issued; and the interest rate used for such computation shall be that rate quoted in The Bond Buyer 25 Revenue Bond Index, or its successor or replacement index, for the last week of the month preceding the date of calculation as published by *The Bond Buyer*, or if that index is no longer published, another similar index designated in a Determination, or if a Determination fails to select a replacement index, that rate determined by a banking institution or an investment banking institution as the interest rate or rates at which the City could reasonably expect to borrow by incurring indebtedness with the same term as assumed above, with no credit enhancement and taking into consideration whether such Bonds bear interest which is or is not excluded from gross income for federal income tax purposes; with respect to any Bonds only a portion of which constitutes Balloon Bonds, the remaining portion shall be treated as described in such other provision of the definition of Debt Service Requirements as shall be applicable and, with respect to any Bonds or that portion of a series thereof which constitutes Balloon Bonds, all Debt Service Requirements becoming due prior to the year of the stated maturity of the Balloon Bonds shall be treated as described in such other provision of Debt Service Requirements as shall be applicable.

(ii) In estimating Debt Service Requirements on any Variable Rate Bonds for purposes of projecting compliance with this Section or funding the Reserve Account, the City shall be entitled to assume that such Variable Rate Bonds will bear interest at a rate equal to (A) the average interest rate on the Variable Rate Bonds during the period of twenty-four (24) consecutive calendar months preceding the date of calculation or (B) if the Variable Rate Bonds were not Outstanding during the entire twenty-four (24) month period, the average interest rate on the Variable Rate Bonds since their date of issue or (C) such other rate as may be specified in a Supplemental Ordinance or Determination.

SECTION 5. *Amendment of Section 10.01 of General Ordinance*. Section 10.01 of the General Ordinance is restated in its entirety as set forth below.

Section 10.01. *Amendments and Modifications.* In addition to the enactment of Supplemental Ordinances supplementing or amending this Ordinance in connection with the issuance of successive Series of Bonds, this Ordinance and any Supplemental Ordinance may be further supplemented, modified or amended: (a) to cure any ambiguity, formal defect or omission herein or therein or to make such provisions in regard to matters or questions arising hereunder or thereunder which shall not be inconsistent with the provisions hereof or thereof and which shall not adversely affect the interests of Bondholders; (b) to grant to or confer upon Bondholders, or a trustee, if any, for the benefit of Bondholders any additional rights, remedies, powers, authority, or security that may be lawfully granted or conferred; (c) to incorporate modifications requested by any Rating Agency or Credit Facility provider to obtain or maintain a credit rating on any Series of Bonds; (d) to comply with any mandatory provision of state or federal law or with any permissive provision of such law or regulation which does not substantially impair the security or right to payment of the Bonds; provided however that no amendment or modification discussed in parts (a)-(d) of this Section 10.01 shall be made with respect to any Outstanding Bonds to alter the amount, rate or time of payment, respectively, of the principal thereof or the interest thereon or to alter the redemption provisions thereof without the written consent of the Holders of all affected Outstanding Bonds; and (e) except as aforesaid, in such other respect as may be authorized in writing by the Holders of a majority in principal amount or Original Value in the case of Capital Appreciation Bonds of the Bonds Outstanding and affected. In the case of a Credit Facility, Standby Agreement or Qualified Swap, if and to the extent provided in the Supplemental Ordinance and Determination of Bonds related thereto, the provider thereof may be the representative of the Bondholders of such Series or portion of such Series for purposes of Bondholder consent, approval or authorization. The written authorization of Bondholders of any supplement to or modification or amendment of this Ordinance or any Supplemental Ordinance need not approve the particular form of any proposed supplement, modification or amendment but only the substance thereof. Bonds, the payment for which has been provided for in accordance with Section 6.04 hereof, shall be deemed to be not Outstanding.

SECTION 6. *Other Elections Under the General Ordinance*. The Bond Committee is authorized on behalf of the City, without any further action by City Council, to make any and all additional elections under the General Ordinance as it shall determine to be in the best interest of the City as and when it shall deem such elections to be appropriate.

SECTION 7. *Effect of Ordinance*. This Ordinance is amendatory and supplementary to the General Ordinance and all sections of the General Ordinance and the Act not inconsistent herewith shall remain effective. All definitions of terms contained in the General Ordinance shall apply to such terms in this Ordinance, except to the extent they are amended by this Ordinance. No further action of City Council is necessary for this Ordinance to become effective. Sections 1(c), 1(d) and 1(f), Section 3 and Section 7 shall become effective immediately. Notwithstanding Section 8, the amendments set forth in Sections 1 through 5 (except Sections 1(c), 1(d) and 1(f) and Section 3) shall become effective upon the consent of the Holders of at least sixty- seven percent (67%) of the Outstanding Bonds (the "67% Effective Date"). The City, through the Director of Finance, shall publish notice of the 67% Effective Date to all Holders upon the occurrence of the consent of at least sixty-seven percent (67%) of the Outstanding Bonds. Publication through the Electronic Municipal Market Access System (EMMA) or such other nationally recognized municipal securities information repository shall constitute an acceptable mode of publication.

SECTION 8. *Effective Date*. Subject to the provisions of Section 7, this Ordinance shall take effect immediately.

CERTIFICATION: This is a true and correct copy of the original Bill, Passed by the City Council on April 12, 2018. The Bill was Signed by the Mayor on April 24, 2018.

Michael A. Decker
Michael A. Decker
Chief Clerk of the City Council

APPENDIX IV

GOVERNMENT AND FINANCIAL INFORMATION OF THE CITY OF PHILADELPHIA

The Bonds are payable solely from Project Revenues and monies deposited in the water and wastewater funds. The Bonds are special obligations of the City and do not pledge the full faith, credit or taxing power of the City, or create any debt or charge against the tax or general revenues of the City, or create any lien or charge against any property of the City other than against the Project Revenues and amounts, if any, at any time on deposit in the water and wastewater funds. This APPENDIX IV is included for purposes of providing general financial information regarding the City.

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OVERVIEW

The City of Philadelphia (the "City" or "Philadelphia"), located along the southeastern border of the Commonwealth of Pennsylvania (the "Commonwealth" or "Pennsylvania"), is the largest city in the Commonwealth and the sixth largest city in the United States with approximately 1.584 million residents (based on 2018 estimates). According to the 2010 U.S. Census, the City increased its population in the ten years from 2000 to 2010, reflecting the City's first population gain in 60 years. From 2010 to 2018, the City increased its population by 3.6%. The City is also the center of the United States' eighth largest metropolitan statistical area, which is an 11-county area encompassing the City, Camden, NJ, and Wilmington, DE and represents approximately 6.1 million residents (based on 2018 estimates).

The City benefits from its strategic geographical location, relative affordability, cultural and recreational amenities, and its growing strength in key industries. The City's economy is composed of diverse industries, with virtually all classes of industrial and commercial businesses represented. The City is a major regional business and personal services center with strengths in insurance, law, finance, healthcare, higher education, utilities, and the arts. In addition, the City is a center for health, education, research and science facilities with the nation's largest concentration of healthcare resources within a 100-mile radius.

The cost of living in the City is relatively moderate and affordable compared to other major metropolitan areas in the northeast United States. The City, as one of the country's education centers, offers its business community a large and diverse labor pool that draws from major universities including, within the geographical boundaries of the City, the University of Pennsylvania ("Penn"), Temple University, Drexel University, St. Joseph's University, and LaSalle University, among others.

Fiscal Health of the City

The City has implemented several strategies to address significant fiscal challenges, including the novel coronavirus ("COVID-19") pandemic, for Fiscal Year 2020 and over the course of Fiscal Years 2021-2025, which are described in the Fiscal Year 2021 Adopted Budget (as defined herein) and the Twenty-Ninth Five-Year Plan (as defined herein), respectively.

COVID-19: Due to the increase in the number of cases of COVID-19 around the country and internationally, federal, state, and local governmental bodies have enacted legislation, regulations, and administrative orders, directives, and guidance to mitigate the impacts of COVID-19 on the general population and the economy. In March 2020, the Governor of Pennsylvania declared a disaster emergency in the Commonwealth, which was followed by stay at home orders for an increasing number of counties in Commonwealth (extended to the entire Commonwealth on April 1, 2020). In subsequent executive orders, the restrictions of the Governor's stay at home order have been eased throughout the Commonwealth. The Mayor and City Council have also taken various emergency measures and other actions to respond to the spread of COVID-19 in the City. Similar emergency measures have been implemented in neighboring counties in New Jersey and Delaware.

Plans for Reopening Pennsylvania. The Governor has announced plans for a measured reopening of the Commonwealth and the gradual easing of public health and safety restrictions, to strategically reopen the economy, while minimizing public health risks. Such plans include a three-phase matrix to determine when counties and/or regions would be ready to begin easing some restrictions on work, congregate settings, and social interactions. Each phase is applied on a region-by-region basis and the shift from one phase to another is based upon the incidence rate of COVID-19 cases per capita, regional health care testing capabilities, contact tracing, and an evaluation of the region's high-risk settings.

- **Red Phase**. The red phase is designed to minimize the spread of COVID-19 through strict social distancing, closures of non-life sustaining businesses and schools, and building safety protocols. No counties in the Commonwealth are currently in the red phase.

- **Yellow Phase**. The yellow phase is expected to ease some restrictions on returning to work and social interaction while others, such as closures of schools, gyms, entertainment venues, and other indoor recreation centers, as well as limitations around large gatherings, would remain in place. Retail locations are able to open with safety precautions in place relating to worker and building safety. This phase is designed to reopen the economy while continuing to closely monitor public health data to ensure the spread of COVID-19 remains contained to the greatest extent possible.

- **Green Phase**. The green phase eases most restrictions by lifting the stay at home and business closure orders to allow the economy to strategically reopen while continuing to prioritize public health. In this phase, public health indicators continue to be monitored and orders and restrictions are adjusted as necessary to ensure the spread of COVID-19 remains at a minimum. All counties in the Commonwealth are currently in the green phase.

As of the date hereof, the City is in the green phase with its related restrictions, as described above. However, the City has adopted a "modified, restricted green phase," which slows certain aspects of the reopening process. The City currently expects to fully reopen no earlier than August 1, 2020. No assurances can be given that circumstances will not deteriorate in the future as a result of a subsequent COVID-19 outbreak.

For more information on the City's response to COVID-19, see the forepart of this Official Statement and "INTRODUCTORY STATEMENT – COVID-19 Response" and "CERTAIN INVESTMENT CONSIDERATIONS – COVID-19."

Fiscal Impact. The City continues to closely monitor and assess the effects of the COVID-19 pandemic and its economic, operating, financial, and budgetary impact on the City. Such impact is expected to be significant, but cannot be fully quantified at this time. As a result of revenue losses and increases in expenses relating to COVID-19 and the ensuing economic downturn, the City identified a $749 million budgetary gap for Fiscal Year 2021 to be addressed in the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan through reductions to planned spending, reduced reserve levels, and increased tax rates. For more information on the City's historical financial operations and the City's projected General Fund balances for Fiscal Years 2020-2025, see "– Fiscal Health of the City – General Fund Reserves" and "DISCUSSION OF FINANCIAL OPERATIONS" and Tables 1 and 2 (and the text following Table 2) herein.

The Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan reflect the sudden, dramatic changes in service demands, unanticipated costs, and economic conditions as a result of the COVID-19 global pandemic and the City's associated response.

Revenues. With all but essential City services and businesses ceasing operations and with schools closed and City workers focused on preventing the spread of COVID-19 and treating those affected, the City has seen an immediate impact on certain revenue sources, resulting in projected revenues of $4.58 billion in Fiscal Year 2021, a $278.6 million (5.7%) decrease compared to the current estimate for Fiscal Year 2020. For Fiscal Year 2021, the City is currently projecting a decline in various components of its tax base, including decreases in Wage and Earnings Taxes, Real Estate Taxes, Real

Property Transfer Taxes, Sales and Use Taxes, and Business Income and Receipts Taxes ("BIRT"), resulting in projected tax collections of $3.33 billion in Fiscal Year 2021, a $192.7 million (5.5%) decrease compared to the current estimate for Fiscal Year 2020.

The impact on Wage and Earnings Taxes is compounded because commuters account for about 40% for all Wage and Earnings Taxes and such tax is not due when those commuters are required to work from home outside the City. If there are more long-term or permanent shifts to work from home, changes in consumer preferences, and population shifts, then there may be a greater and lasting negative impact on City finances.

The City is also projecting reductions in amusement and hotel taxes, among other tax base impacts. The City is currently estimating that total tax collections will be less than in Fiscal Year 2020. As of the date hereof, no federal funds have been approved to offset revenue losses. The City is evaluating measures to maximize reimbursements from the Federal Emergency Management Agency ("FEMA") and other federal and Commonwealth sources and working to identify and leverage all federal stimulus funding entitlements available to the City. For information on the current estimates for tax revenues for Fiscal Year 2020 and budgeted amounts for Fiscal Year 2021, see "– Fiscal Health of the City – Tax Revenues" and "REVENUES OF THE CITY" and Table 3 herein.

Expenses. The City is projecting higher costs for essential services and increased fixed costs, including overtime and other added labor costs and higher pension payments. With tax filing and payment deadlines delayed, the City also expects lower near-term collections and plans to issue tax and revenue anticipation notes in Fiscal Year 2021 to maintain cash flow (see "OTHER FINANCING RELATED MATTERS – Recent and Upcoming Financings – *Upcoming Financings*").

The City has incurred in Fiscal Year 2020 and projects for Fiscal Year 2021 significant new expenses for healthcare to reduce the spread of COVID-19 and treat those affected, including labor costs and expenses for testing sites and supplies, quarantine locations and services, surge hospital capacity, medical vehicles, personal protective equipment, disinfectant/cleaning supplies, morgue capacity, and business supports.

On March 27, 2020, Congress passed the Coronavirus Aid, Relief, and Economic Security Act (the "CARES Act"), which provided the City with certain federal stimulus funding for COVID-19-related expenses. The City received $276 million in such federal funds in April 2020. The Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan include CARES Act funding for Fiscal Years 2020 and 2021 in the amounts of $100 million in the General Fund and $176 million in the Grants Revenue Fund, respectively. The Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan do not include potential federal stimulus funding entitlements, reimbursements from FEMA, or funds from other federal or Commonwealth sources that may be received.

Budget Measures. The projected revenue losses and increases in expenses described above are expected to be addressed with reductions to planned spending, reduced reserve levels, and new revenue sources.

Even with budgetary spending pressures, the City expects to increase its annual contribution to the School District of Philadelphia (the "School District") by $30.1 million from $222.5 million in Fiscal Year 2020 to $252.6 million in Fiscal Year 2021. For more information on the School District, see "– Fiscal Health of the City – Increased Funding for the School District," "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Local Government Agencies – Mayoral-Appointed or Nominated Agencies – The School District," Table 6 – Real Estate Tax Rates and Allocations, and "EXPENDITURES OF THE CITY – City Payments to School District" and Table 21 herein.

With respect to cuts to expenses, the City expects to reduce spending with a hiring freeze, layoffs for temporary, seasonal, and part-time workforce, pay cuts, and containing labor costs with the City's unions. The City also expects to implement targeted cost saving initiatives to reduce certain overtime expenses and eliminate vacant positions, among others.

The City is projecting that Fiscal Year 2021 will end with a cumulative adjusted year end General Fund balance of $51.4 million. For more information on the City's historical financial operations and the City's projected General Fund balances for Fiscal Years 2020-2025, see "– Fiscal Health of the City – General Fund Reserves" and "DISCUSSION OF FINANCIAL OPERATIONS" and Tables 1 and 2 (and the text following Table 2) herein.

The Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan include budgeted reserves for specific costs or scenarios in the future. Over the course of the Twenty-Ninth Five-Year Plan, the City has reduced the projected overall reserve allocations to make a portion of those funds available for the delivery of services, while maintaining a minimal level of reserve balances to guard against greater than expected revenue losses or new spending pressures. For information on budgeted reserves, see "– Fiscal Health of the City – Budgeted Reserves" and "DISCUSSION OF FINANCIAL OPERATIONS," Table 1, footnotes 12, 13, 14, 15, and 16, and Table 2, footnotes 7, 8, 9, 10, and 11 herein.

The City also expects to draw down on the funds set aside in the Budget Stabilization Reserve. For information on the Budget Stabilization Reserve, see "– Fiscal Health of the City – Budget Stabilization Reserve" and "DISCUSSION OF FINANCIAL OPERATIONS – Budget Stabilization Reserve" herein.

The Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan include certain revenue enhancements, totaling $40.6 million in Fiscal Year 2021. Such revenue enhancements include (i) freezing the BIRT rate at the Fiscal Year 2020 level for the next three Fiscal Years; (ii) freezing the resident rate for Wage and Earnings Taxes and Net Profits Taxes at the Fiscal Year 2020 level for the next three Fiscal Years; (iii) raising the non-resident rate for Wage and Earnings Taxes and Net Profits Taxes for one year; (iv) raising the parking tax rate for one year; (v) eliminating the discount for early payment of Real Estate Taxes; (vi) adjusting license and permit fees; and (vii) raising the commercial refuse fee.

The City continues to closely monitor and assess the effects of the COVID-19 pandemic and its impact on the City's financial position and operations. The full fiscal impact of COVID-19 on the City is likely to change significantly as the situation further develops and is expected to impact various economic sectors throughout the City, including higher education, healthcare, travel, leisure and hospitality, and professional services, among others. It is not possible at present to project with any reasonable degree of certainty the impact on City revenues, expenditures, reserves, budgets, or financial position. Such overall impact will depend heavily on future events and actions by the federal and Commonwealth governments, as well as other nations around the world. No assurance can be given regarding future events or impacts because many actions and events are unpredictable, unknowable at this time, and outside the control of the City.

The information provided by the City in this Official Statement and previous filings by the City on EMMA was provided as of the respective dates and for the periods specified therein and is subject to change without notice. In particular, the dates as of and periods for which information was provided in this Official Statement and previous filings by the City on EMMA may have occurred before the COVID-19 pandemic and before realizing the economic impact of measures instituted to slow the spread of

COVID-19. Accordingly, such information may not be indicative of future results or performance due to these and other factors.

General Fund Reserves: In the Fiscal Year 2020 Adopted Budget (as defined herein), the City projected that Fiscal Year 2019 would end with a cumulative adjusted year end General Fund balance of $209.9 million. Based on the actual results included in the City's CAFR for Fiscal Year 2019 (the "Fiscal Year 2019 CAFR"), the City reported that Fiscal Year 2019 ended with a cumulative adjusted year end General Fund balance of $438.7 million. Such number has been included as part of the current estimate for Fiscal Year 2020 in the Twenty-Ninth Five-Year Plan. As such, the City's current estimate is that Fiscal Year 2020 will end with a cumulative adjusted year end General Fund balance of $254.9 million, below the Mayor's target for the General Fund balance of 6-8% of expenditures.

Over the course of the Twenty-Ninth Five-Year Plan, the City's projected General Fund balance averages approximately $117.8 million per Fiscal Year (as defined herein), with a low of $50.8 million in Fiscal Year 2022. After including the current estimate of the General Fund balance for Fiscal Year 2020, as included in the Twenty-Ninth Five-Year Plan, the average fund balance over this same period would be $140.8 million (assuming no other changes). These projected General Fund balances incorporate budgeted amounts for certain budgeted reserves and expected contributions to the Budget Stabilization Reserve in Fiscal Year 2025 (each as described below).

The City's General Fund balance still remains below recommended levels. The Government Finance Officers Association ("GFOA") recommends fund balances of approximately 17% of revenues or expenditures and the City's General Fund balances over the course of the Twenty-Ninth Five-Year Plan are projected to be below the City's internal 6-8% goal. The projected Fiscal Year 2021 General Fund balance of $51.4 million, as noted above, is approximately 1.1% of planned expenditures for such Fiscal Year.

For more information on the City's historical financial operations and the City's projected General Fund balances for Fiscal Years 2020-2025, see "DISCUSSION OF FINANCIAL OPERATIONS" and Tables 1 and 2 (and the text following Table 2) herein.

Budget Stabilization Reserve: To provide the City with a financial cushion should unexpected costs arise, the City made a deposit of $34.3 million to the Budget Stabilization Reserve (as defined herein), pursuant to the Fiscal Year 2020 Adopted Budget. The Fiscal Year 2021 Adopted Budget includes a draw down on such funds and redirects them to spending. The Twenty-Ninth Five-Year Plan does not include any additional payments to the Budget Stabilization Reserve in Fiscal Years 2021-2024, but such payments are projected to resume in Fiscal Year 2025, in the amount of $39.9 million. For more information on the Budget Stabilization Reserve, see "DISCUSSION OF FINANCIAL OPERATIONS – Budget Stabilization Reserve" herein.

Budgeted Reserves: The Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan include budgeted reserves, certain of which are described below.

Labor Reserve. The City's unions are covered by bargaining agreements through June 30, 2021. The Twenty-Ninth Five-Year Plan includes a labor reserve for potential future labor cost increases once such agreements expire.

Reopening and Recession Reserve. To mitigate against the fiscal impact of the national and local economic recession and the costs of reopening efforts related to COVID-19, the Twenty-Ninth Five-Year Plan includes a reopening and recession reserve to address related expenses (the "Reopening and Recession Reserve").

For Fiscal Year 2020, information related to the foregoing reserves can be found in Tables 1 and 2 in the rows entitled "Advances & Miscellaneous Payments" or "Payments to Other Funds," as applicable. See "DISCUSSION OF FINANCIAL OPERATIONS," Table 1, footnotes 12, 14, 15, and 16, and Table 2, footnotes 7, 9, 10, and 11.

In the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable, the City projects that Labor Reserve and Reopening and Recession Reserve will total approximately (i) $25.0 million in Fiscal Year 2021 (as budgeted), (ii) $80.0 million in Fiscal Year 2022, (iii) $75.0 million in Fiscal Year 2023, (iv) $90.0 million in Fiscal Year 2024, and (v) $90.0 million in Fiscal Year 2025.

For the budgeted reserves, any portion of such reserves that is not used to offset the applicable stated costs will increase the General Fund balance at the end of the given Fiscal Year, if not used by the City for other purposes.

Tax Revenues: Approximately three-quarters of the City's revenues come from local taxes and more than 85% of tax revenues come from just four taxes: Wage and Earnings Taxes, Real Estate Taxes, BIRT, and Real Property Transfer Taxes. The largest portion of these tax revenues, more than 40%, comes from the Wage and Earnings Tax (see Table 3 and "REVENUES OF THE CITY – Wage, Earnings, and Net Profits Taxes" herein). Approximately 40% of the Wage and Earnings Tax is paid by non-resident workers. Additionally, the City remains unique among the nation's largest cities in that it imposes a tax on both corporate profits and revenue through the BIRT, which is projected to generate 13.9% of the City's local tax revenue in Fiscal Year 2021 (based on the Fiscal Year 2021 Adopted Budget). See "REVENUES OF THE CITY" and Table 3 herein.

High Fixed Costs: The City's high fixed costs consume a significant portion of the City's budget. The largest of such costs is the City's payment to the Municipal Pension Fund. Based on the current estimate in the Twenty-Ninth Five-Year Plan, pension costs are expected to consume approximately 13.5% of expenditures in Fiscal Year 2021, with a City pension cost of approximately $650.2 million (from the General Fund). Even with such payments, the Municipal Pension Fund is under 50% funded. See "PENSION SYSTEM" herein.

Increased Funding for the School District: In the Fiscal Year 2021 Adopted Budget, the City's direct contribution to The School District of Philadelphia (the "School District") from the General Fund is $252.6 million in Fiscal Year 2021, an amount $30.1 million higher than the current estimate for Fiscal Year 2020 ($222.5 million). The School District is an independent governmental entity.

For more information on the School District, see "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Local Government Agencies – Mayoral-Appointed or Nominated Agencies – The School District." For more information on the City's historical contributions to the School District, see "EXPENDITURES OF THE CITY – City Payments to School District" and Table 21 herein.

In addition to the fiscal challenges and related strategic planning described above, the City faces several near-term fiscal uncertainties, such as (i) continued expenditures related to COVID-19, (ii) the severity of the economic downturn and length of the recession, (iii) continued increases in pension costs, (iv) uncertainties related to how amendments to the federal tax code may impact the City's economy (such as the limits placed on the state and local tax deduction, among others), (v) possible decreases in federal and state spending, (vi) potential increases in labor costs under future labor agreements, and (vii) continued increases in City contributions to the School District.

This "OVERVIEW" is intended to highlight the strategies implemented by the City to address its principal anticipated fiscal challenges. The reader is cautioned to review with care the more detailed information presented in this APPENDIX IV.

THE GOVERNMENT OF THE CITY OF PHILADELPHIA

Introduction

As noted above, the City is the largest city in the Commonwealth, the sixth largest city in the United States, and the center of the United States' eighth largest metropolitan statistical area. The City benefits from its strategic geographical location, relative affordability, cultural and recreational amenities, and its growing strength in key industries.

As one of the country's education centers, the City offers the business community a large and diverse labor pool. Penn, Temple University, Drexel University, St. Joseph's University, La Salle University, and Community College of Philadelphia are certain of the well-known institutions of higher education located in the City. There are also a number of other well-known colleges and universities located near the City, notably including Villanova University, Bryn Mawr College, Haverford College, Swarthmore College, Lincoln University, and the Camden Campus of Rutgers University, among others.

The City is a center for health, education, research and science facilities. In the City, there are more than 30 hospitals, including the Children's Hospital of Philadelphia, Hospital of the University of Pennsylvania, Einstein Medical Center-Philadelphia, Temple University Hospital, and Thomas Jefferson University Hospitals and Jefferson Health, among others, and schools of medicine, dentistry, pharmacy, optometry, podiatry, and veterinary medicine.

Tourism is important to the City and is driven by the City's extraordinary historic and cultural assets. The City's Historic District includes Independence Hall, the Liberty Bell, Carpenters' Hall, the Betsy Ross House, and Elfreth's Alley, the Nation's oldest residential street. The Benjamin Franklin Parkway District (referred to as the "Parkway" in APPENDIX V) includes the Philadelphia Museum of Art, the Barnes Foundation, and the Rodin Museum. The Avenue of the Arts, located along a mile-long section of South Broad Street between City Hall and Washington Avenue, includes the Kimmel Center, the Academy of Music, and other performing arts venues. All of the foregoing are key tourist attractions in the City.

For more information on the City's demographic and economic resources and economic development initiatives, see APPENDIX V hereto.

History and Organization

The City was incorporated in 1789 by an Act of the General Assembly of the Commonwealth (the "General Assembly") (predecessors of the City under charters granted by William Penn in his capacity as proprietor of the colony of Pennsylvania may date to as early as 1682). In 1854, the General Assembly, by an act commonly referred to as the Consolidation Act: (i) made the City's boundaries coterminous with the boundaries of Philadelphia County (the same boundaries that exist today) (the "County"); (ii) abolished all governments within these boundaries other than the City and the County; and (iii) consolidated the legislative functions of the City and the County. Article 9, Section 13 of the Pennsylvania Constitution abolished all county offices in the City, provides that the City performs all functions of county government, and states that laws applicable to counties apply to the City.

Since 1952, the City has been governed under a Home Rule Charter authorized by the General Assembly pursuant to the First Class City Home Rule Act, Act of April 21, 1949, P.L. 665, Section 17, and adopted by the voters of the City (as amended and supplemented, the "City Charter"). The City Charter provides, among other things, for the election, organization, powers and duties of the legislative branch (the "City Council") and the executive and administrative branch, as well as the basic rules governing the City's fiscal and budgetary matters, contracts, procurement, property, and records. Under Article XII of the City Charter, the School District operates as a separate and independent home rule school district. Certain other constitutional provisions and Commonwealth statutes continue to govern various aspects of the City's affairs, notwithstanding the broad grant of powers of local self-government in relation to municipal functions set forth in the First Class City Home Rule Act.

Under the City Charter, there are two distinct principal governmental entities in the City: (i) the City, which performs municipal and county functions; and (ii) the School District, which has boundaries coterminous with the City and responsibility for all public primary and secondary education.

The court system in the City, consisting of Common Pleas and Municipal Courts, is part of the Commonwealth judicial system. Although judges are paid by the Commonwealth, most other court costs are paid by the City, with partial reimbursement from the Commonwealth.

Elected and Appointed Officials

The Mayor is elected for a term of four years and is eligible to be elected for no more than two successive terms. Each of the seventeen members of City Council is also elected for a four-year term, which runs concurrently with that of the Mayor. There is no limitation on the number of terms that may be served by members of City Council. Of the members of City Council, ten are elected from districts and seven are elected at-large. No more than five of the seven at-large candidates for City Council may be nominated by any one party or political body. The District Attorney and the City Controller are elected at the mid-point of the terms of the Mayor and City Council.

The City Controller's responsibilities derive from the City Charter, various City ordinances and state and federal statutes, and contractual arrangements with auditees. The City Controller must follow Generally Accepted Government Auditing Standards, established by the federal Government Accountability Office (formerly known as the General Accounting Office), and Generally Accepted Auditing Standards, promulgated by the American Institute of Certified Public Accountants (collectively, "Generally Accepted Auditing Standards").

The City Controller audits and reports on the City's and the School District's respective Comprehensive Annual Financial Reports ("CAFRs"), federal assistance received by the City, and the performance of City departments. The City Controller also conducts a pre-audit program of City expenditure documents required to be submitted for approval, such as invoices, payment vouchers, purchase orders and contracts. Documents are selected for audit by category and statistical basis. The Pre-Audit Division verifies that expenditures are authorized and accurate in accordance with the City Charter and other pertinent legal and contractual requirements before any moneys are paid by the City Treasurer. The Pre-Audit Technical Unit, consisting of auditing and engineering staff, inspects and audits capital project design, construction and related expenditures. Other responsibilities of the City Controller include investigation of allegations of fraud, preparation of economic reports, certification of the City's debt capacity and the capital nature and useful life of the capital projects, and opining to the Pennsylvania Intergovernmental Cooperation Authority ("PICA") on the reasonableness of the assumptions and estimates in the City's five-year financial plans.

Under the City Charter, the principal officers of the City's government are the Managing Director of the City (the "Managing Director"), the Director of Finance of the City (the "Director of Finance"), the City Solicitor (the "City Solicitor"), the Director of Commerce (the "Director of Commerce"), the City Representative (the "City Representative"), and the Director of Planning and Development (the "Director of Planning and Development"). Under the City Charter, the Mayor appoints the Managing Director, the Director of Finance, the Director of Commerce, the City Representative, and the Director of Planning and Development. The Mayor, with the advice and consent of a majority of City Council, also appoints the City Solicitor.

The Managing Director, in coordination with the senior officials of City departments and agencies, is responsible for supervising the operating departments and agencies of the City that render the City's various municipal services. The Director of Commerce is charged with the responsibility of promoting and developing commerce and industry. The City Representative is the Ceremonial Representative of the City and especially of the Mayor. The City Representative is charged with the responsibility of giving wide publicity to any items of interest reflecting the activities of the City and its inhabitants, and for the marketing and promotion of the image of the City. Under the City Charter, the Director of Planning and Development oversees the Department of Planning and Development, which includes three divisions: (i) the Division of Development Services; (ii) the Division of Planning and Zoning; and (iii) the Division of Housing and Community Development. Such divisions represent five budgetary programs/fiscal divisions, including Executive Administration, Planning & Zoning, Development Services, Community Development, and Housing Development.

The City Solicitor is head of the Law Department and acts as legal advisor to the Mayor, City Council, and all of the agencies of the City government. The City Solicitor is also responsible for: (i) advising on legal matters pertaining to all of the City's contracts and bonds; (ii) assisting City Council, the Mayor, and City agencies in the preparation of ordinances for introduction in City Council; and (iii) conducting litigation involving the City.

The Director of Finance is the chief financial and budget officer of the City and is selected from three names submitted to the Mayor by a Finance Panel, which is established pursuant to the City Charter and is comprised of the President of the Philadelphia Clearing House Association, the Chairman of the Philadelphia Chapter of the Pennsylvania Institute of Certified Public Accountants, and the Dean of the Wharton School of Finance and Commerce of the University of Pennsylvania. Under Mayor Kenney's administration, the Director of Finance is responsible for the financial functions of the City, including: (i) development of the annual operating budget, the capital budget, and capital program; (ii) the City's program for temporary and long-term borrowing; (iii) supervision of the operating budget's execution; (iv) the collection of revenues through the Department of Revenue; (v) the oversight of pension administration as Chairperson of the Board of Pensions and Retirement; and (vi) the supervision of the Office of Property Assessment. The Director of Finance is also responsible for the appointment and supervision of the City Treasurer, whose office manages the City's debt program and serves as the disbursing agent for the distribution of checks and electronic payments from the City Treasury and the management of cash resources.

The following are brief biographies of Mayor Kenney, his Chief of Staff, the Director of Finance, and the City Treasurer.

James F. Kenney, Mayor. On November 3, 2015, James F. Kenney was elected as the City's 99th Mayor and was sworn into office on January 4, 2016. Mayor Kenney was reelected to a second term on November 5, 2019 and was sworn into office on January 6, 2020. Mayor Kenney is a lifelong resident of the City and a graduate of La Salle University. In 1991, Mayor Kenney was elected to serve as a Democratic City Councilman At-Large and was a member of City Council for 23 years.

James Engler, Chief of Staff. Mr. Engler was appointed Chief of Staff effective August 10, 2018. Prior to that, Mr. Engler served as Deputy Mayor for Policy and Legislation since January 2016. In that role, Mr. Engler served as a senior liaison between the Mayor's Office and City Council and was responsible for developing administration policy priorities and working with stakeholders inside and outside of government to advance those goals.

Rob Dubow, Director of Finance. Mr. Dubow has served as Director of Finance since being appointed on January 7, 2008. Prior to that appointment, Mr. Dubow was the Executive Director of PICA. He has also served as Executive Deputy Budget Secretary of the Commonwealth, from 2004 to 2005, and as Budget Director for the City, from 2000 to 2004.

Christian Dunbar, City Treasurer. Mr. Dunbar was appointed City Treasurer in July 2019. Prior to his appointment, Mr. Dunbar served as Deputy City Treasurer. As City Treasurer, Mr. Dunbar oversees the issuance of all notes and bonds on behalf of the City's General Fund and Enterprise Funds used to finance capital projects. Prior to joining the City, Mr. Dunbar was a wealth manager with Wells Fargo Advisors.

Government Services

Municipal services provided by the City include: (i) police and fire protection; (ii) health care; (iii) certain welfare programs; (iv) construction and maintenance of local streets, highways, and bridges; (v) trash collection, disposal and recycling; (vi) provision for recreational programs and facilities; (vii) maintenance and operation of the water and wastewater systems (the "Water and Wastewater Systems"); (viii) acquisition and maintenance of City real and personal property, including vehicles; (ix) maintenance of building codes and regulation of licenses and permits; (x) maintenance of records; (xi) collection of taxes and revenues; (xii) purchase of supplies and equipment; (xiii) construction and maintenance of airport facilities (the "Airport System"); and (xiv) maintenance of a prison system. For information on the Water and Wastewater Systems, see APPENDIX V – "KEY CITY-RELATED SERVICES AND BUSINESSES – Water and Wastewater." For information on the Airport System, see APPENDIX V – "TRANSPORTATION – Airport System."

The City owns the assets that comprise the Philadelphia Gas Works ("PGW" or the "Gas Works"). PGW serves residential, commercial, and industrial customers in the City. PGW is operated by Philadelphia Facilities Management Corporation ("PFMC"), a non-profit corporation specifically organized to manage and operate PGW for the benefit of the City. For more information on PGW, see "PGW PENSION PLAN," "PGW OTHER POST-EMPLOYMENT BENEFITS," "EXPENDITURES OF THE CITY – PGW Annual Payments," and "LITIGATION – PGW."

Local Government Agencies

There are a number of governmental authorities and quasi-governmental non-profit corporations that also provide services within the City. Certain of these entities are comprised of governing boards, the members of which are either appointed or nominated, in whole or part, by the Mayor, while others are independent of the Mayor's appointment or recommendation.

Mayoral-Appointed or Nominated Agencies

Philadelphia Industrial Development Corporation and Philadelphia Authority for Industrial Development. The Philadelphia Industrial Development Corporation ("PIDC") and the Philadelphia Authority for Industrial Development ("PAID"), along with the City's Commerce Department, coordinate the City's efforts to maintain an attractive business environment, attract new businesses to the City, and retain existing businesses. PIDC manages PAID's activities through a management agreement. Of the 30 members of the board of PIDC, eight are City officers or officials (the Mayor, the Managing Director, the Finance Director, the Commerce Director, the Director of Planning and Development, the City Solicitor, and two members of City Council), nine members are designated by the President of the Chamber of Commerce of Greater Philadelphia (the "Chamber of Commerce"), and the remaining 13 members are jointly designated by the Chamber of Commerce and the Commerce Director. The five-member board of PAID is appointed by the Mayor.

Philadelphia Municipal Authority. The Philadelphia Municipal Authority (formerly the Equipment Leasing Authority of Philadelphia) ("PMA") was originally established for the purpose of buying equipment and vehicles to be leased to the City. PMA's powers have been expanded to include any project authorized under applicable law that is specifically authorized by ordinance of City Council. PMA is governed by a five-member board appointed by City Council from nominations made by the Mayor.

Philadelphia Energy Authority. The Philadelphia Energy Authority ("PEA") was established by the City and incorporated in 2011 for the purpose of facilitating and developing energy generation projects, facilitating and developing energy efficiency projects, the purchase or facilitation of energy supply and consumer energy education. PEA is authorized to participate in projects on behalf of the City, other government agencies, institutions and businesses. PEA is governed by a five-member board appointed by City Council from four nominations made by the Mayor and one nomination from City Council.

Philadelphia Redevelopment Authority. The Philadelphia Redevelopment Authority (formerly known as the Redevelopment Authority of the City of Philadelphia) (the "PRA"), supported by federal funds through the City's Community Development Block Grant Fund and by Commonwealth and local funds, is responsible for the redevelopment of the City's blighted areas. PRA is governed by a five-member board appointed by the Mayor.

Philadelphia Land Bank. The Philadelphia Land Bank (the "PLB") is an independent agency formed under the authority of City ordinance and Pennsylvania law to return vacant and tax delinquent properties to productive reuse. The PLB has an 11-member board of directors, of which five are appointed by the Mayor and five are appointed by City Council. The final board member is appointed by a majority vote of the other board members. The City provides funds for its operations. For more information on the PLB, see APPENDIX V – "ECONOMIC DEVELOPMENT STRATEGIES AND IMPLEMENTATION – City and Quasi-City Economic Development Agencies and Related Programs – Philadelphia Land Bank."

Philadelphia Housing Authority. The Philadelphia Housing Authority (the "PHA") is a public body organized pursuant to the Housing Authorities Law of the Commonwealth and is neither a department nor an agency of the City. PHA is responsible for developing and managing low and moderate income rental units and limited amounts of for-sale housing in the City. PHA is also responsible for administering rental subsidies to landlords who rent their units to housing tenants qualified by PHA for such housing assistance payments. PHA is governed by a nine-member Board of Commissioners, all of whom are appointed by the Mayor with the approval of a majority of the members of City Council. The terms of the Commissioners are concurrent with the term of the appointing Mayor. Two of the members of the Board are required to be PHA residents. For more information on PHA, see APPENDIX V – "ECONOMIC DEVELOPMENT STRATEGIES AND IMPLEMENTATION – City and Quasi-City Economic Development Agencies and Related Programs – The Philadelphia Housing Authority."

Hospitals and Higher Education Facilities Authority of Philadelphia. The Hospitals and Higher Education Facilities Authority of Philadelphia (the "Hospitals Authority") assists non-profit hospitals by financing hospital construction projects. The City does not own or operate any hospitals. The powers of the Hospitals Authority also permit the financing of construction of buildings and facilities for certain colleges and universities and other health care facilities and nursing homes. The Hospitals Authority is governed by a five-member board appointed by City Council from nominations made by the Mayor.

Southeastern Pennsylvania Transportation Authority. The Southeastern Pennsylvania Transportation Authority ("SEPTA"), which is supported by transit revenues and federal, Commonwealth, and local funds, is responsible for developing and operating a comprehensive and coordinated public transportation system in the southeastern Pennsylvania region. Two of the 15 members of SEPTA's board are appointed by the Mayor and confirmed by City Council. SEPTA is not a department or agency of the City. For more information on SEPTA, see "EXPENDITURES OF THE CITY – City Payments to SEPTA" and APPENDIX V – "TRANSPORTATION – Southeastern Pennsylvania Transportation Authority (SEPTA)."

Pennsylvania Convention Center Authority. The Pennsylvania Convention Center Authority (the "Convention Center Authority") constructed and maintains, manages, and operates the Pennsylvania Convention Center, which opened on June 25, 1993. The Pennsylvania Convention Center is owned by the Commonwealth and leased to the Convention Center Authority. An expansion of the Pennsylvania Convention Center was completed in March 2011. This expansion enlarged the Pennsylvania Convention Center to approximately 2,300,000 square feet with the largest contiguous exhibit space in the Northeast, the largest convention center ballroom on the East Coast, and the ability to host large tradeshows or two major conventions simultaneously.

Of the 15 members of the board of the Convention Center Authority, two are appointed by the Mayor and one by each of the President and Minority Leader of City Council. The Director of Finance is an ex-officio member of the Board with no voting rights. The Commonwealth, the City and the Convention Center Authority have entered into an operating agreement with respect to the operation and financing of the Pennsylvania Convention Center. In January 2014, SMG began managing and operating the Pennsylvania Convention Center, instituting a number of measures intended to reduce and control show costs and improve customer service. For more information on the Convention Center Authority, see "EXPENDITURES OF THE CITY – City Payments to Convention Center Authority."

The School District. The School District was established, pursuant to the First Class City Home Rule Education Act, by the Educational Supplement to the City Charter as a separate and independent home rule school district to provide free public education to the City's residents. Under the City Charter, the School District is governed by the Board of Education of the School District of Philadelphia (the "Board of Education"), which is appointed by the Mayor.

Effective December 2001, the School District was declared distressed by the Secretary of Education of the Commonwealth (the "Secretary of Education") pursuant to the Public School Code of 1949, as amended (the "School Code"). During such a period of distress, the powers and duties of the Board of Education are vested in a School Reform Commission (the "School Reform Commission") created pursuant to the School Code. In December 2017, the Secretary of Education approved a resolution adopted by the School Reform Commission recommending the dissolution of the School Reform Commission and rescission of the declaration of distressed school district status effective June 30, 2018. In April 2018, the Mayor appointed nine members to serve on the Board of Education and such individuals assumed their duties on July 1, 2018. As of such date, the Board of Education governs the School District.

Under the City Charter, the Board of Education is required to levy taxes annually, within the limits and upon the subjects authorized by the General Assembly or City Council, in amounts sufficient to provide for operating expenses, debt service charges, and for the costs of any other services incidental to the operation of public schools. The School District has no independent power to authorize school taxes. Certain financial information regarding the School District is included in the City's CAFR.

The School District is part of the Commonwealth system of public education. In a number of matters, including the incurrence of short-term and long-term debt, the School District is governed by the separate statutes of the Commonwealth. The School District is a separate political subdivision of the Commonwealth, and the City has no property interest in or claim on any revenues or property of the School District.

In the Fiscal Year 2019 CAFR, the City reported that its direct contribution to the School District from the General Fund was $180.9 million in Fiscal Year 2019. In the Fiscal Year 2020 Adopted Budget, the City's direct contribution to the School District from the General Fund is $222.5 million in Fiscal Year 2020, which amount is unchanged as the current estimate in the Twenty-Ninth Five-Year Plan. In the Fiscal Year 2021 Adopted Budget, the City's direct contribution to the School District from the General Fund is $252.6 million in Fiscal Year 2021. Such amounts do not include funding from taxes levied by the School District and authorized by City Council. For more information on the City's historical contributions to the School District, see "EXPENDITURES OF THE CITY – City Payments to School District" and Table 21.

Non-Mayoral-Appointed or Nominated Agencies

PICA. PICA was created by the Pennsylvania Intergovernmental Cooperation Authority Act for Cities of the First Class (the "PICA Act") in 1991 to provide financial assistance to cities of the first class, and it continues in existence for a period not exceeding one year after all of its liabilities, including the PICA Bonds (as defined herein), have been fully paid and discharged. The City is the only city of the first class in the Commonwealth. The Governor, the President pro tempore of the Pennsylvania Senate, the Minority Leader of the Pennsylvania Senate, the Speaker of the Pennsylvania House of Representatives, and the Minority Leader of the Pennsylvania House of Representatives each appoints one voting member of PICA's board. The Secretary of the Budget of the Commonwealth and the Director of Finance of the City serve as ex officio members of PICA's board with no voting rights.

In January 1992, the City and PICA entered into an Intergovernmental Cooperation Agreement (the "PICA Agreement"), pursuant to which PICA agreed to issue bonds from time to time, at the request of the City, for the purpose of funding, among other things, deficits in the General Fund and a debt service reserve. See "DEBT OF THE CITY – PICA Bonds."

Under the PICA Act and for so long as any PICA Bonds are outstanding, the City is required to submit to PICA: (i) a five-year financial plan on an annual basis; and (ii) quarterly financial reports, each as further described below under "DISCUSSION OF FINANCIAL OPERATIONS – Five-Year Plans of the City" and "– Quarterly Reporting to PICA." Under the PICA Act, at such time when no PICA Bonds are outstanding, the City will no longer be required to prepare such annual financial plans or quarterly reports. As of June 30, 2020, the principal amount of PICA Bonds outstanding was $56,075,000. For more information on PICA Bonds, see "DEBT OF THE CITY – PICA Bonds."

The PICA Act and the PICA Agreement provide PICA with certain financial and oversight functions. PICA has the power to exercise certain advisory and review procedures with respect to the City's financial affairs, including the power to review and approve the five-year financial plans prepared by the City, and to certify non-compliance by the City with the then-existing five-year plan. PICA is also required to certify non-compliance if, among other things, no approved five-year plan is in place or if the City has failed to file mandatory revisions to an approved five-year plan. Under the PICA Act, any such certification of non-compliance would, upon certification by PICA, require the Secretary of the Budget of the Commonwealth to withhold funds due to the City from the Commonwealth or any of its agencies (including, with certain exceptions, all grants, loans, entitlements, and payments payable to the City by the Commonwealth, including payment of the portion of the PICA Tax, as further described under "DEBT OF THE CITY – PICA Bonds" below, otherwise payable to the City). Such withheld funds are held in escrow by the Commonwealth or in the applicable City account until such non-compliance is cured. A majority vote of PICA will determine when the conditions that caused the City to be certified as non-compliant have ceased to exist. Following such vote, PICA notifies the Secretary of the Budget and the withheld funds are released (together with all interest and income earned thereon during the period held in escrow).

Philadelphia Parking Authority. The Philadelphia Parking Authority (the "PPA") is responsible for: (i) the construction and operation of parking facilities in the City and at Philadelphia International Airport ("PHL"); and (ii) enforcement of on-street parking regulations. The members of the PPA's board are appointed by the Governor, with certain nominations from the General Assembly. PPA is not a department or agency of the City. For more information on the PPA, see "REVENUES OF THE CITY – Philadelphia Parking Authority Revenues."

Cybersecurity

The City relies on a complex technology environment to conduct its operations. As a recipient and provider of personal, private, and sensitive information, the City and its departments and offices face multiple cyber threats including, but not limited to, hacking, viruses, malware, and other attacks on computers and other sensitive digital networks and systems.

The City's Office of Innovation and Technology works to protect the City from cyber threats by adopting new technology and ensuring City systems and citizen data are protected. The Office of Innovation and Technology follows industry best practices, develops City-wide security policies, provides regular security training to all City employee users, and uses security tools to mitigate, prevent, deter, and respond to incidents if and when they occur. Additionally, to identify potential vulnerabilities and proactively mitigate them, the City organizes periodic (i) vulnerability scanning of critical systems, (ii) penetration tests of the information security environment, and (iii) regular internal testing of systems and users. These tests are performed by both the Office of Innovation and Technology and third parties.

The Office of Innovation and Technology is working to establish relationships with federal and state government, and commercial, academic, and law enforcement security experts. It is the City's expectation that such relationships will enable the City to stay informed of threats and continuing improvements to security systems.

No assurances can be given that the City's security and operational control measures will be successful in guarding against future cyber threats and attacks. The results of any attack on the City's computer and information technology systems could impact its operations and damage the City's digital networks and systems, and the costs of remedying any such damage could be substantial.

Climate Change

The City's Office of Sustainability ("OOS") works with partners around the City, both public and private, to educate and prepare the City for climate change, among other things. OOS is responsible for implementing Greenworks Philadelphia, the City's comprehensive sustainability plan, which consists of a variety of initiatives to prepare the City for future climate–related challenges.

Planning for the potential impact of climate change in the City is challenging. The City's climate is variable and projections of future conditions range significantly. Potential climate change impacts include rising temperatures (heat waves); air quality issues; increased heavy precipitation events (rain or snow); rising sea levels (two feet by 2050 and four feet by 2100); and storm surges from more intense hurricanes and tropical storms.

Under the mid-century (2050) and end-of-century (2100) analyses, the City projects that it will experience a greater frequency of heavy and extremely heavy precipitation events, with the largest increase occurring in precipitation that falls during winter months. Heavy precipitation and flooding can be caused by a variety of weather systems, including tropical storms and hurricanes, thunderstorms, and frontal activity. When these heavy precipitation events fall as rain, they often exceed the capacity of the City's storm sewer infrastructure; when they fall as snow, they require many City resources to manage. Some of these projections are already becoming a reality, as the City has experienced an increase in the intensity and frequency of storm events over the last decade, which has on occasion resulted in significant flooding.

The sea level rising is a particularly important risk for the City, as rising seas affect water levels in the Delaware and Schuylkill Rivers bordering the City. Higher sea levels will increase the depth and extent of flooding in and around the City from storm surges. Low-lying areas already experience localized flooding during heavy storm events, and both municipal infrastructure and private development exist along the two rivers. Because of the City's topography and its location next to tidal rivers, many City facilities and other properties are vulnerable to sea level rise, even under conservative sea level rise scenarios. For example, PHL and at least a dozen other City facilities would be exposed to flooding with two feet of sea level rise, a scenario that is likely to occur by mid-century. Under the mid-century sea level rise scenario (indicating two feet of sea level rise), only one City facility is highly vulnerable to flooding, but under the end-of-century sea level rise scenario (four feet of sea level rise), 19 facilities are highly vulnerable and another 12 City facilities are moderately vulnerable. Hundreds of additional facilities (both City and private) are highly vulnerable to both riverine flooding and the combination of sea level rise and storm surge.

Financial Impact. While the financial effects of climate change are difficult to quantify, the City has developed some cost estimates related to its future fiscal impact. Climate change will increase both the risk of expensive extreme events and the regular, recurring costs of doing business, along with equally important but less quantifiable costs to quality of life in the City. Proactive planning for climate change can help to reduce many of these costs, both public and private.

Climate change is increasing the intensity of extreme storms, and just one severe hurricane could cause more than $2 billion in damages across the City. The City expects to see more frequent extreme storms with higher winds and more flooding, due in part to sea level rise combined with heavy rains. Depending on severity, each of these storms could cause between $20 million and $900 million in damages in the City.

In addition to increasing disaster costs, higher heat and more precipitation will increase the everyday cost of doing business for the City's government, businesses, and residents. Increased operating costs from climate change across all sectors would result in a significant economic impact in the City. Much of these costs will be borne by City departments in combination with Commonwealth and federal government; others will fall directly on the private sector.

As the effects of climate change take shape in the City, annual costs related thereto are expected to include a variety of increases ranging from energy and maintenance costs to the increasing costs of continuing to provide services. For example, the City expects climate change to (i) increase annual electricity costs by up to $1 million due to increased demand for air conditioning; (ii) create an additional $2 to $4 million in roadway maintenance costs from precipitation, freeze-thaw cycles, and high temperatures; and (iii) increase the annual cost of running heat emergency helplines to advise callers about how to avoid heat stress and refer those in need of help to emergency services.

The City also expects to face a variety of other increased costs due to climate change, such as (i) costs associated with a variety of respiratory diseases caused by higher levels of ozone (with costs for medical treatment and lost productivity associated with these diseases approaching $20 million by 2050), and (ii) increased regional transportation expenses (increased operational costs and damages from climate change could rise by almost $2 million per year).

In 2016, OOS, along with a cross-departmental Climate Adaptation Working Group, issued *Growing Stronger: Toward a Climate-Ready Philadelphia* to (i) assess vulnerabilities and preparation opportunities for municipal government; (ii) identify low-barrier and high-impact internal actions that can be taken to reduce risks and decrease stressors on City infrastructure services; and (iii) guide proactive projects with benefits beyond municipal operations. City-wide climate adaptation planning efforts are now also underway.

In addition to participating in planning efforts, City departments are taking action and implementing projects that aim to increase resilience on a broad array of climate issues. The Department of Public Property ensures that emergency generators in City-maintained facilities are well maintained and fueled, which is intended to allow other City departments to continue providing services during emergency situations. During heat emergencies, the Department of Public Health ensures communication among City agencies and deploys environmental health teams into the community. Philadelphia Parks and Recreation works with citizen scientists to identify forest restoration practices suitable for the City's changing climate. Regarding broader development across the City, the Philadelphia City Planning Commission (the "Planning Commission") requires new facilities located in flood zones to be raised 18 inches above FEMA base flood elevation, and the Philadelphia Water Department (the "Water Department") promotes green storm water infrastructure as a source control measure to minimize flooding impacts.

CITY FINANCES AND FINANCIAL PROCEDURES

Except as otherwise noted, the financial statements, tables, statistics, and other information shown below have been prepared by the Office of the Director of Finance and can be reconciled to the financial statements in the Fiscal Year 2019 CAFR and notes therein. The Fiscal Year 2019 CAFR was prepared by the Office of the Director of Finance in conformance with guidelines adopted by the Governmental Accounting Standards Board and the American Institute of Certified Public Accountants' audit guide, Audits of State and Local Government Units and audited by the City Controller under Generally Accepted Auditing Standards.

General

Governmental funds account for their activities using the current financial resources measurement focus and the modified accrual basis of accounting. Revenues are recognized as soon as they are both measurable and available. Revenues are considered to be available when they are collectible within the current period or soon enough thereafter to pay liabilities of the current period. For this purpose, the City considers revenues to be available if they are collected within 60 days of the end of the current fiscal period. Expenditures are generally recorded when a liability is incurred, as in the case of full accrual accounting. Debt service expenditures, as well as expenditures related to compensated absences and claims and judgments, are recorded only when payment is due; however, those expenditures may be accrued if they are to be liquidated with available resources.

Imposed non-exchange revenues, such as real estate taxes, are recognized when the enforceable legal claim arises and the resources are available. Derived tax revenues, such as wage, BIRT, net profits and earnings taxes, are recognized when the underlying exchange transaction has occurred and the resources are available. Grant revenues are recognized when all the applicable eligibility requirements have been met and the resources are available. All other revenue items are considered to be measurable and available only when cash is received by the City.

Revenue that is considered to be program revenue includes: (i) charges to customers or applicants for goods received, services rendered or privileges provided; (ii) operating grants and contributions; and (iii) capital grants and contributions. Internally dedicated resources are reported as general revenues rather than as program specific revenues; therefore, all taxes are considered general revenues.

The City's financial statements reflect the following three funds as major Governmental Funds:

- The General Fund is the City's primary operating fund. It accounts for all financial resources of the general government, except those required to be accounted for in other funds.

- The Health Choices Behavioral Health Fund accounts for resources received from the Commonwealth. These resources are restricted to providing managed behavioral health care to residents of the City.

- The Grants Revenue Fund accounts for the resources received from various federal, Commonwealth, and private grantor agencies, including those received by the City's Department of Human Services ("DHS"). The resources are restricted to accomplishing the various objectives of the grantor agencies.

The City also reports on permanent funds, which are used to account for resources legally held in trust for use by the park and library systems of the City. There are legal restrictions on the resources of the permanent funds that require the principal to remain intact, while only the earnings may be used for the programs.

The City reports on the following fiduciary funds:

- The Municipal Pension Fund accumulates resources to provide pension benefit payments to qualified employees of the City and certain other quasi-governmental organizations.

- The PGW Retirement Reserve Fund accounts for contributions made by PGW to provide pension benefit payments to its qualified employees under its pension plan. For more information on the PGW Pension Plan (as defined herein), see "PGW PENSION PLAN."

- The Escrow Fund accounts for funds held in escrow for various purposes.

- The Employees Health & Welfare Fund accounts for funds deducted from employees' salaries for payment to various organizations.

- The Departmental Custodial Accounts account for funds held in custody by various departments of the City.

The City reports on the following major proprietary funds:

- The Water Fund accounts for the activities related to the operation of the Water and Wastewater Systems.

- The Aviation Fund accounts for the activities of the Airport System.

Proprietary funds distinguish operating revenues and expenses from non-operating items. Operating revenues and expenses generally result from providing services and producing and delivering goods in connection with a proprietary fund's ongoing operations. The principal operating revenues of the Water Fund are charges for water and sewer service. The principal operating revenues of the Aviation Fund are charges for the use of the City's airports, PHL and Northeast Philadelphia Airport. Operating expenses for enterprise funds include the cost of sales and services, administrative expenses, and depreciation on capital assets. All revenues and expenses not meeting this definition are reported as non-operating revenues and expenses.

Current City Disclosure Practices

It is the City's practice to file its CAFR, which contains the audited combined financial statements of the City, in addition to certain other information, such as the City's bond ratings and information about upcoming debt issuances, with the Municipal Securities Rulemaking Board ("MSRB") as soon as practicable after delivery of such information. For bonds issued in calendar year 2015 and thereafter, the annual filing deadline is February 28; for bonds issued prior to calendar year 2015, the annual filing deadline is 240 days after the end of the respective Fiscal Year, being February 25. The Fiscal Year 2019 CAFR was filed with the MSRB on February 25, 2020, through the MSRB's Electronic Municipal Market Access ("EMMA") system.

A wide variety of information concerning the City is available from publications and websites of the City and others, including the City's investor information website at http://www.phila.gov/investor (the "City's Investor Website"). Any such information that is inconsistent with the information set forth in this Official Statement should be disregarded. No such information is a part of or incorporated into this Official Statement.

Independent Audit and Opinion of the City Controller

The City Controller has examined and expressed opinions on the basic financial statements of the City contained in the Fiscal Year 2019 CAFR. The City Controller has not participated in the preparation of this Official Statement nor in the preparation of the budget estimates and projections and cash flow statements and forecasts set forth in various tables contained in this Official Statement. Consequently, the City Controller expresses no opinion with respect to any of the data contained in this Official Statement other than what is contained in the basic financial statements of the City in the Fiscal Year 2019 CAFR.

Budgetary Accounting Practices

The City's budgetary process accounts for certain transactions on a basis other than generally accepted accounting principles ("GAAP"). In accordance with the City Charter, the City has formally established budgetary accounting control for its operating and capital improvement funds.

The operating funds of the City, consisting of the General Fund, eleven (11) Special Revenue Funds (County Liquid Fuels Tax, Special Gasoline Tax, Health Choices Behavioral Health, Hotel Room Rental Tax, Grants Revenue, Community Development, Car Rental Tax, Housing Trust, Acute Care Hospital Assessment, Budget Stabilization, and Water Residual Funds) and two Enterprise Funds (Water and Aviation Funds), are subject to annual operating budgets adopted by City Council. These budgets appropriate funds for all City departments, boards and commissions by major class of expenditure within each department. Major classes are defined as: (i) personal services; (ii) purchase of services; (iii) materials and supplies; (iv) equipment; (v) contributions, indemnities, and taxes; (vi) debt service; (vii) payments to other funds; and (viii) advances and other miscellaneous payments. The appropriation amounts for each fund are supported by revenue estimates and take into account the elimination of accumulated deficits and the re-appropriation of accumulated surpluses to the extent necessary. All transfers between major classes (except for materials and supplies and equipment, which are appropriated together) must have City Council approval. Appropriations that are not expended or encumbered at year-end are lapsed.

The City's capital budget is adopted annually by City Council. The capital budget is appropriated by project for each department. Requests to transfer appropriations between projects must be approved by City Council. Any appropriations that are not obligated at year-end are either lapsed or carried forward to the next Fiscal Year.

Schedules prepared on the legally enacted basis differ from the GAAP basis in that both expenditures and encumbrances are applied against the current budget, adjustments affecting activity budgeted in prior years are accounted for through fund balance or as reduction of expenditures and certain interfund transfers and reimbursements are budgeted as revenues and expenditures. The primary difference between the GAAP and legal (budgetary) fund balance is due to the timing of recognizing the BIRT. The legal basis recognizes BIRT revenues in the Fiscal Year they are collected. The GAAP basis requires the City to recognize the BIRT revenues (which are primarily paid in April) for the calendar year in which the BIRT taxes are due, requiring the City to defer a portion of the April payment into the next Fiscal Year. For more information on BIRT, see "REVENUES OF THE CITY – Business Income and Receipts Tax."

DISCUSSION OF FINANCIAL OPERATIONS

Principal Operations

The major financial operations of the City are conducted through the General Fund. In addition to the General Fund, operations of the City are conducted through two other major governmental funds and 19 non-major governmental funds. The City operates on a July 1 to June 30 fiscal year ("Fiscal Year") and reports on all the funds of the City, as well as its component units, in the City's CAFR. PMA's and PICA's financial statements are blended with the City's statements. The financial statements for PGW, PRA, the PPA, the School District, the Community College of Philadelphia, the Community Behavioral Health, Inc., the Delaware River Waterfront Corporation, and PAID are presented discretely.

Fund Accounting

Funds are groupings of activities that enable the City to maintain control over resources that have been segregated for particular purposes or objectives. All of the funds of the City can be divided into three categories: governmental funds, proprietary funds, and fiduciary funds.

Governmental Funds. The governmental funds are used to account for the financial activity of the City's basic services, such as: general government; economic and neighborhood development; public health, welfare and safety; cultural and recreational; and streets, highways and sanitation. The funds' financial activities focus on a short-term view of the inflows and outflows of spendable resources, as well as on the balances of spendable resources available at the end of the Fiscal Year. The financial information presented for the governmental funds is useful in evaluating the City's short-term financing requirements.

The City maintains 22 individual governmental funds. The City's CAFRs, including the Fiscal Year 2019 CAFR, present data separately for the General Fund, Grants Revenue Fund, and Health Choices Behavioral Health Fund, which are considered to be major funds. Data for the remaining 19 funds are combined into a single aggregated presentation.

Proprietary Funds. The proprietary funds are used to account for the financial activity of the City's operations for which customers are charged a user fee; they provide both a long- and short-term view of financial information. The City maintains three enterprise funds that are a type of proprietary fund – airport, water and wastewater operations, and industrial land bank.

Fiduciary Funds. The City is the trustee, or fiduciary, for its employees' pension plans. It is also responsible for PGW's employees' retirement reserve assets. Both of these fiduciary activities are reported in the City's CAFRs, including the Fiscal Year 2019 CAFR, as separate financial statements of fiduciary net assets and changes in fiduciary net assets.

See "CITY FINANCES AND FINANCIAL PROCEDURES" for a further description of these governmental, proprietary, and fiduciary funds.

Budget Procedure

At least 90 days before the end of the Fiscal Year, the operating budget for the next Fiscal Year is prepared by the Mayor and submitted to City Council for adoption. The budget, as adopted, must be balanced and provide for discharging any estimated deficit from the current Fiscal Year and make appropriations for all items to be funded with City revenues. The Mayor's budgetary estimates of revenues for the ensuing Fiscal Year and projection of surplus or deficit for the current Fiscal Year may not be altered by City Council. Not later than the passage of the operating budget ordinance, City Council must enact such revenue measures as will, in the opinion of the Mayor, yield sufficient revenues to balance the budget.

At least 30 days before the end of the Fiscal Year, City Council must adopt by ordinance an operating budget and a capital budget for the ensuing Fiscal Year and a capital program for the six ensuing Fiscal Years. If the Mayor disapproves the bills, he must return them to City Council with the reasons for his disapproval at the first meeting thereof held not less than ten days after he receives such bills. If the Mayor does not return the bills within the time required, they become law without his approval. If City Council passes the bills by a vote of two-thirds of all of its members within seven days after the bills have been returned with the Mayor's disapproval, they become law without his approval. While the City Charter requires that City Council adopt the ordinances for the operating and capital budgets at least 30 days before the end of the Fiscal Year, in practice, such ordinances are often adopted after such deadline, but before the end of such Fiscal Year. For example, the City's Fiscal Year 2021 operating budget ordinance was presented to City Council on March 5, 2020, revised and resubmitted to City Council on May 1, 2020, approved by City Council on June 25, 2020, and signed by the Mayor on June 26, 2020. There is no practical consequence to adopting the budget ordinances after the deadline in the City Charter, but before the end of the Fiscal Year.

The capital program is prepared annually by the Planning Commission to present the capital expenditures planned for each of the six ensuing Fiscal Years, including the estimated total cost of each project and the sources of funding (local, state, federal, and private) estimated to be required to finance each project. The capital program is reviewed by the Mayor and transmitted to City Council for adoption with his recommendation thereon. The Capital Program ordinance for Fiscal Years 2021-2026 (the "Fiscal Year 2021-2026 Adopted Capital Program") was approved by City Council on June 25, 2020, and signed by the Mayor on June 26, 2020 (see Table 48).

The capital budget ordinance, authorizing in detail the capital expenditures to be made or incurred in the ensuing Fiscal Year from City Council appropriated funds, is adopted by City Council concurrently with the capital program. The capital budget must be in full conformity with that part of the capital program applicable to the Fiscal Year that it covers.

For information on the City's Fiscal Year 2020 Adopted Budget, see "– Current Financial Information – Fiscal Year 2020 Adopted Budget and Twenty-Eighth Five-Year Plan" herein. For information on the Fiscal Year 2021 Adopted Budget and Twenty-Ninth Five-Year Plan, see "– Current Financial Information – Fiscal Year 2021 Adopted Budget and Twenty-Ninth Five-Year Plan" herein. For information on the City's capital program, see "CITY CAPITAL PROGRAM" herein.

Budget Stabilization Reserve

In April 2011, the City adopted an amendment to the City Charter that established the "Budget Stabilization Reserve." The City Charter provides that the annual operating budget ordinance is required to provide for appropriations to a Budget Stabilization Reserve, to be created and maintained by the Director of Finance as a separate fund, which may not be commingled with any other funds of the City. Appropriations to the Budget Stabilization Reserve are required to be made each Fiscal Year if the projected General Fund balance for the upcoming Fiscal Year equals or exceeds three percent of General Fund appropriations for such Fiscal Year. City Council can appropriate additional amounts to the Budget Stabilization Reserve by ordinance, no later than at the time of passage of the annual operating budget ordinance and only upon recommendation of the Mayor. Total appropriations to the Budget Stabilization Reserve are subject to a limit of five percent of General Fund appropriations. Amounts in the Budget Stabilization Reserve from the prior Fiscal Years, including any investment earnings certified by the Director of Finance, are to remain on deposit therein. The City has made a deposit of $34.3 million to the Budget Stabilization Reserve, pursuant to the Fiscal Year 2020 Adopted Budget.

Withdrawals from the Budget Stabilization Reserve are permitted only upon (i) approval by ordinance of a transfer of appropriations from the Budget Stabilization Reserve and only for the purposes set forth in such transfer ordinance and (ii) either (1) a certification by the Director of Finance that General Fund revenues actually received by the City during the prior Fiscal Year were at least one percent less than the General Fund revenues set forth in the Mayor's estimate of receipts, or (2) a certification by the Director of Finance that such withdrawal is necessary to avoid either a material disruption in City services or to fund emergency programs necessary to protect the health, safety or welfare of City residents, and that it would be fiscally imprudent to seek emergency appropriations pursuant to the City Charter. Any such certification must be approved either by a resolution adopted by two-thirds of all of the members of City Council or an agency of the Commonwealth with responsibility for ensuring the fiscal stability of the City.

For information on the planned withdrawal from the Budget Stabilization Reserve for Fiscal Year 2021, see "OVERVIEW – Fiscal Health of the City – Budget Stabilization Reserve."

Annual Financial Reports

The City is required by the City Charter to issue, within 120 days after the close of each Fiscal Year, a statement as of the end of the Fiscal Year showing the balances in all funds of the City, the amounts of the City's known liabilities, and such other information as is necessary to furnish a true picture of the City's financial condition (the "Annual Financial Reports"). The Annual Financial Reports, which are released on or about October 28 of each year, are intended to meet these requirements and are unaudited. As described above, the audited financial statements of the City are contained in its CAFR, which is published at a later date. The Annual Financial Reports contain financial statements for all City governmental funds and blended component units presented on the modified accrual basis. The proprietary and fiduciary funds are presented on the full accrual basis. They also contain budgetary comparison schedules for those funds that are subject to an annual budget. The financial statements of the City's discretely presented component units that are available as of the date of the Annual Financial Reports are also presented. Historically, the results for General Fund balance have not materially changed between the Annual Financial Reports and the CAFRs.

The Annual Financial Report for Fiscal Year 2019 was released on October 28, 2019. As noted herein, the Fiscal Year 2019 CAFR was filed with the MSRB on February 25, 2020, through the EMMA system. See "CITY FINANCES AND FINANCIAL PROCEDURES – Current City Disclosure Practices."

Five-Year Plans of the City

The PICA Act requires the City to annually prepare a financial plan that includes projected revenues and expenditures of the principal operating funds of the City for five Fiscal Years consisting of the current Fiscal Year and the subsequent four Fiscal Years. Each five-year plan, which must be approved by PICA, is required to, among other things, eliminate any projected deficits, balance the Fiscal Year budgets and provide procedures to avoid fiscal emergencies. For information on the Twenty-Eighth Five-Year Plan, see "– Current Financial Information – Fiscal Year 2020 Adopted Budget and Twenty-Eighth Five-Year Plan" herein. For information on the Twenty-Ninth Five-Year Plan, see "– Current Financial Information – Fiscal Year 2021 Adopted Budget and Twenty-Ninth Five-Year Plan" herein.

Quarterly Reporting to PICA

The PICA Act requires the City to prepare and submit quarterly reports to PICA so that PICA may determine whether the City is in compliance with the then-current five-year plan. Each quarterly report is required to describe actual or current estimates of revenues, expenditures, and cash flows compared to budgeted revenues, expenditures, and cash flows by covered funds for each month in the previous quarter and for the year-to-date period from the beginning of the then-current Fiscal Year of the City to the last day of the fiscal quarter or month, as the case may be, just ended. Each such report is required to explain any variance existing as of such last day.

Under the PICA Agreement, a "variance" is deemed to have occurred as of the end of a reporting period if (i) a net adverse change in the fund balance of a covered fund (i.e., a principal operating fund) of more than 1% of the revenues budgeted for such fund for that Fiscal Year is reasonably projected to occur, such projection to be calculated from the beginning of the Fiscal Year for the entire Fiscal Year, or (ii) the actual net cash flows of the City for a covered fund are reasonably projected to be less than 95% of the net cash flows of the City for such covered fund for that Fiscal Year originally forecast at the time of adoption of the budget, such projection to be calculated from the beginning of the Fiscal Year for the entire Fiscal Year.

PICA may not take any action with respect to the City for variances if the City: (i) provides a written explanation of the variance that PICA deems reasonable; (ii) proposes remedial action that PICA believes will restore overall compliance with the then-current five-year plan; (iii) provides information in the immediately succeeding quarterly financial report demonstrating to the reasonable satisfaction of PICA that the City is taking remedial action and otherwise complying with the then-current five-year plan; and (iv) submits monthly supplemental reports until it regains compliance with the then-current five-year plan.

PICA last declared a variance in February 2009. Such variance was cured by the City pursuant to a revised five-year plan for Fiscal Years 2010-2014 and the Commonwealth's authorization of an increase in the City Sales Tax (as defined herein). See "REVENUES OF THE CITY – Sales and Use Tax" herein. A failure by the City to explain or remedy a variance would, upon certification by PICA, require the Secretary of the Budget of the Commonwealth to withhold funds due to the City from the Commonwealth or any of its agencies (including, with certain exceptions, all grants, loans, entitlements and payments payable to the City by the Commonwealth, including payment of the portion of the PICA Tax, as further described under "DEBT OF THE CITY – PICA Bonds" below, otherwise payable to the City). The City uses its Quarterly City Manager's Reports to satisfy the quarterly reporting requirement to PICA. Such reports are released within 45 days following the end of the applicable quarter and the most recent versions of such reports are available on the City's Investor Website. The most recent Quarterly City Manager's Report is the report for the period ending March 31, 2020, which was released on May 15, 2020. The next Quarterly City Manager's Report is the report for the period ending June 30, 2020, and it is expected to be released on August 17, 2020.

Summary of Operations

The following table presents the summary of operations for the General Fund for Fiscal Years 2017-2019, budgeted amounts and current estimates for Fiscal Year 2020, and budgeted amounts for Fiscal Year 2021. For a description of the legally enacted basis on which the City's budgetary process accounts for certain transactions, see "CITY FINANCES AND FINANCIAL PROCEDURES – Budgetary Accounting Practices." "Current Estimate," as used in the tables and text below, refers (except as otherwise indicated) to the most recently revised estimates for Fiscal Year 2020, which were released by the City on June 26, 2020, as part of the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable.

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Table 1
General Fund
Summary of Operations (Legal Basis)
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD)(1), (2)

	Actual 2017	Actual 2018	Actual 2019	Adopted Budget 2020 (June 18, 2019)	Current Estimate 2020 (June 26, 2020)	Adopted Budget 2021 (June 26, 2020)
Revenues						
Real Property Taxes	$587.1	$650.4	$696.6	$690.9	$691.5	$684.5
Wage and Earnings Tax	1,448.9	1,542.3	1,581.9	1,633.7	1,603.3	1,519.1
Net Profits Tax	22.3	32.3	35.8	38.2	36.6	29.9
Business Income and Receipts Tax	417.5	446.1	540.9	497.3	514.0	464.3
Sales Tax[3]	188.4	198.4	224.2	227.9	194.2	174.5
Other Taxes[4]	367.7	454.9	458.6	472.6	417.4	390.4
Philadelphia Beverage Tax[5]	39.5	77.4	76.9	75.9	65.8	67.4
Total Taxes	3,071.4	3,401.8	3,614.8	3,636.5	3,522.8	3,330.1
Locally Generated Non-Tax Revenue	309.5	320.6	349.1	353.3	362.2	357.9
Revenue from Other Governments						
Net PICA Taxes Remitted to the City[6]	409.5	454.2	493.6	499.3	497.7	470.6
Other Revenue from Other Governments[7]	307.7	323.9	311.1	347.9	389.3	297.6
Total Revenue from Other Governments	717.2	778.2	804.7	847.2	887.0	768.2
Receipts from Other City Funds	60.1	55.4	51.7	81.0	88.5	125.6
Total Revenue	4,158.2	4,556.1	4,820.3	4,918.0	4,860.4	4,581.8
Obligations/Appropriations						
Personal Services	1,589.0	1,690.1	1,749.8	1,820.1	1,884.4	1,795.2
Purchase of Services[8]	851.4	891.1	915.5	1,001.3	1,032.1	948.6
Materials, Supplies and Equipment	94.4	102.2	113.3	123.7	166.6	117.3
Employee Benefits	1,241.0[11]	1,314.0[11]	1,371.1[11]	1,412.0[11]	1,348.4[11]	1,287.2[11]
Indemnities, Contributions, and Refunds[9]	186.6	195.2	279.8	322.4	341.7	378.7
City Debt Service[10]	140.9	148.8	159.8	187.5	187.5	185.7
Payments to Other City Funds	36.5	61.5	183.2[12]	68.9	73.9	67.2
Advances & Miscellaneous Payments[13]	0.0	0.0	0.0	55.1[14]	18.4[15]	25.0[16]
Payment to Budget Stabilization Reserve	0.0	0.0	0.0	34.3	34.3	0.0
Total Obligations/Appropriations	4,139.8	4,402.9	4,772.4	5,025.3	5,087.2	4,804.9
Operating Surplus (Deficit) for the Year	18.4	153.2	47.9	(107.3)	(226.8)	(223.1)
Net Adjustments – Prior Year	22.5	26.3	22.0	19.5	43.0	19.5
Cumulative Fund Balance Prior Year	148.3	189.2	368.8	297.7[17]	438.7[17]	254.9
Cumulative Adjusted Year End Fund Balance (Deficit)	$189.2	$368.8	$438.7[17]	$209.9	$254.9	$51.4

(1) Sources: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020 (Adopted Budget), the Fiscal Year 2020 Adopted Budget. For Fiscal Year 2020 (Current Estimate), the Twenty-Ninth Five-Year Plan. For Fiscal Year 2021 (Adopted Budget), the Fiscal Year 2021 Adopted Budget and Twenty-Ninth Five-Year Plan, as applicable.
(2) Figures may not sum due to rounding.
(3) For more information on the City Sales Tax, see "REVENUES OF THE CITY – Sales and Use Tax."
(4) Includes Amusement Tax, Real Property Transfer Tax, Parking Lot Tax, Smokeless Tobacco Tax and miscellaneous taxes.
(5) The Philadelphia Beverage Tax (as defined herein) taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017.
(6) For a detailed breakdown of "Net PICA Taxes Remitted to the City," see Table 43. Such figures reflect revenues received by the City from the PICA Tax of 1.50%, the proceeds of which are remitted to PICA for payment of debt service on PICA Bonds and PICA expenses. After paying debt service and expenses, net proceeds from the tax are remitted to the City as Revenue from Other Governments. See "DEBT OF THE CITY – PICA Bonds."
(7) For a detailed breakdown of "Other Revenue from Other Governments," see Table 12. "Other Revenue from Other Governments" includes state gaming revenues.
(8) Includes debt service on lease and service agreement financings.
(9) Includes contributions to the School District. See also Table 21 and the accompanying text herein.
(10) Includes debt service on General Obligation Debt (as defined herein) and tax and revenue anticipation notes; excludes debt service on PICA Bonds and lease and service agreement financings.
(11) For Fiscal Year 2017, includes $19.2 million from City Sales Tax revenues for the Municipal Pension Fund. For Fiscal Year 2018, includes $24.2 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2019, includes $52.1 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2020 (Adopted Budget), assumes $53.9 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2020 (Current Estimate), assumes $37.1 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2021 (Adopted Budget)), assumes $27.3 million from such tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(12) Includes $20.0 million for recession-related expenses.
(13) Advances & Miscellaneous Payments includes certain budgeted reserves for a given Fiscal Year. Any portion of such reserves that is not used to offset the applicable stated costs will increase the General Fund balance at the end of the given Fiscal Year, if not used by the City for other purposes.
(14) Includes $55.1 million in the Federal and State Funding and Recession Reserves.
(15) Includes $18.4 million in the Reopening and Recession Reserve.
(16) Includes $25.0 million in the Reopening and Recession Reserve.
(17) In its Fiscal Year 2020 Adopted Budget, the City projected that Fiscal Year 2019 would end with a General Fund balance of $297.9 million. In the Fiscal Year 2019 CAFR, the City reported that Fiscal Year 2019 ended with a General Fund balance of $438.7 million. Such number has been included as the "Cumulative Fund Balance Prior Year" in the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan.

Current Financial Information

Table 2 below shows General Fund balances for Fiscal Year 2019, budgeted amounts and current estimates for Fiscal Year 2020, and budgeted amounts for Fiscal Year 2021.

Table 2
General Fund – Fund Balance Summary
(Amounts in Thousands of USD)[(1)]

	Fiscal Year 2019 Actual[(2)] (June 30, 2019)	Fiscal Year 2020 Adopted Budget[(2)] (June 18, 2019)	Fiscal Year 2020 Current Estimate[(2)] (June 26, 2020)	Fiscal Year 2021 Adopted Budget[(2)] (June 26, 2020)
REVENUES				
Taxes	$3,614,840[(3)]	$3,636,492[(3)]	$3,522,792[(3)]	$3,330,098[(3)]
Locally Generated Non – Tax Revenues	349,062	353,328	362,177	357,890
Revenue from Other Governments	804,698	847,172	886,989	768,197
Revenues from Other Funds of City	51,677	81,011	88,476	125,608
Total Revenue	**$4,820,277**	**$4,918,003**	**$4,860,434**	**$4,581,793**
OBLIGATIONS / APPROPRIATIONS				
Personal Services	$1,749,789	$1,820,084	$1,884,357	$1,795,159
Personal Services – Employee Benefits	1,371,066[(4)]	1,411,963[(4)]	1,348,375[(4)]	1,287,159[(4)]
Purchase of Services[(5)]	915,529	1,001,325	1,032,109	948,562
Materials, Supplies, and Equipment	113,267	123,682	166,576	117,304
Contributions, Indemnities, and Taxes	279,769	322,432	341,732	378,737
Debt Service[(6)]	159,787	187,483	187,484	185,714
Payments to Other Funds	183,182[(7)]	68,913	73,913	67,216
Advances & Miscellaneous Payments[(8)]	0	55,108[(9)]	18,403[(10)]	25,000[(11)]
Payment to Budget Stabilization Reserve	0	34,276	34,276	0
Total Obligations / Appropriations	**$4,772,389**	**$5,025,266**	**$5,087,225**	**$4,804,851**
Operating Surplus (Deficit)	**47,888**	**(107,263)**	**(226,791)**	**(223,058)**
OPERATIONS IN RESPECT TO PRIOR FISCAL YEARS				
Net Adjustments – Prior Years	22,009	19,500	43,019	19,500
Operating Surplus/(Deficit) & Prior Year Adj.	69,897	(87,763)	(183,772)	(203,558)
Prior Year Fund Balance	368,783	297,666[(12)]	438,680[(12)]	254,908
Year End Fund Balance	**$438,680**[(12)]	**$209,903**	**$254,908**	**$51,350**

(1) Figures may not sum due to rounding.
(2) Sources: For Fiscal Year 2019, the Fiscal Year 2019 CAFR. For Fiscal Year 2020 Adopted Budget, the Fiscal Year 2020 Adopted Budget. For Fiscal Year 2020 Current Estimate, the Twenty-Ninth Five-Year Plan. For Fiscal Year 2021 Adopted Budget, Fiscal Year 2021 Adopted Budget and Twenty-Ninth Five-Year Plan, as applicable.
(3) For Fiscal Year 2019, includes $76.9 million in revenue from the Philadelphia Beverage Tax. For Fiscal Year 2020 Adopted Budget, assumes $75.9 million in revenue from such tax. For Fiscal Year 2020 Current Estimate, assumes $65.8 million in revenue from such tax. For Fiscal Year 2021 Adopted Budget, assumes $ 67.4 million in revenue from such tax. The Philadelphia Beverage Tax taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017.
(4) For Fiscal Year 2019, includes $52.1 million from City Sales Tax revenues for the Municipal Pension Fund. For Fiscal Year 2020 (Adopted Budget), assumes $53.9 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2020 (Current Estimate), assumes $37.1 million from such tax revenues for the Municipal Pension Fund. For Fiscal Year 2021 (Adopted Budget), assumes $27.3 million from such tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(5) Includes debt service on lease and service agreement financings.
(6) Includes debt service on General Obligation Debt (as defined herein) and tax and revenue anticipation notes; excludes debt service on PICA Bonds and lease and service agreement financings.
(7) Includes $20.0 million for recession-related expenses.
(8) Advances & Miscellaneous Payments includes certain budgeted reserves for a given Fiscal Year. Any portion of such reserves that is not used to offset the applicable stated costs will increase the General Fund balance at the end of the given Fiscal Year, if not used by the City for other purposes.
(9) Includes $55.1 million in the Federal and State Funding and Recession Reserves.
(10) Includes $18.4 million in the Reopening and Recession Reserve.
(11) Includes $25.0 million in the Reopening and Recession Reserve.
(12) In its Fiscal Year 2020 Adopted Budget, the City projected that Fiscal Year 2019 would end with a General Fund balance of $297.666 million. In the Fiscal Year 2019 CAFR, the City reported that Fiscal Year 2019 ended with a General Fund balance of $438.680 million. Such number has been included as the "Prior Year Fund Balance" in the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan.

The following discussion of the Fiscal Year 2020 Adopted Budget, the Twenty-Eighth Five-Year Plan, the Fiscal Year 2021 Adopted Budget, and the Twenty-Ninth Five-Year Plan, as applicable, is based, in part, on projections and forward-looking statements related to Fiscal Years 2020 and 2021. No assurance can be given that the applicable budget estimates and forward-looking statements will be realized. The accuracy of such budget estimates and forward-looking statements cannot be verified until after the close of the applicable Fiscal Year and the completion of the related audit.

Fiscal Year 2020 Adopted Budget and Twenty-Eighth Five-Year Plan. The City's proposed Fiscal Year 2020 operating budget was submitted by the Mayor to City Council on March 7, 2019, along with the City's proposed five-year plan for Fiscal Years 2020-2024. On June 13, 2019, City Council approved the Fiscal Year 2020 operating budget ordinance, which was signed by the Mayor on June 18, 2019 (the "Fiscal Year 2020 Adopted Budget"). On June 18, 2019, the City submitted to PICA its FY 2020-2024 Five Year Financial Plan Per Council Approved Budget and PICA approved such plan on July 16, 2019.

Fiscal Year 2020 Current Estimate. The current estimate for Fiscal Year 2020 is derived from information included in the Twenty-Ninth Five-Year Plan.

In the Twenty-Ninth Five-Year Plan, the City estimates that it will end Fiscal Year 2020 with a General Fund balance (on the legally enacted basis) of approximately $254.9 million.

Fiscal Year 2021 Adopted Budget and Twenty-Ninth Five-Year Plan. The City's proposed Fiscal Year 2021 operating budget was submitted by the Mayor to City Council on March 5, 2020, along with the City's proposed five-year plan for Fiscal Years 2021-2025. Each of those documents was revised and resubmitted on May 1, 2020 to include the City's current assessment of the impact of the COVID-19 pandemic on the City's financial position and operations. On June 25, 2020, City Council approved the Fiscal Year 2021 operating budget ordinance, which was signed by the Mayor on June 26, 2020 (the "Fiscal Year 2021 Adopted Budget").

On June 26, 2020, the City submitted to PICA its FY 2021-2025 Five Year Financial Plan Per Council Approved Budget (the "Twenty-Ninth Five-Year Plan"). PICA recommended approval of such plan on July 21, 2020, on the condition that the City provides monthly updates on obligations and revenues to protect against any significant deviation from projected revenues, obligations or fund balance, which could appropriately be deemed a variance by PICA and require a revision to the Twenty-Ninth Five-Year Plan in accordance with the PICA Act and the PICA Agreement. PICA staff, in recommending that PICA approve the Twenty-Ninth Five-Year Plan, noted that the revenue and expenditure projections presented in the Twenty-Ninth Five-Year Plan were [quoting from the PICA Act] "based on reasonable and appropriate assumptions and methods of estimation . . . consistently applied." The PICA staff report concluded that "[a]lthough PICA is confident that the [Twenty-Ninth Five-Year Plan] is based on reasonable and appropriate assumptions, and year end fund balances are positive throughout the life of the [Twenty-Ninth Five-Year Plan], certain factors were identified that might present risks to the [Twenty-Ninth Five-Year Plan]." The PICA report identified such factors as: (i) the length and uncertainty of the COVID-19 global pandemic; (ii) the possibility of slower than projected economic growth over the period covered by the plan; (iii) the projected growth of BIRT collections; (iv) low General Fund balance levels; and (v) increasing overtime and pension costs. The PICA staff report also highlighted certain other financial concerns that could impact the City's financial condition, including, among others (a) future labor, overtime, and employee health benefit costs; (b) funding of the now locally controlled School District; (c) speculative revenues from sources such as locally generated non-tax revenue, revenue from other governments, and revenue from other funds; and (d) the use of the Budget Stabilization Reserve in Fiscal Year 2021 and the lack of near-term plans to fund such reserve (not projected to occur until Fiscal Year 2025).

For more information on the current assessment of the fiscal impact of COVID-19 on the City, see “OVERVIEW – Fiscal Health of the City – COVID-19.”

For Fiscal Years 2021-2025, the Twenty-Ninth Five-Year Plan projects that the City will end such Fiscal Years with General Fund balances (on the legally enacted basis) of approximately (i) $51.4 million (Fiscal Year 2021), (ii) $50.8 million (Fiscal Year 2022), (iii) $141.3 million (Fiscal Year 2023), (iv) $117.1 million (Fiscal Year 2024), and (v) $229.2 million (Fiscal Year 2025).

For more information on the City’s annual budget process under the City Charter and the five-year financial plans and quarterly reporting required under the PICA Act, see “– Budget Procedure,” “– Five-Year Plans of the City,” and “– Quarterly Reporting to PICA,” above.

REVENUES OF THE CITY

General

Prior to 1939, the City relied heavily on the real estate tax as the mainstay of its revenue system. In 1932, the General Assembly adopted an act (commonly referred to as the Sterling Act) under which the City is permitted to levy any tax that was not specifically pre-empted by the Commonwealth. Acting under the Sterling Act and other Pennsylvania legislation, the City has taken various steps over the years to broaden its sources of income, including: (i) enacting the wage, earnings, and net profits tax in 1939; (ii) introducing a sewer service charge to make the sewage treatment system self-sustaining after 1945; (iii) requiring under the City Charter that the water, sewer, and other utility systems be fully self-sustaining; (iv) enacting the Mercantile License Tax (a gross receipts tax on business done within the City) in 1952, which was replaced as of the commencement of Fiscal Year 1985 by the Business Privilege Tax (renamed the Business Income and Receipts Tax in May 2012), and (v) enacting the City Sales Tax (as defined herein) for City general revenue purposes effective beginning in Fiscal Year 1992.

Major Revenue Sources

The City currently derives its revenues primarily from various taxes, non-tax revenues, and receipts from other governments. See Table 3 for General Fund tax revenues for Fiscal Years 2017-2019, budgeted amounts and current estimates for Fiscal Year 2020, and budgeted amounts for Fiscal Year 2021. The following discussion of the City’s revenues does not take into account revenues in the non-debt related funds. The tax rates for Fiscal Years 2017 through 2019 are contained in the Fiscal Year 2019 CAFR.

Table 3 provides a detailed breakdown of the “Total Taxes” line from Table 1 above. Table 3 does not include “Revenues from Other Governments,” which consists of “Net PICA Taxes Remitted to the City” and “Other Revenue from Other Governments.” “Net PICA Taxes Remitted to the City” is set forth in Table 1 and a detailed breakdown of such revenues is shown in Table 43. “Other Revenue from Other Governments” is set forth in Table 1 and a detailed breakdown of such revenues is shown in Table 12.

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Table 3
General Fund Tax Revenues
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD) (1), (2), (3)

	Actual 2017	Actual 2018	Actual 2019	Adopted Budget 2020 (June 18, 2019)	Current Estimate 2020 (June 26, 2020)	Adopted Budget 2021 (June 26, 2020)
Real Property Taxes						
Current	$542.9	$611.3	$658.2	$653.4	$653.9	$647.5
Prior	44.2	39.1	38.4	37.6	37.6	36.8
Total	$587.1	$650.4	$696.6	$690.9	$691.5	$684.3
Wage and Earnings Tax[4]						
Current	$1,440.6	$1,536.9	$1,577.5	$1,628.3	$1,597.9	$1,513.7
Prior	8.3	5.4	4.4	5.4	5.4	5.4
Total	$1,448.9	$1,542.3	$1,581.9	$1,633.7	$1,603.3	$1,519.1
Business Taxes						
Business Income and Receipts Tax Current & Prior	$417.5	$446.1	$540.9	$497.3	$514.0	$464.3
Net Profits Tax						
Current	$25.3	$27.6	$29.5	$33.5	$31.9	$25.2
Prior	(3.0)	4.7	6.4	4.7	4.7	4.7
Subtotal Net Profits Tax	$22.3	$32.3	$35.8	$38.2	$36.6	$29.9
Total Business and Net Profits Taxes	$439.8	$478.4	$576.7	$535.6	$550.6	$494.2
Other Taxes						
Sales and Use Tax[5]	$188.4	$198.4	$224.2	$227.9	$194.2	$174.5
Amusement Tax	20.6	23.0	26.4	28.9	18.5	16.6
Real Property Transfer Tax	247.3	331.5	328.4	339.3	313.5	292.9
Parking Taxes	96.1	96.5	99.3	100.2	80.7	76.7
Other Taxes	3.8	4.0	4.4	4.2	4.7	4.4
Subtotal Other Taxes	$556.1	$653.3	$682.7	$700.5	$611.6	$565.1
Philadelphia Beverage Tax[6]	39.5	77.4	76.9	75.9	65.8	67.4
TOTAL TAXES	**$3,071.4**	**$3,401.8**	**$3,614.8**	**$3,636.5**	**$3,522.8**	**$3,330.1**

(1) Sources: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020 (Adopted Budget), the Fiscal Year 2020 Adopted Budget. For Fiscal Year 2020 (Current Estimate), the Twenty-Ninth Five-Year Plan. For Fiscal Year 2021 (Adopted Budget), the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable.
(2) See Table 7 in the Fiscal Year 2019 CAFR for tax rates.
(3) Figures may not sum due to rounding.
(4) Does not include the PICA Tax of 1.50%, the proceeds of which are remitted to PICA for payment of debt service on PICA Bonds and PICA expenses. After paying debt service and expenses, net proceeds from the tax are remitted to the City as Revenue from Other Governments. See "DEBT OF THE CITY – PICA Bonds" for a description of the PICA Tax.
(5) For more information on the City Sales Tax, see "– Sales and Use Tax" and Table 11.
(6) The Philadelphia Beverage Tax taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017.

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Wage, Earnings, and Net Profits Taxes

The largest tax revenue source (comprising more than 43% of all tax revenues in Fiscal Year 2019) is the wage, earnings and net profits tax. The Wage and Earnings Tax is collected from all employees working within City limits, and all City residents regardless of work location. The Net Profits Tax is collected on the net profits from the operation of a trade, business, profession, enterprise or other activity conducted by individuals, partnerships, associations or estates and trusts within the City limits. The following table sets forth the resident and non-resident wage, earnings and net profits tax rates for Fiscal Years 2017-2021, the annual wage, earnings and net profits tax receipts in Fiscal Years 2017-2019, the budgeted amount and current estimate of such receipts for Fiscal Year 2020, and the budgeted amount of such receipts for Fiscal Year 2021.

Table 4
Summary of Wage, Earnings and Net Profits Tax Rates and Receipts
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)[(1)]

Fiscal Year	Resident Wage, Earnings and Net Profits Tax Rates[(2)]	Non-Resident Wage, Earnings and Net Profits Tax Rates	Annual Wage, Earnings and Net Profits Tax Receipts (including PICA Tax) (Amounts in Millions of USD)[(3)]
2017	3.9004%	3.4741%	$1,940.4 (Actual)
2018	3.8907%	3.4654%	$2,071.5 (Actual)
2019	3.8809%	3.4567%	$2,146.4 (Actual)
2020	3.8712%	3.4481%	$2,218.0 (Adopted Budget) $2,184.5 (Current Estimate)
2021	3.8712%	3.5019%	$2,056.8 (Adopted Budget)

(1) See Table 7 in the Fiscal Year 2019 CAFR for tax rates for Fiscal Years 2017-2019. See the Twenty-Ninth Five-Year Plan for tax rates for Fiscal Years 2020 and 2021.
(2) Includes PICA Tax. See "DEBT OF THE CITY – PICA Bonds" for a description of the PICA Tax.
(3) Sources: For Fiscal Years 2017-2019, the City's CAFRs for the City's annual wage, earnings, and net profits tax receipts and the City's Quarterly City Manager's Reports for gross PICA Tax (see first column in Table 43). For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Fiscal Year 2021 Adopted Budget. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.

Commonwealth funding from gaming revenues is mandated by statute to be used to reduce the resident and nonresident wage tax rate. Gaming revenues have averaged approximately $86.3 million in Fiscal Years 2017-2019. For Fiscal Year 2020, the budgeted amount and current estimate of gaming revenues is $86.3 million. For Fiscal Year 2021, the budgeted amount of gaming revenues is $86.3 million.

See "– Other Tax Rate Changes" herein, for information regarding wage and earnings tax rate reductions under the Twenty-Ninth Five-Year Plan.

In a 2015 decision by the Supreme Court of the United States (*Comptroller of the Treasury of Maryland v. Wynne*, 135 S. Ct. 1787 (2015)), a state's failure to provide certain credits against its personal income tax was held to have violated the dormant Commerce Clause of the United States Constitution. Such personal income tax was applied to income earned outside of the state of residency, and residents were not given a credit for income taxes paid to the state where such income was earned, resulting, in the circumstances presented, in taxing income earned interstate at a rate higher than income earned intrastate. The City provides a credit to resident taxpayers against their respective wage, earnings, and net profits tax liabilities for similar taxes paid to another locality, but does not provide a credit for similar taxes paid to another state. Taxpayers have challenged the City's refusal to grant a credit for taxes paid to other states and have appealed to the Commonwealth Court on such matters. To date, the City's position has been upheld by both the Tax Review Board and the Court of Common Pleas. The City estimates the cost of current appeals to be approximately $10 million.

Business Income and Receipts Tax

Pursuant to The First Class City Business Tax Reform Act of 1984, City Council imposed a business tax measured by gross receipts, net income or the combination of the two. The same year, City Council by ordinance repealed the Mercantile License Tax and the General Business Tax and imposed the Business Privilege Tax. As of May 1, 2012, the Business Privilege Tax was renamed the Business Income and Receipts Tax (or BIRT). The BIRT allows for particular allocations and tax computations for regulated industries, public utilities, manufacturers, wholesalers, and retailers. Rental activities are usually considered to be business activities. Every estate or trust (whether the fiduciary is an individual or a corporation) must file a BIRT return if the estate or trust is engaged in any business or activity for profit within the City. There are also credit programs where meeting the requirement of the program allows for a credit against the BIRT. All persons subject to both the BIRT and the Net Profits Tax are entitled to apply a credit of 60% of the net income portion of their BIRT liability against what is due on the Net Profits Tax to the maximum of the Net Profits Tax liability for that tax year.

In November 2011, legislation was enacted to halt a previously enacted program of reducing the gross receipts portion of the BIRT and to commence reductions in the net income portion of the BIRT. The following table provides a summary of BIRT rates for tax years 2012-2024. Future BIRT rates remain subject to amendment by action of City Council and the Mayor.

Table 5
Summary of Business Income and Receipts Tax Rates

Tax Year	Gross Receipts	Net Income
2012	1.415 mills	6.45%
2013	1.415 mills	6.45%
2014	1.415 mills	6.43%
2015	1.415 mills	6.41%
2016	1.415 mills	6.39%
2017	1.415 mills	6.35%
2018	1.415 mills	6.30%
2019	1.415 mills	6.25%
2020	1.415 mills	6.20%
2021	1.415 mills	6.20%
2022	1.415 mills	6.20%
2023	1.415 mills	6.20%
2024	1.415 mills	6.15%

The 2011 legislation incorporated several changes intended to help small and medium sized businesses and lower costs associated with starting a new business in order to stimulate new business formation and increase employment in the City, including the following: (i) the Commercial Activity License fee for all businesses was eliminated in 2014; (ii) business taxes for the first two years of operations for all new businesses with at least three employees in their first year and six employees in their second year were eliminated beginning in 2012; and (iii) across the board exclusions on the gross receipts portion of the BIRT were provided for all businesses phased in over a three-year period beginning in 2014 and eventually excluding the first $100,000 of gross receipts, along with proportional reductions in the net income portion of the BIRT. The legislation also provided for implementation of single sales factor apportionment in 2015, which enables businesses to pay BIRT based solely on sales in the City, rather than on property or payroll.

By Fiscal Year 2024, the net income (profits) portion of the business tax is projected to reach 6.10%. In addition, legislation was enacted, effective for tax year 2019, to (i) eliminate the requirement for new businesses to make an estimated business tax payment when filing a return for their first tax year of business operations and (ii) allow such estimated payments in the second year to be made in quarterly installments.

Real Property Taxes

Assessment and Collection. Taxes are levied on the assessed value of all taxable residential and commercial real property located within the City's boundaries for the City and for the School District (each, a "Real Estate Tax") as assessed by the Office of Property Assessment ("OPA") and collected by the Department of Revenue for both the City and the School District. Real Estate Taxes are authorized by Commonwealth law with the millage split between the City Real Estate Tax and the School District Real Estate Tax changing over the years. Currently, the City Real Estate Tax is equal to 45% of the total authorized millage and the School District Real Estate Tax is equal to 55% of the total authorized millage. Real Estate Taxes are levied on a calendar year basis. By separate ordinances, City Council authorizes and levies the rate of the City Real Estate Tax and authorizes the rate of the School District Real Estate Tax. The Board of Education levies all School District taxes, including the School District Real Estate Tax. Bills are sent in December for the following year and payments are due March 31.

For tax year 2014, all properties in Philadelphia were reassessed at their actual market value by OPA under the Actual Value Initiative ("AVI") in order to replace outdated values and inequities within the system. Under AVI, the total assessed value of all properties more accurately reflected the market in the City and the total assessment grew substantially. As a result, the Mayor and City Council significantly reduced the Real Estate Tax rate to ensure that, in its first year, the reassessment resulted in the collection of approximately the same amount of Real Estate Taxes as the prior year (tax year 2013).

In order to mitigate any hardship that could be created by the substantial increases in assessed value, the ordinance imposing the new Real Estate Tax rates included a homestead exemption of $30,000 for all primary residential owner-occupants, which was subsequently increased to $40,000 of assessed value in Fiscal Year 2019. In the Fiscal Year 2020 Adopted Budget, the homestead exemption was increased from $40,000 to $45,000 of assessed value. In addition to the homestead exemption, the City has also instituted several other property tax relief programs for taxpayers.

In December 2019, City Council also passed legislation to modify the existing 10-year property tax abatement for new construction of residential properties. Effective for exemption applications beginning January 1, 2021, the program will be adjusted to exempt 100% of the improvement value in the first year with graduated 10% annual reductions in the exemption percentage each subsequent year. No changes were made to the existing property tax abatement programs for commercial buildings or substantial rehabilitation of residential structures.

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The Real Estate Tax rates for tax years 2016-2020 are set forth in Table 6 below:

Table 6
Real Estate Tax Rates and Allocations

Tax Year	City	School District	Total
2016	0.6317%	0.7681%	1.3998%
2017	0.6317%	0.7681%	1.3998%
2018	0.6317%	0.7681%	1.3998%
2019	0.6317%	0.7681%	1.3998%
2020	0.6317%	0.7681%	1.3998%

For Fiscal Year 2019, the actual amount of Real Estate Tax revenue for the City was $658.2 million (excluding delinquent collections). For Fiscal Year 2020, the budgeted amount of Real Estate Tax revenue for the City is $653.4 million (excluding delinquent collections). For Fiscal Year 2020, the current estimate of Real Estate Tax revenue for the City is $653.9 million (excluding delinquent collections). For Fiscal Year 2021, the budgeted amount of Real Estate Tax revenue for the City is $647.5 million (excluding delinquent collections). See Table 3 above. For information on the process for appealing a property tax assessment, see the text before and after Table 7 below.

Table 7 shows the assessed values of properties used for tax year 2020 and 2021 Real Estate Taxes.

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Table 7
Certified Property Values for Tax Years 2020 and 2021

Tax Year 2020

Category	Market Value(1)	Taxable Assessed Value	Exempt Assessed Value	Homestead	# of Properties
Single Family Residential	$79,112,006,350	$63,891,731,827	$6,964,128,995	$8,256,145,52	457,631
Multi-Family Residential (Apartments)(2)	29,341,610,800	21,276,976,823	7,771,704,222	292,929,755	42,064
Non-Residential(3)	55,275,284,866	28,285,867,793	26,948,588,073	40,829,000	36,908
Vacant Land	4,534,177,300	2,121,913,727	2,409,942,273	2,321,300	44,722
Total	**$168,263,079,316**	**$115,576,490,170**	**$44,094,363,563**	**$8,592,225,583**	**581,325**

[1] Assessment data current as of March 31, 2019.
[2] Apartments were split from the previous hotels and apartments category and are now reflected as multi-family residential.
[3] Includes commercial, industrial, store with dwelling, hotels, and motels.

Tax Year 2021

Category	Market Value(1)	Taxable Assessed Value	Exempt Assessed Value	Homestead	# of Properties
Single Family Residential	$79,889,823,850	$63,697,212,563	$6,844,885,434	$9,347,725,853	457,751
Multi-Family Residential (Apartments)(2)	30,080,351,000	21,561,546,044	8,201,312,244	317,492,712	42,331
Non-Residential(3)	55,443,377,866	28,471,130,722	26,926,216,544	46,030,600	36,763
Vacant Land	4,541,666,800	2,154,649,414	2,384,398,986	2,618,400	44,611
Total	**$169,955,219,516**	**$115,884,538,743**	**$44,356,813,208**	**$9,713,867,565**	**581,456**

[1] Assessment data current as of December 31, 2019.
[2] Apartments were split from the previous hotels and apartments category and are now reflected as multi-family residential.
[3] Includes commercial, industrial, store with dwelling, hotels, and motels.

Assessment and Appeals. OPA is responsible for property assessments, while the Board of Revision of Taxes ("BRT"), an independent, seven-member board appointed by the Board of Judges of the Philadelphia Common Pleas Court, is the property assessment appeals board.

OPA certifies the market values by March 31 of the prior year (i.e., for tax year 2021, OPA certified the market values on March 31, 2020). Taxpayers base their appeals on the certified market values, and therefore, the assessed values are adjusted as the appeals are finalized. In some circumstances and for certain tax years, taxpayers are permitted, during the appeals process, to pay their property tax bills based on the certified market value of their properties from the prior assessment. For budgetary purposes, OPA provides updated assessment data to the Office of the Director of Finance by February of each year, from which Real Estate Tax projections are made. Certified values can vary substantially from the amounts included in such data and, as such, Real Estate Tax collections can also vary from the amounts included in the City's proposed annual operating budget.

Under AVI, OPA set up a new process called a first level review ("FLR"), where a taxpayer could request an administrative review of its assessment notice prior to launching a formal appeal with the BRT. The BRT has the authority, following a formal appeal, to either increase, decrease, or leave unchanged the property assessment. Some appeals are not resolved before bills are sent to taxpayers. As such, some property assessments are modified after taxpayers receive bills.

For tax year 2018, OPA revised the assessed values of over 60,000 parcels (which included properties of all categories, including commercial and residential parcels) throughout the City as part of its reassessment. In September 2017, the owners of multiple commercial properties in the City filed a lawsuit against the City in the Court of Common Pleas. The plaintiffs in such matter alleged, based on a July 2017 Pennsylvania Supreme Court decision, that OPA violated the uniformity clause of the Pennsylvania Constitution in reassessing commercial properties and not residential properties for tax year 2018. The plaintiffs sought declaratory relief, a permanent injunction, and an order directing OPA to recertify their properties at tax year 2017 values. Subsequently, ten additional cases were filed, asserting virtually the same claims. All of the cases, which encompass approximately 600 plaintiffs and approximately 700 properties, were consolidated for management purposes. In a ruling handed down on July 18, 2019, the Common Pleas Court found that plaintiffs were owed refunds for overpayments equal to the difference between the plaintiffs' Real Estate Taxes for tax year 2017 and tax year 2018. The Common Pleas Court calculated the total amount of these refunds against the City and the School District at more than $50 million. The City and School District appealed the ruling on October 22, 2019. As noted below, City-wide reassessments were conducted for tax years 2019 and 2020. As such, the City does not expect the Real Estate Taxes for such tax years to be impacted by the final judgment on this matter. For more general information on judgments and settlements on claims against the City, see "LITIGATION."

For tax year 2019, OPA revised the assessed values of over 515,000 parcels throughout the City as part of its reassessment. As of December 11, 2019, OPA has received 20,757 FLRs, with approximately 200 that have yet to be decided. As of July 7, 2020, BRT has received approximately 10,200 formal appeals, with approximately 200 that have yet to be decided.

For tax year 2020, OPA revised the assessed values of over 503,000 parcels throughout the City as part of its reassessment. As of December 11, 2019, OPA has received 11,706 FLRs, with approximately 4,650 that have yet to be decided. As of July 7, 2020, BRT has received approximately 7,400 appeals, with approximately 5,000 that have yet to be decided.

For tax year 2021, OPA had planned to conduct a second year of trending for assessments, but initial results showed certain anomalies that would result in assessed values that were not acceptable to the City's standards. As such, the City carried forward the assessed values from tax year 2020, with the exception of properties that had new construction, expiring abatements, renovations, subdivisions, consolidations, or errors in prior year assessments. As described below in "Review of Assessment Methodology," OPA will continue implementing procedures to ensure greater accuracy in future assessments, including the planned assessment for tax year 2022.

Review of Assessment Methodology. OPA continues to review its assessment methodology in order to improve the transparency and accuracy of its assessment activities and the quality of assessments. Such efforts include (i) implementing the new computer-assisted mass appraisal system program, (ii) contracting with an outside vendor to improve the quality of OPA's data, (iii) strengthening OPA's modeling team, and (iv) providing more training to the sales validation team, which was created in 2019, to help ensure improved data.

Collection Initiatives. Since 2010, the City has pursued a number of initiatives to improve the collection of Real Estate Taxes, including (i) prompt correspondence with taxpayers with overdue Real Estate Taxes, (ii) using outside collection firms to collect overdue Real Estate Taxes, (iii) sequestration of delinquent properties occupied by commercial tenants, and (iv) tax lien sales.

As a result of economic disruptions from the COVID-19 pandemic, the City's regular collection strategies have been modified. At this time, the Department of Revenue continues to send bills and notifications and its outreach efforts, but some legal action, enforcement projects, and placements with collection agencies have been suspended. The City continues to evaluate and pursue long-time delinquent accounts and place liens on properties for property-based taxes and fees. Along with existing flexible payment agreements for property tax and water fees, the City has also launched new payment agreements for all business taxes in an effort to bring businesses affected by COVID-19 closures into compliance.

Real Estate Tax Tables. See Table 8 below for data with respect to Real Estate Taxes levied from 2015 to 2019 and collected by the City from January 1, 2015 to June 30, 2019. See Table 9 for the assessed property values of the City's principal taxable assessed parcels in 2020. See Table 10 for the 2020 market and assessed values of the ten highest valued taxable real properties in the City, as well as the amounts and duration of Real Estate Tax abatements with respect to such properties.

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Table 8
City of Philadelphia
Real Property Taxes Levied and Collected
For the Calendar Years 2015-2019
(Amounts in Millions of USD)[(1), (2)]

Calendar Year	Taxes Levied Based on Original Assessment[(3)]	Taxes Levied Based on Adjusted Assessment[(4)]	Collections in the Calendar Year of Levy[(6)]	Percentage Collected in the Calendar Year of Levy	Collections in Subsequent Years[(5), (6)]	Total Collections to Date: All Years[(6)]	Percentage Collected to Date: All Years[(6)]
2015	$547.4	$516.7	$489.1	94.7%	$25.9	$515.0	99.7%
2016	$569.9	$548.8	$525.2	95.7%	$19.5	$544.7	99.3%
2017	$580.5	$564.7	$542.9	96.1%	$16.5	$559.4	99.1%
2018	$658.1	$629.2	$604.4	96.1%	$8.7	$613.2	97.5%
2019	$709.4	$690.8	$636.5	N/A	N/A	$636.5	N/A

(1) Source: Fiscal Year 2019 CAFR.
(2) Real Estate Taxes are levied by the City and the School District. While this table reflects City General Fund Real Estate Tax revenues exclusively, the School District Real Estate Tax collection rates are the same.
(3) Taxes are levied on a calendar year basis. They are due on March 31.
(4) Adjustments include assessment appeals, a 1% discount for payment in full by February 28, the senior citizen tax discount, and the tax increment financing return of tax paid. For more information on the reassessment appeal process, see "– Real Property Taxes – Assessment and Appeals."
(5) Includes payments from capitalization charges. This capitalization occurs one time, after the end of the first year of the levy, on any unpaid balances.
(6) For calendar year 2019, the data shown reflects collections through June 30, 2019. For earlier calendar years, the data shown reflects collections through December 31 of the respective year.

Table 9
Principal Taxable Assessed Parcels – 2021
(Amounts in Millions of USD)[(1)]

Taxpayer	2021 Assessment[(2)]	2021 Percentage of Total Assessments
Kim Sub Cira Square LP	$370.6	0.29%
Liberty Property Phila[(3)]	359.0	0.29
EQC Nine Penn Center Prop	352.1	0.28
NG 1500 Market St LLC	349.9	0.28
Phila Liberty Place LP	315.0	0.25
Park Towne Place Assoc	276.9	0.22
Commerce Square Partners	266.4	0.21
Phila Plaza Phaze II	252.7	0.20
Philadelphia Market Street	250.3	0.20
Brandywine Operating	236.4	0.19
Total	$3,029.3	2.41%
Total Taxable Assessments[(4)]	$125,867.6	

Source: City of Philadelphia, Office of Property Assessment.

(1) Figures may not sum due to rounding.
(2) Assessment Values rounded to the nearest $100,000 and only include the largest assessed property for each taxpayer, additional properties owned by the same taxpayer are not included.
(3) Acquired by Prologis, Inc. in the first quarter of calendar year 2020.
(4) Total 2021 Taxable Assessment as of December 31, 2019.

Table 10
Ten Largest Certified Market and Assessment Values of Tax-Abated Properties
Certified Values for 2021
(Amounts in Millions of USD)[(1), (2)]

Location	2020 Certified Market Value	Total Assessment	Total Taxable Assessment	Total Exempt Assessment	Exempt Through Tax Year
1001-99 N Delaware Ave	$307.4	$307.4	$49.7	$257.7	2026
1800 Arch St	$278.8	$278.8	$27.9	$250.9	2027
401 N Broad St	$245.8	$245.8	$223.1	$22.7	2026
1801 John F Kennedy	$200.3	$200.3	$134.0	$66.3	2024
170 S Independence W Mall	$162.1	$162.1	$141.3	20.9	2028
1601 Vine St	$154.1	$154.1	$13.8	$140.3	2028
2402-14 Market St	$148.0	$148.0	$32.3	115.7	2028
450 N 18th St	$146.3	$146.3	$14.6	$131.7	2027
2116 Chestnut St	$144.0	$144.0	$14.4	$129.6	2023
500 N 21st St	$133.4	$133.4	$13.3	$120.1	2026

Source: City of Philadelphia, Office of Property Assessment.

(1) Figures may not sum due to rounding.
(2) Certified Values as of 12/31/2019.

Sales and Use Tax

Pursuant to the authorization granted by the Commonwealth under the PICA Act, the City adopted a 1% sales and use tax (the "City Sales Tax") for City general revenue purposes effective beginning in Fiscal Year 1992. It is imposed in addition to, and on the same basis as, the Commonwealth's sales and use tax. Vendors are required to pay City Sales Taxes to the Commonwealth Department of Revenue together with the Commonwealth sales and use tax. The State Treasurer deposits the collections of City Sales Taxes in a special fund and disburses the collections, including any investment income earned thereon, less administrative fees of the Commonwealth Department of Revenue, to the City on a monthly basis.

The City's budgets for Fiscal Years 2010-2014 provided for an increase in the City Sales Tax rate to 2%, as authorized by the Commonwealth effective October 8, 2009, through June 30, 2014. In July 2013, the Commonwealth authorized the implementation of a new, permanent 1% increase in the City Sales Tax rate effective July 1, 2014, which was adopted by the City on June 12, 2014 and became effective on July 1, 2014. Under the reauthorized City Sales Tax, the first $120 million collected from such additional 1% is distributed to the School District. For Fiscal Years 2015-2018, the General Assembly authorized the City to use the next $15 million of City Sales Tax revenues from such additional 1% collected in such Fiscal Years for the payment of debt service on obligations issued by the City for the benefit of the School District. Following such debt service payments, that remaining portion of the City Sales Tax revenues from such additional 1% distributed to the City is required to be used exclusively in accordance with Act 205 (as defined herein) and deposited to the Municipal Pension Fund.

The following table sets forth the City Sales Taxes collected in Fiscal Years 2017-2019, the budgeted amount and current estimate for Fiscal Year 2020, and the budgeted amount for Fiscal Year 2021.

Table 11
Summary of City Sales Tax Collections
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD)[(1)]

Fiscal Year	City Sales Tax Collections
2017 (Actual)	$188.4[(2)]
2018 (Actual)	$198.4[(2)]
2019 (Actual)	$224.2[(3)]
2020 (Adopted Budget)	$227.9[(3)]
2020 (Current Estimate)	$194.2[(3)]
2021 (Adopted Budget)	$174.5[(3)]

(1) Sources: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Twenty-Ninth Five-Year Plan. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.
(2) Net collections estimated to be distributed to the City (i) from the first 1% City Sales Tax, (ii) following the distribution of $120 million of revenues from the second 1% City Sales Tax to the School District, and (iii) following the payment of debt service on obligations issued by the City for the benefit of the School District, as described above.
(3) Net collections estimated to be distributed to the City from the first 1% City Sales Tax and following the distribution of $120 million of revenues from the second 1% City Sales Tax to the School District, as described above.

Real Property Transfer Tax

Real Property Transfer Taxes are collected in connection with the sale of real property in the City. The Real Property Transfer Tax rate in the City is 4.278%, 3.278% of which is imposed by the City and 1% of which is charged by the Commonwealth. Revenues from this tax fell during the 2008 recession but have grown since such recession ended. In the Fiscal Year 2019 CAFR, the City reported that it collected approximately $328.4 million in revenues from the Real Property Transfer Tax in Fiscal Year 2019.

In the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable, the City currently estimates for Fiscal Years 2020-2025 that it will collect approximately (i) $313.5 million (Fiscal Year 2020), (ii) $292.8 million (Fiscal Year 2021, as budgeted), (iii) $301.3 million (Fiscal Year 2022), (iv) $313.8 million (Fiscal Year 2023), (v) $325.5 million (Fiscal Year 2024), and (vi) $337.7 million (Fiscal Year 2025) in revenues from the Real Property Transfer Tax in such Fiscal Years.

After significant growth through Fiscal Year 2018, changes in the real estate market in the City were projected to return to a more moderate level, with a reduction in Real Property Transfer Tax revenue in Fiscal Year 2019, with relatively slow growth projected annually thereafter, mostly due to a "normalized" level for the commercial property market.

Other Taxes

The City also collects parking taxes, an amusement tax, a valet parking tax, an outdoor advertising tax, a smokeless tobacco tax, the Philadelphia Beverage Tax (see below), and other miscellaneous taxes.

In June 2016, City Council passed the Philadelphia Beverage Tax (Chapter 19-4100 of the Philadelphia Code) (the "Philadelphia Beverage Tax"). On October 31, 2016, the Department of Revenue adopted regulations for the Philadelphia Beverage Tax. The Philadelphia Beverage Tax taxes the distribution of certain beverages at 1.5 cents per ounce and became effective January 1, 2017.

The Philadelphia Beverage Tax is deposited into the General Fund, and with the additional revenue, the City has budgeted for pre-Kindergarten, community schools, and debt service for improvements to parks, playgrounds, recreation centers, and libraries, as contemplated by the City's Rebuild program. In the Fiscal Year 2019 CAFR, the City reported that it collected approximately $76.9 million in revenues from the Philadelphia Beverage Tax for Fiscal Year 2019.

In the Fiscal Year 2021 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable, the City currently estimates that for Fiscal Years 2020-2025 that it will collect approximately (i) $65.8 million (Fiscal Year 2020), (ii) $67.4 million (Fiscal Year 2021, as budgeted), (iii) $68.0 million (Fiscal Year 2022), (iv) $67.4 million (Fiscal Year 2023), (v) $66.9 million (Fiscal Year 2024), and (vi) $66.4 million (Fiscal Year 2025) in revenues from the Philadelphia Beverage Tax in such Fiscal Years.

Improved Collection Initiative

The City is pursuing a multifaceted strategy designed to improve collections of various taxes while decreasing delinquencies. Key compliance strategies continue to include revocation of commercial licenses and sequestration, among others.

In addition to compliance efforts, the City has completed two projects – one to implement technology solutions for its cashiering and payments processing systems and another to develop an integrated data warehouse and case management system. These initiatives improve operational efficiencies and drive compliance efforts by providing tools previously unavailable to the City.

Other Locally Generated Non-Tax Revenues

These revenues include license fees and permit sales, traffic fines and parking meter receipts, court related fees, stadium revenues, interest earnings and other miscellaneous charges and revenues of the City.

Revenue from Other Governments

The following table presents revenues received from other governmental jurisdictions for Fiscal Years 2017-2019, the budgeted amount and current estimate for Fiscal Year 2020, the budgeted amount for Fiscal Year 2021, and the percentage such revenues represent in the General Fund. The table does not reflect substantial amounts of revenues from other governments received by the Grants Revenue Fund, Community Development Fund, and other operating and capital funds of the City.

Table 12
Revenue from Other Governmental Jurisdictions
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Dollar Amounts in Millions of USD)(1), (2), (3)

Fiscal Year	Commonwealth(4)	Federal Government	Other Governments(5)	Total	Percentage of General Fund Revenues
2017 (Actual)	$214.7	$37.6	$55.4	$307.7	7.4%
2018 (Actual)	$224.5	$31.3	$68.2	$323.9	7.1%
2019 (Actual)	$214.2	$21.9	$75.1	$311.1	6.5%
2020 (Adopted Budget)	$235.7	$45.8	$66.4	$347.9	7.1%
2020 (Current Estimate)	$217.5	$119.2	$52.6	$389.3	8.0%
2021 (Adopted Budget)	$222.8	$23.0	$51.8	$297.6	6.5%

(1) Sources: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.
(2) Figures may not sum due to rounding.
(3) Does not include the PICA Tax.
(4) Such revenues are for health, welfare, court, and various other specified purposes.
(5) Such revenues primarily consist of payments from PGW, parking fines and fees from PPA, and other authorized adjustments.

Revenues from City-Owned Systems

In addition to taxes, the City realizes revenues through the operation of various City-owned systems, such as the Water and Wastewater Systems and PGW. The City has issued revenue bonds with respect to the Water and Wastewater Systems and PGW to be paid solely from and secured by a pledge of the respective revenues of these systems. The revenues of the Water and Wastewater Systems and PGW are not legally available for payment of other obligations of the City until, on an annual basis, all revenue bond debt service requirements and covenants relating to those bonds have been satisfied, and then only in a limited amount and upon satisfaction of certain other conditions.

Water Fund. The revenues of the Water Department are required to be segregated from other funds of the City. Under the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 (the "Water Ordinance"), an annual transfer may be made from the Water Fund to the City's General Fund in an amount not to exceed the lesser of (i) all Net Reserve Earnings and (ii) $4,994,000. "Net Reserve Earnings" means the amount of interest earnings during the Fiscal Year on amounts in the Debt Reserve Account and Subordinated Bond Fund, each as defined in the Water Ordinance.

The following table shows the amounts transferred from the Water Fund to the General Fund for Fiscal Years 2017-2019, the budgeted amount and current estimate for Fiscal Year 2020, and the budgeted amount for Fiscal Year 2021.

Table 13
Transfers from Water Fund to General Fund (Excess Interest on Sinking Fund Reserve)
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)[(1), (2)]

Fiscal Year	Amount Transferred
2017 (Actual)	$1,866,455
2018 (Actual)	$1,627,838
2019 (Actual)	$4,094,824
2020 (Adopted Budget and Current Estimate)	$1,500,000
2021 (Adopted Budget)	$1,500,000

(1) Sources: For Fiscal Years 2017-2019, the City's Supplemental Report of Revenues & Obligations for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.
(2) The Water Department's budgeted amount for such transfers is typically greater than the figure included in the City's operating budget.

The City also budgets for certain transfers from the Water Fund to the General Fund related to services performed and costs borne by the General Fund. For Fiscal Year 2019, the amount of such transfers was approximately $7.1 million. For Fiscal Year 2020, the budgeted amount for such transfers is approximately $12.7 million, while the current estimate for such transfers is approximately $8.6 million. For Fiscal Year 2021, the budgeted amount for such transfers is approximately $9.0 million.

PGW. The revenues of PGW are required to be segregated from other funds of the City. Payments for debt service on PGW bonds are made directly by PGW. PGW is required to make an annual payment of $18 million to the General Fund. The Fiscal Year 2021 Adopted Budget includes such $18 million annual payment to the General Fund from PGW for such Fiscal Year. For more information on PGW, see "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Government Services."

Philadelphia Parking Authority Revenues

The PPA was established by City ordinance pursuant to the Pennsylvania Parking Authority Law (P.L. 458, No. 208 (June 5, 1947)). Various statutes, ordinances, and contracts authorize the PPA to plan, design, acquire, hold, construct, improve, maintain and operate, own or lease land and facilities for parking in the City, including such facilities at PHL, and to administer the City's on-street parking program.

The PPA owns and operates five parking garages and a number of surface parking lots at PHL. The land on which these garages and surface lots are located is leased from the City, acting through the Division of Aviation, pursuant to a lease expiring in 2030 (the "Lease Agreement"). The Lease Agreement provides for payment of rent to the City, which is equal to gross receipts less operating expenses, debt service on the PPA's bonds issued to finance improvements at PHL, and reimbursement to the PPA for capital expenditures and prior year operating deficits relating to its operations at PHL, if any.

The PPA's administrative costs are a component of its operating expenses. In 1999, at the request of the FAA, the PPA and the City entered into a letter agreement (the "FAA Letter Agreement"), which contained a formula for calculating the PPA's administrative costs and capped such costs at 28% of the PPA's total administrative costs for all of its cost centers. The PPA owns and/or operates parking facilities at a number of locations in the City in addition to those at PHL. The PPA parking facilities at PHL are cost centers for purposes of the FAA Letter Agreement.

On-street parking revenues are administered and collected, on behalf of the City, by the PPA. Pursuant to Pennsylvania law, the PPA transmits these revenues to the City, net of any actual expenses incurred in the administration of the on-street parking system in accordance with the PPA's approved budget. If such net revenues exceed a designated threshold, then any excess above that threshold is to be transmitted to the School District. The current threshold is $35 million and includes a mandatory escalator to take into account increases in revenues.

The following table presents payments received by the City from PPA for on-street parking for Fiscal Years 2017-2019, the budgeted amount and current estimate for Fiscal Year 2020, and the budgeted amount for Fiscal Year 2021.

Table 14
PPA On-Street Parking Payments to the City
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)[(1), (2)]
(Amounts in Millions of USD)

Fiscal Year	Payments to the City
2017 (Actual)	$39.9
2018 (Actual)	$41.3
2019 (Actual)	$39.1
2020 (Adopted Budget)	$45.8
2020 (Current Estimate)	$32.0
2021 (Adopted Budget)	$31.2

(1) Sources: For Fiscal Years 2017-2019, the City's Supplemental Report of Revenues & Obligations for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.

(2) Table 14 shows City revenues; none of such payments is transferred to the School District.

Other Tax Rate Changes

The Twenty-Ninth Five-Year Plan includes changes to both the resident and non-resident wage and earnings tax. The following table details rates under the Twenty-Ninth Five-Year Plan.

Table 15
Changes in Wage and Earnings Tax Rates[1]

	Twenty-Ninth Five-Year Plan	
Fiscal Year	Resident Wage and Earnings Tax Rates[2]	Non-Resident Wage and Earnings Tax Rates
2020	3.8712%	3.4481%
2021	3.8712%	3.5019%
2022	3.8712%	3.4481%
2023	3.8712%	3.4481%
2024	3.8616%	3.4395%
2025	3.8519%	3.4309%

(1) Source: The Twenty-Ninth Five-Year Plan.
(2) Includes PICA Tax. See "DEBT OF THE CITY – PICA Bonds" for a description of the PICA Tax.

Under the Twenty-Ninth Five-Year Plan, receipts from the Wage and Earnings Tax are estimated to grow at a rate of (i) 2.26% in Fiscal Year 2020, (ii) 8.97% in Fiscal Year 2022, (iii) 7.02% in Fiscal Year 2023, (iv) 4.17% in Fiscal Year 2024, and (v) 3.63% in Fiscal Year 2025. Such receipts are expected to contract at a rate of 4.57% in Fiscal Year 2021.

EXPENDITURES OF THE CITY

Three of the principal City expenditures are for personal services (personnel) (including pensions and other employee benefits), purchase of services (including payments to SEPTA), and debt service. The expenditures for personal services (personnel) and purchase of services are addressed below under this caption; debt service is addressed below under "DEBT OF THE CITY."

Personal Services (Personnel)

As of June 30, 2019, the City employed 28,083 full-time employees, representing approximately 4.1% of employees in Philadelphia (approximately 682,034 employees, according to preliminary, non-seasonally adjusted data from the Bureau of Labor Statistics). Of the 28,083 full-time employees, the salaries of 22,210 were paid from the General Fund. Additional sources of funding for full-time City employees include the Grants Revenue Fund, the Water Fund, and the Aviation Fund, as well as grants and contributions from other governments. Activities funded through such grants and contributions are not undertaken if funding is not received. The following table sets forth the number of filled, full-time positions of the City as of the dates indicated.

Table 16
Filled, Full-Time Positions(1), (2)

	June 30, 2015	June 30, 2016	June 30, 2017	June 30, 2018	June 30, 2019
General Fund					
Police	7,061	6,942	6,986	7,172	7,241
Fire	2,150	2,316	2,281	2,511	2,530
Courts	1,842	1,839	1,856	1,867	1,842
Prisons	2,286	2,289	2,277	2,177	2,130
Streets	1,664	1,676	1,702	1,738	1,736
Public Health	653	653	687	711	752
Human Services(3)	395	449	385	517	396
All Other	5,115	5,263	5,436	5,533	5,583
Total – General Fund	21,166	21,427	21,610	22,226	22,210
Other Funds	5,626	5,615	5,849	5,641	5,873
Total – All Funds	26,792	27,042	27,459	27,867	28,083

(1) Source: Table P-1 in the City's Quarterly City Manager's Reports.
(2) Table 16 does not include seasonal or temporary employees.
(3) Positions have been transferred to the Grants Revenue Fund. Non-reimbursed expenditures will be transferred to the General Fund during the fiscal year.

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Overview of City Employees

The wages and benefits of City employees vary not only by position, but also by whether the employees are represented by a union and, if so, which union. Employee wages and benefits may also be impacted by whether the employee is subject to the civil service system or exempt from those rules. Thus, City employees may be broken down into three major categories for purposes of understanding how their wages and benefits are determined: (i) employees who are not subject to the civil service system ("exempt employees"); (ii) employees who fall under the civil service system but are not represented by a union ("non-represented employees"); and (iii) employees who are subject to the civil service system and are represented by a union ("union employees").

As of March 31, 2020, the City had over 23,000 unionized employees, representing approximately 80% of the City's employees. Such employees were represented by the City's four municipal unions: (i) Fraternal Order of Police ("FOP") Lodge No. 5; (ii) International Association of Fire Fighters ("IAFF") Local 22; (iii) American Federation of State, County and Municipal Employees District Council 33 ("AFSCME DC 33"); and (iv) American Federation of State, County and Municipal Employees District Council 47 ("AFSCME DC 47"). The foregoing unions were previously covered by bargaining agreements through June 30, 2020. In light of the COVID-19 global pandemic, the City and all of its unions reached one-year agreements to extend contract terms through June 30, 2021, as described in more detail in Table 18 below.

On March 29, 2020, the City and FOP Lodge No. 5 (Police Department) reached a one-year extension agreement, which resulted in a 2.5% wage increase, a one-time lump sum bonus for members, and a lump sum payment to the retiree health fund. The cost of the bonus will be funded by a one-month City contribution holiday to the health fund. This contract resulted in a projected cost to the City of approximately $19.11 million during Fiscal Years 2020-2021.

On March 29, 2020, the City reached a one-year agreement with the FOP Lodge No. 5 (Philadelphia Sheriff's Office and Register of Wills), reflecting annual wage increases of 2.0% for Register of Wills employees and 2.25% for Sheriff's Office employees. The contract resulted in a projected aggregate cost to the City of approximately $729,198 during Fiscal Years 2020-2021.

On April 7, 2020, the City and the American Federation of State, County, and Municipal Employees (AFSCME) District Council 47 Locals 2186, 2187, and 810 reached one-year agreements, reflecting a 2.0% wage increase for employees and a one-time lump sum bonus for members. The cost of the bonus will be funded by a City contribution holiday to the health and welfare fund. The agreement results in a projected aggregate cost to the City of approximately $3.83 million during Fiscal Years 2020 and 2021.

On April 16, 2020, the City and the International Association of Fire Fighters (IAFF) Local 22 reached a one-year extension agreement, which resulted in a 2.5% wage increase and a lump sum payment to the retiree health fund. The contract resulted in a projected cost to the City of approximately $8.30 million during Fiscal Years 2020 and 2021.

On May 4, 2020, the City and AFSCME District Council 33 reached a one-year extension agreement, which resulted in a 2.0% wage increase and a one-time lump sum bonus for members. The cost of the bonus will be funded by a one-month City contribution holiday to the health fund. The contract resulted in a projected cost to the City of approximately $4.83 million during Fiscal Years 2020 and 2021.

On May 6, 2020, the City and AFSCME District Council 33 Local 159 reached a one-year extension agreement, which resulted in a 2.25% wage increase and a one-time lump sum bonus for members. The cost of the bonus will be funded by a one-month City contribution holiday to the health fund. The contract resulted in a projected cost to the City of approximately $2.76 million during Fiscal Years 2020 and 2021.

The costs of the agreements discussed above have been included in the City's five-year plans, as applicable. See "DISCUSSION OF FINANCIAL OPERATIONS – Current Financial Information" herein).

For more information on the current status of the interest arbitration awards that have been issued for, and contract settlements reached with, the City's major labor organizations, as well as changes that have been made for non-represented employees, see Table 18.

Collective bargaining with respect to the wages, hours and other terms and conditions of employment of union employees, other than uniformed employees of the Police Department and the Fire Department, is governed by the Public Employee Relations Act (Pa. P.L. 563, No. 195 (1970)) ("PERA"). PERA requires the City and the unions to negotiate in good faith to attempt to reach agreement on new contract terms and, if an impasse exists after such negotiations, to mediate through the Commonwealth Bureau of Mediation. Once the mediation procedures have been satisfied, and if no collective bargaining agreement has been reached, most employees covered by PERA are permitted to strike. Certain employees, however, including employees of the Sheriff's Office and the Register of Wills represented by the FOP, corrections officers represented by AFSCME DC 33, and employees of the First Judicial District represented by AFSCME DC 47, are not permitted to strike under PERA. These employees must submit any impasse to binding interest arbitration once the mediation procedures have been satisfied. PERA permits parties at an impasse, which are not required to submit to binding interest arbitration, to do so voluntarily. Provisions of an interest arbitration award issued under PERA that require legislative action are considered advisory only and the legislative body is permitted to meet, consider, and reject those provisions.

Uniformed employees of the Police Department and the Fire Department bargain under the Policemen and Firemen Collective Bargaining Act (Pa. P.L. 237, No. 111 (1968)) ("Act 111"), which provides for final and binding interest arbitration to resolve collective bargaining impasses and prohibits these employees from striking. Interest arbitration under Act 111 operates similarly to interest arbitration under PERA, but City Council is not permitted to reject the portions of an interest arbitration award that require legislative action. To the contrary, City Council is required to pass any legislation necessary to implement the award unless doing so would violate state or federal law. Thus, the arbitration panel has significant, although not limitless, power to issue an award on mandatory subjects of bargaining. As with interest arbitration under PERA, the arbitration panel cannot issue an award on a matter that is one of inherent managerial policy. In addition to the grounds available to challenge a PERA interest arbitration award on appeal, the PICA Act requires an Act 111 interest arbitration panel to, among other things, give substantial weight to the City's five-year plan and ability to pay for the cost of the award without negatively impacting services, and gives the City the right to appeal the award to the Court of Common Pleas if it believes the panel has failed to meet these responsibilities. If the arbitration panel fails to do so or, among other things, if it awards wages or benefits that exceed what is assumed in the most-recent five-year plan without substantial evidence in the record demonstrating that the City can afford these increases without adversely impacting service levels, the Court of Common Pleas is required to vacate the arbitration award and remand it to the arbitration panel.

Overview of Employee Benefits

The City provides various pension, life insurance, and health benefits for its employees. The benefits offered depend on the employee's union status and bargaining unit, if applicable. General Fund employee benefit expenditures for Fiscal Years 2017 through 2021 are shown in the following table.

Table 17
General Fund Employee Benefit Expenditures
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD)(1)

	Actual 2017	Actual 2018	Actual 2019	Adopted Budget 2020	Current Estimate 2020	Adopted Budget 2021
Pension Costs(2)	\$665.2(5)	\$742.2(6)	\$752.5(7)	\$749.1(8)	\$728.1(9)	650.2(10)
Health						
Payments under City-administered plan	83.8	81.6	77.7	90.0	94.2	92.0
Payments under union-administered plans	345.3	336.6	379.3	400.0	365.8	367.3
Total Health	429.1	418.2	457.0	490.0	460.0	459.3
Federal Insurance Contributions Act (FICA) Taxes(3)	75.1	80.4	81.8	84.5	80.7	84.3
Other(4)	71.5	72.9	79.8	88.4	79.6	93.4
Total	\$1,241.0	\$1,314.0	\$1,371.1	\$1,412.0	\$1,348.4	\$1,287.2

(1) Sources: The City's five-year financial plans, the City's Quarterly City Manager's Reports, and other City records. "Payments under City-administered plan" and "Payments under union-administered plans" were provided by the City, Department of Human Resources and the Office of Budget and Program Evaluation. Figures may not sum due to rounding.
(2) Includes debt service on Pension Bonds (as defined herein) and the Commonwealth contributions to the Municipal Pension Fund. See Tables 29 and 30.
(3) Includes payments of social security and Medicare taxes.
(4) Includes payments for unemployment compensation, employee disability, group life, group legal, tool allowance, and flex cash payments.
(5) Includes \$19.2 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(6) Includes \$24.2 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(7) Includes \$52.1 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(8) Assumes \$53.9 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(9) Assumes \$37.1 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."
(10) Assumes \$27.3 million from City Sales Tax revenues for the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."

Each of the City's four municipal unions sponsors its own health plan that provides medical, prescription, dental and optical benefits to participating employees and eligible retirees through trusts on which the City has varying degrees of minority representation. Exempt and non-represented employees, along with represented employees of the Register of Wills and employees represented by AFSCME DC 33 who have chosen not to become members of the union's healthcare plan, receive health benefits through a plan sponsored and administered by the City. Each of the plans provides different benefits determined by the plan sponsor or through collective bargaining. To provide health care coverage, the City pays a negotiated monthly premium for employees covered by the union contract for AFSCME DC 33 and is self-insured for all other eligible employees. Aside from AFSCME DC 33, the City is responsible for the actual health care cost that is invoiced to the City's unions by their respective vendors. The actual cost can be a combination of self-insured claim expenses, premiums, ancillary services, and administrative expenses. In addition, employees who satisfy certain eligibility criteria receive five years of health benefits after their retirement. See "OTHER POST-EMPLOYMENT BENEFITS" below. Such benefits are determined and administered by the plan in which the employee participated at the time of his or her retirement. Other employee benefits, including life insurance and paid leave, are similarly determined by the respective collective bargaining agreements, as well as City policies and Civil Service Regulations. Employees also participate in the Municipal Pension Plan. See "PENSION SYSTEM" below.

Overview of Current Labor Situation

Table 18 summarizes the current status of the contract settlements reached with the City's major labor organizations, as well as changes that have been made for non-represented employees. It also provides a brief summary of pension reforms that have occurred since 2016, as part of previous labor contract settlements.

Table 18
Status of Arbitration Awards and Labor Contract Settlements

Organization	Authorized Number of Full-Time Citywide Employees Represented[1]	Status of Arbitration Award or Contract Settlement	Wage Increases	Pension Reforms[2]
FOP Lodge No. 5 (Police Department)	6,552	One-year contract extension effective July 1, 2020 through June 30, 2021	• 2.5% pay increase effective May 4, 2020	• Current employees in Plan 87 or Plan 10 will pay an additional .92% of salary effective 7/1/17, increasing by an additional .92% of salary effective 7/1/18 (total increase of 1.84%). These contributions are on top of the current 5% or 6% contribution rates in effect, varies by plan membership • Employees hired on or after 7/1/17 will be required to pay an additional 2.5% of salary
FOP Lodge No. 5 (Sheriff's Office and Register of Wills)	391	One-year contract extension effective July 1, 2020 through June 30, 2021	Sheriff's Office employees: • 2.25% increase effective May 4, 2020 Register of Wills employees: • 2.0% increase effective May 4, 2020	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contributions to the pension fund • Mandatory stacked-hybrid plan for new hires under which employees receive a defined benefit pension for their first $65,000 of earnings and a defined contribution pension for earnings above $65,000 • Plan 10 closed to new enrollment for members of Lodge 5 but remains unchanged for other employee groups • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid plan • DROP (as defined below) interest rate decreases from 4.5% to the rate on the one-year treasury effective January 1 of each year for participants not currently enrolled or eligible to enroll
IAFF Local 22	2,525	One-year contract extension effective July 1, 2020 through June 30, 2021	• 2.5% pay increase effective May 4, 2020	• Current employees in Plan 87 or Plan 10 will pay an additional .92% of salary effective 7/1/17, increasing by an additional .92% of salary effective 7/1/18 (total increase of 1.84%). These contributions are on top of the current 5% or 6% contribution rates in effect; varies by plan membership • Employees hired on or after 7/1/17 will be required to pay an additional 2.5% of salary
AFSCME DC 33	8,196	One-year contract term effective July 1, 2020 through June 30, 2021	• 2.0% pay increase effective May 4, 2020	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contributions to the pension fund • Mandatory stacked-hybrid plan for new hires under which employees receive a defined benefit pension for their first $65,000 of earnings and a defined contribution pension for earnings above $65,000 • Plan 10 closed to new enrollment for members of DC33 but remains unchanged for other employee groups • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid plan • DROP interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year for participants not currently enrolled or eligible to enroll

(1) From data provided by the Mayor's Office of Labor Relations on March 31, 2020.
(2) "Plan 87," "Plan 10," and "Plan 16" referenced in this column are described in Table 19.

Organization	Authorized Number of Full-Time Citywide Employees Represented[(1)]	Status of Arbitration Award or Contract Settlement	Wage Increases	Pension Reforms[(2)]
AFSCME DC 33, Local 159 Correctional Officers	1,978	One-year contract effective July 1, 2020 through June 30, 2021	• 2.25% pay increase effective May 4, 2020	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contributions to the pension fund • Mandatory stacked-hybrid plan for new hires under which employees receive a defined benefit pension for their first $65,000 of earnings and a defined contribution pension for earnings above $65,000 • Plan 10 closed to new enrollment for members of DC33 but remains unchanged for other employee groups • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid plan • DROP interest rate decreases from 4.5% to the rate on the one year treasury effective January 1 of each year for participants not currently enrolled or eligible to enroll
AFSCME DC 47	3,760	One-year contract extension effective July 1, 2020 through June 30, 2021	• 2.0% pay increase effective May 1, 2020	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contributions to the pension fund (effective January 1, 2019) • Mandatory stacked-hybrid plan for new hires under which employees receive a defined benefit pension for their first $65,000 of earnings and a defined contribution pension for earnings above $65,000 (effective January 1, 2019) • Plan 10 closed to new enrollment for members of DC47 (effective January 1, 2019) • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid plan
AFSCME DC 47 Local 810 Court Employees	488	One-year contract extension effective July 1, 2020 through June 30, 2021	• 2.0% pay increase effective May 1, 2020	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contribution to the pension fund (effective January 1, 2019) • Mandatory stacked-hybrid plan for new hires under which employees receive a defined benefit pension for their first $65,000 of earnings and a defined contribution pension for earnings above $65,000 (effective January 1, 2019) • Plan 10 closed to new enrollment for members of DC47 (effective January 1, 2019) • Once fully implemented, such employees in Plan 10 are expected to receive a letter indicating that they have 90 days to make an irrevocable election to opt into the stacked-hybrid plan
Non-Represented Employees	1,157	Changes for non-represented employees	• 3.0% pay increase for Fiscal Year 2018 • 2.5% pay increase for Fiscal Year 2019	• Tiered contribution system for current employees under which employees who have higher salaries pay a higher percent of their salaries as contribution to the pension fund (effective January 1, 2019) • Mandatory stacked-hybrid plan for new hires under which employees receive a defined benefit pension for their first $65,000 of earnings and a defined contribution pension for earnings above $65,000 (effective January 1, 2019) • Previous 2011 reforms to DROP program remain in place; interest rate was decreased from 4.5% to the rate on the one year treasury effective January 1 of each year for participants not currently enrolled or eligible to enroll and eligibility age remains increased by two years

(1) From data provided by the Mayor's Office of Labor Relations on March 31, 2020.
(2) "Plan 87," "Plan 10," and "Plan 16" referenced in this column are described in Table 19.

Certain features of the 1987 Plan ("Plan 87"), the 2010 Plan ("Plan 10"), and the 2016 Plan ("Plan 16") are summarized below. Plan 87 is solely a defined benefit plan. Plan 10 and Plan 16 are "hybrid" plans that include both defined benefit and defined contribution components. A more comprehensive summary of each plan is included as Appendix D of the July 1, 2019 Valuation (as defined herein). See "PENSION SYSTEM" below.

Table 19
Summary of Key Aspects of Plan 87, Plan 10, and Plan 16

Plan 87	Normal Retirement Eligibility	Average Final Compensation ("AFC")	Defined Benefit – Retirement Benefits Multiplier
Municipal (Plan Y)	Age 60 and 10 years of credited service(1)	Average of three highest calendar or anniversary years	• (2.2% x AFC x years of service up to 10 years) plus (2.0% x AFC x numbers of years in excess of 10 years), subject to a maximum of 100% of AFC
Police and Fire	Age 50 and 10 years of credited service(1)	Average of two highest calendar or anniversary years	• (2.2% x AFC x years of service up to 20 years) plus (2.0% x AFC x numbers of years in excess of 20 years), subject to a maximum of 100% of AFC
Elected Official (Plan L)	Age 55 and 10 years of credited service(2)	Average of three highest calendar or anniversary years	• 3.5% x AFC x years of service, subject to a maximum of 100% of AFC

Plan 10	Normal Retirement Eligibility	Average Final Compensation ("AFC")	Defined Benefit – Retirement Benefits Multiplier
Municipal(3)	Age 60 and 10 years of credited service	Average of five highest calendar or anniversary years	• 1.25% x AFC x years of service up to 20 years
Police and Fire	Age 50 and 10 years of credited service	Average of five highest calendar or anniversary years	• 1.75% x AFC x years of service up to 20 years - **Defined Contribution** • The City matches employee contributions at a 50% rate, with the total City match not to exceed 1.5% of compensation for each year. • After five years of credited service, the full amount in the account is distributed to the employee when he or she separates from City service. • The right to the portion of the account attributable to City contributions does not vest until the completion of five years of credited service.

Plan 16	Normal Retirement Eligibility	Average Final Compensation ("AFC")	Defined Benefit – Retirement Benefits Multiplier
Municipal	Age 60 and 10 years of credited service	Lesser of (i) AFC under Plan Y (of Plan 87) (which is the average of three highest calendar or anniversary years) or (ii) $50,000 (cap increases to $65,000 on 1/1/2019)	• (2.2% x AFC x years of service up to 10 years) plus (2.0% x AFC x numbers of years in excess of 10 years), subject to a maximum of 100% of AFC - **Defined Contribution** • Employees may voluntarily participate in the defined contribution portion; employee contributions vest immediately. • For employees with annual salaries above the cap, the City matches employee contributions at a 50% rate, with the total City match not to exceed 1.5% of compensation for each year (only if employee is contributing); the City's matching contributions vest after five years of credited service. • The maximum annual employee contribution is $19,500, excluding the City's matching contributions.

(1) Five years of credited service for those who make additional contributions. See "PENSION SYSTEM – Pension System; Pension Board – Membership."
(2) The lesser of two full terms or eight years of credited service for those elected officials who make additional contributions. See "PENSION SYSTEM – Pension System; Pension Board – Membership."
(3) Under Plan 10 (Municipal), pension contributions freeze after 20 years. At such time and for each subsequent year, the employee's pension payments remain fixed and the employee may no longer make pension contributions.

Purchase of Services

The following table shows the City's major purchase of services, which represents one of the major classes of expenditures from the General Fund. Table 20 shows contracted costs of the City for Fiscal Years 2017-2019, the budgeted amounts and current estimates for Fiscal Year 2020, and the budgeted amounts for Fiscal Year 2021.

Table 20
Purchase of Services in the General Fund
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD)(1), (7)

	Actual 2016	Actual 2017	Actual 2018	Actual 2019	Adopted Budget 2020	Current Estimate 2020	Adopted Budget 2021
Human Services(2)	$75.3	$75.7	$76.3	$82.8	$89.2	$89.2	$129.3
Public Health	64.9	70.7	72.7	72.9	90.2	83.5	90.5
Public Property(3)	155.0	158.5	157.4	163.9	172.5	176.9	166.2
Streets(4)	51.9	46.2	49.2	53.5	58.8	54.8	59.5
First Judicial District	17.7	12.1	13.5	10.3	8.5	8.5	8.5
Licenses & Inspections	10.4	12.0	11.6	13.5	14.4	12.4	13.5
Homeless Services(5)	37.1	38.0	39.2	47.3	50.0	50.9	36.0
Prisons	104.9	105.3	102.2	92.5	92.8	106.5	88.4
All Other(6)	305.0	332.9	369.0	378.8	424.7	449.4	357.2
Total	**$822.2**	**$851.4**	**$891.1**	**$915.5**	**$1,001.3**	**$1,032.1**	**$948.6**

(1) For Fiscal Years 2017-2019, the City's Supplemental Report of Revenues & Obligations for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.
(2) Includes payments for care of dependent and delinquent children.
(3) Includes payments for SEPTA, space rentals, and utilities.
(4) Includes solid waste disposal costs.
(5) Includes homeless shelter and boarding home payments.
(6) Includes the Convention Center subsidy, payments for vehicle leasing, and debt service on lease and service agreement financings, among other things.
(7) Figures may not sum due to rounding.

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City Payments to School District

The following table presents the City's payments to the School District from the General Fund for Fiscal Years 2017-2019, the budgeted amount and current estimate for Fiscal Year 2020, and the budgeted amount for Fiscal Year 2021.

Table 21
City Payments to School District
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD)[(1)]

	Actual 2017	Actual 2018	Actual 2019	Adopted Budget and Current Estimate 2020	Adopted Budget 2021
City Payments to School District	$104.3	$104.3	$180.9	$222.5	$252.6

[(1)] Sources: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.

Beginning with the City's adopted budget for Fiscal Year 2016, the City implemented a $25 million property tax increase and a $10 million parking tax increase to benefit the School District. The figures in Table 21 reflect such increases.

For more discussion of the School District, see "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Local Government Agencies – *Mayoral-Appointed or Nominated Agencies* – The School District," above. For a discussion of changes in the funding provided by the City to the School District, see "REVENUES OF THE CITY – Sales and Use Tax." For a discussion of the transition to AVI and how such transition affects funding for the School District, see "REVENUES OF THE CITY – Real Property Taxes."

City Payments to SEPTA

SEPTA operates a public transportation system within the City and Bucks, Chester, Delaware, and Montgomery counties. SEPTA's operating budget is supported by federal, Commonwealth, and local subsidies, including payments from the City. The following table presents the City's payments to SEPTA from the General Fund for Fiscal Years 2017-2019, the budgeted amount and current estimate for Fiscal Year 2020, and the budgeted amount for Fiscal Year 2021.

Table 22
City Payments to SEPTA
Fiscal Years 2017-2019 (Actual), 2020 (Adopted Budget and Current Estimate), and 2021 (Adopted Budget)
(Amounts in Millions of USD)[(1)]

	Actual 2017	Actual 2018	Actual 2019	Adopted Budget 2020	Current Estimate 2020	Adopted Budget 2021
City Payment to SEPTA	$79.7	$81.9	$84.6	$87.6	$86.4	$84.6

[(1)] Sources: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget and the Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.

The City budgets operating subsidies each Fiscal Year to match the estimated operating subsidies of the Commonwealth under Act 89. The state operating subsidy is funded through the Pennsylvania Public Transportation Trust Fund as created by Act 44 of 2007, amended by Act 89 of 2013. The local match requirement is calculated to match state operating subsidies. In addition, local matching funds must be appropriated each Fiscal Year in which state funds are received in order for SEPTA to receive the full allocation of state funds. The Twenty-Ninth Five-Year Plan projects annual operating subsidy payments to SEPTA from the City will increase to $101.5 million by Fiscal Year 2025. For more information on SEPTA, see APPENDIX V – "TRANSPORTATION – Southeastern Pennsylvania Transportation Authority (SEPTA)."

City Payments to Convention Center Authority

In connection with the financing of the expansion to the Pennsylvania Convention Center and the refinancing of debt for the original Pennsylvania Convention Center construction, the Commonwealth, the City, and the Convention Center Authority entered into an operating agreement in 2010 (the "Convention Center Operating Agreement"). The Convention Center Operating Agreement provides for the operation of the Convention Center by the Convention Center Authority and includes an annual subsidy of $15,000,000 from the City to the Convention Center Authority in each Fiscal Year through Fiscal Year 2040.

As authorized by ordinance, the City has agreed to pay to the Convention Center Authority on a monthly basis a certain percentage of hotel room taxes and hospitality promotion taxes collected during the term of the Convention Center Operating Agreement. The remaining percentages of such taxes are paid to the City's tourism and marketing agencies. The General Fund does not retain any portion of the proceeds of the hotel room rental tax or the hospitality promotion tax.

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PENSION SYSTEM

The amounts and percentages set forth under this heading relating to the City's pension system, including, for example, actuarial liabilities and funded ratios, are based upon numerous demographic and economic assumptions, including the investment return rates, inflation rates, salary increase rates, post-retirement mortality, active member mortality, rates of retirement, etc. The reader is cautioned to review and carefully consider the assumptions set forth in the documents that are cited as the sources for the information in this section. In addition, the reader is cautioned that such sources and the underlying assumptions are relevant as of their respective dates, and are subject to changes, any of which could cause a significant change in the unfunded actuarial liability.

Each year, an actuarial valuation report of the City's pension system is published in late March or early April. Such report includes, as of July 1 of a given Fiscal Year, an examination of the current financial condition of the pension system, key historical trends, and the projected financial outlook of the pension system, among other information. In addition, an annual report on the audited financial statements of the City's pension system is published in late December or early January. The information included under the caption "PENSION SYSTEM" is derived from the actuarial valuation reports or the annual reports on the audited financial statements of the City's pension system, unless otherwise noted herein.

Overview

The City faces significant ongoing financial challenges in meeting its pension obligations, including an unfunded actuarial liability ("UAL") of approximately $5.9 billion as of July 1, 2019. In Fiscal Year 2019, the City's contribution to the Municipal Pension Fund was approximately $797.8 million, of which the General Fund's share (including the Commonwealth contribution) was $642.5 million. See Table 29. The City's aggregate pension costs (consisting of payments to the Municipal Pension Fund and debt service on the Pension Bonds (as defined herein)) have increased from approximately 7.87% of the City's General Fund budget to approximately 14.20% of the General Fund budget from Fiscal Years 2010 to 2019. See Table 31. The funded ratio of the Municipal Pension Plan was 76.7% on July 1, 1999 (at which time the UAL was approximately $1.4 billion), and was 49.7% on July 1, 2019.

The decline in the Municipal Pension System's funded status and the net growth of the unfunded liability is the product of a number of factors, including the following:

- The declines in the equity markets in 2000-2001 and in 2008-2009. See Table 24 below.

- A reduction in the assumed rate of return, from 8.75% in 2009 to 7.55% effective July 1, 2019 (i.e., Fiscal Year 2020). Although the gradual reductions in the assumed rates of return reflected in Table 24 are considered a prudent response to experience studies, by reducing the assumed return in the measurement of the actuarial liabilities, it serves to increase the UAL from what it otherwise would have been.

- Adopting more conservative mortality rates in response to experience studies performed by the Municipal Pension Plan actuary.

- The Municipal Pension Plan is a mature system, which means the number of members making contributions to the Municipal Pension Plan is less than the number of retirees and other beneficiaries receiving payments from the Municipal Pension Plan, by approximately 9,100. As a result, the aggregate of member contributions and the City's contributions are less than the amount of benefits and refunds payable in most years, with the result that in such years investment income must be relied upon to meet such difference before such income can contribute to an increase in the Municipal Pension System's assets growth. See Table 26 (which reflects that in Fiscal Years 2018-2019, however, the aggregate of member contributions and the City's contribution exceeded the amount of benefits and refunds payable in such Fiscal Years).

- The determination by the City, commencing in Fiscal Year 2005, to fund in accordance with the "minimum municipal obligation" ("MMO"), as permitted and as defined by Pennsylvania law, in lieu of the City Funding Policy (as defined herein), resulted in the City contributing less than otherwise would have been contributed. See below, "– Funding Requirements; Funding Standards."

- Revising, in Fiscal Year 2009, in accordance with Pennsylvania law, the period over which the UAL was being amortized, such that the UAL as of July 1, 2009 was "fresh started" to be amortized over a 30-year period ending June 30, 2039. In addition, changes were made to the periods over which actuarial gains and losses and assumption changes were amortized under Pennsylvania law. See "UAL and its Calculation – Actuarial Valuations."

The City has taken a number of steps to address the funding of the Municipal Pension Plan, including the following:

- Reducing the assumed rate of return on a gradual and consistent basis, which results in the City making larger annual contributions. See Table 24 below.

- Adopting more conservative mortality rates in response to experience studies performed by the Municipal Pension Plan actuary.

- In conjunction with the revisions to the amortization periods that occurred in Fiscal Year 2009, changing from a level percent of pay amortization schedule to a level dollar amortization schedule. This results in producing payments that ensure that a portion of principal on the UAL is paid each year.

- Funding consistently an amount greater than the MMO (subject to the authorized deferrals for Fiscal Years 2010 and 2011 described below). See Table 29.

- Negotiating collective bargaining agreements by which additional contributions are being made (and will be made) by certain current (and future) members and by which benefits will be capped for certain future members of the Municipal Pension Plan. See Table 18.

- Securing additional funding, including funds required to be deposited by the City to the Municipal Pension Fund from its share of sales tax revenue.

- Adopting a Revenue Recognition Policy (defined and described below), by which sources of anticipated additional revenue that will be received by the System are specifically dedicated toward paying down the unfunded pension liability and not to reducing future costs of the City. The additional revenue is tracked and accumulated in a notional account, which is then deducted from the Actuarial Asset Value to determine the contribution under the Revenue Recognition Policy. As a result, such contribution is higher than the MMO.

- Changing the investment strategy to increase the use of passive investment vehicles, which has resulted in increased returns and decreased fees.

This "Overview" is intended to highlight certain of the principal factors that led to the pension system's current funded status, and significant steps the City and the Pension Board (as defined herein) have taken to address the underfunding. The reader is cautioned to review with care the more detailed information presented below under this caption, "Pension System."

Pension System; Pension Board

The City maintains two defined-benefit pension programs: (i) the Municipal Pension Plan, a single employer plan, which provides benefits to police officers, firefighters, non-uniformed employees, and non-represented appointed and elected officials, and (ii) the PGW Pension Plan, a single employer plan, which provides benefits to PGW employees. The Municipal Pension Plan is administered through 20 separate benefit structures, the funding for which is accounted for on a consolidated basis by the Municipal Pension Fund. Such benefit structures establish for their respective members different contribution levels, retirement ages, etc., but all assets are available to pay benefits to all members of the Municipal Pension Plan. The Municipal Pension Plan is a mature plan, initially established in 1915, with net investment assets that totaled approximately $5.7 billion as of June 30, 2019. The Municipal Pension Plan has approximately 28,600 members who make contributions to the plan, and provides benefits to approximately 37,700 retirees and other beneficiaries.

PGW is principally a gas distribution facility owned by the City. For accounting presentation purposes, PGW is a component unit of the City and follows accounting rules as they apply to proprietary fund-type activities. The PGW Pension Plan is funded with contributions by PGW to such plan, which are treated as an operating expense of PGW, and such plan is not otherwise addressed under the caption "PENSION SYSTEM." See "PGW PENSION PLAN" below.

Contributions are made by the City to the Municipal Pension Fund from: (i) the City's General Fund; (ii) funds that are received by the City from the Commonwealth for deposit into the Municipal Pension Fund; and (iii) various City inter-fund transfers, representing amounts contributed, or reimbursed, to the City's General Fund for pensions from the City's Water Fund, Aviation Fund, and certain other City funds or agencies. See Table 29. In addition to such City (employer) contribution, the other principal additions to the Municipal Pension Fund are: (i) member (employee) contributions; (ii) interest and dividend income; (iii) net appreciation in asset values; and (iv) net realized gains on the sale of investments. See Table 26 below. An additional source of funding is that portion of the 1% Sales Tax rate increase that is required under Pennsylvania law to be deposited to the Municipal Pension Fund. See "REVENUES OF THE CITY – Sales and Use Tax."

The City of Philadelphia Board of Pensions and Retirement (the "Pension Board") was established by the City Charter to administer "a comprehensive, fair and actuarially sound pension and retirement system covering all officers and employees of the City." The City Charter provides that the Pension Board "shall consist of the Director of Finance, who shall be its chairman, the Managing Director, the City Controller, the City Solicitor, the Personnel Director and four other persons who shall be elected to serve on the Board by the employees in the civil service in such manner as shall be determined by the Board." In addition, there is one non-voting member on the Pension Board, who is appointed by the President of City Council. An Executive Director, together with a budgeted staff of 73 personnel, administers the day-to-day activities of the retirement system, providing services to approximately 66,300 members.

The Municipal Pension Plan, the Municipal Pension Fund, and the Pension Board are for convenience sometimes collectively referred to under this caption as the "Municipal Retirement System."

Membership. The following table shows the membership totals for the Municipal Pension Plan, as of July 1, 2019 and as compared to July 1, 2018.

Table 23
Municipal Pension Plan – Membership Totals

	July 1, 2019	July 1, 2018	% Change
Actives	28,596	28,845	-0.9%
Terminated Vesteds	965	1,074	-10.1%
Disabled	3,883	3,890	-0.2%
Retirees	22,241	22,275	-0.2%
Beneficiaries	8,574	8,547	0.3%
Deferred Retirement Option Plan ("DROP")	2,069	1,944	6.4%
Total City Members	66,328	66,575	-0.4%
Annual Salaries	$1,842,554,883	$1,805,400,096	2.1%
Average Salary per Active Member	$64,434	$62,590	2.9%
Annual Retirement Allowances	$774,067,324	$761,946,574	1.6%
Average Retirement Allowance	$22,309	$21,951	1.6%

Source: July 1, 2019 Valuation.

As shown in Table 23, total membership in the Municipal Pension Plan decreased by 0.4%, or from 66,575 to 66,328 members, from July 1, 2018 to July 1, 2019, including a decrease of 0.9% in active members from 28,845 to 28,596 (who were contributing to the Municipal Pension Fund). Of the 66,328 members, 37,732 were retirees, beneficiaries, disabled, and other members (who were withdrawing from, or not contributing to, the Municipal Pension Fund).

Subject to the exceptions otherwise described in this paragraph, employees and officials become vested in the Municipal Pension Plan upon the completion of ten years of service. Employees and appointed officials who hold positions that are exempt from civil service and who are not entitled to be represented by a union, and who were hired before January 13, 1999, may elect accelerated vesting after five years of service in return for payment of a higher employee contribution than if the vesting period were ten years. Such employees and officials become vested after five years of service if hired after January 13, 1999 or seven years of service if hired after January 1, 2019, and pay a higher employee contribution than if the vesting period were ten years. Elected officials become vested in the Municipal Pension Plan once they complete service equal to the lesser of two full terms in their elected office or eight years and pay a higher contribution than if the vesting period were ten years. Elected officials pay an additional employee contribution for the full cost of the additional benefits they may receive over those of general municipal employees. Upon retirement, employees and officials may receive up to 100% of their average final compensation depending upon their years of credited service and the plan in which they participate.

All City employees participate in the U.S. Social Security retirement system except for uniformed Police and uniformed Fire employees.

Certain membership information relating to the City's municipal retirement system provided by the Pension Board is set forth in Appendix A to the July 1, 2019 Actuarial Valuation Report (the "July 1, 2019 Valuation") and includes as of July 1, 2019, among other information, active and non-active member data by plan, age/service distribution for active participants and average salary for all plans, and age and benefit distributions for non-active member data.

Funding Requirements; Funding Standards

City Charter. The City Charter establishes the "actuarially sound" standard quoted above. Case law has interpreted "actuarially sound" as used in the City Charter to require the funding of two components: (i) "normal cost" (as defined below) and (ii) interest on the UAL. (*Dombrowski v. City of Philadelphia*, 431 Pa. 199, 245 A.2d 238 (1968)).

Pennsylvania Law. The Municipal Pension Plan Funding Standard and Recovery Act (Pa. P.L. 1005, No. 205 (1984)) ("Act 205"), applies to all municipal pension plans in Pennsylvania, "[n]otwithstanding any provision of law, municipal ordinance, municipal resolution, municipal charter, pension plan agreement or pension plan contract to the contrary . . . ." Act 205 provides that the annual financial requirements of the Municipal Pension Plan are: (i) the normal cost; (ii) administrative expense requirements; and (iii) an amortization contribution requirement. In addition, Act 205 requires that the MMO be payable to the Municipal Pension Fund from City revenues, and that the City shall provide for the full amount of the MMO in its annual budget. The MMO is defined as "the financial requirements of the pension plan reduced by . . . the amount of any member contributions anticipated as receivable for the following year." Act 205 further provides that the City has a "duty to fund its municipal pension plan," and the failure to provide for the MMO in its budget, or to pay the full amount of the MMO, may be remedied by the institution of legal proceedings for mandamus.

In accordance with Pennsylvania law and Act 205, the City uses the entry age normal actuarial funding method, whereby "normal cost" (associated with active employees only) is the present value of the benefits that the City expects to become payable in the future distributed evenly as a percent of expected payroll from the age of first entry into the plan to the expected age at retirement. The City's share of such normal cost (to which the City adds the Plan's administrative expenses) is reduced by member contributions. The term "level" means that the contribution rate for the normal cost, expressed as a percentage of active member payroll, is expected to remain relatively level over time.

The City has budgeted and paid at least the full MMO amount since such requirement was established, and more specifically, prior to Fiscal Year 2005 the City had been contributing to the Municipal Pension Plan the greater amount as calculated pursuant to the City Funding Policy which was implemented before Act 205 was effective, as described below. Beginning in Fiscal Year 2018, the City is contributing under the Revenue Recognition Policy (defined below), which requires higher contribution amounts than under the MMO. Payment of the MMO is a condition for receipt of the Commonwealth contribution to the Municipal Pension Fund. See Table 29.

Act 205 was amended in 2009 by Pa. P.L. 396, No. 44 ("Act 44") to authorize the City to: (i) "fresh start" the amortization of the UAL as of July 1, 2009 by a level annual dollar amount over 30 years ending June 30, 2039; and (ii) revise the amortization periods for actuarial gains and losses and assumption changes in accordance with Act 44, as described below under "UAL and its Calculation – Actuarial Valuations." In addition, Act 44 authorized the City to defer, and the City did defer, $150 million of the MMO otherwise payable in Fiscal Year 2010, and $80 million of the MMO otherwise payable in Fiscal Year 2011, subject to repayment of the deferred amounts by June 30, 2014. The City repaid the aggregate deferred amount of $230 million, together with interest at the then-assumed interest rate of 8.25%, in Fiscal Year 2013. See Table 29. Because the final amortization date is fixed, if all actuarial assumptions are achieved, the unfunded liability would decline to zero as of the final amortization date. To the extent future experience differs from the assumptions used to establish the 30-year fixed amortization payment schedule, new amortization bases attributable to a particular year's difference would be established and amortized over their own 20-year schedule.

GASB; City Funding Policy. Governmental Accounting Standards Board ("GASB") Statement No. 27, "Accounting for Pensions by State and Local Governmental Employers" ("GASB 27"), applied to the City for Fiscal Years beginning prior to July 1, 2014. For the Fiscal Year beginning July 1, 2014, GASB Statement No. 68 ("GASB 68"), which amends GASB 27 in several significant respects, applies. GASB 27 defined an "annual required contribution" ("ARC") as that amount sufficient to pay (i) the normal cost and (ii) the amortization of UAL, and provides that the maximum acceptable amortization period is 30 years (for the initial 10 years of implementation, 1996-2006, a 40-year amortization period was permitted). GASB 27 did not establish funding requirements for the City but rather was an accounting and financial reporting standard. GASB 68 does not require the calculation of an ARC but does require the City to include as a liability on its balance sheet the City's "net pension liability," as defined by GASB 68. The City has been funding the Municipal Pension Fund since Fiscal Year 2003 based on the MMO (at a minimum), including the deferral permitted by Act 44. See Table 29 below.

The City, prior to Fiscal Year 2005, had been funding the Municipal Pension Fund in accordance with what the City referred to as the "City Funding Policy." That reference was used and continues to be used in the Actuarial Reports. Under the City Funding Policy, the UAL as of July 1, 1985 was to be amortized over 34 years ending June 30, 2019, with payments increasing at 3.3% per year, the assumed payroll growth. This initial UAL base under the City's Funding Policy has now been fully amortized. Other changes in the unfunded actuarial liability were amortized in level-dollar payments over various periods as prescribed in Act 205. In 1999, the City issued pension funding bonds, the proceeds of which were deposited directly into the Municipal Pension Fund to pay down its UAL. See "– Annual Contributions – *Annual Debt Service Payments on the Pension Bonds*" below.

Revenue Recognition Policy. The City follows a policy (the "Revenue Recognition Policy") to contribute each year to the Municipal Pension Fund an amount in excess of the MMO. Aspects of such policy are mandated by City ordinance or labor agreements, as applicable. The determination for such additional funding is based on not including (i) the portion of the amounts generated by the increase in the Sales Tax rate that became effective on July 1, 2014 and are required by Act 205 to be deposited to the Municipal Pension Fund (see "REVENUES OF THE CITY – Sales and Use Tax"), (ii) contributions to be made by City employees that are under Plan 16 (described above in the text that immediately follows Table 19), and (iii) additional member contributions for current and future members in Plan 87 Police, Plan 87 Fire, and all Municipal Plans in the actuarial asset value when determining the annual contribution obligation.

The amounts projected by the City in the Twenty-Ninth Five-Year Plan to be deposited from Sales Tax revenue into the Municipal Pension Fund, for the six Fiscal Years 2020-2025, respectively, are as follows: $37.1 million; $27.3 million; $39.3 million; $47.2 million; $52.9 million; and $58.6 million.

UAL and its Calculation

According to the July 1, 2019 Valuation, the funded ratio (the valuation of assets available for benefits to total actuarial liability) of the Municipal Pension Fund as of July 1, 2019 was 49.7% and the Municipal Pension Fund had an unfunded actuarial liability ("UAL") of $5.931 billion. The UAL is the difference between total actuarial liability ($11.783 billion as of July 1, 2019) and the actuarial value of assets ($5.852 billion as of July 1, 2019).

Key Actuarial Assumptions. In accordance with Act 205, the actuarial assumptions must be, in the judgment of both Cheiron (the independent consulting actuary for the Municipal Pension Fund) and the City, "the best available estimate of future occurrences in the case of each assumption." The assumed investment return rate used in the July 1, 2019 Valuation was 7.55% a year (which includes an inflation assumption of 2.75%), net of administrative expenses, compounded annually. For the prior actuarial valuation, the assumed investment return rate was 7.60%. See Table 24 for the assumed rates of return for Fiscal Years 2010 to 2019. The 7.60% was used to establish the MMO payment for Fiscal Year 2019; 7.55% will be used to establish the MMO payment for Fiscal Year 2020; 7.55% will be used to establish the MMO payment for Fiscal Year 2021.

Other key actuarial assumptions in the July 1, 2019 Valuation include the following: (i) total annual payroll growth of 3.30%, (ii) annual administrative expenses assumed to increase 3.30% per year, (iii) to recognize the expense of the benefits payable under the Pension Adjustment Fund (as described below), actuarial liabilities were increased by 0.54%, based on the statistical average expected value of the benefits, (iv) a vested employee who terminates will elect a pension deferred to service retirement age so long as their age plus years of service at termination are greater than or equal to 55 (45 for police and fire employees in the 1967 Plan), (v) for municipal and elected members, 65% of all disabilities are ordinary and 35% are service-connected, and (vi) for police and fire members, 25% of all disabilities are ordinary and 75% are service-connected.

"Smoothing Methodology". The Municipal Retirement System uses an actuarial value of assets to calculate its annual pension contribution, using an asset "smoothing method" to dampen the volatility in asset values that could occur because of fluctuations in market conditions. The Municipal Retirement System used a five-year smoothing prior to Fiscal Year 2009, and beginning with Fiscal Year 2009 began employing a ten-year smoothing. Using the ten-year smoothing methodology, investment returns in excess of or below the assumed rate are prospectively distributed in equal amounts over a ten-year period, subject to the requirement that the actuarial value of assets will be adjusted, if necessary, to ensure that the actuarial value of assets will never be less than 80% of the market value of the assets, nor greater than 120% of the market value of the assets. The actuarial value of assets as of July 1, 2019, was approximately 102.9% of the market value of the assets, as compared to 101.1% as of July 1, 2018.

Actuarial Valuations. The Pension Board engages an independent consulting actuary (currently Cheiron) to prepare annually an actuarial valuation report. Act 205, as amended by Act 44, establishes certain parameters for the actuarial valuation report, including: (i) use of the entry age normal actuarial cost method; (ii) that the report shall contain: (a) actuarial exhibits, financial exhibits, and demographic exhibits; (b) an exhibit of normal costs expressed as a percentage of the future covered payroll of the active membership in the Municipal Pension Plan; and (c) an exhibit of the actuarial liability of the Municipal Pension Plan; and (iii) that changes in the actuarial liability be amortized in level-dollar payments as follows: (a) actuarial gains and losses be amortized over 20 years beginning July 1, 2009 (prior to July 1, 2009, gains and losses were amortized over 15 years); (b) assumption changes be amortized over 15 years beginning July 1, 2010 (prior to July 1, 2010, assumption changes were amortized over 20 years); (c) plan changes for active members be amortized over 10 years; (d) plan changes for inactive members be amortized over one year; and (e) plan changes mandated by the Commonwealth be amortized over 20 years.

Act 205 further requires that an experience study be conducted at least every four years, and cover the five-year period ending as of the end of the plan year preceding the plan year for which the actuarial valuation report is filed. The most recent Experience Study was prepared by Cheiron in March 2018 for the period July 1, 2012 – June 30, 2017. The actuarial and demographic assumptions that were adopted by the Pension Board in response to such Experience Study continue to be employed for the July 1, 2019 Valuation (which is used to determine the June 30, 2021 fiscal year end MMO, City Funding

Policy, and Revenue Recognition Policy contributions). Details of these assumption changes and the experience of the Municipal Pension Plan can be found in the *City of Philadelphia Municipal Retirement System Experience Study Results for the period covering July 1, 2012 – June 30, 2017,* available at the Investor Information section of the City's Investor Website.

Pension Adjustment Fund

Pursuant to § 22-311 of the Philadelphia Code, the City directed the Pension Board to establish a Pension Adjustment Fund ("PAF") on July 1, 1999, and further directed the Pension Board to determine, effective June 30, 2000 and each Fiscal Year thereafter, whether there are "excess earnings" as defined available to be credited to the PAF. The Pension Board's determination is to be based upon the actuary's certification using the "adjusted market value of assets valuation method" as defined in § 22-311. Although the portion of the assets attributed to the PAF is not segregated from the assets of the Municipal Pension Fund, the Philadelphia Code provides that the "purpose of the Pension Adjustment Fund is for the distribution of benefits as determined by the Board for retirees, beneficiaries or survivors [and] [t]he Board shall make timely, regular and sufficient distributions from the Pension Adjustment Fund in order to maximize the benefits of retirees, beneficiaries or survivors." Distributions are to be made "without delay" no later than six months after the end of each Fiscal Year. The PAF was established, in part, because the Municipal Retirement System does not provide annual cost-of-living increases to retirees or beneficiaries. At the time the PAF was established, distributions from the PAF were subject to the restriction that the actuarial funded ratio using the "adjusted market value of assets" be not less than such ratio as of July 1, 1999 (76.7%). That restriction was deleted in 2007.

The amount to be credited to the PAF is 50% of the "excess earnings" that are between one percent (1%) and six percent (6%) above the actuarial assumed investment rate. Earnings in excess of six percent (6%) of the actuarial assumed investment rate remain in the Municipal Pension Fund. Although the Pension Board utilizes a ten-year smoothing methodology, as explained above, for the actuarial valuation of assets for funding and determination of the MMO, § 22-311 provides for a five-year smoothing to determine the amount to be credited to the PAF. The actuary determined that for the Fiscal Year ended June 30, 2019, there were no "excess earnings" as defined to be credited to the PAF. The Pension Board transfers to the PAF the full amount calculated by the actuary as being available in any year for transfer within six months of the Pension Board designating the amount to be transferred.

Transfers to the PAF and the resultant additional distributions to retirees result in removing assets from the Municipal Pension Plan. To account for the possibility of such transfers, and as an alternative to adjusting the assumed investment return rate to reflect such possibility, the actuary applies a load of 0.54% to the calculated actuarial liability as part of the funding requirement and MMO. Such calculation was utilized for the first time in the July 1, 2013 actuarial valuation.

The market value of assets as used under this caption, "PENSION SYSTEM," represents the value of the assets if they were liquidated on the valuation date and this value includes the PAF (except as otherwise indicated in certain tables), although the PAF is not available for funding purposes. The actuarial value of assets does not include the PAF.

Rates of Return; Asset Values; Changes in Plan Net Position

Rates of Return. The following table sets forth for the Fiscal Years 2010-2019 the market value of assets internal rate of return and actuarial value of assets internal rate of return experienced by the Municipal Pension Fund, and the assumed rate of return. The 5-year and 10-year annual average returns as of June 30, 2019, were 4.81% and 8.25%, respectively, on a market value basis.

Table 24
Municipal Pension Fund
Annual Rates of Return

Year Ending June 30,	Market Value	Actuarial Value[1]	Assumed Rate of Return
2010	13.8%	12.9%	8.25%
2011	19.4%	9.9%	8.15%
2012	0.2%	2.4%	8.10%
2013	10.9%	5.1%	7.95%
2014	15.7%	4.8%	7.85%
2015	0.3%	5.8%	7.80%
2016	-3.2%	4.5%	7.75%
2017	13.1%	4.4%	7.70%
2018	9.0%	5.1%	7.65%
2019	5.7%	7.6%	7.60%

Source: July 1, 2019 Valuation.

(1) Net of PAF. See "Pension Adjustment Fund" above. The actuarial values reflect a ten-year smoothing.

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Asset Values. The following table sets forth, as of the July 1 actuarial valuation date for the years 2010-2019, the actuarial and market values of assets in the Municipal Pension Fund and the actuarial value as a percentage of market value.

Table 25
Actuarial Value of Assets vs. Market Value of Net Assets
(Dollar Amounts in Millions of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets[(1)]	Market Value of Net Assets[(1)]	Actuarial Value as a Percentage of Market Value
2010[(2)]	$4,380.9	$3,650.7	120.0%
2011[(2)]	$4,719.1	$4,259.2	110.8%
2012[(2)]	$4,716.8	$4,151.8	113.6%
2013	$4,799.3	$4,444.1	108.0%
2014	$4,814.9	$4,854.3	99.2%
2015	$4,863.4	$4,636.1	104.9%
2016	$4,936.0	$4,350.8	113.5%
2017	$5,108.6	$4,873.0	104.8%
2018	$5,397.4	$5,340.1	101.1%
2019	$5,852.5	$5,687.2	102.9%

Source: July 1, 2019 Valuation for Actuarial Value of Assets; 2010-2019 Actuarial Reports for Market Value of Net Assets.

(1) For purposes of this table, the Market Value of Net Assets excludes the PAF, which as of June 30, 2019 equaled $1.225 million. The Actuarial Value of Assets excludes that portion of the Municipal Pension Fund that is allocated to the PAF. The actuarial values reflect a ten-year smoothing.

(2) The July 1, 2010 actuarial and market values of assets include the $150 million deferred contribution from Fiscal Year 2010, and the July 1, 2011 and July 1, 2012 actuarial and market values of assets include the total deferred contribution of $230 million. See Table 29 below.

Changes in Plan Net Position. The following table sets forth, for the Fiscal Years 2015-2019, the additions, including employee (member) contributions, City contributions (including contributions from the Commonwealth), investment income and miscellaneous income, and deductions, including benefit payments and administration expenses, for the Municipal Pension Fund. Debt service payments on pension funding bonds (as described below at "Annual Contributions – *Annual Debt Service Payments on the Pension Bonds*") are made from the City's General Fund, Water Operating Fund, and Aviation Operating Fund, but are not made from the Municipal Pension Fund, and therefore are not included in Table 26. In those years in which the investment income is less than anticipated, the Municipal Pension Fund may experience negative changes (total deductions greater than total additions), which, as the table reflects, did occur in Fiscal Years 2015 and 2016. Furthermore, if unrealized gains are excluded from Table 26, resulting in a comparison of cash actually received against actual cash outlays, it results in a negative cash flow in Fiscal Years 2015-2017, which is typical of a mature retirement system. In Fiscal Years 2018-2019, there was a positive cash flow.

Contributions from the Commonwealth are provided pursuant to the provisions of Act 205. Any such contributions are required to be used to defray the cost of the City's pension system. The amounts contributed by the Commonwealth for each of the last ten Fiscal Years are set forth in Table 29 below. The contributions from the Commonwealth are capped pursuant to Act 205, which provides that "[n]o municipality shall be entitled to receive an allocation of general municipal pension system State aid in an amount greater that 25% of the total amount of the general municipal pension system State aid available."

Employee (member) contribution amounts reflect contribution rates as a percent of pay, which for the plan year beginning July 1, 2019, vary from 6.00% to 8.50% for police and fire employees, and from 2.37% to 7.00% for municipal employees excluding elected officials. These rates include the increases for police employees effective July 1, 2017 resulting from the FOP Lodge No. 5 and IAFF Local No. 22 Labor Contracts. Such contracts increased member contributions for current police officers in Plan 87 and Plan 10 by 0.92% effective July 1, 2017 and an additional 0.92% effective July 1, 2018. For new police officers and fire fighters hired or rehired on or after July 1, 2017, the member contribution rate is increased by 2.5% over the rate which would otherwise be in effect as of July 1, 2017. The rates also include the increases in contributions for certain municipal employees and elected officials currently in Plans 67, 87 and 87 Prime and elected officials as required by legislation. This legislation called for employees in these groups to pay an additional 0.5% of compensation from January 1, 2015 to December 31, 2015 and an additional 1.0% from January 1, 2016 onwards. New employees in these groups entering Plan 87 Municipal Prime will pay an additional 1.0% of compensation which is included in the table below. Finally, these rates do not include the additional tiered contributions paid by current and future municipal employees based on their level of compensation.

Table 26
Changes in Net Position of the Municipal Pension Fund
Fiscal Years 2015-2019
(Amounts in Thousands of USD)

	2015	2016	2017	2018	2019
Beginning Net Assets (Market Value)[1]	$4,916,705	$4,674,252	$4,357,975	$4,874,075	$5,341,286
Additions					
- Member Contributions	58,658	67,055	73,607	83,289	99,180
- City Contributions[2]	577,195	660,247	706,237	781,984	797,806
- Investment Income[3]	11,790	(147,424)	563,372	438,515	301,749
- Miscellaneous Income[4]	2,049	1,742	3,253	1,812	1,987
Total	$649,692	$581,620	$1,346,469	$1,305,600	$1,200,721
Deductions					
- Benefits and Refunds	(881,666)	(889,343)	(821,495)	(828,266)	(842,469)
- Administration	(10,479)	(8,554)	(8,874)	(10,123)	(11,155)
Total	$(892,145)	$(897,897)	$(830,369)	$(838,389)	$(853,624)
Ending Net Assets (Market Value)	$4,674,252	$4,357,975	$4,874,075	$5,341,286	$5,688,383

Source: Municipal Pension Fund's audited financial statements.

(1) Includes the PAF, which is not available for funding purposes.

(2) City Contributions include pension contributions from the Commonwealth. See Table 29.

(3) Investment income is shown net of fees and expenses, and includes interest and dividend income, net appreciation (depreciation) in fair value of investments, and net gains realized upon the sale of investments.

(4) Miscellaneous income includes securities lending and other miscellaneous revenues.

Funded Status of the Municipal Pension Fund

The following two tables set forth, as of the July 1 actuarial valuation date for the years 2010-2019, the asset value, the actuarial liability, the UAL, the funded ratio, covered payroll and UAL, as a percentage of covered payroll for the Municipal Pension Fund on actuarial and market value bases, respectively.

Table 27
Schedule of Funding Progress (Actuarial Value)
(Dollar Amounts in Millions of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets[1] (a)	Actuarial Liability (b)	UAL (Actuarial Value) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAL as a % of Covered Payroll [(b-a)/c]
2010	$4,380.9	$9,317.0	$4,936.1	47.0%	$1,421.2	347.3%
2011	$4,719.1[2]	$9,487.5	$4,768.4	49.7%	$1,371.3	347.7%
2012	$4,716.8[2]	$9,799.9	$5,083.1	48.1%	$1,372.2	370.4%
2013	$4,799.3	$10,126.2	$5,326.9	47.4%	$1,429.7	372.6%
2014	$4,814.9	$10,521.8	$5,706.9	45.8%	$1,495.4	381.6%
2015	$4,863.4	$10,800.4	$5,937.0	45.0%	$1,597.8	371.6%
2016	$4,936.0	$11,024.8	$6,088.8	44.8%	$1,676.5	363.2%
2017	$5,108.6	$11,275.7	$6,167.1	45.3%	$1,744.7	353.5%
2018	$5,397.4	$11,521.0	$6,123.5	46.8%	$1,805.4	339.2%
2019	$5,852.5	$11,783.1	$5,930.6	49.7%	$1,842.6	321.9%

Source: July 1, 2019 Valuation.

(1) The July 1, 2010 Actuarial Value of Assets includes the $150 million deferred contribution from Fiscal Year 2010 and each of the July 1, 2011 and July 1, 2012 Actuarial Value of Assets includes the total deferred contribution of $230 million.

(2) Reflects the assumed rate of return on deferred contributions at the time of the deferral.

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Table 28
Schedule of Funding Progress (Market Value)
(Dollar Amounts in Millions of USD)

Actuarial Valuation Date (July 1)	Market Value of Net Assets[1] (a)	Actuarial Liability (b)	UAL (Market Value) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAL as a % of Covered Payroll [(b-a)/c]
2010	$3,650.7	$9,317.0	$5,666.3	39.2%	$1,421.2	398.7%
2011	$4,259.2	$9,487.5	$5,228.3	44.9%	$1,371.3	381.3%
2012	$4,151.8	$9,799.9	$5,648.1	42.4%	$1,372.2	411.6%
2013	$4,444.1	$10,126.2	$5,682.1	43.9%	$1,429.7	397.4%
2014	$4,854.3	$10,521.8	$5,667.6	46.1%	$1,495.4	379.0%
2015	$4,636.1[2]	$10,800.4	$6,164.3	42.9%	$1,597.8	385.8%
2016	$4,350.8[2]	$11,024.8	$6,674.0	39.5%	$1,676.5	398.1%
2017	$4,873.0[2]	$11,275.7	$6,402.7	43.2%	$1,744.7	367.0%
2018	$5,340.1[2]	$11,521.0	$6,180.9	46.4%	$1,805.4	342.4%
2019	$5,687.2[2]	$11,783.1	$6,095.9	48.3%	$1,842.6	330.8%

Source: 2010-2019 Actuarial Valuation Reports.

(1) The July 1, 2010 Market Value of Net Assets includes the $150 million deferred contribution from Fiscal Year 2010 and each of the July 1, 2011 and July 1, 2012 Market Value of Net Assets includes the total deferred contribution of $230 million.

(2) For purposes of this table, the Market Value of Net Assets excludes the PAF, which as of June 30, 2015 equaled $38,198,762; as of June 30, 2016 equaled $7,223,000; as of June 30, 2017 equaled $1,097,499; as of June 30, 2018 equaled $1,160,247; and as of June 30, 2019 equaled $1,225,114.

Annual Contributions

Annual Municipal Pension Contributions

Table 29 shows the components of the City's annual pension contributions to the Municipal Pension Fund for the Fiscal Years 2010-2019.

Table 29
Total Contribution to Municipal Pension Fund
(Dollar Amounts in Millions of USD)

Fiscal Year	General Fund Contribution (A)	Commonwealth Contribution (B)	Aggregate General Fund Contribution (A+B)	Water Fund Contribution	Aviation Fund Contribution	Grants Funding and Other Funds Contribution[1]	Contributions from Quasi-governmental Agencies	Pension Bond Proceeds	Total Contribution (C)	MMO (D)	MMO (Deferred) Makeup Payments	% of MMO Contributed (C/D)
2010	$190.8[2]	$59.2	$250.0	$25.1	$11.6	$10.8	$15.1	$0.0	$312.6[2]	$447.4	$(150.0)[3]	100.0%[4]
2011	$325.8[2]	$61.8	$387.6	$37.7	$17.1	$13.6	$14.2	$0.0	$470.2[2]	$511.0	$(80.0)[3]	100.0%[4]
2012	$352.7	$95.0	$447.7	$43.8	$20.6	$27.4	$16.2	$0.0	$555.7	$507.0	-	109.7%
2013	$356.5	$65.7	$422.2	$41.4	$20.3	$27.2	$18.1	$252.6[3]	$781.8	$492.0	$230.0[3]	100.0%[4]
2014	$365.8	$69.6	$435.4	$45.5	$22.5	$30.0	$19.8	$0.0	$553.2	$523.4	-	105.7%
2015	$388.5	$62.0	$450.5	$48.3	$23.9	$33.4	$21.1	$0.0	$577.2	$556.0	-	103.8%
2016	$449.6	$62.6	$512.2	$55.1	$27.1	$34.8	$31.0	$0.0	$660.2	$595.0	-	110.0%
2017	$487.0	$68.7	$555.7	$61.0	$28.8	$33.3	$27.4	$0.0	$706.2	$629.6	-	112.2%
2018	$559.7	$72.4	$632.1	$62.7	$28.8	$32.5	$25.9	$0.0	$782.0	$661.3	-	118.3%
2019	$567.7	$74.8	$642.5	$64.7	$31.6	$33.8	$25.2	$0.0	$797.8	$668.3	-	119.4%

(1) Other Funds Contributions represents contributions to the Municipal Pension Fund from the City's Special Gasoline Tax Fund, Community Development Block Grant Fund, Municipal Pension Fund, and Parks and Recreation Programs and Facilities Fund.

(2) Reflects the actual cash outlays for Fiscal Year 2010 and Fiscal Year 2011, which do not include the deferred contributions authorized pursuant to Act 44. See "– Funding Requirements; Funding Standards – Pennsylvania Law" above for a discussion of pension contribution deferrals authorized pursuant to Act 44.

(3) As authorized pursuant to Act 44, the City deferred payments to the Municipal Pension Fund of $150 million in fiscal year 2010 and $80 million in fiscal year 2011. Those amounts were repaid in fiscal year 2013, in which year the City made a contribution of $252.6 million to the Municipal Pension Fund, consisting of $230 million of proceeds of Pension Bonds that were issued in October 2012 and $22.6 million in refunding savings from a refunding Pension Bond financing in December 2012. See "– *Annual Debt Service Payments on the Pension Bonds*" below.

(4) Act 205 directs the Actuary, in performing the actuarial valuations, to disregard deferrals, and therefore for ease of presentation 100.0% is reflected in this column for both the years in which the deferrals occurred and the year in which the makeup payment was made.

Annual Debt Service Payments on the Pension Bonds

Pension funding bonds ("Pension Bonds") were initially issued in Fiscal Year 1999 (the "1999 Pension Bonds"), at the request of the City, by PAID. Debt service on the Pension Bonds is payable pursuant to a Service Agreement between the City and PAID. The Service Agreement provides that the City is obligated to pay a service fee from its current revenues and the City covenanted in the agreement to include the annual amount in its operating budget and to make appropriations in such amounts as are required. If the City's revenues are insufficient to pay the full service fee in any Fiscal Year as the same becomes due and payable, the City has covenanted to include amounts not so paid in its operating budget for the ensuing Fiscal Year.

The 1999 Pension Bonds were issued in the principal amount of $1.3 billion, and the net proceeds were used, together with other funds of the City, to make a contribution in Fiscal Year 1999 to the Municipal Pension Fund in the amount of approximately $1.5 billion.

In October 2012, PAID, at the request of the City, issued Pension Bonds in the principal amount of $231.2 million, the proceeds of which were used principally to make the $230 million repayment of deferred contributions to the Municipal Pension Fund reflected in Table 29 above. These bonds had maturities of April 1, 2013 and 2014, and have been repaid.

In December 2012, PAID, at the request of the City, issued Pension Bonds in the approximate principal amount of $300 million, the proceeds of which were used to current refund a portion of the 1999 Pension Bonds. The refunding generated savings of approximately $22.6 million, which the City deposited into the Municipal Pension Fund.

Table 30 shows the components of the City's annual debt service payments on the Pension Bonds for the Fiscal Years 2010-2019.

Table 30
Total Debt Service Payments on Pension Bonds
(Amounts in Millions of USD)

Fiscal Year	General Fund Payment	Water Fund Payment	Aviation Fund Payment	Other Funds Payment[1]	Grants Funding	Total Payment
2010	$96.7	$7.6	$3.4	$0.6	$1.5	$109.8
2011	$97.7	$10.3	$4.6	$0.8	$1.5	$114.9
2012	$100.1	$10.7	$4.8	$0.7	$3.4	$119.7
2013[2]	$196.6	$21.5	$10.1	$1.3	$3.8	$233.3
2014[2]	$211.0	$23.6	$11.2	$1.4	$3.7	$250.9
2015	$107.7	$12.6	$5.9	$0.8	$4.0	$131.0
2016	$109.9	$13.7	$6.4	$0.9	$3.8	$134.7
2017	$109.5	$14.5	$6.6	$0.9	$3.3	$134.8
2018	$110.1	$14.3	$6.3	$0.9	$3.1	$134.7
2019	$109.8	$14.2	$6.6	$1.1	$3.0	$134.7

(1) Other Funds Payments represents the allocable portion of debt service payments on the City's Pension Bonds from the City's Community Development Block Grant Fund and Municipal Pension Fund.

(2) The increase in debt service payments in fiscal years 2013 and 2014 over the fiscal year 2012 amounts reflect the debt service payments on the Pension Bonds that were issued in October 2012.

Annual Pension Costs of the General Fund

Table 31 shows the annual pension costs of the General Fund for the Fiscal Years 2010-2019, being the sum of the General Fund Contribution to the Municipal Pension Fund (column (A) in Table 29 above) and the General Fund debt service payments on Pension Bonds (Table 30 above).

Table 31
Annual Pension Costs of the General Fund
(Amounts in Millions of USD)

Fiscal Year	General Fund Pension Fund Contribution (A)[1]	General Fund Pension Bond Debt Service Payment (B)	Annual Pension Costs (A+B)	Total General Fund Expenditures (C)	General Fund portion of Annual Pension Costs as % of Total General Fund Expenditures (A+B) / C
2010	$190.8	$96.7	$287.5	$3,653.73	7.87%
2011	$325.8	$97.7	$423.5	$3,785.29	11.19%
2012	$352.7	$100.1	$452.8	$3,484.88	12.99%
2013	$356.5	$196.6	$553.1	$3,613.27	15.31%
2014	$365.8	$211.0	$576.8	$3,886.56	14.84%
2015	$388.5	$107.7	$496.2	$3,831.51	12.95%
2016	$449.6	$109.9	$559.5	$4,015.80	13.93%
2017	$487.0	$109.5	$596.5	$4,139.80	14.41%
2018	$559.7	$110.1	$669.8	$4,402.85	15.21%
2019	$567.7	$109.8	$677.5	$4,772.39	14.20%

(1) Does not include Commonwealth contribution. See Table 29.

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The following table shows the annual City contribution to the Municipal Pension Fund as a percentage of the covered employee payroll.

Table 32
Annual City Contribution as % of Covered Employee Payroll
(Dollar Amounts in Thousands of USD)

Fiscal Year	Annual City Contribution	Fiscal Year Covered Employee Payroll(1)	ACC as % of Payroll
2010	$312,556	$1,421,151	21.99%
2011	$470,155	$1,371,274	34.29%
2012	$555,690	$1,372,174	40.50%
2013	$781,823	$1,429,723	54.68%
2014	$553,179	$1,495,421	36.99%
2015	$577,195	$1,597,849	36.12%
2016	$660,247	$1,676,549	39.38%
2017	$706,237	$1,744,728	40.48%
2018	$781,984	$1,805,400	43.31%
2019	$797,806	$1,842,555	43.30%

Source: Municipal Pension Fund Financial Statements, June 30, 2019.

(1) The definition of "covered-employee payroll" in GASB 68 differs slightly from the "covered payroll" definition in GASB 27. See "PENSION SYSTEM – Funding Requirements; Funding Standards – *GASB; City Funding Policy*."

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Actuarial Projections of Funded Status

Cautionary Note. The information under this subheading, "Actuarial Projections of Funded Status," was prepared by Cheiron. The table below shows a five-year projection of Revenue Recognition Policy ("RRP") payments, Actuarial Value of Assets, Actuarial Liability, UAL, and Funded Ratio. The charts below show projections of funded ratios and City contributions based on the RRP through Fiscal Year 2039. All projections, whether for five years or for twenty years, are subject to actual experience deviating from the underlying assumptions and methods, and that is particularly the case for the charts below for the periods beyond the projections in the five-year table. **Projections and actuarial assessments are "forward looking" statements and are based on assumptions which may not be fully realized in the future and are subject to change, including changes based on the future experience of the City's Municipal Pension Fund and Municipal Pension Plan.**

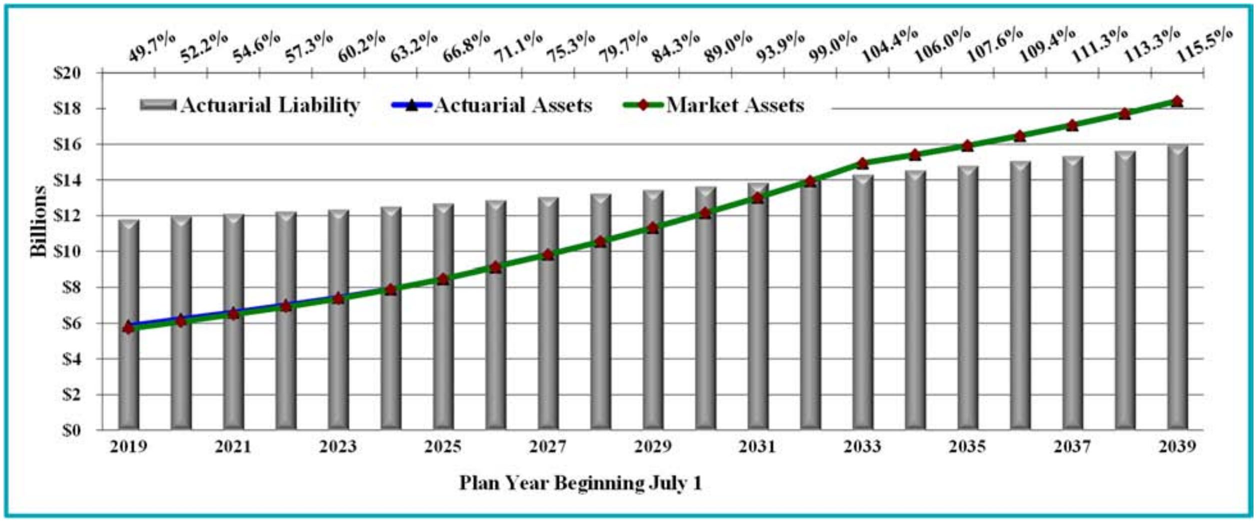
The projections are on the basis that all assumptions as reflected in the July 1, 2019 Valuation are exactly realized and the City makes all future RRP payments on schedule as required by the funding policy adopted by the Pension Board, and must be understood in the context of the assumptions, methods and benefits in effect as described in the July 1, 2019 Valuation. Included among such assumptions are: (i) the rates of return for the Municipal Pension Fund over the projection period will equal 7.55% annually, (ii) RRP contributions will be made each year, (iii) the provisions of Act 205 as amended by Act 44 will remain in force during the projection period, and (iv) the future population changes of the participants in the pension plan will follow the demographic actuarial assumptions with the active population remaining constant in the future. The July 1, 2019 Valuation includes charts reflecting the contributions based on MMO (Baseline projection set 1), and charts reflecting the additional contributions in accordance with the RRP (Baseline projection set 2). The charts provided below reflect the RRP contributions, which are higher than the MMO required under Pennsylvania law. Using the RRP, the System is projected to be 80% funded by 2029 and 100% funded by 2033, three years earlier than under the MMO projections. By the end of the projection period, the System is expected to be funded at 115.5% compared to 103.9% when MMO contributions are made. See the July 1, 2019 Valuation for further discussion of the assumptions and methodologies used by the Actuary in preparing the July 1, 2019 Valuation and the following projections, all of which should be carefully considered in reviewing the projections. The July 1, 2019 Valuation is available for review on the website of the City's Board of Pensions. The table and charts below separately set forth estimates of Sales Tax revenues that will be deposited by the City into the Municipal Pension Fund, which were provided by the City to Cheiron at the time of the valuation and differ from the current estimates or budgeted amounts of such revenues as included in the Twenty-Ninth Five-Year Plan or the Fiscal Year 2021 Adopted Budget, as applicable. Cheiron has not analyzed and makes no representation regarding the validity of the sales tax revenue assumptions and estimates provided by the City. See "REVENUES OF THE CITY – Sales and Use Tax." Each of the tables and graphs that follow are part of the July 1, 2019 Valuation and such report should be referenced regarding the underlying benefits, methods, and assumptions utilized in the production of these values.

Five-Year Projection. The following chart provides dollar amounts in millions of USD.

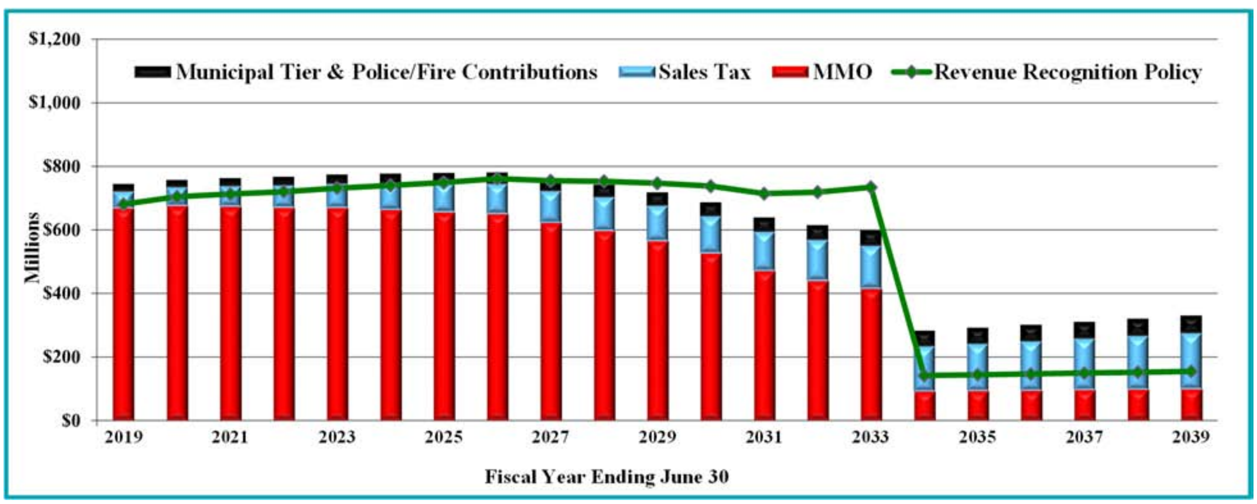
Fiscal Year End	RRP	Sales Tax Contribution	Value of Assets	Actuarial Liability	UAL	Funded Ratio
2020	$ 704.6	$ 58.1	$ 5,852.5	$ 11,783.1	$ 5,930.6	49.7%
2021	713.0	63.7	6,238.1	11,945.8	5,707.7	52.2%
2022	720.5	69.7	6,599.2	12,094.2	5,495.0	54.6%
2023	731.7	75.7	7,010.9	12,226.8	5,216.0	57.3%
2024	740.1	82.2	7,432.3	12,342.6	4,910.4	60.2%
2025	749.4	89.4	7,908.6	12,508.0	4,599.4	63.2%

Twenty-Year Projections.

Funded Ratio Chart based on the RRP:



Expected City Contribution Chart based on the RRP:



OTHER POST-EMPLOYMENT BENEFITS

The City self-administers a single employer, defined benefit plan for post-employment benefits other than pension benefits ("OPEB"), and funds such plan on a pay-as-you-go basis. The City's OPEB plan provides for those persons who retire from the City and are participants in the Municipal Pension Plan: (i) post-employment healthcare benefits for a period of five years following the date of retirement and (ii) lifetime life insurance coverage ($7,500 for firefighters who retired before July 1, 1990; $6,000 for all other retirees). In general, retirees eligible for OPEB are those who terminate their employment after ten years of continuous service to immediately become pensioned under the Municipal Pension Plan.

To provide health care coverage, the City pays a negotiated monthly premium for retirees covered by the union contract for AFSCME DC 33 and is self-insured for all other eligible pre-Medicare retirees. Aside from AFSCME DC 33, the City is responsible for the actual health care cost that is invoiced to the City's unions by their respective vendors. The actual cost can be a combination of self-insured claim expenses, premiums, ancillary services, and administrative expenses. Eligible union represented employees receive five years of coverage through their union's health fund. The City's funding obligation for pre-Medicare retiree benefits is the same as for active employees. Union represented and non-union employees may defer their retiree health coverage until a later date. For some groups, the amount that the City pays for their deferred health care is based on the value of the health benefits at the time the retiree claims the benefits, but for police and fire retirees who retired after an established date, the City pays the cost of five years of coverage when the retiree claims the benefits.

The annual payments made by the City for OPEB for Fiscal Years 2015-2019 are shown in Table 33 below.

Table 33
Annual OPEB Payment
(Amounts in Thousands of USD)

Fiscal Year ended June 30,	Annual OPEB Payment
2015	$95,300
2016	$107,200
2017	$114,800
2018	$96,400
2019	$96,900

Source: See Note IV.3 to the City's audited Financial Statements for such Fiscal Years (as included in the City's CAFRs).

For financial reporting purposes, although the City funds OPEB on a pay-as-you-go basis, it is required to include in its financial statements (in accordance with GASB Statement No. 75) a calculation similar to that performed to calculate its pension liability. Pursuant to GASB 75, an annual required contribution is calculated which, if paid on an ongoing basis, is projected to cover normal costs each year and to amortize any unfunded actuarial liability over a period not to exceed 30 years. As of June 30, 2018, the date of the most recent actuarial valuation, the UAL for the City's OPEB was $1.824 billion, the covered annual payroll was $1.805 billion, and the ratio of UAL to the covered payroll was 101.02%. See Note IV.3 to the City's audited Financial Statements for the Fiscal Year ended June 30, 2019.

PGW PENSION PLAN

General

PGW consists of all the real and personal property owned by the City and used for the acquisition, manufacture, storage, processing, and distribution of gas within the City, and all property, books, and records employed and maintained in connection with the operation, maintenance, and administration of PGW. The City Charter provides for a Gas Commission (the "Gas Commission") to be constituted and appointed in accordance with the provisions of contracts between the City and the operator of PGW as may from time to time be in effect, or, in the absence of a contract, as may be provided by ordinance. The Gas Commission consists of the City Controller, two members appointed by City Council and two members appointed by the Mayor.

PGW is operated by PFMC, pursuant to an agreement between the City and PFMC dated December 29, 1972, as amended, authorized by ordinances of City Council (the "Management Agreement"). Under the Management Agreement, various aspects of PFMC's management of PGW are subject to review and approval by the Gas Commission. The PUC has the regulatory responsibility for PGW with regard to rates, safety, and customer service.

The City sponsors the Philadelphia Gas Works Pension Plan (the "PGW Pension Plan"), a single employer defined benefit plan, to provide pension benefits for certain current and former PGW employees and other eligible class employees of PFMC and the Gas Commission. As plan sponsor, the City, through its General Fund, could be responsible for plan liabilities if the PGW Pension Plan does not satisfy its payment obligations to PGW retirees. At June 30, 2019, the PGW Pension Plan membership total was 3,729, comprised of: (i) 2,516 retirees and beneficiaries currently receiving benefits and terminated employees entitled to benefits but not yet receiving them; and (ii) 1,213 participants, of which 961 were vested and 252 were nonvested.

PGW Pension Plan

The PGW Pension Plan provides retirement benefits as well as death and disability benefits. Retirement benefits vest after five years of credited service. Retirement payments for vested employees commence: (i) at age 65 and five years of credited service; (ii) age 55 and 15 years of credited service; or (iii) without regard to age, after 30 years of credited service. For covered employees hired prior to May 21, 2011 (union employees) or prior to December 21, 2011 (non-union employees), PGW pays the entire cost of the PGW Pension Plan. Union employees hired on or after May 21, 2011 and non-union employees hired on or after December 21, 2011 have the option to participate in the PGW Pension Plan and contribute 6% of applicable wages, or participate in a plan established in compliance with Section 401(a) of the Internal Revenue Code (deferred compensation plan) and have PGW contribute 5.5% of applicable wages.

PGW is required by statute to contribute the amounts necessary to fund the PGW Pension Plan. The PGW Pension Plan is being funded with contributions by PGW to the Sinking Fund Commission of the City, together with investment earnings and employee contributions required for new hires after December 2011 who elect to participate in the PGW Pension Plan. Benefit and contribution provisions are established by City ordinance and may be amended only as allowed by City ordinance. The pension payments are treated as an operating expense of PGW and are included as a component of PGW's base rate. The PUC approves all items that are to be included in PGW's base rates.

Effective October 2015, payments to beneficiaries of the PGW Pension Plan are made by the PGW Retirement Reserve Fund. Prior to October 2015, payments to beneficiaries of the PGW Pension

Plan were made by PGW through its payroll system. The financial statements for the PGW Pension Plan for the fiscal year ended June 30, 2019, show an amount due to PGW of approximately $0.1 million, which represents the cumulative excess of payments made to the retirees and administrative expenses incurred by PGW, over the sum of PGW's required annual contribution and reimbursements received from the PGW Pension Plan.

Pension Costs and Funding

PGW pays an annual amount that is projected to be sufficient to cover its normal cost and an amortization of the PGW Pension Plan's UAL. The following table shows the normal cost, the amortization payment, and the resulting annual required contribution as of the last five actuarial valuation dates for the PGW Pension Plan. Prior to fiscal year 2016, PGW had been using a 20-year open amortization period (and the payments in Table 34 are on the basis of a 20-year open amortization). Commencing in PGW's fiscal year 2016, PGW calculated an annual required contribution on the basis of both a 20-year open amortization period and a 30-year closed amortization period, and contributed the higher of the two amounts. An open amortization period is one that begins again or is recalculated at each actuarial valuation date. With a closed amortization period, the unfunded liability is amortized over a specific number of years to produce a level annual payment. Because the final amortization date is fixed, if all actuarial assumptions are achieved, the unfunded liability would decline to zero as of the final amortization date. To the extent future experience differs from the assumptions used to establish the 30-year fixed amortization payment schedule, new amortization bases attributable to a particular year's difference would be established and amortized over their own 30-year schedule. Commencing in PGW's fiscal year 2020, PGW's annual contribution is anticipated to be $29,227,000. The contribution amount exceeds the suggested level of funding in the actuarial report that was presented to the Sinking Fund Commission for review and is consistent with the contribution amount in PGW's base rates.

Table 34
PGW Pension – Annual Required Contributions
(Dollar Amounts in Thousands of USD)

Calculation of ARC for the 12-month period ended:	**Normal Cost**[1] (A)	**Amortization Payment**[1] (B)	**ARC**[(1), (2)] (A + B)	**Payments to Beneficiaries**[3]
7/1/2015	$7,859	$18,063	$25,922	$46,917
7/1/2016	$7,992	$20,238	$28,230	$50,447
7/1/2017	$7,717	$19,678	$27,395	$51,376
7/1/2018	$7,760	$20,022	$27,782	$52,627
7/1/2019	$7,282	$18,617	$25,899	$53,893

(1) Source: The Actuarial Valuation Report (Funding) for the Plan Year July 1, 2019 – June 30, 2020 for the PGW Pension Plan.

(2) As described above, until October 2015, PGW did not make a net cash contribution to the PGW Pension Plan, but rather paid beneficiaries through its payroll system, and then was reimbursed by the Plan. Effective October 2015, payments to beneficiaries of the PGW Pension Plan are made by the PGW Retirement Reserve Fund. Each ARC is the sum reflected in this table, but the "Calculated Mid-Year Contribution" in Tables 36 and 37 more closely approximates the actual pension contributions made by PGW.

(3) Sources: For 2015, PGW's CAFR for the fiscal year ended August 31, 2015. For 2016, the audited financial statements for PGW for the fiscal years ended August 31, 2016 and 2015. For 2017, the audited financial statements for PGW for the fiscal years ended August 31, 2017 and 2016. For 2018, the audited financial statements for PGW for the fiscal years ended August 31, 2018 and 2017. For 2019, the audited financial statements for PGW for the fiscal years ended August 31, 2019 and 2018.

Although PGW has paid its annual required contribution each year, the market value of assets for the PGW Pension Plan is less than the actuarial accrued liability, as shown in the next table.

Table 35
Schedule of Pension Funding Progress
(Dollar Amounts in Thousands of USD)[1]

Actuarial Valuation Date	Market Value of Assets	Actuarial Liability	UAL (Market Value)	Funded Ratio
7/1/2015	$510,719	$706,704	$195,985	72.27%
7/1/2016	$483,259	$736,078	$252,819	65.65%
7/1/2017	$521,526	$739,872	$218,346	70.49%
7/1/2018	$543,246	$758,069	$214,823	71.66%
7/1/2019	$553,240	$755,782	$202,542	73.20%

(1) Source: The Actuarial Valuation Report (Funding) for the Plan Year July 1, 2019 – June 30, 2020 for the PGW Pension Plan.

The current significant actuarial assumptions for the PGW Pension Plan are: (i) investment return rate of 7.30% compounded annually; (ii) salary increases assumed to reach 4.5% per year; and (iii) retirements that are assumed to occur, for those with 30 or more years of service, at a rate of 15% at ages 55 to 60, 30% at age 61, 50% at ages 62-69, and 100% at age 70 and older.

PGW uses a September 1 – August 31 fiscal year, while the PGW Pension Plan uses a July 1 – June 30 fiscal year (the same as the City's fiscal year). The last five actuarial valuation reports for the PGW Pension Plan utilized a plan year of July 1 to June 30. This is reflected in Table 35 above.

The PGW Pension Plan actuary prepared a separate actuarial valuation report ("GASB 67 Report") for the fiscal year ending June 30, 2019, for purposes of plan reporting information under Governmental Accounting Standards Board Statement No. 67, "Financial Reporting for Pension Plans." The GASB 67 Report shows for the fiscal year ending June 30, 2019, an unfunded liability of approximately $247.2 million (rather than the approximately $202.5 million reflected in Table 35), which results in a funded ratio of 69.11%. In addition, that report provides an interest rate sensitivity, which shows that were the investment rate to be 6.30% (1% lower than the assumed investment rate of 7.30%), the unfunded liability would be approximately $338.4 million.

Projections of Funded Status

The information under this subheading, "Projections of Funded Status," is extracted from tables prepared by Aon Hewitt, as actuary to the PGW Pension Plan, which were included in their "Actuarial Valuation Report (Funding) for the Plan Year July 1, 2019 – June 30, 2020," dated October 10, 2019. The charts show 10-year projections, using both the current amortization method (20-year, open) and the alternative amortization method (30-year, fixed). See "– Pension Costs and Funding" above. Projections are subject to actual experience deviating from the underlying assumptions and methods. **Projections and actuarial assessments are "forward looking" statements and are based upon assumptions that may not be fully realized in the future and are subject to change, including changes based upon the future experience of the PGW Pension Plan.**

Table 36
Schedule of Prospective Funded Status (20-Year Open Amortization)
(Dollar Amounts in Thousands of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets	Actuarial Accrued Liability	UAL (Actuarial Value)	Calculated Mid-Year Contribution[(1), (2)]	Funded Ratio
2019	$548,997	$755,782	$206,785	$29,227	72.64%
2020	561,303	765,294	203,991	26,472	73.34%
2021	577,462	773,638	196,176	25,601	74.64%
2022	587,183	780,981	193,798	25,263	75.19%
2023	594,998	787,203	192,205	24,911	75.58%
2024	603,173	792,179	189,006	24,347	76.14%
2025	610,629	796,040	185,412	23,905	76.71%
2026	617,480	799,478	181,998	23,558	77.24%
2027	623,944	802,474	178,530	23,001	77.75%
2028	629,894	804,699	174,805	22,486	78.28%

(1) Source: The Actuarial Valuation Report (Funding) for the Plan Year July 1, 2019 – June 30, 2020 for the PGW Pension Plan.
(2) PGW makes monthly contributions to the PGW Retirement Reserve Fund. The actuary's report assumes contributions at the beginning, middle, and end of the plan year. PGW utilizes the mid-year contribution level to approximate the actual funding methodology.

Table 37
Schedule of Prospective Funded Status (30-Year Closed Amortization)
(Dollar Amounts in Thousands of USD)

Actuarial Valuation Date (July 1)	Actuarial Value of Assets	Actuarial Accrued Liability	UAL (Actuarial Value)	Calculated Mid-Year Contribution[(1), (2)]	Funded Ratio
2019	$548,997	$755,782	$206,785	$29,227	72.64%
2020	561,303	765,294	203,991	24,809	73.34%
2021	575,738	773,638	197,900	24,428	74.42%
2022	584,117	780,981	196,864	24,492	74.79%
2023	590,910	787,203	196,293	24,528	75.06%
2024	598,389	792,179	193,790	24,370	75.54%
2025	605,520	796,040	190,521	24,333	76.07%
2026	612,442	799,478	187,037	24,381	76.61%
2027	619,391	802,474	183,083	24,214	77.19%
2028	626,266	804,699	178,433	24,087	77.83%

(1) Source: The Actuarial Valuation Report (Funding) for the Plan Year July 1, 2019 – June 30, 2020 for the PGW Pension Plan.
(2) PGW makes monthly contributions to the PGW Retirement Reserve Fund. The actuary's report assumes contributions at the beginning, middle, and end of the plan year. PGW utilizes the mid-year contribution level to approximate the actual funding methodology.

Additional Information

The City issues a publicly available financial report that includes financial statements and required supplementary information for the PGW Pension Plan. The report is not incorporated into this Official Statement by reference. The report may be obtained by writing to the Office of the Director of Finance of the City.

Further information on the PGW Pension Plan, including with respect to its membership, plan description, funding policy, actuarial assumptions and funded status is contained in the Fiscal Year 2019 CAFR.

PGW OTHER POST-EMPLOYMENT BENEFITS

PGW provides post-employment healthcare and life insurance benefits to its participating retirees and their beneficiaries and dependents. The City, through its General Fund, could be responsible for costs associated with post-employment healthcare and life insurance benefits if PGW fails to satisfy its post-employment benefit obligations.

PGW pays the full cost of medical, basic dental, and prescription coverage for employees who retired prior to December 1, 2001. Employees who retire after December 1, 2001 are provided a choice of three plans at PGW's expense and can elect to pay toward a more expensive plan. Union employees hired prior to May 21, 2011 and non-union employees hired prior to December 21, 2011 who retire from active service to immediately begin receiving pension benefits are entitled to receive lifetime post-retirement medical, prescription, and dental benefits for themselves and, depending on their retirement plan elections, their dependents. Employees hired on or after those dates are entitled to receive only five years of post-retirement benefits. Currently, PGW provides for the cost of healthcare and life insurance benefits for retirees and their beneficiaries on a pay-as-you-go-basis.

As part of a July 29, 2010 rate case settlement (the "Rate Settlement"), which provided for the establishment of an irrevocable trust for the deposit of funds derived through a rider from all customer classes to fund OPEB liabilities (the "OPEB Surcharge"), PGW established the trust in July 2010, and began funding the trust in accordance with the Rate Settlement in September 2010. The Rate Settlement provided that PGW was to deposit $15.0 million annually for an initial five-year period towards the ARC, and an additional $3.5 million annually, which represented a 30-year amortization of the OPEB liability at August 31, 2010. These deposits were funded primarily through increased rates of $16.0 million granted in the Rate Settlement. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover normal costs each year and amortize any unfunded actuarial liabilities (or funding excesses) over a period of 30 years. In PGW's 2015-2016 Gas Cost Rate ("GCR") proceeding, PGW proposed to continue its OPEB Surcharge. The parties to the GCR proceeding submitted a settlement agreement continuing the OPEB Surcharge at the same level of revenue ($16.0 million annually) and funding ($18.5 million annually). Such settlement agreement was approved by the PUC.

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Table 38 provides detail of actual PGW OPEB payments for the last five PGW Fiscal Years and projected PGW OPEB payments for PGW Fiscal Years 2020-2024. Table 39 is the schedule of PGW OPEB funding progress.

Table 38
PGW OPEB Payments
(Amounts in Thousands of USD)

	Calculation of OPEB Payment for the 12-month period ended:	Healthcare	Life Insurance	OPEB Trust	Total
Actual[1]					
	8/31/2015	$28,598	$1,749	$18,500	$48,847
	8/31/2016	$29,251	$1,800	$18,500	$49,551
	8/31/2017	$27,788	$1,777	$18,500	$48,065
	8/31/2018	$26,953	$1,661	$18,500	$47,114
	8/31/2019	$27,419	$1,629	$18,500	$47,548
Projections[2]					
	12/31/2020	$30,592	$1,700	$18,500	$50,792
	12/31/2021	$32,121	$1,700	$18,500	$52,321
	12/31/2022	$33,445	$1,700	$18,500	$53,645
	12/31/2023	$34,909	$1,700	$18,500	$55,109
	12/31/2024	$35,782	$1,700	$18,500	$55,982

(1) Source: PGW records.
(2) The Actuarial Valuation Report for the PGW Health and Life Insurance Plan for Retired Employees GASB 75 Financial Disclosure Report for the Fiscal Year Ended August 31, 2019.

Table 39
Schedule of OPEB Funding Progress
(Dollar Amounts in Thousands of USD)

Actuarial valuation date	Actuarial value of assets	Actuarial liability	Unfunded actuarial liability	Funded ratio
8/31/2014[1]	$90,838	$450,289	$359,451	20.2%
12/31/2015[1]	$110,443	$512,527	$402,083	21.6%
12/31/2016[1]	$139,624	$489,979	$350,356	28.5%
12/31/2017[1]	$180,743	$559,631	$378,888	32.3%
12/31/2018[1]	$184,455	$520,533	$336,078	35.4%
12/31/2019[2]	$245,361	$493,570	$248,209	49.7%

(1) The Actuarial Valuation Report for the PGW Health and Life Insurance Plan for Retired Employees GASB 75 Financial Disclosure Report for the Fiscal Year Ended August 31, 2019.
(2) The Actuarial Valuation Report for the PGW Health and Life Insurance Plan for Retired Employees December 31, 2019 GASB 74 Actuarial Valuation.

CITY CASH MANAGEMENT AND INVESTMENT POLICIES

General Fund Cash Flow

Because the receipt of revenues into the General Fund generally lags behind expenditures from the General Fund during each Fiscal Year, the City issues notes in anticipation of General Fund revenues and makes payments from the Consolidated Cash Account (described below) to finance its on-going operations.

The timing imbalance referred to above results from a number of factors, principally the following: (i) Real Estate Taxes, BIRT, and Net Profits Taxes are not due until the latter part of the Fiscal Year; and (ii) the City experiences lags in reimbursement from other governmental entities for expenditures initially made by the City in connection with programs funded by other governments.

From time to time, the City issues, or PICA has issued on behalf of the City, tax and revenue anticipation notes. Each issue was repaid when due, prior to the end of the particular Fiscal Year. The City did not issue any tax and revenue anticipation notes in Fiscal Year 2019 or Fiscal Year 2020. In September 2020, the City expects to issue approximately $300 million in tax and revenue anticipation notes.

The repayment of the tax and revenue anticipation notes is funded through cash available in the General Fund.

Consolidated Cash

The Act of the General Assembly of June 25, 1919 (Pa. P.L. 581, No. 274, Art. XVII, § 6) authorizes the City to make temporary inter-fund loans between certain operating and capital funds. The City maintains a Consolidated Cash Account for the purpose of pooling the cash and investments of all City funds, except those which, for legal or contractual reasons, cannot be commingled (e.g., the Municipal Pension Fund, sinking funds, sinking fund reserves, funds of PGW, the Aviation Fund, the Water Fund, and certain other restricted purpose funds). A separate accounting is maintained to record the equity of each member fund that participates in the Consolidated Cash Account. The City manages the Consolidated Cash Account pursuant to the procedures described below.

To the extent that any member fund temporarily experiences the equivalent of a cash deficiency, an advance is made from the Consolidated Cash Account, in an amount necessary to result in a zero balance in the cash equivalent account of the borrowing fund. All subsequent net receipts of a member fund that has negative equity are applied in repayment of the advance.

All advances are made within the budgetary constraints of the borrowing funds. Within the General Fund, this system of inter-fund advances has historically resulted in the temporary use of tax revenues or other operating revenues for capital purposes and the temporary use of capital funds for operating purposes. With the movement of the reimbursable component of DHS activities from the General Fund to the Grants Revenue Fund, a similar system of advances has resulted in the use of tax revenues or other operating revenues in the General Fund to make expenditures from the Grants Revenue Fund, which advances may be outstanding for multiple Fiscal Years, but which are expected to be reimbursed by the Commonwealth.

The City, in addition to maintaining an ongoing cash reconciliation process, is reviewing and reconciling certain unidentified variances in the Consolidated Cash Account. The reconciliation process, in short, reconciles the account balance and activity shown on the records of the bank at which the cash balance of the Consolidated Cash Account is maintained to that shown on the City's records. The City's records were not consistently reconciled for the period of July 1, 2014 – June 30, 2017. The balance in the Consolidated Cash Account on the City's records was higher than the account balance on the bank's records by approximately $40 million, which is attributable principally to unidentified historic variances. The City engaged the services of an auditing firm to undertake a complete reconciliation and resolve the unidentified variances. In January 2019, a final audit report was delivered. The final reported variance was $528,606 and the City has written-off such amount, which completes the reconciliation efforts for the period of July 1, 2014 – June 30, 2017.

Procedures governing the City's cash management operations require the General Fund-related operating fund to borrow initially from the General Fund-related capital fund, and only to the extent there is a deficiency in such fund may the General Fund-related operating fund borrow money from any other funds in the Consolidated Cash Account.

Investment Practices

Cash balances in each of the City's funds are managed to maintain daily liquidity to pay expenses, and to make investments that preserve principal while striving to obtain the maximum rate of return. Pursuant to the City Charter, the City Treasurer is the City official responsible for managing cash collected into the City Treasury. The available cash balances in excess of daily expenses are placed in demand accounts, swept into money market mutual funds, or used to make investments directed by professional investment managers. These investments are held in segregated trust accounts at a separate financial institution. Cash balances related to revenue bonds for water and sewer and the airport are directly deposited and held separately in trust. A fiscal agent manages these cash balances in accordance with the applicable bond documents and the investment practice is guided by administrative direction of the City Treasurer per the Investment Committee and the Investment Policy (as described below). In addition, certain operating cash deposits (such as Community Behavioral Health, Special Gas/County Liquid and "911" surcharge) of the City are restricted by purpose and required to be segregated into accounts in compliance with federal or Commonwealth reporting.

Investment guidelines for the City are embodied in section 19-202 of the Philadelphia Code. In furtherance of these guidelines, as well as Commonwealth and federal legislative guidelines, the Director of Finance adopted a written Investment Policy (the "Policy") that went into effect in August 1994 and was most recently revised in September 2014. The Policy supplements other legal requirements and establishes guiding principles for the overall administration and effective management of all of the City's monetary funds (except the Municipal Pension Fund, the PGW Retirement Reserve Fund, the PGW OPEB Trust and the PGW Workers' Compensation Reserve Fund).

The Policy delineates the authorized investments as authorized by the Philadelphia Code and the funds to which the Policy applies. The authorized investments include U.S. government securities, U.S. treasuries, U.S. agencies, repurchase agreements, commercial paper, corporate bonds, money market mutual funds, obligations of the Commonwealth, collateralized banker's acceptances and certificates of deposit, and collateralized mortgage obligations and pass-through securities directly issued by a U.S. agency or instrumentality, all of investment grade rating or better and with maturity limitations.

U.S. government treasury and agency securities carry no limitation as to the percent of the total portfolio. Repurchase agreements, money market mutual funds, commercial paper, and corporate bonds are limited to investment of no more than 25% of the total portfolio. Obligations of the Commonwealth and collateralized banker's acceptances and certificates of deposit are limited to no more than 15% of the total portfolio. Collateralized mortgage obligations and pass-through securities directly issued by a U.S. agency or instrumentality are limited to no more than 5% of the total portfolio.

U.S. government securities carry no limitation as to the percent of the total portfolio per issuer. U.S. agency securities are limited to no more than 33% of the total portfolio per issuer. Repurchase agreements and money market mutual funds are limited to no more than 10% of the total portfolio per issuer. Commercial paper, corporate bonds, obligations of the Commonwealth, collateralized banker's acceptances and certificates of deposit, and collateralized mortgage obligations and pass-through securities directly issued by a U.S. agency or instrumentality are limited to no more than 3% of the total portfolio per issuer.

The Policy provides for an ad hoc Investment Committee consisting of the Director of Finance, the City Treasurer and one representative each from the Water Department, the Division of Aviation, and PGW. The Investment Committee meets quarterly with each of the investment managers to review each manager's performance to date and to plan for the next quarter. Investment managers are given any changes in investment instructions at these meetings. The Investment Committee approves all modifications to the Policy. The Investment Committee may from time to time review and revise the Policy and does from time to time approve temporary waivers of the restrictions on assets based on cash management needs and recommendations of investment managers.

The Policy expressly forbids the use of any derivative investment product as well as investments in any security whose yield or market value does not follow the normal swings in interest rates. Examples of these types of securities include, but are not limited to: structured notes, floating rate (excluding U.S. Treasury and U.S. agency floating rate securities) or inverse floating rate instruments, securities that could result in zero interest accrual if held to maturity, and mortgage derived interest and principal only strips. The City currently makes no investments in derivatives.

DEBT OF THE CITY

General

Section 12 of Article IX of the Constitution of the Commonwealth provides that the authorized debt of the City "may be increased in such amount that the total debt of [the] City shall not exceed 13.5% of the average of the annual assessed valuations of the taxable realty therein, during the ten years immediately preceding the year in which such increase is made, but [the] City shall not increase its indebtedness to an amount exceeding 3.0% upon such average assessed valuation of realty, without the consent of the electors thereof at a public election held in such manner as shall be provided by law." The Supreme Court of Pennsylvania has held that bond authorizations once approved by the voters need not be reduced as a result of a subsequent decline in the average assessed value of City property. The general obligation debt subject to the limitation described in this paragraph is referred to herein as "Tax-Supported Debt."

The Constitution of the Commonwealth further provides that there shall be excluded from the computation of debt for purposes of the Constitutional debt limit, debt (herein called "Self-Supporting Debt") incurred for revenue-producing capital improvements that may reasonably be expected to yield revenue in excess of operating expenses sufficient to pay interest and sinking fund charges thereon. In the case of general obligation debt, the amount of such Self-Supporting Debt to be so excluded must be determined by the Court of Common Pleas of Philadelphia County upon petition by the City. Self-Supporting Debt is general obligation debt of the City, with the only distinction from Tax-Supported Debt being that it is not used in the calculation of the Constitutional debt limit. Self-Supporting Debt has no lien on any particular revenues.

For purposes of this Official Statement, Tax-Supported Debt and Self-Supporting Debt are referred to collectively as "General Obligation Debt." The term "General Fund-Supported Debt" is comprised of: (i) General Obligation Debt; and (ii) PAID, PMA, PPA, and PRA bonds, which are secured by agreements with the City to appropriate and pay amounts sufficient to pay principal, interest, or redemption price when due on the bonds.

Using the methodology described above, as of June 30, 2020, the Constitutional debt limitation for Tax-Supported Debt was approximately $11,052,153,000. The total amount of authorized debt applicable to the debt limit was $2,591,357,000, including $867,427,000 of authorized but unissued debt, leaving a legal debt margin of $8,823,319,000. Based on the foregoing figures, the calculation of the legal debt margin is as follows:

Table 40
General Obligation Debt Limit
As of June 30, 2020
(Amounts in Thousands of USD)

Authorized, issued and outstanding	$1,723,930
Authorized and unissued	867,427
Total	$2,591,357
Less: Self-Supporting Debt	($352,838)
Less: Serial bonds maturing within a year	(9,685)
Total amount of authorized debt applicable to debt limit	2,228,834
Legal debt limit	11,052,153
Legal debt margin	$8,823,319

As a result of the implementation of the City's AVI, the assessed value of taxable real estate within the City has increased substantially. See "REVENUES OF THE CITY – Real Property Taxes." The $11.052 billion Constitutional debt limit calculation includes seven years of property values certified under the City's AVI program, and three years of property values under the City's former property valuation process. Assuming no increase or decrease in property values used to calculate the Constitutional debt limit in Table 40, the Constitutional debt limit is estimated to be $16.950 billion by 2028.

The City is also empowered by statute to issue revenue bonds and, as of June 30, 2020, had outstanding $2,149,469,340 aggregate principal amount of Water and Wastewater Revenue Bonds ("Water and Wastewater Bonds"), $939,940,000 aggregate principal amount of Gas Works Revenue Bonds, and $1,469,785,000 aggregate principal amount of Airport Revenue Bonds. The City has also enacted ordinances authorizing the issuance of (i) up to $350 million aggregate principal amount in Airport Revenue Commercial Paper Notes for the Division of Aviation, (ii) up to $400 million of Airport Revenue Bonds to finance capital projects for the Division of Aviation, (iii) up to $270 million of Gas Works Revenue Notes to finance working capital and capital projects for PGW, (iv) up to $460 million of Gas Works Revenue Bonds to finance capital projects for PGW, and (v) up to $800 million of Water and Wastewater Revenue Bonds for the Philadelphia Water Department, of which approximately $250.7 million has been issued. For information on recent and upcoming financings, see "OTHER FINANCING RELATED MATTERS – Recent and Upcoming Financings."

As of June 30, 2020, the principal amount of PICA Bonds outstanding was $56,075,000. For more information on PICA Bonds, see "– PICA Bonds" below.

Short-Term Debt

As provided in the PICA Act, the City's tax and revenue anticipation notes are general obligations of the City, but do not constitute debt of the City subject to the limitations of the Constitutional debt limit. The City does not have any tax and revenue anticipation notes outstanding. The City did not issue any tax and revenue anticipation notes in Fiscal Year 2019 or Fiscal Year 2020. In September 2020, the City expects to issue approximately $300 million in tax and revenue anticipation notes. See "OTHER FINANCING RELATED MATTERS – Recent and Upcoming Financings – *Upcoming Financings*" and "CITY CASH MANAGEMENT AND INVESTMENT POLICIES – General Fund Cash Flow."

Long-Term Debt

The following table presents a synopsis of the bonded debt of the City and its component units as of the date indicated. Of the total balance of the City's general obligation bonds issued and outstanding as of June 30, 2020, approximately 28% is scheduled to mature within five Fiscal Years and approximately 59% is scheduled to mature within ten Fiscal Years. When PICA's outstanding bonds are included with the City's general obligation bonds, approximately 61% is scheduled to mature within ten Fiscal Years.

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Table 41
Bonded Debt
as of June 30, 2020
(Amounts in Thousands of USD)[1], [2]

General Obligation Debt and PICA Bonds				
General Obligation Bonds		$1,723,930		
PICA Bonds		56,075		
Subtotal: General Obligation Debt and PICA Bonds			**$1,780,005**	
Other General Fund-Supported Debt[3]				
Philadelphia Municipal Authority				
Juvenile Justice Center	$79,385			
Public Safety Campus	61,095			
Energy Conservation	7,625			
		$148,105		
Philadelphia Authority for Industrial Development				
Pension capital appreciation bonds	$225,111			
Pension fixed rate bonds	761,655			
Stadiums	215,270			
Library	3,670			
Cultural and Commercial Corridor	76,115			
One Parkway	22,225			
Affordable Housing	49,325			
400 N. Broad[4]	240,024			
Art Museum	9,580			
Rebuild	76,635			
		$1,679,610		
Philadelphia Parking Authority		9,350		
Philadelphia Redevelopment Authority		185,150		
Subtotal: Other General Fund-Supported Debt			**$2,022,215**	
Revenue Bonds				
Water Fund		$2,149,469		
Aviation Fund[5]		1,469,785		
Gas Works[5]		939,940		
Subtotal: Revenue Bonds			**$4,559,194**	
Grand Total				**$8,361,414**

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(1) Unaudited; figures may not sum due to rounding.

(2) For tables setting forth a ten-year historical summary of Tax-Supported Debt of the City and the School District and the debt service requirements to maturity of the City's outstanding bonded indebtedness as of June 30, 2018, see the Fiscal Year 2019 CAFR.

(3) The principal amount outstanding relating to the PAID 1999 Pension Obligation Bonds, Series B (capital appreciation bonds) is reflected as the accreted value thereon as of June 30, 2020.

(4) Includes (i) sublease payments of approximately $15.2 million annually for the police headquarters renovation; and (ii) an assumption that the City issues approximately $200 million in bonds in 2026 to acquire the project at an assumed interest rate of 5% over the next 20 years.

(5) Does not include any outstanding commercial paper or short-term note issuances for the Division of Aviation or PGW, as applicable.

T able 42
Annual Debt Service on General Fund-Supported Debt
(as of June 30, 2020)
(Amounts in Millions of USD)[1]

Fiscal Year	General Obligation Debt[2] Principal	Interest[3]	Total	Other General Fund-Supported Debt[4], [5] Principal	Interest[5]	Total	Aggregate General Fund-Supported Debt Principal	Interest	Total
2021	$88.11	$79.81	$167.92	$91.74	$142.54	$234.28	$179.85	$222.35	$402.20
2022	92.16	75.40	167.56	90.36	144.18	234.54	182.51	219.58	402.10
2023	97.59	70.85	168.44	128.39	106.13	234.51	225.98	176.98	402.96
2024	102.06	66.19	168.25	127.77	105.48	233.25	229.83	171.67	401.51
2025	106.79	61.22	168.01	132.95	100.31	233.25	239.74	161.53	401.27
2026	104.42	56.12	160.54	149.28	83.15	232.42	253.70	139.27	392.97
2027	109.36	50.89	160.25	170.42	58.04	228.47	279.78	108.93	388.72
2028	115.16	45.48	160.64	180.05	51.32	231.37	295.21	96.80	392.01
2029	90.98	40.76	131.74	281.74	33.55	315.28	372.71	74.31	447.02
2030	107.66	36.29	143.94	69.60	23.34	92.94	177.25	59.63	236.88
2031	113.45	31.26	144.71	73.00	19.92	92.92	186.45	51.18	237.63
2032	118.83	25.96	144.78	33.21	16.93	50.14	152.03	42.89	194.92
2033	87.01	21.26	108.27	26.22	15.50	41.72	113.23	36.76	149.99
2034	76.43	17.52	93.94	27.51	14.20	41.71	103.93	31.72	135.65
2035	64.91	14.20	79.10	28.87	12.84	41.71	93.77	27.04	120.81
2036	68.07	11.03	79.09	30.30	11.42	41.71	98.36	22.44	120.80
2037	56.21	8.02	64.23	31.80	9.92	41.71	88.01	17.94	105.94
2038	59.15	5.16	64.31	33.37	8.34	41.71	92.52	13.50	106.02
2039	41.79	2.70	44.49	23.00	6.80	29.79	64.78	9.50	74.28
2040	7.58	0.96	8.54	14.24	5.74	19.98	21.82	6.70	28.51
2041	7.93	0.61	8.54	14.94	5.03	19.97	22.87	5.65	28.51
2042	8.34	0.21	8.54	15.68	4.30	19.97	24.01	4.51	28.52
2043	0.00	0.00	0.00	16.45	3.53	19.98	16.45	3.53	19.98
2044	0.00	0.00	0.00	17.26	2.72	19.98	17.26	2.72	19.98
2045	0.00	0.00	0.00	14.04	1.86	15.90	14.04	1.86	15.90
2046	0.00	0.00	0.00	14.76	1.14	15.90	14.76	1.14	15.90
2047	0.00	0.00	0.00	15.52	0.39	15.90	15.52	0.39	15.90
Total	**$1,723.93**	**$721.91**	**$2,445.84**	**$1,852.40**	**$988.61**	**$2,841.02**	**$3,576.33**	**$1,710.52**	**$5,286.86**

(1) Does not include letter of credit fees. Figures may not sum due to rounding.
(2) Includes both Tax-Supported Debt and Self-Supporting Debt. See "– General." Does not include PICA Bonds.
(3) Assumes interest rate on hedged variable rate bonds to be the associated fixed swap rate.
(4) Includes PAID, PMA, PPA, and PRA bonds, which are secured by agreements with the City to appropriate and pay amounts sufficient to pay principal, interest, or redemption price when due on such bonds, with capital appreciation bonds including only actual amounts payable. The original issuance amount of such capital appreciation bonds is included under the "Principal" column in the Fiscal Year such bonds mature and the full accretion amount at maturity less the original issuance amount is included in the "Interest" column in the Fiscal Year such bonds mature.
(5) Includes (i) sublease payments of approximately $15.2 million annually for the police headquarters renovation; and (ii) an assumption that the City issues approximately $200 million in bonds in 2026 to acquire the project at an assumed interest rate of 5% over the next 20 years.
(6) Assumes interest rate on hedged variable rate bonds to be the associated fixed swap rate, plus any fixed spread. Net of capitalized interest on PAID City Service Agreement Revenue Refunding Bonds, Series 2012 (Federally Taxable).

Other Long-Term Debt Related Obligations

The City has entered into other contracts and leases to support the issuance of debt by public authorities related to the City pursuant to which the City is required to budget and appropriate tax or other general revenues to satisfy such obligations, as shown in Table 41. The City budgets all other long-term debt-related obligations as a single budget item with the exception of PPA.

The Hospitals Authority and the State Public School Building Authority have issued bonds on behalf of the Community College of Philadelphia ("CCP"). Under the Community College Act (Pa. P.L. 103, No. 31 (1985)), each community college must have a local sponsor, which for CCP is the City. As the local sponsor, the City is obligated to pay up to 50% of the annual capital expenses of CCP, which includes debt service. The remaining 50% is paid by the Commonwealth. Additionally, the City annually appropriates funds for a portion of CCP's operating costs (less tuition and less the Commonwealth's payment). The amount paid by the City in Fiscal Year 2019 was $32.4 million. The budgeted amount for Fiscal Year 2020 is $33.8 million. The current estimate for Fiscal Year 2020 is $36.1 million. The budgeted amount for Fiscal Year 2021 is $44.1 million.

PICA Bonds

PICA has issued 11 series of bonds at the request of the City (the "PICA Bonds"). PICA no longer has authority under the PICA Act to issue bonds for new money purposes, but may refund bonds previously issued. The proceeds of the PICA Bonds were used to: (i) make grants to the City to fund its General Fund deficits, to fund all or a portion of the costs of certain City capital projects, to provide other financial assistance to the City to enhance operational productivity, and to defease certain of the City's general obligation bonds; (ii) refund other PICA Bonds; and (iii) pay costs of issuance.

On December 3, 2019, PICA issued $31,085,000 of its Series 2019 Special Tax Refunding Bonds (the "2019 PICA Bonds") to provide funds, together with other available funds, to defease certain of its PICA Bonds. On March 17, 2020, PICA issued $24,990,000 Series 2020 Special Tax Refunding Bonds (the "2020 PICA Bonds") to provide funds, together with other available funds, to defease certain of its PICA Bonds. Following the issuance of the 2019 PICA Bonds and 2020 PICA Bonds and the related defeasances, PICA has, as of June 30, 2020, $56,075,000 in PICA Bonds outstanding with a final maturity date of June 15, 2023.

The PICA Act authorizes the City to impose a tax for the sole and exclusive purposes of PICA. In connection with the adoption of the Fiscal Year 1992 budget and the execution of the PICA Agreement, as so authorized by the PICA Act, the City reduced the wage, earnings, and net profits taxes on City residents by 1.5% and enacted a new tax of 1.5% on wages, earnings, and net profits of City residents (the "PICA Tax"), which continues in effect. The PICA Tax secures the PICA Bonds. Pursuant to the PICA Act, at such time when no PICA Bonds are outstanding, the PICA Tax will expire. At any time, the City is authorized to increase for its own use its various taxes, including its wage, earnings, and net profits taxes on City residents and could do so upon the expiration of the PICA Tax. Certain taxes, such as sales, liquor, and hotel taxes, among others, cannot be increased by the City without Commonwealth approval.

The PICA Tax is collected by the City's Department of Revenue, as agent of the State Treasurer, and deposited in the Pennsylvania Intergovernmental Cooperation Authority Tax Fund (the "PICA Tax Fund") of which the State Treasurer is custodian. The PICA Tax Fund is not subject to appropriation by City Council or the General Assembly. See "THE GOVERNMENT OF THE CITY OF PHILADELPHIA – Local Government Agencies – *Non-Mayoral-Appointed or Nominated Agencies* – PICA."

The PICA Act authorizes PICA to pledge the PICA Tax to secure its bonds and prohibits the Commonwealth and the City from repealing the PICA Tax or reducing its rate while any PICA Bonds are outstanding. PICA Bonds are payable from PICA revenues, including the PICA Tax, pledged to secure PICA's bonds, the Bond Payment Account (as described below) and any debt service reserve fund established for such bonds and have no claim on any revenues of the Commonwealth or the City.

The PICA Act establishes a "Bond Payment Account" for PICA as a trust fund for the benefit of PICA bondholders and authorizes the creation of a debt service reserve fund for bonds issued by PICA. The State Treasurer is required to pay the proceeds of the PICA Tax held in the PICA Tax Fund directly to the Bond Payment Account. The proceeds of the PICA Tax in excess of amounts required for: (i) debt service; (ii) replenishment of any debt service reserve fund for bonds issued by PICA; and (iii) certain PICA operating expenses, are required to be deposited in a trust fund established exclusively to benefit the City and designated the "City Account." Amounts in the City Account are required to be remitted to the City not less often than monthly, unless PICA certifies the City's non-compliance with the then-current five-year financial plan.

The total amount of PICA Tax remitted by the State Treasurer to PICA (which is net of the costs of the State Treasurer in collecting the PICA Tax), PICA annual debt service and investment expenses, and net PICA tax revenue remitted to the City for Fiscal Years 2017-2019, the budgeted amounts and current estimates for Fiscal Year 2020, and the budgeted amounts for Fiscal Year 2021 are set forth below.

Table 43
Summary of PICA Tax Remitted by the State Treasurer to PICA and Net Taxes Remitted by PICA to the City (Amounts in Millions of USD)[(1)]

Fiscal Year	PICA Tax[(2)]	PICA Annual Debt Service and Expenses[(2)]	Net taxes remitted to the City[(3)]
2017 (Actual)	$469.2	$59.7	$409.5
2018 (Actual)	$497.0	$42.8	$454.2
2019 (Actual)	$528.7	$35.2	$493.6
2020 (Adopted Budget)	$546.1	$46.8	$499.3
2020 (Current Estimate)[(4)]	$544.5	$46.8	$497.7
2021 (Adopted Budget)	$507.8	$37.2	$470.6

(1) Figures may not sum due to rounding.
(2) Source: The City's Quarterly City Manager's Reports or the budget for the applicable Fiscal Year.
(3) Source: For Fiscal Years 2017-2019, the City's CAFRs for such Fiscal Years. For Fiscal Year 2020, the Fiscal Year 2020 Adopted Budget, the Fiscal Year 2021 Adopted Budget, and the Twenty-Ninth Five-Year Plan, as applicable. For Fiscal Year 2021, the Fiscal Year 2021 Adopted Budget.
(4) Does not reflect the bond issuances and related defeasances described in the second paragraph under the caption "– PICA Bonds" above.

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OTHER FINANCING RELATED MATTERS

Swap Information

The City is a party to various swaps related to its outstanding General Fund-Supported Debt as detailed in the table below.

Table 44
Summary of Swap Information
for General Fund-Supported Debt (as of June 30, 2020)

City Entity	City GO	City Lease PAID	City Lease PAID
Related Bond Series	2009B[1]	2007B-2 (Stadium)[3]	2007B-2 (Stadium)[4]
Initial Notional Amount	$313,505,000	$217,275,000	$72,400,000
Current Notional Amount	$100,000,000	$54,303,091	$18,096,909
Termination Date	8/1/2031	10/1/2030	10/1/2030
Product	Fixed Payer Swap	Fixed Payer Swap	Fixed Payer Swap
Rate Paid by Dealer	SIFMA	SIFMA	SIFMA
Rate Paid by City Entity	3.829%	3.9713%	3.9713%
Dealer	Royal Bank of Canada	JPMorgan Chase Bank, N.A.	Merrill Lynch Capital Services, Inc.
Fair Value[2]	($30,551,542)	($10,614,808)	($3,537,168)
Additional Termination Events	For Dealer: Rating change below BBB- or Baa3 For City: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)	For Dealer: Rating change below BBB- or Baa3 For PAID: Rating change below BBB- or Baa3 upon insurer event (includes insurer being rated below A- or A3)

(1) On July 28, 2009, the City terminated a portion of the swap in the amount of $213,505,000 in conjunction with the refunding of its Series 2007B bonds with the Series 2009A fixed rate bonds and the Series 2009B variable rate bonds. The City made a termination payment of $15,450,000.

(2) Fair values are as of June 30, 2020, and are shown from the City's perspective and include accrued interest.

(3) On July 15, 2014, PAID terminated a portion of the swap in the amount of $41,555,000 in conjunction with the refunding of a portion of its Series 2007B bonds with the Series 2014B fixed rate bonds. PAID made a termination payment of $4,171,000 to JPMorgan. On September 11, 2019, PAID terminated a portion of the swap in the amount of $33,455,654 in conjunction with the refunding of a portion of its Series 2007B bonds with the Series 2019 fixed rate bonds. PAID made a termination payment of $6,051,000 to JPMorgan.

(4) On July 15, 2014, PAID terminated a portion of the swap in the amount of $13,840,000 in conjunction with the refunding of a portion of its Series 2007B bonds with the Series 2014B fixed rate bonds. PAID made a termination payment of $1,391,800 to Merrill Lynch. On September 11, 2019, PAID terminated a portion of the swap in the amount of $11,149,346 in conjunction with the refunding of a portion of its Series 2007B bonds with the Series 2019 fixed rate bonds. PAID made a termination payment of $1,998,000 to Merrill Lynch.

While the City is party to several interest rate swap agreements, for which there is General Fund exposure and on which the swaps currently have a negative mark against the City, the City has no obligation to post collateral on these swaps while the City's underlying ratings are investment grade.

For more information related to certain swaps entered into in connection with revenue bonds issued for PGW, the Water Department, and the Division of Aviation, see the Fiscal Year 2019 CAFR. In addition, PICA has entered into swaps, which are detailed in the Fiscal Year 2019 CAFR.

Swap Policy

The City has adopted a swap policy for the use of swaps, caps, floors, collars and other derivative financial products (collectively, "swaps") in conjunction with the City's debt management. The swap program managed by the City includes swaps related to the City's general obligation bonds, tax-supported service contract debt issued by related authorities, debt of the Water Department, Division of Aviation, and debt of PGW. Swaps related to debt of the PICA, the School District, and the PPA are managed by those governmental entities, respectively.

The Director of Finance has overall responsibility for entering into swaps. Day-to-day management of swaps is the responsibility of the City Treasurer, and the Executive Director of the Sinking Fund Commission is responsible for making swap payments. The Office of the City Treasurer and the City Solicitor's Office coordinate their activities to ensure that all swaps that are entered into are in compliance with applicable federal, state, and local laws.

The swap policy addresses the circumstances when swaps can be used, the risks that need to be evaluated prior to entering into swaps and on an ongoing basis after swaps have been executed, the guidelines to be employed when swaps are used, and how swap counterparties will be chosen. The swap policy is used in conjunction with the City's Debt Management Policy, reviewed annually, and updated as needed.

Under the swap policy, permitted uses of swaps include: (i) managing the City's exposure to floating interest rates through interest rate swaps, caps, floors and collars; (ii) locking in fixed rates in current markets for use at a later date through the use of forward starting swaps and rate locks; (iii) reducing the cost of fixed or floating rate debt through swaps and related products to create "synthetic" fixed or floating rate debt; and (iv) managing the City's credit exposure to financial institutions and other entities through the use of offsetting swaps.

Since swaps can create exposure to the creditworthiness of financial institutions that serve as the City's counterparties on swap transactions, the City has established standards for swap counterparties. As a general rule, the City enters into transactions with counterparties whose obligations are rated in the A rated category or better from two nationally recognized rating agencies. If counterparty's credit rating is below the double-A rating category, the swap policy requires that the City's exposure be collateralized. If a counterparty's credit is downgraded below the A category, even with collateralization, the swap policy requires a provision in the swap permitting the City to exercise a right to terminate the transaction prior to its scheduled termination date.

Letter of Credit Agreements

The City has entered into various letter of credit agreements related to its General Fund-Supported Debt as detailed in the table below. Under the terms of such letter of credit agreements, following a purchase of the applicable bonds, the City may be required to amortize such bonds more quickly than as originally scheduled at issuance.

Table 45
Summary of Letter of Credit Agreements for General Fund-Supported Debt as of June 30, 2020

Variable Rate Bond Series	Amount Outstanding	Bond Maturity Date	Provider	Expiration Date	Rating Thresholds (1)
General Obligation Multi-Modal Refunding Bonds, Series 2009B	$100,000,000	August 1, 2031	Barclays Bank PLC	May 24, 2023	The long-term rating assigned by any one of the rating agencies to any unenhanced long-term parity debt of the City is (i) withdrawn or suspended for credit-related reasons or (ii) reduced below investment grade.
PAID Multi-Modal Lease Revenue Refunding Bonds, Series 2007B-2	$72,400,000	October 1, 2030	TD Bank	May 29, 2024	The long-term ratings assigned by at least two of the rating agencies to any unenhanced general obligation bonds of the City is (i) withdrawn or suspended for credit-related reasons, or (ii) reduced below investment grade.

(1) The occurrence of a Rating Threshold event would result in an event of default under the reimbursement agreement with the related bank.

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Recent and Upcoming Financings

Recent Financings. The following is a list of financings that the City has entered into since the beginning of Fiscal Year 2020.

- In January 2020, the City issued $118,030,000 in General Obligation Refunding Bonds.
- In September 2019, PAID issued $147,615,000 in Lease Revenue Refunding Bonds for the benefit of the City.
- In August 2019, the City issued $293,360,000 in General Obligation Bonds.
- In August 2019, the City issued $250,660,000 in Water and Wastewater Revenue Bonds.

Upcoming Financings. The following is a list of financings that the City expects to enter into in calendar year 2020.

- In August 2020, the City expects to issue approximately $250 million in Gas Works Revenue and Revenue Refunding Bonds.
- In September 2020, the City expects to issue approximately $300 million in Tax and Revenue Anticipation Notes.
- In the summer of 2020, the City expects to issue approximately $365 million in Airport Revenue Refunding Bonds.
- In October 2020, the City expects to issue approximately $128 million in Water and Wastewater Revenue Refunding Bonds pursuant to a Forward Delivery Bond Purchase Agreement signed in February 2019.
- In the fall of 2020, the City expects to issue approximately $400 million in Airport Revenue Bonds.
- In the fall of 2020, the City expects to issue approximately $250 million in General Obligation Refunding Bonds.
- In the fall of 2020, PMA expects to issue approximately $60 million in City Service Agreement Refunding Bonds for the benefit of the City.

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CITY CAPITAL PROGRAM

As part of the annual budget process, the Mayor submits for approval a six-year capital program to City Council, together with the proposed operating budget. For more information on the City's budget process, see "DISCUSSION OF FINANCIAL OPERATIONS – Budget Procedure."

Certain Historical Capital Expenditures

Table 46 shows the City's historical expenditures for Fiscal Years 2015-2019 for certain capital purposes, including expenditures for projects related to transit, streets and sanitation, municipal buildings, recreation, parks, museums, and stadia, and economic and community development. The source of funds used for such expenditures are primarily general obligation bond proceeds, but also include federal, state, private, and other government funds and operating revenue. Figures in the table below are generated after the Fiscal Year closes and may not sum due to rounding.

Table 46
Historical Expenditures for Certain Capital Purposes
Fiscal Years 2015-2019

Purpose Category	2015	2016	2017	2018	2019
Transit	$ 1,283,307	$ 3,223,431	$ 378,229	$ 7,284,978	$7,511,909
Streets & Sanitation	63,612,248	76,350,266	43,772,678	27,626,173	51,724,238
Municipal Buildings	53,419,449	50,653,561	45,002,188	75,096,668	76,886,156
Recreation, Parks, Museums & Stadia	29,875,633	35,963,360	37,323,288	61,839,958	42,098,687
Economic & Community Development	12,714,468	16,176,644	4,570,196	18,288,380	17,060,541
TOTAL	**$160,905,105**	**$182,367,262**	**$131,046,579**	**$190,136,157**	**$195,281,531**

Table 47 shows the City's historical expenditures for Fiscal Years 2015-2019 for certain capital purposes from general obligation bond proceeds only and the percentage of the total costs covered by such proceeds in such Fiscal Years. Figures in the table below are generated after the Fiscal Year closes and may not sum due to rounding.

Table 47
Historical Expenditures for Certain Capital Purposes
(General Obligation Bond Proceeds Only)
Fiscal Years 2015-2019

Purpose Category	2015	2016	2017	2018	2019
Transit	$ 1,274,467	$ 3,223,431	$ 414,434	$ 7,227,880	$7,509,010
Streets & Sanitation	24,887,488	23,963,058	21,952,654	19,601,019	27,508,365
Municipal Buildings	47,163,418	40,036,844	43,400,701	70,850,458	70,306,949
Recreation, Parks, Museums & Stadia	25,494,778	25,364,901	29,135,962	54,534,870	35,427,491
Economic & Community Development	12,714,468	12,474,164	4,570,196	18,288,380	17,060,541
TOTAL	**$111,534,619**	**$105,062,398**	**$99,473,947**	**$170,502,607**	**$157,812,356**
Percentage of Total Costs	**69%**	**58%**	**76%**	**90%**	**81%**

Fiscal Year 2021-2026 Adopted Capital Program

The Fiscal Year 2021-2026 Adopted Capital Program contemplates a total budget of $11.29 billion (an increase from the $10.92 billion as budgeted in the Fiscal Year 2020-2025 Adopted Capital Program). In the Fiscal Year 2021-2026 Adopted Capital Program, approximately $3.32 billion is expected to be provided from federal, Commonwealth, and other sources and approximately $7.97 billion through City funding. For Fiscal Year 2021, the City has budgeted $3.39 billion for capital projects (an increase from $3.08 billion in Fiscal Year 2020). The following table shows the amounts budgeted each year from various sources of funds for capital projects in the Fiscal Year 2021-2026 Adopted Capital Program.

Table 48

Fiscal Year 2021-2026 Adopted Capital Program

(Amounts in Thousands of USD)

Funding Source	2021	2022	2023	2024	2025	2026	2021-2026
City Funds--Tax Supported							
Carried-Forward Loans	$394,162	-	-	-	-	-	$394,162
Operating Revenue	129,902	$12,200	$12,200	$12,200	$1,700	$700	168,902
New Loans	128,260	199,734	199,944	199,432	190,033	191,058	1,108,461
Prefinanced Loans	4,958	-	-	-	-	-	4,958
PICA Prefinanced Loans	4,279	-	-	-	-	-	4,279
Tax Supported Subtotal	**$661,561**	**$211,934**	**$212,144**	**$211,632**	**$191,733**	**$191,758**	**$1,680,762**
City Funds--Self Sustaining							
Self-Sustaining Carried Forward Loans	$475,968	-	-	-	-	-	$475,968
Self-Sustaining Operating Revenue	228,810	$74,019	$73,907	$72,206	$67,873	$78,887	595,702
Self-Sustaining New Loans	818,600	798,334	969,168	750,958	859,811	941,170	5,138,041
Self-Sustaining Subtotal	**$1,523,378**	**$872,353**	**$1,043,075**	**$823,164**	**$927,684**	**$1,020,057**	**$6,209,711**
Other City Funds							
Revolving Funds	$17,000	$15,000	$13,000	$13,000	$13,000	$5,000	$76,000
Other Than City Funds							
Carried-Forward Other Government	$28,614	-	-	-	-	-	$28,614
Other Government Off Budget	2,257	$2,120	$1,621	$1,681	$1,664	$1,639	10,982
Other Governments/Agencies	3,100	2,100	100	100	100	100	5,600
Carried-Forward State	211,974	-	-	-	-	-	211,974
State Off Budget	205,112	234,393	201,119	210,933	201,948	194,362	1,247,867
State	61,900	51,937	46,029	50,681	47,833	47,881	306,261
Carried-Forward Private	118,108	-	-	-	-	-	118,108
Private	35,220	31,382	28,291	27,442	27,654	27,707	177,696
Carried-Forward Federal	366,520	-	-	-	-	-	366,520
Federal Off-Budget	35,284	77,752	21,212	16,000	8,800	9,600	168,648
Federal	124,950	135,354	99,188	108,707	106,963	106,542	681,704
Other Than City Funds Subtotal	**$1,193,039**	**$535,038**	**$397,560**	**$415,544**	**$394,962**	**387,831**	**$3,323,974**
TOTAL	**$3,394,978**	**$1,634,325**	**$1,665,779**	**$1,463,340**	**$1,527,379**	**$1,604,646**	**$11,290,447**

LITIGATION

Generally, judgments and settlements on claims against the City are payable from the General Fund, except for claims against the Water Department, the Division of Aviation, and PGW, which are paid out of their respective funds or revenues and only secondarily out of the General Fund.

The Act of October 5, 1980, P.L. 693, No. 142, known as the "Political Subdivision Tort Claims Act," (the "Tort Claims Act") establishes a $500,000 aggregate limitation on damages for injury to a person or property arising from the same cause of action or transaction or occurrence or series of causes of action, transactions or occurrences with respect to governmental units in the Commonwealth such as the City. The constitutionality of that aggregate limitation on damages has been upheld by the Pennsylvania appellate courts, including in the recent decision of the Supreme Court of Pennsylvania in *Zauflik v. Pennsbury School District*, 104 A.3d 1096 (Pa. 2014). Under Pennsylvania Rule of Civil Procedure 238, delay damages are not subject to the $500,000 limitation. The limit on damages is inapplicable to any suit against the City that does not arise under state tort law, such as claims made against the City under federal civil rights laws.

General Fund

The following table presents the City's aggregate losses from settlements and judgments paid out of the General Fund for Fiscal Years 2017-2019, and the budgeted amounts for Fiscal Years 2020-2021.

Table 49
Aggregate Losses – General and Special Litigation Claims (General Fund)
Fiscal Years 2017-2019 (Actual) and 2020-2021 (Budget)
(Amounts in Millions of USD)

	Actual 2017	Actual 2018	Actual 2019	Budget 2020	Budget 2021
Aggregate Losses	$38.3	$44.6	$45.3	$49.2	$49.2

Sources: The City, Office of Budget and Program Evaluation – Budget Bureau, Indemnity Account, Status Reports.

The current estimate of settlements and judgments from the General Fund for Fiscal Year 2020 is $47.7 million. Such estimate is based on internal calculations using (i) the "Possible Costs" listed in its Quarterly Litigation Reports, (ii) the 3-year average cost for closed cases, and (iii) current year-to-date spending reports. Current year spending includes payments made for settled cases pursuant to payment plans over multiple years. Such payments are generally made at the start of a Fiscal Year, which can result in the current estimate being skewed higher during the early part of such Fiscal Year. By the end of Fiscal Year 2020, the City expects that the actual amount of settlements and judgments paid from the General Fund will be at or near the budgeted amount of $49.2 million.

Based on the Twenty-Ninth Five-Year Plan, the City expects settlements and judgments from the General Fund for Fiscal Years 2021-2025 to range from $49.2 million in Fiscal Year 2021 to $50.3 million in Fiscal Year 2025.

In budgeting for settlements and judgments in the annual operating budget and projecting settlements and judgments for each five-year plan, the City bases its estimates on past experience and on an analysis of estimated potential liabilities and the timing of outcomes, to the extent a proceeding is sufficiently advanced to permit a projection of the timing of a result. General and special litigation claims are budgeted separately from back-pay awards and similar settlements relating to labor disputes. Usually, some of the costs arising from labor litigation are reported as part of current payroll expenses.

In addition to routine litigation incidental to performance of the City's governmental functions and litigation arising in the ordinary course relating to contract and tort claims and alleged violations of law, certain special litigation matters are currently being litigated and/or appealed and adverse final outcomes of such litigation could have a substantial or long-term adverse effect on the General Fund. These proceedings involve: (i) environmental-related actions and proceedings in which it has been or may be alleged that the City is liable for damages, including but not limited to property damage and bodily injury, or that the City should pay fines or penalties or the costs of response or remediation, because of the alleged generation, transport, or disposal of toxic or otherwise hazardous substances by the City, or the alleged disposal of such substances on or to City-owned property; (ii) contract disputes and other commercial litigation; (iii) union arbitrations and other employment-related litigation; (iv) potential and certified class action suits; and (v) civil rights litigation. The ultimate outcome and fiscal impact, if any, on the General Fund of the claims and proceedings described in this paragraph are not currently predictable.

In addition, see "REVENUES OF THE CITY – Real Property Taxes" for a discussion of litigation relating to the reassessment of commercial property in tax year 2018.

Water Fund

Various claims have been asserted against the Water Department and in some cases lawsuits have been instituted. Many of these Water Department claims have been reduced to judgment or otherwise settled in a manner requiring payment by the Water Department. The following table presents the Water Department's aggregate losses from settlements and judgments paid out of the Water Fund for Fiscal Years 2017-2019, and the budgeted amounts for Fiscal Years 2020-2021. The current estimate for Fiscal Year 2020 is $3.9 million. The Water Fund is the first source of payment for any of the claims against the Water Department.

Table 50
Aggregate Losses – General and Special Litigation Claims (Water Fund)
Fiscal Years 2017-2019 (Actual) and 2020-2021 (Budget)
(Amounts in Millions of USD)

	Actual 2017	Actual 2018	Actual 2019	Budget 2020	Budget 2021
Aggregate Losses	$7.0	$6.3	$3.3	$7.5	$7.5

Sources: The City, Office of Budget and Program Evaluation – Budget Bureau, Indemnity Account, Status Reports.

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Aviation Fund

Various claims have been asserted against the Division of Aviation and in some cases lawsuits have been instituted. Many of these Division of Aviation claims have been reduced to judgment or otherwise settled in a manner requiring payment by the Division of Aviation. The following table presents the Division of Aviation's aggregate losses from settlements and judgments paid out of the Aviation Fund for Fiscal Years 2017-2019, and the budgeted amounts for Fiscal Years 2020-2021. The current estimate for Fiscal Year 2020 is $1.2 million. The Aviation Fund is the first source of payment for any of the claims against the Division of Aviation.

Table 51
Aggregate Losses – General and Special Litigation Claims (Aviation Fund)
Fiscal Years 2017-2019 (Actual) and 2020-2021 (Budget)
(Amounts in Millions of USD)

	Actual 2017	Actual 2018	Actual 2019	Budget 2020	Budget 2021
Aggregate Losses	$1.6	$1.1	$1.7	$2.5	$2.5

Sources: The City, Office of Budget and Program Evaluation – Budget Bureau, Indemnity Account, Status Reports.

PGW

Various claims have been asserted against PGW and in some cases lawsuits have been instituted. Many of these PGW claims have been reduced to judgment or otherwise settled in a manner requiring payment by PGW. The following table presents PGW's settlements and judgments paid out of PGW revenues, with accompanying reserve information, in PGW Fiscal Years 2015 through 2019. PGW revenues are the first source of payment for any of the claims against PGW. PGW currently estimates approximately $2.9 million and $3.9 million in settlements and judgments for PGW Fiscal Years 2020 and 2021, respectively.

Table 52
Claims and Settlement Activity (PGW)
PGW Fiscal Years 2015-2019
(Amounts in Thousands of USD)

Fiscal Year (ending August 31)	Beginning of Year Reserve	Current Year Claims and Adjustments	Claims Settled	End of Year Reserve	Current Liability Amount
2015	$9,944	$3,610	($2,042)	$11,512	$5,011
2016	$11,512	$2,022	($3,041)	$10,493	$5,307
2017	$10,493	$6,681	($2,797)	$14,377	$4,627
2018	$14,377	$2,910	($3,223)	$14,064	$6,100
2019	$14,064	($1,582)	($2,922)	$9,560	$3,925

Sources: For fiscal years ended August 31, 2015 through August 31, 2018, PGW's audited financial statements. For fiscal year ended August 31, 2019, PGW records.

APPENDIX V

CITY OF PHILADELPHIA SOCIOECONOMIC INFORMATION

The Bonds are payable solely from Project Revenues and monies deposited in the water and wastewater funds. The Bonds are special obligations of the City and do not pledge the full faith, credit or taxing power of the City, or create any debt or charge against the tax or general revenues of the City, or create any lien or charge against any property of the City other than against the Project Revenues and amounts, if any, at any time on deposit in the water and wastewater funds. This APPENDIX V is included for purposes of providing general socioeconomic information regarding the City.

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COVID-19

This APPENDIX V includes historical demographic and socioeconomic information regarding the City of Philadelphia (the "City" or "Philadelphia"), which describes periods of time prior to the outbreak of the COVID-19 pandemic. The reader is cautioned that this APPENDIX V does not reflect the impact of COVID-19 on the City's demographic and socioeconomic conditions; nor does it address the impact of anticipated government, business, or policy initiatives. As such, historical and current data points and trends included in this APPENDIX V should be viewed in such context.

The COVID-19 pandemic has resulted in stay-at-home orders, travel bans, and closures of schools and non-essential businesses, and the United States economy is now experiencing a sharp contraction, with COVID-19 impacting almost every industry. The City continues to monitor such impact, which is expected to be substantial. There are significant uncertainties and risks in the City's key economic sectors and industries and the circumstances related thereto continue to evolve.

As noted in this Official Statement, the City has taken various emergency measures and other actions to respond to the spread of COVID-19 in the City. While the City continues to closely monitor and assess the effects of the COVID-19 pandemic and its impact on the City's financial position and operations, the City also expects COVID-19 to have a substantial impact on its demographic and socioeconomic conditions. The City expects reductions to job growth, population growth, resident employment, and personal income growth, as well as an increase in the unemployment rate and uncertain impacts on retail sales and commercial real estate occupancy.

In addition to the impact to the City's existing economic and employment base, the City expects that COVID-19 will result in a downturn in economic development and the tourism and hospitality industries in the City. Uncertainties regarding the economic impact of COVID-19 on the City's public educational institutions and private colleges and universities, with the possibility that remote learning arrangements will continue for an indefinite period of time, and uncertainties in the healthcare sector, are also being closely monitored.

The transportation sector, particularly mass transit and air travel, in the City has also been uniquely impacted by COVID-19. There have been significant interruptions to normal service and passenger fares and other revenues, with the implementation of stay-at-home orders, remote work arrangements, travel bans, and social distancing guidelines, among other public health safety measures.

It is likely that the impact of COVID-19 on the City, its economy and financial position, and its demographic and socioeconomic conditions will continue to change as circumstances and events evolve. The duration, severity, and degree of the impact of COVID-19 is extremely difficult to predict at this time due to the dynamic nature of the outbreak. The City believes that it may be some time before it is able to determine the full impact of the various events surrounding COVID-19.

For more information on the City's response to COVID-19 and the related financial impact on the City, see the forepart of this Official Statement and "INTRODUCTORY STATEMENT – COVID-19 Response" and "CERTAIN INVESTMENT CONSIDERATIONS – COVID-19" and APPENDIX IV – "OVERVIEW – Fiscal Health of the City – COVID-19."

INTRODUCTION

The City is the sixth largest city in the nation by population, and is at the center of the United States' eighth largest metropolitan statistical area, according to 2018 estimates. The Philadelphia MSA (further described below) includes a substantial retail sales market, as well as a diverse network of business suppliers and complementary industries. Some of the City's top priorities include attracting and retaining knowledge workers, increasing educational attainment and employment skills among Philadelphians, attracting real estate development, and promoting Philadelphia as a desirable location for business.

According to the 2010 U.S. Census, the City increased its population by 0.7% to 1.53 million residents in the ten years from 2000 to 2010, ending six decades of population decline. Although the increase was modest, it was an indicator of more recent growth and development in Philadelphia. From 2010 to 2018, the City increased its population by 3.6% to 1.584 million residents. As described below, the 25 to 39 year-old age group is the largest age group in Philadelphia.

Philadelphia's recent population and job growth, the latter of which outpaced the national average for three of the past four years, is expected to provide additional resources to tackle the City's largest challenges. These challenges include underfunded pension liabilities, low estimated General Fund balances in Fiscal Years 2020-2025, high rates of poverty, and the School District of Philadelphia's (the "School District") ongoing fiscal challenges. Given the population shifts and economic development taking place nationwide, coupled with the City's strategic geographical location, relative affordability, diversified economy, cultural and recreational amenities, and its growing strength in key industries, Philadelphia is well-positioned to attract new businesses and investment over the coming years.

Geography

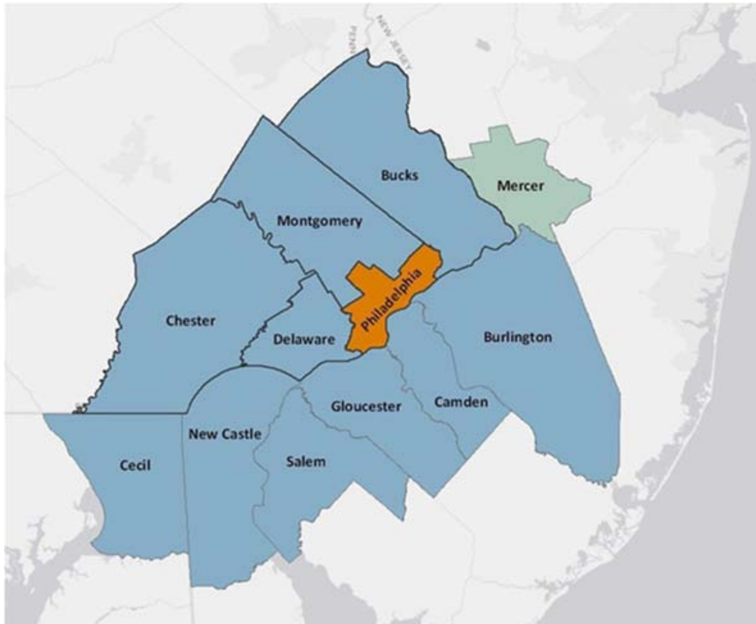
The City has an area of approximately 134 square miles, and is located along the southeastern border of the Commonwealth of Pennsylvania (the "Commonwealth"), at the confluence of the Delaware and Schuylkill Rivers. The City, highlighted in orange in Figure 1, lies at the geographical and economic center of the MSA and PMSA (described below). Philadelphia is both the largest city and the only city of the first class in the Commonwealth, and is coterminous with the County of Philadelphia.

Philadelphia Metropolitan Statistical Area (the "MSA"), highlighted in blue in Figure 1, is the eleven-county area named the Philadelphia-Camden-Wilmington metropolitan statistical area, representing an area of approximately 5,118 square miles with approximately 6,096,372 residents according to 2018 estimates by the U.S. Census Bureau.[1]

Philadelphia Primary Metropolitan Statistical Area (the "PMSA"), highlighted with bold black outlines, in Figure 1, is a five-county area within the MSA that lies in the Commonwealth and is sometimes called the Philadelphia Metropolitan Division. The counties of Bucks, Chester, Delaware, and Montgomery are referred to as the Suburban PMSA herein.

[1] Due to its close proximity and impact on the region's economy, Mercer County, New Jersey, highlighted in green in Figure 1, is included in the MSA by many regional agencies, although it is not included in the area defined by the U.S. Office of Management and Budget.

Figure 1
Map of Philadelphia Region including the MSA, PMSA, and Mercer County, NJ



Source: 2009 TIGER County Shapefiles

Strategic Location

Philadelphia is at the center of the fourth largest MSA on the East Coast, and is served by a robust transportation infrastructure, including: the Philadelphia International Airport, Amtrak's Northeast Corridor rail service, major interstate highway access, regional train service provided by Southeastern Pennsylvania Transportation Authority ("SEPTA") and New Jersey's PATCO (as defined herein), and the Port of Philadelphia. Due to the transportation infrastructure centered in the City, Philadelphia is accessible to regional and international markets, and is within a day's drive of 50% of the nation's population. Philadelphia's central location along the East Coast, an hour from New York City and less than two hours from Washington, D.C. by high-speed rail, also allows for convenient access to these significant economic centers.

Population and Demographics

Philadelphia is the nation's sixth most populous city, with 1.584 million residents, based on 2018 estimates. The 2000 and 2010 U.S. Census reflect the City's first population gain in 60 years. The City's population reached its nadir in 2006 with 1.45 million residents. Philadelphia's population has increased by 135,744 residents from 2006 – 2018, or by 8.57%.

In 2018, 26% of Philadelphia's population was comprised of "millennials," or those within the 25 to 39 year-old age bracket. This demographic group tends to be better educated than the City's and the nation's adult population as a whole. In 2018, 45.1% of 25- to 34-year-olds in Philadelphia held a bachelor's degree or higher, while only 36.2% of 25 to 34-year-olds in the United States held a bachelor's degree or higher. The City's many universities, diverse employment opportunities, and relative affordability are likely reasons for Philadelphia's large millennial population.

Philadelphia is also a highly diverse city in terms of race and ethnicity. In 2018, 43.7% of the population identified as Black or African American, 42.1% identified as white, 8.4% identified as Asian, and 9.9% identified as some other race. Additionally, 15.2% of the population identified as Hispanic or Latino/a.

Table 1
Population: City, MSA, Pennsylvania & Nation

	1990	2000	2010	2018	Percent Change 2000 - 2010	Percent Change 2010 - 2018
Philadelphia	1,585,577	1,517,550	1,528,427	1,584,138	0.7%	3.6%
Philadelphia-Camden-Wilmington MSA	5,435,468	5,687,147	5,972,049	6,096,372	5.0%	2.1%
Pennsylvania	11,881,643	12,281,054	12,712,343	12,807,060	3.5%	0.7%
United States	248,709,873	281,421,906	309,348,193	327,167,434	9.9%	5.8%

Source: U.S. Census Bureau, Population Estimates 2018, Census 2010, Census 2000, Census 1990.

Approximately 26% of Philadelphia's population is enrolled in some level of school. In 2018, Philadelphia exceeded many selected peer cities in its share of students who are enrolled in an undergraduate, graduate or professional education program. Selected peer cities (as shown in Table 2) reflect characteristics consistent with Philadelphia, such as geography, socio-economic statistics, industrial legacies, or port facilities. Among these cities, Philadelphia had the sixth highest percentage of its population enrolled in higher education and the fifth largest higher education population.

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Table 2
2018 Total Number of Students, as a Percent of Total Population of Selected Cities, Ranked by Total Number of Students Enrolled in Higher Education

City	Total Number of Students Enrolled in School (all years)	Total Number of Students Enrolled in Higher Education	Percent of All Students Enrolled in Higher Education	Percent of Total Population Enrolled in Higher Education
United States	**80,916,775**	**22,068,328**	**27.3%**	**7.0%**
Los Angeles, CA	991,864	350,505	35.3%	9.1%
Chicago, IL	635,175	204,890	32.3%	7.9%
Houston, TX	611,029	163,203	26.7%	7.3%
Phoenix, AZ	416,980	94,430	22.6%	5.9%
San Antonio, TX	411,539	114,828	27.9%	7.8%
Philadelphia, PA	**400,437**	**131,063**	**32.7%**	**8.6%**
San Diego, CA	365,477	143,203	39.2%	10.4%
Boston, MA	197,849	109,912	55.6%	16.3%
Washington, D.C.	173,303	72,478	41.8%	10.7%
Detroit, MI	166,076	36,610	22.0%	5.7%
Milwaukee, WI	165,341	44,798	27.1%	7.9%
Memphis, TN	163,610	42,531	26.0%	6.8%
Baltimore, MD	147,836	53,692	36.3%	9.2%
Cleveland, OH	89,569	23,782	26.6%	6.5%

Source: 2018 American Community Survey, 1-Year Estimates.

ECONOMIC BASE AND EMPLOYMENT

The Philadelphia Economy

The City's economy is composed of diverse industries, with virtually all classes of industrial and commercial businesses represented. The City is a major regional business and personal services center with strengths in insurance, law, finance, health, education, utilities, and the arts. The City also provides a destination for entertainment, arts, dining and sports for residents of the suburban counties, as well as for those residents of the counties comprising the MSA plus Mercer County, New Jersey.

As shown in Table 10, the cost of living in the City is relatively moderate and affordable compared to other major metropolitan areas along the East Coast. For example, Philadelphia's cost of living is 29% less than the Washington D.C. metropolitan area and 54% less than Manhattan. The City, as the commercial center of an MSA of 6.1 million people, offers its business community access to a large, diverse, and industrious labor pool. As one of country's education centers, these businesses also enjoy access to a large pool of recent graduates from the institutions of higher education in the MSA.

Key Industries

Table 3 provides location quotients for Philadelphia's most concentrated industry sectors. Location quotients quantify how concentrated a particular industry is in a region as compared to a base reference area, usually the nation. A location quotient greater than 1.00 indicates an industry with a greater share of the local area employment than is the case in the reference area.

As shown in Table 3, compared to the nation, Philadelphia County has higher concentrations in eight sectors: 1. educational services; 2. health care and social assistance; 3. professional and technical services; 4. other services, except public administration; 5. arts, entertainment, and recreation; 6. management of companies and enterprises; 7. finance and insurance; and 8. transportation and warehousing.[2] Of these eight sectors, the City has a higher concentration of employment than the Commonwealth in four sectors: educational services; health care and social assistance; professional and technical services; and other services, except public administration.

Table 3

Ratio of Philadelphia County and Pennsylvania Industry Concentrations Compared to the United States

Industry	Philadelphia County to the US	Pennsylvania to the US
Educational Services	4.24	1.55
Health Care and Social Assistance	1.79	1.30
Professional and Technical Services	1.25	0.95
Other Services, Except Public Administration	1.13	1.11
Arts, Entertainment, and Recreation	1.09	1.12
Management of Companies and Enterprises	1.07	1.41
Finance and Insurance	1.06	1.10
Transportation and Warehousing	1.01	1.20

Source: Bureau of Labor Statistics: June 2019 Employment Location Quotient, Quarterly Census of Employment and Wages

The concentration of educational services not only provides stable support to the local economy, but also generates a steady and educated workforce, fueling the City's professional services and healthcare industries. As of 2018, there were 118,580 Philadelphia residents between the ages of 25 and 34 with college degrees, and a 2019 Campus Philly report found that 54% of recent graduates in the Greater Philadelphia area have remained in the area, outpacing the retention rate of Boston (42%).

The City is also capitalizing on the region's assets to become a leader in research generated by life sciences and educational institutions. Several sites now foster life science incubator facilities, including University City Science Center, The Wistar Institute, University of Pennsylvania ("Penn"), and Drexel University. University Place Associates (UPA) recently announced a strategic collaboration to

[2] The Bureau of Labor Statistics ("BLS") defines the "Other Services" (except Public Administration) sector as establishments engaged in providing services not specifically provided for elsewhere in the BLS classification system, such as equipment and machinery repairing, promoting or administering religious activities, grant making, advocacy, providing dry cleaning and laundry services, personal care services, death care services, pet care services, photofinishing services, temporary parking services, and dating services.

curate a 240,000 square foot building to be dedicated to supporting the life sciences industry with state-of-the-art laboratory/office space in the heart of Philadelphia's University City District. It is expected to be completed early 2021. Johnson & Johnson utilizes Pennovation Works as the site for JPOD, an interactive, high-tech conference space. Announced in June 2019, Pennovation Works is to enter its next phase with a $35 million project to renovate the existing building into lab-related space. The four-story, 73,400-square-foot structure will have 65,000 square feet of wet lab space. It is expected to be completed by September 2020. Penn's Penn Center for Innovation and Temple University's Office of Technology Development and Commercialization are two of several organizations driving tech transfer and commercialization of innovations developed at Philadelphia's major research institutions. The Cambridge Innovation Center, in partnership with Biolabs, occupies part of uCity Square, which includes state-of-the-art wet lab and shared working space. The project expanded the one million square feet in facilities offered by the University City Science Center to 6 million square feet, with a projected investment of over $1 billion. It is expected to be completed in 2027.

Employment

Table 4 shows non-farm payroll employment in the City over the last decade by industry sectors. In the past 10 years, growth has occurred in Leisure and Hospitality; Mining, Logging, and Construction; Professional and Business Services; Education and Health Services; Other Services; Trade, Transportation, and Utilities; and Financial Activities. These sectors provide stability to the City's overall economy.

Table 4
Philadelphia Non-Farm Payroll Employment[1] (Amounts in Thousands)

Sector	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	% Change 2010-2019
Leisure and hospitality	58.4	60.6	63.2	64.8	66.9	68.5	70.8	73.1	74.3	78.6	34.6%
Mining, logging, and construction	10.0	10.0	10.2	10.4	11.0	11.5	12.0	12.1	12.6	13.2	32.0%
Professional and business services	81.9	83.3	84.4	86.7	88.6	91.2	95.2	97.4	99.6	103.4	26.3%
Education and health services	202.4	206.6	208.4	209.7	213.2	217.3	223.8	230.2	238.2	243.1	20.1%
Other services	26.5	26.4	26.8	26.9	26.8	27.1	27.8	27.8	28.3	28.7	8.3%
Trade, transportation, and utilities	86.5	87.3	88.8	89.4	90.9	92.1	92.5	92.3	92.8	93.4	8.0%
Financial activities	42.6	41.6	41.0	41.1	41.7	42.3	42.4	41.6	42.5	44.2	3.8%
Information	12.2	12.0	12.0	11.5	11.5	11.8	11.6	11.6	12.1	12.1	-0.8%
Manufacturing	24.7	23.7	22.9	21.8	21.5	21.0	20.5	20.2	19.9	19.3	-21.9%
Private Sector Total	*545.2*	*551.5*	*557.7*	*562.3*	*572.1*	*582.8*	*596.6*	*606.3*	*620.3*	*636.0*	16.7%
Government	112.1	109.0	105.3	103.5	102.2	101.6	101.3	102.2	103.7	105.4	-6.0%
Total	***657.4***	***660.4***	***662.9***	***665.9***	***674.3***	***684.4***	***698.0***	***708.6***	***724.0***	***741.2***	***12.7%***

Source: Bureau of Labor Statistics, 2019.
[1]Includes person employed within the City, without regard to residency.

Table 5
Philadelphia Change in Share of Employment Sectors, Ranked by Percent Change of Share

Sector	Share of Total Employment 2010	Share of Total Employment 2019	Change 2010-2019
Education and health services	31.0%	32.8%	1.8%
Leisure and hospitality	8.9%	10.6%	1.7%
Professional and business services	12.5%	14.0%	1.4%
Mining, logging, and construction	1.5%	1.8%	0.2%
Other services	4.1%	3.9%	-0.2%
Information	1.9%	1.6%	-0.2%
Financial activities	6.5%	6.0%	-0.6%
Trade, transportation, and utilities	13.2%	12.6%	-0.6%
Manufacturing	3.8%	2.6%	-1.2%
Government	17.2%	14.2%	-2.9%
Total	**100.0%**	**100.0%**	**0.0%**

Source: Bureau of Labor Statistics, 2019.
[1] Includes persons employed within the City, without regard to residency.

Bureau of Labor Statistics data show that in 2019, the Education and Health Services, Professional and Business Services, Trade, Transportation and Utilities, and Leisure and Hospitality sectors collectively represented 70% of total employment in the City for the year. From 2010 to 2019, Philadelphia gained 90,800 private sector jobs.

Unemployment

Although Philadelphia has recently narrowed the gap between its unemployment levels and the national unemployment levels, the effects of the 2007-2009 recession on unemployment endured longer in Philadelphia than in many other parts of the country.

As shown in Table 6, employment gains in the latter part of 2013 through 2019 have resulted in a decline in Philadelphia's unemployment rate from a high of 10.9% in 2012 to 5.2% in 2019.

Table 6 below shows unemployment information for Philadelphia, the MSA, the Commonwealth and the United States.

Table 6
Unemployment Rate in Selected Geographical Areas
(Annual Average 2010-2019)

Geographical Area	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Change in rate from 2010-2019
United States	9.6	8.9	8.1	7.4	6.2	5.3	4.9	4.4	3.9	3.7	-5.9
Pennsylvania	8.5	7.9	7.8	7.4	5.9	5.3	5.4	4.9	4.3	4.1	-4.4
Philadelphia-Camden-Wilmington MSA	8.8	8.5	8.4	7.8	6.2	5.4	5.1	4.7	4.2	3.9	-4.9
Philadelphia	10.6	10.7	10.9	10.3	8.1	7.1	6.8	6.2	5.5	5.2	-5.4

Source: Local Area Unemployment Statistics, Bureau of Labor Statistics, 2019.

Principal Private Sector Employers in the City

Table 7 lists the 20 largest private employers that are based in Philadelphia. Penn and Thomas Jefferson University and Jefferson Health top this list.

Fortune 500 companies headquartered or maintaining a major presence in Philadelphia include the Comcast Corporation and the Aramark Corporation. Three Fortune 1000 companies are also headquartered within the City: FMC Corporation, Urban Outfitters, and Carpenter Technology.

Table 7
Largest Private Employers Based in Philadelphia
Ranked by Number of Local Employees, 2020

Employer	Local Employees
University of Pennsylvania	41,676
Thomas Jefferson University and Jefferson Health	30,500
Comcast Corporation	14,444
Drexel University	10,225
Temple University Health System	9,722
Einstein Healthcare Network	8,800
Temple University	9,722
Independence Health Group	7,403
Wells Fargo	6,138
Accenture	2,236
PricewaterhouseCoopers	1,900
Community College of Philadelphia	1,813
Deloitte	1,775
Rivers Casino	1,581
Ernst & Young LLP	1,336
KPMG	1,321
Saint Joseph's University	1,308
Willis Towers Watson	1,300
LaSalle University	1,002
Health Partners Plans	971
Total	**155,173**

Source: Philadelphia Business Journal, 2020 Book of Lists (published in December 2019)

Hospitals and Medical Centers

The City is a center for health, education, research and science facilities with the nation's largest concentration of healthcare resources within a 100-mile radius. There are presently more than 30 hospitals, five medical schools, two dental schools, two pharmacy schools, as well as schools of optometry, podiatry and veterinary medicine located in the City. The City is one of the largest health care and health care education centers in the world, and several of the nation's largest pharmaceutical companies are located in the Philadelphia area.

Major research facilities are also located in the City, including those located at its universities and medical schools: Children's Hospital of Philadelphia, the Hospital of the University of Pennsylvania, The Wistar Institute, the Fox Chase Cancer Center, and the University City Science Center. Philadelphia is home to two of the nation's 41 National Cancer Institute ("NCI")-designated Comprehensive Cancer Centers (the Abramson Cancer Center at the University of Pennsylvania and Fox Chase Cancer Center, which is part of the Temple University Health System). Additionally, Philadelphia is also home to two NCI-designated Cancer Centers (Kimmel Cancer Center and The Wistar Institute Cancer Center).

Penn Medicine University of Pennsylvania Health System

Penn Medicine includes Pennsylvania Hospital, the nation's first hospital, founded in 1751 and the nation's first medical school, the University of Pennsylvania School of Medicine, opened in 1765. In addition, the Hospital of the University of Pennsylvania was established in 1874 as the nation's first teaching hospital. Penn Medicine's hospitals have been named among the top ten hospitals in the country with the combined University of Pennsylvania and Penn Presbyterian Medical Center ranked #1 in the region by *U.S. News and World Report*. Penn Medicine, which has invested more than $200 million in major capital investments between 2014 and 2015, began construction in 2016 on a new 1.5 million square foot Patient Pavilion, a clinical facility that is projected to be occupied by spring of 2021.

Children's Hospital of Philadelphia Expansion

Children's Hospital of Philadelphia ("CHOP") is the oldest children's hospital in the nation and one of the largest in the world. CHOP was ranked #2 in the nation in 2017-2018 according to the *U.S. News and World Report*. Since 2002, CHOP has invested over $5.3 billion in its expansion in Philadelphia. In 2017, CHOP opened two facilities as a part of this expansion: the $500 million, 700,000 square foot Buerger Center for Advanced Pediatric Care, and the $275 million, 466,000 square foot Roberts Center for Pediatric Research.

Temple University Hospital, Inc.

Temple University Hospital, Inc. ("TUH") is one of the region's most respected academic medical centers. The 732-bed Philadelphia hospital is also the chief clinical training site for the Lewis Katz School of Medicine at Temple University. TUH was ranked among the "Best Regional Hospitals" in six different specialties in *U.S. News & World Report* 2015-2016 regional rankings.

Thomas Jefferson University and Jefferson Health

Thomas Jefferson University Hospitals ("TJUH") has been at the top of the list of hospitals in Pennsylvania (3rd) and the Philadelphia metro area (2nd) in *U.S. News & World Report*'s annual listing of the best hospitals and specialties. TJUH also ranked 16th overall in the U.S. News and World Report listing. Jefferson Health has recently participated in several significant mergers, integrating Magee Hospital, Kennedy Health System, the Aria Health system and Abington Hospital into its system. In 2017, Thomas Jefferson University acquired Philadelphia University to become the fifth largest educational institution in Philadelphia.

Einstein Healthcare Network

Einstein Healthcare Network is a private, not-for-profit organization with several major facilities and many outpatient centers that has been in existence for nearly 150 years. The Einstein Health and Medical Center in Philadelphia has been listed as a top hospital in *U.S. News & World Report*.

In September 2018, Einstein Healthcare Network and Thomas Jefferson University announced a merger agreement and such entities are seeking necessary state and federal regulatory approvals to close the transaction. Such merger has not been completed at this time and is being challenged by the Federal Trade Commission.

Educational Institutions

The MSA plus Mercer County, New Jersey, has the second largest concentration of undergraduate and graduate students on the East Coast, with approximately 100 degree granting institutions of higher education and a total enrollment of over 434,000 full and part-time students. Approximately 137,807 students lived within the geographic boundaries of the City in 2016. Included among these institutions are Penn, Temple University, Drexel University, St. Joseph's University, and LaSalle University. Within a short drive from the City are such schools as Princeton University, Villanova University, Bryn Mawr College, Haverford College, Swarthmore College, Lincoln University, and the Camden Campus of Rutgers University.

University of Pennsylvania

Penn, the first university in the U.S., founded in 1740, and a prominent Ivy League institution, is located in West Philadelphia across the Schuylkill River from downtown Philadelphia. In the fall of 2018, more than 21,000 full-time undergraduate, graduate and professional full-time students attended Penn, 5,333 of whom are international students. Approximately 3,900 part-time students were enrolled. As of the fall 2018, Penn had a total workforce of over 18,000 faculty and staff, and the University of Pennsylvania Health System had a workforce of 23,275 employees. In September 2016, Penn opened Pennovation Works, a 55,000 square foot business incubator and laboratory that houses researchers, innovators, and entrepreneurs for the commercialization of research discoveries.

Penn has undergone significant expansion in the last decade and has a growing endowment currently valued at $13.8 billion. In 2015, Penn, and related third-party developers, spent $932 million dollars on new buildings and renovations. A recent independent report conducted by Econsult Solutions, Inc. found that Penn and the University of Pennsylvania Health System had a combined economic impact on the City and the Commonwealth of more than $14 billion in Fiscal Year 2015, including $10.8 billion to the City. According to the same study, such Penn entities generate $1 out of every $20 of Philadelphia's general fund and one out of every nine jobs in the Philadelphia economy.

In Fiscal Year 2018, Penn was the fifth largest recipient of funding from the National Institutes of Health ("NIH"), receiving approximately $405.6 million. Penn is consistently one of the largest annual recipients of NIH funding.

Drexel University

Founded in 1891 as the Drexel Institute of Science, Art and Industry, Drexel University ("Drexel") is one of Philadelphia's top 10 private employers, and a major engine for economic development in the region. Drexel is known for its innovation and civic engagement, ranked a "top 15 most innovative school" by *U.S. News and World Report*. Drexel's student body consists of approximately 26,000, making it one of the 15 largest private universities in the country. Drexel is unique in that it provides its students with a co-op work experience every six months throughout the four-year college experience. Over the last decade, Drexel has undergone significant expansion and has major plans for future development. In 2011, Drexel opened the doors to the $69 million Constantine N. Papadakis Integrated Sciences Building, a $92 million facility for its LeBow School of Business, and a new mixed use residential and retail project, Chestnut Square.

Temple University

Temple University ("Temple"), founded in 1884, has undergone a significant transformation over the past three decades from a university with a mostly commuter-based enrollment to one in which on and near-campus housing is now in high demand. Temple features 17 schools and colleges, eight campuses, hundreds of degree programs and nearly 40,000 students. Currently, an estimated 12,000 students live on or around the Temple campus.

"Visualize Temple," approved in 2014, is Temple's campus master plan to guide the continued growth and evolution of the City's leading public research university. It is the culmination of an 18-month long process driven by the input of over 3,000 Temple students, alumni, faculty, and staff. Such plan identifies challenges and opportunities at each campus and defines a collective vision for further campus transformation. Temple continues to implement key elements of this master plan.

Thomas Jefferson University

In 2017, Thomas Jefferson University and Philadelphia University merged to create the fifth largest university in the City. The new Thomas Jefferson University ("Jefferson") creates a national comprehensive university designed to deliver high-impact education and value for students in medicine, science, architecture, design, fashion, textiles, health, business, engineering, and other disciplines.

In addition to nine colleges and three schools from both universities, the formation of the Philadelphia University Honors Institute and the Philadelphia University Design Institute are key components of the combined university's educational ecosystem. Jefferson includes (i) campuses in Center City, Philadelphia ("Center City"), East Falls, Montgomery County, Bucks County, and Atlantic County (NJ); (ii) a growing online presence; (iii) numerous clinical sites; and (iv) an extensive global footprint with locations in Italy and Japan, study abroad sites and curricular and co-curricular partnerships and networks. Jefferson is home to more than 7,800 students, 4,000 faculty members and 63,000 alumni.

Community College of Philadelphia

The Community College of Philadelphia (the "College") serves over 19,000 students in associate's degree and certificate programs. The College operates four campuses: its main Campus in Center City Philadelphia and three regional campuses in West Philadelphia, Northeast Philadelphia, and Northwest Philadelphia. The College offers more than 70 associate's degree, academic and proficiency certificate, and workforce programs. Graduates continue to strengthen Philadelphia's local economy and workforce, both in Philadelphia and the Greater Philadelphia region.

The College enables students to embark on a smart path to a bachelor's degree program, with transfer agreements and partnerships to assist in the transition. In the 2015-16 academic year, approximately 30,194 students took credit and noncredit courses. The College is embarking on an expansion of its West Philadelphia Campus, to expand its Automotive Center and to establish a Workforce Campus with a new $20 million facility in the heart of Philadelphia's Promise Zone.

The College is one of 30 community colleges in the nation to undertake a new Career Pathways model under which it has expanded its dual enrollment programs, including establishing the first Middle College in the Commonwealth, with the School District of Philadelphia. Upon completion of high school, enrolled students will receive both a high school degree and an associate's degree.

The College has vastly expanded its role in workforce development and economic innovation, establishing a division that is responsible for working directly with Philadelphia employers to meet their workforce hiring and professional development needs. The College has established new post-secondary programs matched with Philadelphia's high priority occupations enabling Philadelphians to earn family sustaining wages without a degree.

Family and Household Income

Table 8 shows median family income, which includes related people living together, and Table 9 shows median household income, which includes unrelated individuals living together, for Philadelphia, the MSA, the Commonwealth and the United States. Over the period 2009-2018, median family income for Philadelphia increased by 20.6% (see Table 8), while median household income increased by 24.6% over the period 2009-2018 as a result of an influx of higher income households (see Table 9).

Table 8
Median Family Income* for Selected Geographical Areas, 2009-2018
(Dollar Amounts in Thousands)

Year	Philadelphia	Philadelphia-Camden-Wilmington MSA	Pennsylvania	United States	Philadelphia as a percentage of the US
2009	$45.70	$76.90	$62.20	$61.10	74.8%
2010	$43.10	$74.50	$61.90	$60.60	71.1%
2011	$42.70	$75.70	$63.30	$61.50	69.4%
2012	$44.30	$77.00	$65.10	$62.50	70.9%
2013	$44.60	$78.20	$66.50	$64.00	69.7%
2014	$47.00	$80.60	$67.90	$65.90	71.3%
2015	$49.30	$83.00	$70.20	$68.30	72.2%
2016	$50.30	$84.80	$72.30	$71.10	70.7%
2017	$50.40	$86.20	$72.70	$70.90	71.1%
2018	$55.10	$90.43	$77.49	$76.40	72.1%
Change 2009-2018	20.6%	17.6%	24.6%	25.0	

* Includes related people living together.
Source: 2018 American Community Survey 1-Year Estimates

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Table 9
Median Household Income* for Selected Geographical Areas, 2009-2018
(Dollar Amounts in Thousands)

Year	Philadelphia	Philadelphia-Camden-Wilmington MSA	Pennsylvania	United States	Philadelphia as a percentage of the US
2009	$37.00	$60.10	$49.50	$50.20	73.7%
2010	$34.40	$58.10	$49.30	$50.00	68.8%
2011	$34.20	$58.30	$50.20	$50.50	67.7%
2012	$35.40	$60.10	$51.20	$51.40	68.9%
2013	$36.80	$60.50	$52.00	$52.30	70.4%
2014	$39.00	$62.20	$53.20	$53.70	72.6%
2015	$41.20	$65.10	$55.70	$55.80	73.8%
2016	$41.40	$66.00	$56.90	$57.60	71.9%
2017	$41.00	$66.30	$57.00	$57.70	71.1%
2018	$46.12	$70.75	$60.91	$61.94	74.5%
Change 2009-2018	24.6%	17.7%	23.1%	23.4%	

* Includes unrelated people living together.
Source: 2018 American Community Survey 1-Year Estimates

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Cost of Living Index

Philadelphia has the lowest cost of living index among major urban areas in the Northeast, as shown in Table 10 below. Additionally, the City's Wage, Earnings, and Net Profits Tax Rates have decreased in each of Fiscal Years 2013-2019. See "REVENUES OF THE CITY – Wages, Earnings, and Net Profits Taxes" in APPENDIX IV for this Official Statement.

Table 10
2019 Cost of Living Index
Philadelphia Indexed to 100

Urban Area	Cost of Living Index
New York- Manhattan	215
San Francisco	178
D.C.	144
Seattle	142
Boston	136
Los Angeles-Long Beach	132
Chicago	109
Baltimore	102
Denver	100
Philadelphia	**100**
Dallas	97
Pittsburgh	93
Atlanta	93
Detroit	90
Austin	90

Source: Council for Community and Economic Research (C2ER), Cost of Living Index (COLI)

Housing

Growing rapidly from its founding in 1682, Philadelphia's historic housing stock reflects its past roles as the largest city in the British Empire and as "the workshop of the world" during the peak of the industrial revolution. However, its condition and age (among the oldest of any city in the country) is also a reflection of the decades of depopulation and abandonment that marked the second half of the 20th Century. Nevertheless, Philadelphia has undergone a significant revitalization in the most recent decades, particularly in the neighborhoods within and around its downtown core. The period between the 2000 and 2010 Censuses was the first wherein Philadelphia experienced a net population increase since 1940 to 1950, due both to rapid growth in the number of higher income households in these core neighborhoods and to a significant influx in the foreign-born population in more peripheral neighborhoods of the City.

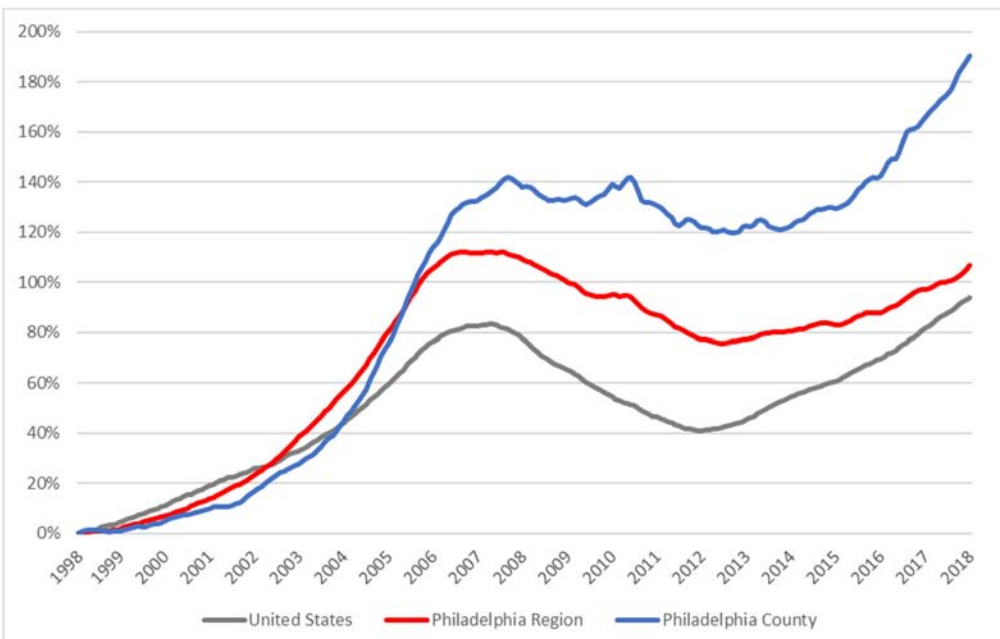
The City's population growth has driven significant new construction and investment in many of its neighborhoods resulting in increases in the value of the City's housing stock. Most housing indicators for Philadelphia indicate an upward outlook, in terms of prices, construction, and sales, for the near future. Nevertheless, the City continues to face significant challenges caused by the persistent problems of poverty, crime, underperforming schools, and lack of employment opportunities.

The total housing stock, measured by the number of units, increased by 0.7% from 2010-2016, for a total of 674,500 in 2016.[3] This increase of 4,500 units is the result of a net increase of 6,000 multifamily units and 500 "other" units (such as mobile homes and boats), off-set by a net loss of 2,000 single-family homes (due to multifamily conversions and demolitions).[3] The homeownership rate in the City in 2016 was 52.1%, which represents a decline from 54.1% in 2000.[3] Accordingly, properties in the City have continued to command higher rents, with the median monthly rent in June 2018 equal to $1,214, representing a 10.9% increase over the prior five-year period.[4]

Home Prices

As shown in the chart below, after eight years of moderate house price deflation following the peak of the 2007 recession, Philadelphia's housing market began posting rapid increases in prices, citywide, starting in 2013. In 2015, home values in Philadelphia recovered to their pre-recession peak and have continued to climb to 20% above that peak as of January 2018. The following chart uses the Home Value Index to chart changes in home values in Philadelphia, the Philadelphia region, and the U.S. as a whole over the 20-year period from February 1998 through January 2018.[5]

Percent Change in Median Nominal Home Value (Zillow Home Value Index), 1998-2018



Source: Zillow Research, ZHVI Time Series

In the first years shown in this chart, housing values in Philadelphia were not only lower than the region and country as a whole, in nominal terms, but they also grew at a lower rate. From 2002 to 2007, however, the rate of growth in the City's home values significantly outpaced these comparison regions. Although home values in the City stagnated and declined for eight years, after hitting a peak in 2007, the

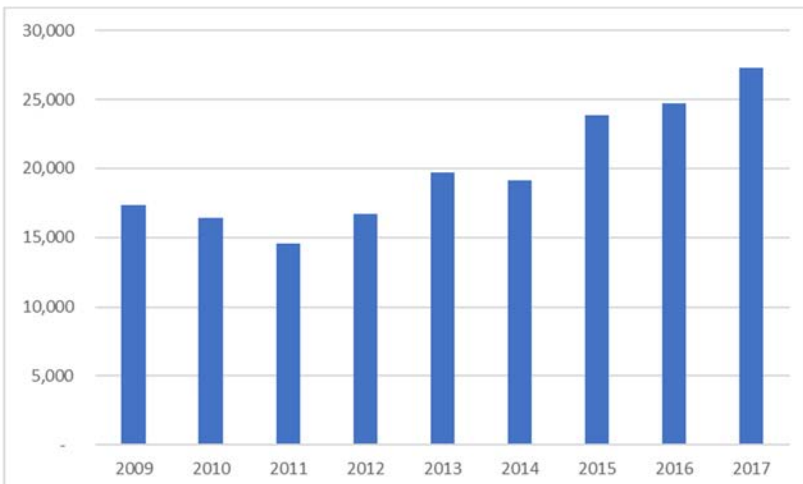
[3] US Census Bureau, American Communities Survey, 1-Year Survey
[4] Zillow Research, ZRI Time Series
[5] Zillow Research, ZHVI Time Series

housing market in Philadelphia retained a much greater share of its pre-recession gains during this period than did either the region or country as a whole. Since then, Philadelphia's housing market has surged, such that, in nominal terms, housing values within the City have nearly tripled since 1998, a rate of growth that is more than 50% greater than the rest of the country.

Home Sales

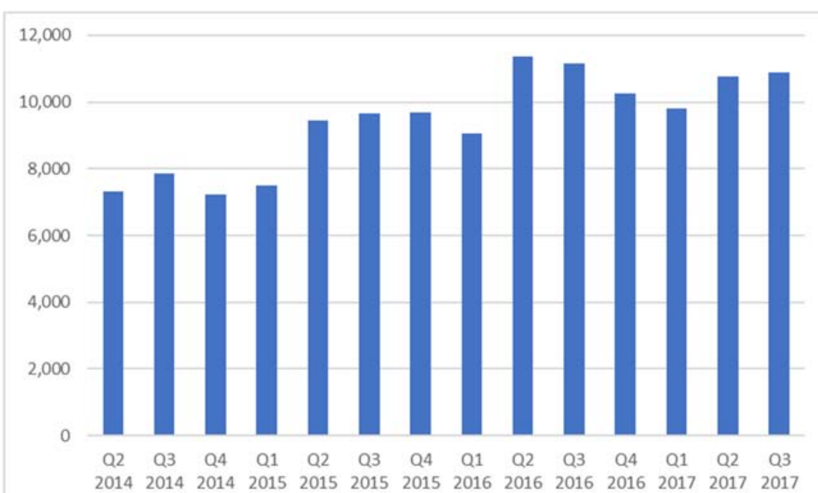
Another indicator of the housing market's recovery is home sales. The following chart shows the annual number of home sales in Philadelphia since 2009. Like prices, home sales dropped significantly following the 2007 recession, but have, seasonal variations notwithstanding, steadily increased since 2011. In 2017, there were 27,327 home sales, nearly double their post-recession nadir of 2011 of 14,542. This trend reflects a recovery of the City's housing market and is likely to continue as the significant increment of new housing construction (described below) is absorbed.

Home Sales in Philadelphia, 2009-2017



Source: Zillow Research, Home Sales Time Series

Home Sales in Philadelphia, April 2014 through September 2017

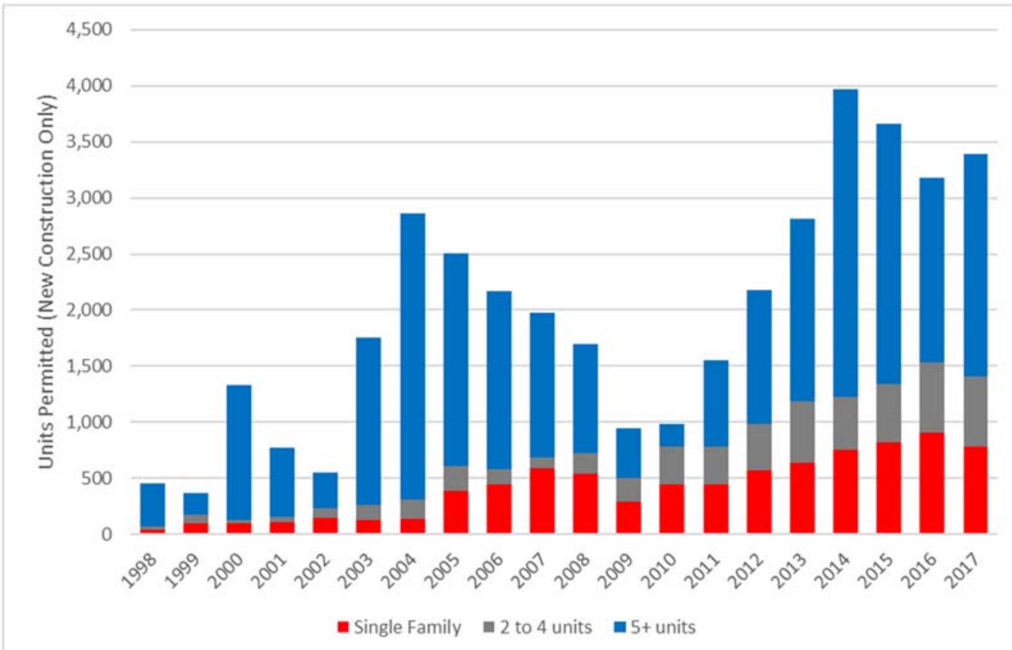


Source: Philadelphia Department of Revenue

Home Construction

Home building activity in Philadelphia has also made significant progress since hitting its recessionary low in 2009. The following chart shows the number of newly constructed units being added to Philadelphia's housing stock, as represented by the number of building permits issued for such units, from 1998 through 2017.

Building Permits Issued in Philadelphia, New Construction Only (Number of Units by Building Type), 1998-2017



Source: US Census, Building Permits Survey

Prior to 2000, construction of new housing units in Philadelphia was low by both absolute and relative measures, averaging only 507 units per year in the decade from 1990 through 1999. However, since 2003, permits for new construction have not been for less than 947 units in any single year, including during the nadir of the 2007 recession. In 2014, permits were issued to approve the construction of nearly 4,000 new housing units in Philadelphia—an all-time high. Notably, these data do not include additions or substantial alteration to existing buildings, which together account for nearly a third of all new housing units in Philadelphia from 2013 to 2017, based on permit issuance data from the Department of Licenses and Inspections. Although total permitting activity declined in 2015 and 2016, recovering somewhat in 2017, total residential development activity has remained high.

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Office Market

The City currently has approximately 48.0 million square feet of office space in the Central Business District ("CBD"), with an additional 231,000 square feet under construction according to Jones Lang LaSalle's ("JLL") statistics for the fourth quarter of 2019.

The average direct asking rental rates in the City's CBD rose slightly to $32.37 per square foot in the fourth quarter of 2019. Markedly, the City's CBD enjoys rising rents with low overall total vacancy, while its suburban counterparts have higher overall total vacancy and lower rents during the same period, at 15.9% and $28.10 per square foot.

Table 11 shows comparative overall fourth quarter 2019 office vacancy rates for selected office markets.

Table 11
Total Office Vacancy Rates of Selected Office Markets
Fourth Quarter 2019

Market	Vacancy Rate
San Francisco	5.2%
New York	7.7%
Austin	9.2%
Seattle	9.9%
Charlotte	10.3%
Philadelphia	**10.6%**
San Diego	11.2%
Boston	11.9%
Chicago	12.1%
Los Angeles	13.0%
San Antonio	13.3%
Washington, DC	13.8%
United States CBD, All Markets	14.3%
Baltimore	15.1%
Phoenix	16.9%
Atlanta	17.7%
Detroit	18.6%
Cleveland	19.3%
Dallas	20.1%
Houston	22.8%

Source: Jones Lang LaSalle, National CBD Data, Fourth Quarter 2019

ECONOMIC DEVELOPMENT STRATEGIES AND IMPLEMENTATION

City of Philadelphia Economic Development Mission and Goals

The City's economic development strategy is to (1) spur job-creation by fostering an improved business environment; (2) increase the City's population and visitation; and (3) enhance quality of life within the City. The City partners with numerous quasi-city and private agencies to accomplish these objectives.

The City utilizes several place-based economic development strategies to spur development in Philadelphia. These strategies include: (i) a 10-year real estate tax abatement on all new construction, as well as on improvements to existing properties (which program was modified for new construction of residential properties; see APPENDIX IV – "REVENUES OF THE CITY – Real Property Taxes – Assessment and Collection"); (ii) Commonwealth-designated Keystone Opportunity Zones in which eligible businesses may be exempt from all Commonwealth and local business taxes until a specified date; (iii) Commonwealth-designated Keystone Innovation Zones in which energy, defense, technology, and life-sciences companies may be eligible for saleable tax credits worth $100,000 annually for the first eight years of operations; (iv) tax increment financing; and (v) commercial corridor revitalization through support of Business Improvement Districts and reimbursement for certain storefront and interior retail improvements.

The City has also actively worked to raise its profile in the international business community. In 2015, Philadelphia received the designation of the first World Heritage City in the United States by the Organization of World Heritage Cities. In 2015, the City entered into a "sister city" agreement with Frankfurt, Germany, considered the largest financial center in continental Europe. This agreement is Philadelphia's first sister city since 1992. In recent years, the City has hosted delegations of business leaders and officials on trade missions to the United States and participated in trade missions to Germany, France, Portugal, China, South Korea, and Canada. In 2018, a website was launched, philadelphiadelivers.com, which showcases all that the City has to offer businesses including location, talent, affordability, and amenities. Also in 2018, Philadelphia was one of four cities selected by the Brookings Institute to join the Global Identity Cohort. As such, more than 80 local stakeholders have been engaged to begin crafting a shared brand and narrative around Philadelphia in order to attract residents, businesses and events.

City and Quasi-City Economic Development Agencies and Related Programs

City of Philadelphia Department of Commerce

The mission of the Department of Commerce is to (i) ensure that Philadelphia is a globally-competitive city where employers hire, entrepreneurs thrive, and innovation abounds; (ii) recruit and retain a diverse set of businesses; (iii) foster economic opportunities for all Philadelphians in all neighborhoods; and (iv) partner with workforce development programs and local businesses on talent development with the goal of ensuring that all Philadelphians can find and retain living-wage jobs. The Department of Commerce has three major divisions: Neighborhood & Business Services; Office of Business Development and Office of Economic Opportunity.

City of Philadelphia Department of Planning and Development

The Department of Planning and Development ("Planning and Development") oversees all planning, real estate development support, and commissions such as the Historical Commission, Planning

Commission, Art Commission and Civic Design Review. Planning and Development also oversees all housing initiatives and plays a key role in community development.

Philadelphia Industrial Development Corporation ("PIDC")

PIDC is a non-profit organization founded by the City of Philadelphia and the Greater Philadelphia Chamber of Commerce in 1958. PIDC offers flexible financing tools, a targeted portfolio of industrial and commercial real estate, and expertise to help clients invest, develop, and grow in Philadelphia. PIDC also structures and invests in public-private partnerships for key City policy areas and development priorities. Over the past 62 years, PIDC and its affiliates have settled over 7,500 transactions, including more than $17 billion in financing that has leveraged over $30 billion in total investment and assisted in creating and retaining hundreds of thousands of jobs in Philadelphia. Its direct loan and managed third-party portfolio at year-end 2019 was more than $518 million, representing 500 loans.

Philadelphia Redevelopment Authority ("PRA")

In 1945, the Commonwealth enacted the Urban Renewal Law and created the PRA as the City's urban renewal agency. Today, the PRA continues its role as a key financer, project manager, leader, and expert of developing and maintaining land in the City. The PRA is one of five municipal land holding agencies. Its Real Estate Division facilitates the redevelopment of PRA assets and it provides project management and analysis for real estate sales, acquisitions, redeveloper agreements, developer submissions, and required approvals. Its Housing Department leads the underwriting and loan closing process for all affordable housing projects within the City and works primarily with non-profit and for-profit developers as a lender.

Philadelphia Land Bank ("PLB")

Established in 2013, the PLB is a new institutional partner in land use. The aim of the PLB is to consolidate many of the land acquisition and disposition processes of the City under one umbrella, making it easier for private individuals and organizations to acquire properties that otherwise contribute to neighborhood disinvestment and turn them into assets for the community in which they are located. The PLB can: (i) consolidate properties owned by multiple public agencies into single ownership to speed property transfers to new, private owners; (ii) acquire tax-delinquent properties through purchase or by bidding the City's lien interests at a tax foreclosure; (iii) with consent of the City, clear the title to those properties so new owners are not burdened by old liens; and (iv) assist in the assemblage and disposition of land for community, non-profit, and for-profit uses.

The Division of Housing and Community Development ("DHCD")

DHCD, formerly known as the Office of Housing and Community Development and now part of Planning and Development, manages planning, policy, and investment in low-income housing through several assistance programs. Most significantly, the DHCD creates and manages implementation of the Consolidated Plan, a federally-mandated plan and budget that must be updated yearly in order to receive federal Community Development Block Grant funding.

The Philadelphia Housing Authority ("PHA")

PHA is funded primarily by the federal government and is the largest landlord in Pennsylvania. PHA develops, acquires, leases and operates affordable housing for City residents with limited incomes. PHA works in partnership with the City and Commonwealth governments, as well as private investors.

Over 93% of PHA's annual budget is funded directly or indirectly by the U.S. Department of Housing and Urban Development, and most of the balance of PHA's budget is derived from resident rent payments. Neither PHA's funds nor its assets are available to pay City expenses, debts, or other obligations, and the City has no power to tax PHA or its property. Neither the City's funds nor its assets are subject to claims for the expenses, debts, or other obligations of PHA.

Rebuilding Community Infrastructure Program ("Rebuild")

The Rebuild program, using funds from the Philadelphia Beverage Tax, will invest hundreds of millions of dollars in Philadelphia's parks, recreation centers, and libraries over a seven-year period. Rebuild prioritizes sites in high-need neighborhoods, as well as sites that are in extremely poor condition. This program is intended to catalyze economic development in some of Philadelphia's most impoverished communities and neighborhoods. Rebuild is not only committed to making transformative capital improvements in neighborhood public and shared spaces, but will also strive to build capacity and opportunities for minority and women-owned businesses and job opportunities for local residents. In November 2018, the Philadelphia Authority for Industrial Development issued $79,460,000 in City Service Agreement Revenue Bonds to finance certain costs of the Rebuild program.

Key Commercial Districts and Development

Over the last two decades the efforts of Philadelphia's economic development agencies and others have spurred significant economic revitalization throughout the City. In particular, a number of geographic areas have experienced concentrated developments: Philadelphia's Historic District, Avenue of the Arts, North Broad Street, and the Benjamin Franklin Parkway. Many of these developments, such as a significant increase to Philadelphia's hotel room inventory in Center City and expansion of the Pennsylvania Convention Center, are key to the growth of Philadelphia's leisure and hospitality sector. Several key areas within the City have been instrumental in the economic and commercial development of Philadelphia over the past twenty-five years and the population growth since 2000. Recent and current developments in the key commercial districts described below are listed in Table 12.

Center City

A district that has seen a resurgence over the last two and a half decades, Center City is Philadelphia's central business and office region within the City. Center City is the strongest employment center in the City. In addition, the area contains a sizeable residential population and provides ample access to retail, dining, arts and culture, entertainment, and mass transportation services, to both residents and daily commuters. Center City is flanked by neighborhoods that are considered "Greater Center City." Approximately 309,000 riders take public transit into Greater Center City every weekday. Over the last two decades, as there has been an influx of new businesses and residents in these neighborhoods, the boundaries of Greater Center City have moved significantly further North and South, with the Delaware and Schuylkill rivers remaining boundaries on the East and West.

Old City

Old City is home to some of the country's oldest historical assets and is considered America's "most historic square mile." Independence National Historical Park is an international destination, attracting 3.6 million visitors annually. Important culturally and economically, Old City is also home to world-class museums, theaters and art galleries. The neighborhood offers excellent hotels, a wide range of dining and nightlife establishments, independent retailers and a diverse mix of technology, media, professional, and service organizations. Some 8,000 residents live in historic townhouses, industrial loft apartments, and new condominium properties. Old City is located within a Keystone Innovation Zone, meaning that technology, energy, and life sciences businesses may be eligible for up to $100,000 in tax credits.

Old City District ("OCD") is a business improvement district that promotes the area and fosters economic development locally. OCD helps companies find suitable real estate and actively promotes the sector to attract businesses. Over the last few years, technology and creative businesses have established an increasingly important presence in the area.

University City

Located west of Center City, University City is a hub for the health care, life sciences, and higher education sectors and accounted for approximately 11% of the City's employment in 2017. It includes the campuses of Penn, Drexel University, University of the Sciences, the University of Pennsylvania Health System, the Children's Hospital of Philadelphia, and The Wistar Institute, as well as the University City Science Center, a biomedical incubator. University City has experienced significant real estate development, driven mostly through the investment of its universities and research institutional anchors.

Penn built the $88 million Singh Center for Nanotechnology in 2013 and invested $127 million in a new residence hall called New College House at Hill Field. Drexel University invested nearly $300 million in University City in 2013, and is planning for an additional $3.5 billion over 20 years in the development of Schuylkill Yards in partnership with Brandywine Realty Trust. Such project will develop 14 acres of underutilized land near Philadelphia's 30th Street Station into an innovation neighborhood, which will feature a mix of entrepreneurial spaces, educational facilities and research laboratories, corporate offices, residential and retail spaces, hospitality and cultural venues and public open spaces.

The Navy Yard

The Navy Yard is a 1,200 acre mixed-use office, research and industrial campus with over 15,000 people working on site across 170 companies. The Navy Yard has diverse tenants such as Philly Shipyard, one of the world's most advanced commercial shipbuilding facilities; the global headquarters for retailer Urban Outfitters, Inc.; a 208,000 square foot, double LEED Platinum corporate office for pharmaceutical company GlaxoSmithKline; and a LEED Silver bakery facility for the Tasty Baking Company. More than 7.5 million square feet of space is currently occupied or in development with significant additional capacity available for office, industrial, retail and residential development.

PIDC and its partners released an updated Navy Yard master plan in 2013, detailing a comprehensive vision for the Navy Yard. The plan calls for a total of over 13.5 million square feet of new construction and historic renovation supporting office, research and development, industrial and residential development, complemented with commercial retail amenities, open spaces and expanded mass transit. Under such plan, the fully built out Navy Yard would support more than 30,000 employees and over $3 billion in private investment. PIDC continues to work on this long-term plan for the Navy Yard.

The Navy Yard continues to grow bringing it closer to its strategic targets. Since 2000, the Navy Yard has leveraged more than $170 million in publicly funded infrastructure improvements to spur more than $850 million in new private investment.

Table 12
Recently Completed Projects or Projects Under Construction in the Key Commercial Districts

Project Name, by Neighborhood	Project Type	Cost in Millions	Est. Completion Date
CENTER CITY			
Comcast Innovation and Technology Center	Commercial/Hotel	$1,200	Completed 2019
2400 Market	Commercial	$230	2020
W Hotel/Element	Hotel	$359	2020
Fashion District Philadelphia	Commercial	400	Q2 2020
1911 Walnut	Mixed Use	$300	2021
SLS Residences	Residential and Hotel	$253	2021
Police Headquarters in Inquirer Building	Public	$300	Q1 2021
OLD CITY			
I-95 Overcap Park	Public	$225	2024
OTHER NEIGHBORHOODS			
2100 Hamilton	Residential	$24	2021
Piers at Penn's Landing	Mixed Use		
UNIVERSITY CITY			
4601 Market	Mixed Use	$250	2021
Penn Health Tower	Health Care	$1,500	2021
TOTAL		**$5,041**	

Source: Philadelphia Department of Planning and Development.

Waterfront Developments

Taking advantage of the City's geographic assets, the Schuylkill River and the Delaware River, the City is redeveloping its waterfront to accommodate a variety of developments, including mixed-use projects and housing, parks and recreational trails, and hotels. These projects improve quality of life for residents and improve the visitor experience, but also are an impetus for environmental remediation and private development of former industrial property within the City.

Delaware River Waterfront Corporation (the "DRWC")

The Delaware River has historically been a center of activity, industry, and commerce, bounded at its north and south ends by active port facilities. The City adopted a Master Plan for the central Delaware River in 2011. DRWC, in partnership with the City, is a nonprofit corporation that works to transform the central Delaware River waterfront into a vibrant destination for recreational, cultural, and commercial activities. Over the last ten years, DRWC has successfully opened four adaptive reuse park projects built on former pier structures, including the newly-renovated Cherry Street Pier in 2018. I-95 Overcap Park will cap a section of I-95 and connect Old City Philadelphia with the Delaware River. The proposed 4-acre multimillion-dollar park project is in the planning stages. The current work schedule will last from 2021 to 2024.

DRWC, the City, and the Commonwealth have partnered to redevelop Penn's Landing, a major public space along the Delaware River waterfront. The resulting civic space will leverage investment from private sources for the redevelopment of the adjoining parcels.

Schuylkill River Development Corporation (the "SRDC")

Redevelopment along the Schuylkill River is managed by a partnership among SRDC, the Department of Parks & Recreation, and the Department of Commerce. SRDC works with federal, Commonwealth, City, and private agencies to coordinate, plan and implement economic, recreational, environmental and cultural improvements, and tourism initiatives on the Schuylkill River. From 1992 to 2017, $70 million was invested by SRDC, the City, and their partners along the tidal Schuylkill to create 3.65 miles of riverfront trails within 30 acres of premiere park space in the heart of the City, and has added amenities to the Schuylkill River Park such as floating docks, fishing piers, a composting toilet, and architectural bridge lighting. SRDC continues to work towards meeting its goal of creating and maintaining trails and green space along the tidal Schuylkill River in Philadelphia, such as the Christian to Crescent Connection. This trail section will connect neighborhoods on both sides of the Schuylkill River to a vast existing network of parks and trails, including the Schuylkill River trail, Fairmount Park, and the regional network of recreational trails and related facilities known as the Circuit. It will also provide those neighborhoods with a direct pedestrian and bicycle route to Center City's jobs and services. In addition, it will help complete Philadelphia's segment of the East Coast Greenway.

Since 2005, Philadelphia has benefitted from more than $1 billion in development along the Schuylkill River, with more planned by private developers, universities, and healthcare institutions.

Casinos

Rivers Casino

Philadelphia's first casino, Rivers (originally SugarHouse), opened in September 2010. Rivers Casino sits on the Delaware River waterfront offering an array of slot machines, table games and dining options. Its operations also include a multi-purpose event space with waterfront views, restaurants, and a parking garage. As of August 2018, Rivers had approximately 1,500 employees. As reported to the Pennsylvania Gaming Control Board, River's gaming revenue was approximately $299.1 million in Fiscal Year 2018.

Cordish Live!

Scheduled to open by the end of 2020, Live! (Live!) Casino & Hotel Philadelphia will be a $700 million world-class hotel, gaming, dining and entertainment destination featuring 2,200 slot machines and 150+ live action table games, an upscale 200+ room hotel, a new 2,700-space parking garage, locally and nationally-recognized restaurants and live entertainment venues. The project will be located in the heart of the Stadium District in South Philadelphia, immediately proximate to Xfinity Live!, The Cordish Companies' premier dining & entertainment district. The project will create the first comprehensive gaming, resort, entertainment and sports destination in the United States, making it a true regional destination

TOURISM AND HOSPITALITY

Philadelphia has experienced a significant increase in tourism over the last decade, fueled by several high profile, global events that the City hosted, notably the 2015 World Meeting of Families, culminating in a papal visit from Pope Francis, and the Democratic National Convention in 2016. In April 2017, Philadelphia hosted the NFL Draft on the Benjamin Franklin Parkway in Center City, with an estimated attendance of more than 250,000. Both business and convention tourism, as well as leisure tourism continue to grow and set a new record-high for room revenue generated for lodging in 2019. In 2016, Lonely Planet named Philadelphia on its top-10 best list of "unexpectedly exciting places to see," in 2017, Travel and Leisure named Philadelphia as one of the best places to visit in the world, and in November 2019, National Geographic named Philadelphia "one of the 25 must-visit destinations in the world in 2020" and was the only U.S. city included.

The Philadelphia Convention and Visitors Bureau ("PHLCVB") books meetings, conventions and sporting events and supports international marketing of Philadelphia to overseas markets. PHLCVB also books domestic group tours. Tourism Economics, an Oxford Economics Company, reported that international visitors from overseas to Philadelphia in 2018 – the most recent numbers publicly available - numbered more than 696,000, spending $723 million generating $1.2 billion in total economic impact to the Philadelphia region. According to the same source, Philadelphia ranks as the 16th most visited city in the U.S. by overseas travelers. Philadelphia's international visitation has seen significant growth over the past decade, a 18% growth in overseas travelers since 2009 (up from 593,000 in 2009).

The PHLCVB currently has 635 meetings, conventions, and sporting events booked for future years. These groups will bring a total of 3 million attendees to Philadelphia consuming 3.6 million room nights. *It should be noted that some of such events could be cancelled or postponed as a result of COVID-19.*

Visit Philadelphia markets Philadelphia domestically, as well as in Canada and Mexico, to promote leisure travel. Philadelphia has attracted more overnight leisure travelers than ever before and Center City hotels reached a landmark 1 million leisure room nights in 2016 which has grown to 1.1 million in 2019. Further, several big and new-to-the-city brands are entering the market, along with smaller boutique hotels. Leisure hotel room stays have increased 334% since 1997 and in 2018 the estimated economic impact of all visitors to Philadelphia was an estimated $7.1 billion according to the Visit Philly 2019 Annual Report.

Table 13
Greater Philadelphia Visitor Growth, 1997-2017
(In Millions)

	1997	2017	Net Change	% Change
Total Visitation	26.7	43.3	16.6	62%
Leisure- Overnight	7.3	15.1	7.8	107%
Leisure- Day	15.5	23.1	7.6	49%
Business- Overnight	1.4	2.3	0.9	64%
Business- Day	2.5	2.8	0.3	12%

Source: EConsult: Visit Philadelphia Annual Report, 2018

Philadelphia has seen an influx in new hotel development, with numerous new developments underway or confirmed. Since 2015, there has been notable hotel development in the City, representing over $1 billion in investment. The number of hotel rooms available in the City in 1993 was 5,613, with occupancy at 65%. In 2019, two major hotels opened – the Four Seasons and Pod Philly – bringing the City's hotel room inventory to 17,279 rooms at year-end, with occupancy at 76.4% Several hotel projects are currently under development, which will increase hotel room inventory by close to 1,660 rooms.

Museum and Cultural Centers

Crucial to tourism is the City's robust arts and culture sector. One in three tourists who come to Center City cite museums and cultural events as the primary reason for their visit. Top attractions in

Philadelphia include Independence National Park, the Philadelphia Museum of Art, the Philadelphia Zoo, and Reading Terminal Market.

Organizations like the Philadelphia Museum of Art, the Kimmel Center, FringeArts, and more than 430 smaller cultural organizations throughout the City help improve the quality of life for residents and visitors. The Greater Philadelphia Cultural Alliance reported in 2017 that arts and culture produced $3.4 billion in economic impact and contributed $930 million in household income in the City.

Avenue of the Arts (South Broad Street) Investments

The Avenue of the Arts is located along a mile-long section of South Broad Street between City Hall and Washington Avenue, in the heart of Center City. Reinventing South Broad Street as the Avenue of the Arts, a world class cultural destination, has been a civic goal in Philadelphia for more than two decades. Cultural institutions, the William Penn Foundation, local property owners and civic leaders advanced the idea of a performing arts district on South Broad Street anchored by the Academy of Music and modeled after successful performing arts districts around the country. The Avenue of the Arts became a key element of the City's strategy to strengthen Center City as the region's premier cultural destination and an important element in the City's bid to expand its convention and tourism industries.

The Benjamin Franklin Parkway

Complementing the Avenue of the Arts theater district developments, the Benjamin Franklin Parkway (the "Parkway") is considered the spine of Philadelphia's museum district. Designed by French architect Jacques Gréber, to emulate the Champs Elysées of Paris, the Parkway opened in 1929. It runs from the area of City Hall to the Philadelphia Museum of Art and is a central public space and tourist attraction. Key Parkway features include Love Park (which has undergone major renovations and was reopened in the spring of 2018), the Philadelphia Museum of Art, the Rodin Museum, the Franklin Institute, The Barnes Foundation, the Free Library of Philadelphia, the Academy of Natural Sciences, the Swann Memorial Fountain, Sister Cities Park, Cathedral Basilica of Saints Peter and Paul on Logan Square, and numerous pieces of public art.

The Barnes Foundation, which opened on the Parkway in 2012, is a welcome addition to the City's impressive roster of arts facilities and has had a significant impact on the City's leisure and hospitality industry. As of 2018, the Barnes has welcomed over 1.8 million visitors from all 50 states and 70 countries. With 18,000 household memberships, it is ranked among the top institutions of its kind in the country.

Historic District

Key to the City's leisure and hospitality growth is the maintenance and investment in the City's extraordinary historic assets. As the birthplace of the country, Philadelphia remains a major tourist destination year-round, particularly the City's Historic District, which includes various museums and cultural centers, as well as such national treasures as the Liberty Bell, Independence Hall, Carpenters' Hall, the Betsy Ross House and Elfreth's Alley, the Nation's oldest residential street. The City continues to invest in the maintenance and expansion of the Historic District's tourist experience. Such district is expected to remain competitive in the national and international tourism markets for years to come.

North Broad Street and the Philadelphia Convention Center

In 1993, with support from the Commonwealth, the Pennsylvania Convention Center (the "Convention Center") was completed, providing a total of 624,000 square feet of saleable space across its four exhibit halls, ballroom and banquet spaces. In 2011, a $786 million expansion, across 20 acres of central Philadelphia real estate, increased the facility to 2.3 million square feet. It is the largest single public works project in Pennsylvania history.

In 2014, SMG began managing and operating the Convention Center, instituting a number of measures intended to reduce and control show costs and improve customer service. In 2019, hotel rooms booked related to events taking place at the Convention Center grew by 11% year-over-year.

Following the 2011 expansion of the Convention Center, development efforts in the North Broad Street area increased. This includes improvements to the Lenfest Plaza at the Pennsylvania Academy of Fine Arts, the opening of the Aloft Hotel, the re-opening of the Philadelphia Metropolitan Opera House, the revitalization of the Divine Lorraine and the Studebaker Building, and much more. Development continues to move north along Broad Street, with significant investment taking place to restore the Beury Building and the Uptown Theater, and to establish the North Station District, a transit-oriented, mixed-use development. There is approximately $1 billion in assessed commercial property value along North Broad Street between City Hall and Germantown Avenue.

South Philadelphia Sports Complex

Another key element of Philadelphia's hospitality industry is professional sports. Philadelphia is the only city to have a professional hockey, basketball, baseball, and football team playing in a single district within the City, the Sports Complex Special Services District, created by the City in 2000.

The South Philadelphia Sports Complex houses three professional sports facilities: The Wells Fargo Center opened in 1996 and is home to the Philadelphia Flyers (National Hockey League) and Philadelphia 76ers (National Basketball Association); Lincoln Financial Field opened in 2003 and is home to the Philadelphia Eagles (National Football League); and Citizens Bank Park opened in 2004 and is home to the Philadelphia Phillies (Major League Baseball). The Phillies and the Eagles are contractually obligated to play in Philadelphia until 2033 and 2034, respectively.

Within the South Philadelphia Sports Complex is Xfinity Live!, a sports entertainment and dining complex. There are also plans to expand this area to include retail, hotel, and theater space, a casino, a spa, and a conference center.

Retail Market, Food and Dining

In the last five years, the City's retail market has grown substantially, attracting 90 national retailers. With nearly 193,000 residents, 308,000 workers, 3.6 million occupied hotel room nights and 111,000 college students in and around Center City, the market generates more than $1 billion in annual retail demand. More than 1.4 million square feet of retail space is currently under construction with significant development surging east of Broad Street, with some of Philadelphia's most ambitious retail and mixed-use projects.

Market East, an important commercial area between City Hall and the City's Historic District is experiencing significant development. New developments in Market East represent a $910 million investment that is creating a continuous shopping and dining experience from Independence Mall to the major Center City convention hotels, just east of City Hall. In late 2019, Fashion District Philadelphia opened to the public. A $420 million redevelopment project, the Fashion District is a unique retail development offering fashion, dining, entertainment, and arts and culture. The revitalization of this section of the City, containing a major transport hub, is expected to be transformative.

Complementing the rise of retail in Philadelphia, the City has experienced a revival of restaurant establishments, especially in Center City and Greater Center City, indicating an improved quality of life and vibrancy of those neighborhoods. Increased investment in Center City to beautify the area, as well as the City's support in making the area more welcoming to visitors and diners, has sparked a significant increase in the number of indoor/outdoor dining establishments throughout Center City, which now total over 1,058.

TRANSPORTATION

The residents of the City and surrounding counties are served by a commuter transportation system operated by SEPTA. This system includes two subway lines, a network of buses and trolleys, and a commuter rail network joining Center City and other areas of the City to PHL (as defined herein) and to the surrounding counties. For more information on SEPTA, see "– Southeastern Pennsylvania Transportation Authority" and APPENDIX IV – "EXPENDITURES OF THE CITY – City Payments to SEPTA."

A high-speed train line runs from southern New Jersey to Center City and is operated by the Port Authority Transit Corporation ("PATCO"), a subsidiary of the Delaware River Port Authority. On the average weekday, PATCO brings approximately 30,000 riders to Philadelphia.

New Jersey Transit operates 19 different bus routes and the Atlantic City Train Line, all of which serve to connect Philadelphia and New Jersey. On the average weekday, the New Jersey Transit bus routes bring approximately 4,000 riders to Philadelphia and the Atlantic City Line brings approximately 1,400 riders to Philadelphia.

Amtrak, SEPTA, Norfolk Southern, CSX Transportation, Conrail and the Canadian Pacific provide inter-city commuter and freight rail services connecting the City to other major cities and markets in the United States. According to Amtrak, Philadelphia's 30th Street Station is the third busiest station in the United States. Structural improvements of $30 million were recently completed to the station, and an additional $60 million restoration project is awaiting federal approval. SEPTA was recently awarded a $15 million federal grant towards a $37 million project to renovate the Market Frankford Line subway entrances at 30th Street, the busiest transit route in the Philadelphia region.

The City now has one of the most accessible downtown areas in the nation with respect to highway transportation by virtue of Interstate 95 ("I-95"); Interstate 676 (the "Vine Street Expressway"), running east-to-west through the CBD between Interstate 76 (the "Schuylkill Expressway") and I-95; and Interstate 476 (the "Blue Route") in suburban Delaware and Montgomery Counties, which connects the Pennsylvania Turnpike and I-95 and connects to the Schuylkill Expressway, which runs to Center City. In addition, more than 100 truck lines serve the Philadelphia area.

The City is served within city limits by numerous private buses and shuttles. These buses and shuttles are operated by apartment complexes, universities, and private companies. These buses and shuttles connect Philadelphians to transit hubs, employment, and residences. A rail line reaches PHL in less than 20 minutes from the City's central business district and connects directly with the commuter rail network and the Pennsylvania Convention Center.

Philadelphia launched the Indego bike share program, sponsored by Independence Blue Cross, in April 2015. The system launched with 600 bicycles and 70 stations throughout the City from Temple University in North Philadelphia to Tasker Street in South Philadelphia and from the Delaware River on the east to 44th Street in West Philadelphia. Indego is the first bike share system in the United States to launch with a cash payment option for members. Over the past five years, the City expanded Indego to

1,400 bicycles and 141 bike share stations, with stations as far north as Diamond Street in North Philadelphia, down to the Navy Yard in South Philadelphia, and from the Delaware River in the east to 48th Street in the west. In 2019, electric-assist bicycles were added to the fleet and proved extremely popular with users – they were used approximately 4 times as often as standard bicycles. Over the course of the year, 742,000 trips were taken.

Southeastern Pennsylvania Transportation Authority

SEPTA operates facilities across the PMSA, encompassing approximately 2,200 square miles and serving approximately 4.1 million inhabitants. SEPTA operates service 24 hours a day, seven days a week, 365 days a year. A significant segment of the region relies on SEPTA for public transportation and annual SEPTA ridership totaled more than 292.9 million in Fiscal Year 2019.

SEPTA's operations are accounted for in three separate divisions: City Transit; Regional Rail; and Suburban Transit. The City Transit Division serves the City with a network of 89 subway-elevated, light rail, trackless trolley and bus routes, providing approximately 852,000 unlinked passengers trips per weekday. The Regional Rail Division serves the City and the local counties with a network of 13 commuter rail lines providing approximately 120,000 passenger trips per weekday.

SEPTA continues to rehabilitate and replace critical infrastructure and systems, such as substations, bridges, and stations. Its long-term capital program includes (i) safety and security enhancements, (ii) modernization of communication, signal equipment, and fare collection systems, (iii) replacement of rail vehicles that have exceeded their useful life, (iv) enhancing accessibility, (v) expanding capacity to address ridership growth, (vi) expanding its fleet of hybrid buses, and (vii) performing vehicle overhauls to optimize vehicle performance.

Airport System

The Airport System serves residents and visitors from a broad geographic area that includes eleven counties within four states: Pennsylvania, New Jersey, Delaware, and Maryland. The Airport System consists of the Philadelphia International Airport ("PHL" or the "Airport") and Northeast Philadelphia Airport ("PNE").

Philadelphia International Airport

PHL is classified by the Federal Aviation Administration as a large air traffic hub (enplaning 1.0% or more of the total passengers enplaned in the U.S.). According to data reported by Airports Council International – North America, PHL was ranked the twentieth busiest airport in the United States, serving 31.7 million passengers in calendar year 2018. PHL is located approximately seven miles from Center City on approximately 2,598 acres.

PHL has four runways, consisting of two parallel runways, a crosswind runway, and a commuter runway, as well as interconnecting taxiways. PHL's terminal facilities consist of seven terminal units, totaling approximately 3.2 million square feet. Such terminal facilities include ticketing areas, passenger and baggage screening areas, passenger hold rooms and other amenities, baggage claim areas, approximately 175 food, retail and service establishments, and other support areas. PHL also has six active cargo facilities, a variety of support buildings, training areas, an air traffic control tower, a fixed-base operator, corporate hangars, a fueling supply facility, two American Airlines aircraft maintenance hangars, and a first-class office complex.

Outside of the PHL terminal area, there are a 14-story, 419-room hotel, seven rental car facilities, a 150-vehicle cell-phone lot, and two employee parking lots with more than 4,000 spaces. This area also includes five parking garages and surface lots consisting of more than 18,900 vehicle spaces, operated by the Philadelphia Parking Authority.

The current Airport-Airline Use and Lease Agreement (the "Airline Agreement") between PHL and the airlines began July 1, 2015 and has a five-year term with options for two one-year extensions. The Airline Agreement was approved by City Council in June 2015.

Capital Development. The Airport System's long-term capital program includes (i) terminal and landside improvements, (ii) airfield improvements, (iii) security and information technology improvements, and (iv) land acquisition and ground transportation improvements, among other things.

PHL Passenger and Other Traffic Activity. The table below shows PHL passenger and cargo activity. In Fiscal Year 2019, PHL enplaned passenger traffic increased by 5.5%, domestic enplanements increased by 5.0%, international enplanements increased by 9.0%, and total cargo traffic increased by 12.9%.

	Fiscal Year 2019	**Fiscal Year 2018**
Domestic Enplanements	14,046,663	13,372,943
International Enplanements	2,041,761	1,872,510
Total Enplanements	16,088,424	15,245,453
Freight (US tons)	554,606	487,086
Mail (US tons)	21,664	23,344
Total (US tons)	576,270	510,430

Northeast Philadelphia Airport

PNE is located approximately ten miles northeast of Center City on approximately 1,118 acres. PNE serves as a reliever airport for PHL and provides for general aviation, air taxi, corporate, and occasional military use. PNE currently has no scheduled commercial service. There are a variety of hangars (corporate and general aviation) at PNE. There are approximately 175 general aviation aircraft based at PNE. The Airport System's long-term capital program includes PNE improvement projects.

Port of Philadelphia

The Port of Philadelphia (the "Port") is located on the Delaware River within the City limits. The Port's facilities are serviced by two Class I railroads (CSX and Norfolk Southern) and provide service to major eastern Canadian points, as well as Midwestern, southern and southeastern U.S. destinations. Terminal facilities, encompassing four million square feet of warehousing, are located in close proximity to Interstate 95 and Interstate 76. Over 1,600 local general freight trucking companies operate in the MSA, according to Hoover's Inc.

The Philadelphia Regional Port Authority (the "PRPA") reported approximately 6.3 million metric tons of cargo moved through the Port in 2016, the second year of more than 6 million tons of cargo in a single calendar year, representing a 2.7% increase over 2015. The Port is the top-ranked port for meat importing in the United States, and is among the nation's leaders for fruit, cocoa, forest products and steel imports. In December 2015, the PRPA secured a new shipping service that will link directly with burgeoning port operations on the Gulf of Mexico at Veracruz and Altamira. This service will target commodities including goods such as avocados, lemons, tomatoes and commercial cargo.

As part of an ongoing project, the PRPA has been working to increase the Port's competitiveness by increasing capacity by deepening the main channel of the Delaware River from 40 to 45 feet. Improvements will double container and auto capacity at the Port and increase the Port's ability to handle wood pulp, a food grade commodity.

KEY CITY-RELATED SERVICES AND BUSINESSES

Water and Wastewater

The water and wastewater systems of the City are owned by the City and operated by the City's Water Department (the "Water Department"). The water and wastewater systems are referred to herein individually as the "Water System" and "Wastewater System", respectively.

The Water System's service area includes the City and has one wholesale water service contract. Based on the 2018 U.S. Census Bureau estimate, the Water System served 1,584,138 individuals. As of June 30, 2019, the Water System served approximately 490,000 active customer accounts using approximately 3,100 miles of mains and approximately 25,000 fire hydrants.

The City obtains approximately 58% of its water from the Delaware River and the balance from the Schuylkill River. The City is authorized by the Pennsylvania Department of Environmental Protection (the "PaDEP") to withdraw up to 423 million gallons per day ("MGD") from the Delaware River and up to 258 MGD from the Schuylkill River. On September 27, 2016, the PaDEP issued the Water Department a new water allocation permit, which expires on September 27, 2041. Under the new permit, the amount the City is authorized to withdraw from each river has not changed.

Water treatment is provided by the Samuel S. Baxter Water Treatment Plant on the Delaware River and by the Belmont and Queen Lane Water Treatment Plants on the Schuylkill River. The combined rated treatment capacity of these plants under the Water Department's Partnership for Safe Water procedures is 546 MGD. The combined maximum source water withdrawal capacity from the two rivers that supply these plants is 680 MGD. The excess source water capacity enables higher than normal withdrawal from either river should conditions limit withdrawals from one.

The Wastewater System's service area includes the City and ten wholesale wastewater service contracts. Based on the 2018 U.S. Census Bureau estimate, the Water System served 1,584,138 individuals that live in the City and ten wholesale contracts.

As of June 30, 2019, the Wastewater System served approximately 545,000 accounts, including approximately 60,000 stormwater-only accounts and ten wholesale contracts with neighboring municipalities and authorities.

The Wastewater System consists of three water pollution control plants, the Northeast, Southwest and Southeast water pollution control plants (the "WPCPs"), 29 pumping stations, approximately 3,700 miles of sewers, and a privately managed centralized biosolids handling facility. It includes approximately 1,850 miles of combined sewers, 770 miles of sanitary sewers, 750 miles of stormwater sewers, 16 miles of force mains (sanitary and storm) and 330 miles of appurtenant piping. The three WPCPs processed a combined average of 484 MGD of wastewater in Fiscal Year 2019, have a 522 MGD combined average daily design capacity and a peak capacity of 1,059 MGD.

Solid Waste Disposal

The City is responsible for collecting solid waste, including recycling, from residential households and some commercial establishments. On average, approximately 2,300 tons of solid waste per day are collected by the City. Municipal solid waste is disposed of through a combination of recycling processing facilities, private and City transfer stations within the City limits, and at various landfills operated outside the City limits.

Parks

The City was originally designed by William Penn and Thomas Holme around five urban parks, each of which remains in Center City to this day. The City's parklands total over 10,300 acres, and include Fairmount Park, the world's largest landscaped urban park at 9,200 acres, Pennypack Park, and the Philadelphia Zoo, the country's first zoo. The City also offers its residents and visitors America's most historic square mile, which includes Independence Hall and the Liberty Bell. Under the Rebuild initiative, an estimated $500 million will be invested in Philadelphia parks, recreation centers, playgrounds and libraries in the next several years.

Libraries

The Free Library of Philadelphia, the City's public library system, comprises 54 branches and an extensive online resource system.

Streets and Sanitation

The Philadelphia Streets Department (the "Streets Department") and the divisions within it are responsible for the City's large network of streets and roadways. The City's pavement condition is considered to be a "Fair" pavement condition. In order for the City to maintain its pavement in a state of good repair, local streets should be repaved once every 20 years and arterials should be repaved once every 10 years. This requires approximately 131 miles of paving every year. The pavement program has accumulated a backlog of approximately 1,100 miles since 1996. As a result of the new funding under Act 89, the Streets Department has funds to address long standing state of good repair needs without an additional allocation from the General Fund. During Fiscal Years 2014-2017, the Streets Department invested in critical equipment replacements and began to implement a strategy to address recurring state of good repair needs. This includes critical equipment replacement, street paving and pothole repair, and replacement of traffic control equipment.

The Streets Department is also responsible for the ongoing collection and disposal of residential trash and recyclables, as well as the construction, cleanliness and maintenance of the street system. The streets system in Philadelphia totals 2,575 miles - 2,180 miles of City streets, 35 miles of Fairmount Park roads and 360 miles of state highways. The Highway Unit and Sanitation Division annually collects and disposes of approximately 600,000 tons of rubbish and 125,000 tons of recycling, completes over 48,000 miles of mechanical street cleaning, clears 1,800 major illegal dump sites, and removes over 155,000 abandoned tires.

Sustainability and Green Initiatives

Mayor Kenney continues the City's commitment to make Philadelphia the greenest and most sustainable city in America. To aid in achieving this goal, the Philadelphia Energy Authority has been tasked with improving energy sustainability and affordability in the City and with educating consumers on their energy choices. The City is investing in and evaluating additional options and investing in green infrastructure to better manage storm water reclamation and reduce pollution of the City's public waters. There has been extensive investment in creating more and better public green spaces, such as Love Park in Center City, as well as green spaces along both the Delaware and Schuylkill Rivers. Finally, the City has been taking steps to further reduce automobile traffic, congestion and pollution by making Philadelphia's streets increasingly friendly to bicyclists. The City introduced its new bicycle sharing system, Indego, in 2015, as further described in "TRANSPORTATION."

APPENDIX VI

FORM OF APPROVING OPINION OF CO-BOND COUNSEL

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APPENDIX VI

FORM OF APPROVING OPINION OF CO-BOND COUNSEL

August 6, 2020

Re: City of Philadelphia, Pennsylvania $201,530,000 Water and Wastewater Revenue Bonds and Revenue Refunding Bonds, Series 2020A and $95,025,000 Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B

Ladies and Gentlemen:

We have acted as Co-Bond Counsel to the City of Philadelphia (the "City") in connection with the issuance by the City of $201,530,000 Water and Wastewater Revenue Bonds and Revenue Refunding Bonds, Series 2020A (the "Tax-Exempt Bonds"), and $95,025,000 Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B (the "Taxable Bonds" and, together with the Tax-Exempt Bonds, the "Bonds"). The Bonds are issued under and pursuant to (a) The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972 (the "Act"); (b) the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989 approved June 24, 1993, as amended by an Ordinance approved on January 23, 2007 and the Twenty-First Supplemental Ordinance approved by the Mayor on April 24, 2018 (as so amended, the "General Ordinance"), and as supplemented, including by the Eighteenth Supplemental Ordinance approved by the Mayor on December 8, 2015, and the Twentieth Supplemental Ordinance approved by the Mayor on April 18, 2018, (collectively, the "Supplemental Ordinances"); and (c) the Bond Committee Determination dated July 22, 2020 (the "Bond Committee Determination"). Capitalized terms used but not defined herein have the meanings assigned to such terms in the General Ordinance.

The Tax-Exempt Bonds are being issued for the purpose of providing funds that will be used to finance (a) capital improvements to the City's Water System and Wastewater System (the "System"), including funding of capitalized interest, (b) the refunding of all or a portion of the City's outstanding Water and Wastewater Revenue Bonds, Variable Rate Series 1997B and Water and Wastewater Revenue Bonds, Series 2010C (collectively, the "Refunded Bonds") and (c) the costs of issuance of the Tax-Exempt Bonds.

The Taxable Bonds are being issued for the purpose of providing funds that will be used to finance (a) the refunding of all or a portion of the City's outstanding Water and Wastewater Revenue Refunding Bonds, Series 2011B, Water and Wastewater Revenue Refunding Bonds, Series 2012 and Water and Wastewater Revenue Refunding Bonds, Series 2013A (collectively, the "Defeased Bonds"), and (b) the costs of issuance of the Taxable Bonds.

The City previously has issued, pursuant to the General Ordinance, and there are outstanding Water and Wastewater Revenue Bonds and Water and Wastewater Revenue Refunding Bonds, consisting of (including the Refunded Bonds and the Defeased Bonds) the Variable Rate Series 1997B, the Series 2009B (Pennvest), the Series 2009C (Pennvest), the Series 2009D (Pennvest), the 2010B (Pennvest), the Series 2010C, the Series 2011A, the Series 2011B, the Series 2012, the Series 2013A, the Series 2014A, the Series 2015A, the Series 2015B, the Series 2016, the Series 2017A, the Series 2017B, Series 2018A, the Series 2019A and the Series 2019B (collectively, the "Outstanding Bonds"). The Outstanding Bonds, the Bonds and all other Water and Wastewater Revenue Bonds hereafter issued by the City under the General Ordinance are and will be equally and ratably secured to the extent provided in the General Ordinance and the Act by the pledge of, and the security interest created in, all Project Revenues derived from the water and wastewater systems of the City and all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established pursuant to the General Ordinance.

The City has covenanted in the Supplemental Ordinances and the Bond Committee Determination that it will make or permit no investment or other use of the proceeds of the Tax-Exempt Bonds that would cause the Tax-Exempt Bonds to be "arbitrage bonds" under Section 148 of the Internal Revenue Code of 1986, as amended (the "Code"), and the rules promulgated thereunder, and that it will comply with the requirements of said Section throughout the term of the Tax-Exempt Bonds. The City has further covenanted that it will comply with the requirements of the Code that must be met after the issuance of the Tax-Exempt Bonds in order that interest on the Tax-Exempt Bonds be excluded from gross income for federal income tax purposes. An officer of the City has executed a certificate stating the reasonable expectations of the City on the date of issue of the Tax-Exempt Bonds as to future events that are material for purposes of Section 148 of the Code pertaining to arbitrage bonds. We have reviewed this certificate, and in our opinion the Tax-Exempt Bonds are not arbitrage bonds. The City is filing with the Internal Revenue Service a report of the issuance of the Tax-Exempt Bonds as required by Section 149(e) of the Code as a condition of the exclusion from gross income of the interest on the Tax-Exempt Bonds for federal income tax purposes. We have not undertaken to monitor compliance with respect to the aforesaid covenants or to advise any party as to changes in the law that may affect the exclusion of interest on the Tax-Exempt Bonds from gross income for federal income tax purposes.

We have examined such proceedings, documents, statutes and decisions, as we consider necessary as the basis for this opinion, including, *inter alia*, the Act, the General Ordinance, the Supplemental Ordinances, the Bond Committee Determination, and the executed and authenticated Bonds. We assume that all other Bonds have been similarly executed and authenticated. We also assume that all documents, records, certifications and other instruments examined by us are genuine (including the signatures thereon), accurate and complete and we have not undertaken, by independent investigation, to verify the factual matters set forth in any such documents, records, certifications or other instruments.

Based on the foregoing, it is our opinion that:

1. The City has the power under the Constitution and the laws of the Commonwealth of Pennsylvania (the "Commonwealth") to perform its obligations under the General Ordinance, the Supplemental Ordinances, the Bond Committee Determination and the Bonds.

2. Under the Constitution and the laws of the Commonwealth, including the Act, the City is authorized to issue the Bonds, and the terms of the Bonds comply with the requirements of the Act, the General Ordinance, the Supplemental Ordinances and the Bond Committee Determination.

3. The purposes for which the Bonds have been issued are lawful purposes under the Act and the General Ordinance.

4. The General Ordinance and the Supplemental Ordinances have been duly enacted, and the Bond Committee Determination has been duly authorized, executed and delivered by the City, and each is a legal, valid and binding obligation of the City enforceable in accordance with its terms, except as the rights created thereunder and the enforcement thereof may be limited by bankruptcy, insolvency, moratorium or other laws or legal or equitable principles affecting the enforcement of creditors' rights.

5. The Bonds have been duly authorized, executed, authenticated, issued and delivered and are legal, valid and binding obligations of the City, enforceable in accordance with their terms, except as enforcement may be limited as described in paragraph 4 above.

6. Under the Act and the General Ordinance, the Bonds constitute special obligations of the City payable solely from Project Revenues and all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established pursuant to the General Ordinance, together with interest earnings, if any, on amounts in such funds and accounts (other than the Rebate Fund). The Bonds do not pledge the credit or taxing power or create any debt or charge against the tax or general revenues of the City or create any lien against property of the City other than all amounts on deposit in or standing to the credit of the funds and accounts (other than the Rebate Fund) established pursuant to the General Ordinance, together with interest earnings on amounts in such funds and accounts (other than the Rebate Fund).

7. In the opinion of Co-Bond Counsel, interest on the Tax-Exempt Bonds is excludable from gross income for purposes of federal income tax under existing laws as enacted and construed on the date of initial delivery of the Tax-Exempt Bonds, assuming the accuracy of the certifications of the City and continuing compliance by the City with the requirements of the Code. Interest on the Tax-Exempt Bonds is not an item of tax preference for purposes of federal alternative minimum tax. Co-Bond Counsel express no opinion regarding other federal tax consequences of ownership or disposition of, or the accrual or receipt of interest on, the Tax-Exempt Bonds.

Original issue premium on a Tax-Exempt Bond issued at an issue price that exceeds its principal amount is amortizable periodically over the term of a Tax-Exempt Bond through reductions in the holder's tax basis for the Tax-Exempt Bond for determining taxable gain or loss from sale or from redemption prior to maturity. Amortization of premium does not create a deductible expense or loss.

In rendering this opinion, we have assumed compliance by the City with the covenants contained in the General Ordinance, the Supplemental Ordinances and the Bond Committee Determination that are intended to comply with the requirements in the Code relating to actions to be taken by the City in respect of the Tax-Exempt Bonds after the issuance thereof to the extent necessary to effect or maintain the federal exclusion from gross income of the interest on the Tax-Exempt Bonds. Failure to comply with such covenants could cause the interest on the Tax-Exempt Bonds to be includable in gross income retroactively to the date of issuance of the Tax-Exempt Bonds.

8. Interest on the Taxable Bonds is not excludable from gross income for purposes of federal income tax. We express no opinion regarding other federal tax consequences relating to ownership or disposition of, or the accrual or receipt of interest on, the Taxable Bonds.

9. Under the laws of the Commonwealth, as enacted and construed on the date of the issuance of the Bonds, interest on the Bonds is exempt from Pennsylvania personal income tax and Pennsylvania corporate net income tax.

We render this opinion as of the date hereof on the basis of federal law and the laws of the Commonwealth as enacted and construed on the date hereof. We express no opinion as to any matter not set forth in the numbered paragraphs herein, including, without limitation, the accuracy or completeness of the preliminary or final official statement or other documents prepared or statements made in connection with the offering and sale of the Bonds, and make no representation that we have independently verified the contents thereof.

Very truly yours,

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APPENDIX VII

FORM OF CONTINUING DISCLOSURE AGREEMENT

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CONTINUING DISCLOSURE AGREEMENT

This Continuing Disclosure Agreement (the "Agreement") dated August 6, 2020, is entered into and by and between The City of Philadelphia, Pennsylvania ("City") and Digital Assurance Certification, L.L.C., as dissemination agent ("Dissemination Agent") in connection with the issuance and sale by the City of Philadelphia, Pennsylvania (the "City") of $201,530,000 aggregate principal amount of its Water and Wastewater Revenue Bonds and Revenue Refunding Bonds, Series 2020A and its $95,025,000 aggregate principal amount of its Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B (together, the "Bonds"). The Bonds are being issued pursuant to the Act and the General Ordinance. Capitalized terms used in this Agreement but not defined herein shall have the meanings ascribed to such terms in the Official Statement, including Appendix III-A and Appendix III-B thereto.

In consideration of the mutual covenants, promises and agreements contained herein and intending to be legally bound hereby, the parties hereto agree as follows:

ARTICLE I

The Undertaking

Section 1.1. Purpose. This Agreement is authorized to be executed and delivered by the City pursuant to the General Ordinance and Section 7 of the Bond Committee Determination in order to assist the Underwriters in complying with subsection (b)(5) of the Rule.

Section 1.2. Annual Financial Information. (a) Commencing with the fiscal year ending June 30, 2020, the Disclosure Representative shall deliver to the Dissemination Agent no later than February 28, 2021, and no later than each succeeding February 28 thereafter, Annual Financial Information with respect to each fiscal year of the City. The Dissemination Agent shall promptly upon receipt thereof file the Annual Financial Information with EMMA (as defined herein).

(b) The Dissemination Agent shall provide, in a timely manner, notice of any failure of the City to provide the Annual Financial Information by the date specified in subsection (a) hereof.

Section 1.3. Audited Financial Statements. If not provided as part of Annual Financial Information by the date required by Section 1.2(a) hereof, the Disclosure Representative shall provide Audited Financial Statements, when and if available, to the Dissemination Agent. The Dissemination Agent shall promptly upon receipt thereof file such Audited Financial Statements with EMMA.

Section 1.4. Notice Events. (a) If a Notice Event occurs, the Disclosure Representative shall provide through the Dissemination Agent, in a timely manner not in excess of ten (10) business days after the occurrence of such Notice Event, notice of such Notice Event to EMMA.

(b) Any notice of a defeasance of the Bonds shall state whether the Bonds have been escrowed to maturity or to an earlier redemption date and the timing of such maturity or redemption.

(c) Each Notice Event notice relating to the Bonds shall include the CUSIP numbers of the Bonds to which such Notice Event notice relates or, if the Notice Event notice relates to all bond issues of the City including the Bonds, such Notice Event notice need only include the CUSIP number of the City.

(d) The Dissemination Agent shall promptly advise the City whenever, in the course of performing its duties as Dissemination Agent under this Agreement, the Dissemination Agent has actual notice of an occurrence which, if material, would require the City to provide notice of a Notice Event hereunder; provided, however, that the failure of the Dissemination Agent so to advise the City shall not constitute a breach by the Dissemination Agent of any of its duties and responsibilities under this Agreement.

Section 1.5. Additional Information. Nothing in this Agreement shall be deemed to prevent the City from disseminating any other information, using the means of dissemination set forth in this Agreement or any other means of communication, or including any other information in any Annual Financial Information or notice of Notice Event hereunder, in addition to that which is required by this Agreement. If the City chooses to do so, the City shall have no obligation under this Agreement to update such additional information or include it in any future Annual Financial Information or notice of a Notice Event hereunder.

Section 1.6. Additional Disclosure Obligations. The City acknowledges and understands that other state and federal laws, including but not limited to the Securities Act of 1933 and Rule 10b-5 promulgated under the Securities Exchange Act of 1934, may apply to the City and that, under some circumstances, compliance with this Agreement without additional disclosures or other action may not fully discharge all duties and obligations of the City under such laws.

ARTICLE II

Operating Rules

Section 2.1. Reference to Other Filed Documents. It shall be sufficient for purposes of Section 1.2 hereof if the City provides Annual Financial Information by specific reference to documents (i) available to the public on the MSRB Internet Web site (currently, www.emma.msrb.org) or (ii) filed with the SEC. The provisions of this Section shall not apply to notices of Notice Events pursuant to Section 1.4 hereof.

Section 2.2. Submission of Information. Annual Financial Information may be set forth or provided in one document or a set of documents, and at one time or in part from time to time.

Section 2.3. Dissemination Agent. The City has designated the Dissemination Agent as its agent to act on its behalf in providing or filing notices, documents and information as required of the City under this Agreement. The City may revoke or modify such designation. Upon any revocation of such designation, the City shall comply with its obligation to provide or file notices, documents and information as required under this Agreement or may designate another agent to act on its behalf.

Section 2.4. Transmission of Notices, Documents and Information. (a) Unless otherwise required by the MSRB, all notices, documents and information provided to the MSRB shall be provided to the MSRB's Electronic Municipal Markets Access ("EMMA") system, the current Internet Web address of which is www.emma.msrb.org.

(b) All notices, documents and information provided on EMMA shall be provided in an electronic format as prescribed by the MSRB and shall be accompanied by identifying information as prescribed by the MSRB.

Section 2.5. Fiscal Year. (a) The City's current fiscal year begins July 1, and the City shall promptly file a notification on EMMA, through the Dissemination Agent, of any change in its fiscal year.

(b) Annual Financial Information shall be provided at least annually notwithstanding any fiscal year longer than 12 calendar months.

ARTICLE III

Effective Date, Termination, Amendment and Enforcement

Section 3.1. Effective Date; Termination. (a) This Agreement shall be effective upon the issuance of the Bonds.

(b) The City's and the Dissemination Agent's obligations under this Agreement shall terminate upon a legal defeasance, prior redemption or payment in full of all of the Bonds.

Section 3.2. Amendment. (a) This Agreement may be amended, by written agreement of the parties, without the consent of the holders of the Bonds (except to the extent required under clause (4)(ii) below), if all of the following conditions are satisfied: (1) such amendment is made in connection with a change in circumstances that arises from a change in legal (including regulatory) requirements, a change in law (including rules or regulations) or in interpretations thereof, or a change in the identity, nature or status of the City or the type of business conducted thereby, (2) this Agreement as so amended would have complied with the requirements of the Rule as of the date of this Agreement, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances, (3) the City shall have delivered to the Dissemination Agent an opinion of Counsel, addressed to the City and the Dissemination Agent, to the same effect as set forth in clause (2) above, (4) either (i) the City shall have delivered to the Dissemination Agent an opinion of Counsel or a determination by an entity, in each case unaffiliated with the City (such as bond counsel or the Dissemination Agent), addressed to the City and the Dissemination Agent, to the effect that the amendment does not materially impair the interests of the holders of the Bonds or (ii) the holders of the Bonds consent to the amendment to this Agreement pursuant to the same procedures as are required for amendments to the General Ordinance with consent of holders of Bonds pursuant to the General Ordinance as in effect at the time of the amendment, and (5) the Disclosure Representative shall have delivered copies of such opinion(s) and amendment to the Dissemination Agent. The items provided in clause (5) shall be promptly filed by the Dissemination Agent on EMMA and sent to each Registered Owner.

(b) This Agreement may be amended, by written agreement of the parties, without the consent of the holders of the Bonds, if all of the following conditions are satisfied: (1) an amendment to the Rule is adopted, or a new or modified official interpretation of the Rule is issued, after the effective date of this Agreement which is applicable to this Agreement, (2) the City shall have delivered to the Dissemination Agent an opinion of Counsel, addressed to the City and the Dissemination Agent, to the effect that performance by the City and the Dissemination Agent under this Agreement as so amended will not result in a violation of the Rule and (3) the Disclosure Representative shall have delivered copies of such opinion and amendment to the Dissemination Agent. The items provided in clause (3) shall be promptly filed by the Dissemination Agent on EMMA and sent to each Registered Owner.

(c) This Agreement may be amended by written agreement of the parties, without the consent of the holders of the Bonds, if all of the following conditions are satisfied: (1) the City shall have delivered to the Dissemination Agent an opinion of Counsel, addressed to the City and the Dissemination Agent, to the effect that the amendment is permitted by rule, order or other official pronouncement, or is consistent with any interpretive advice or no-action positions of Staff, of the SEC, and (2) the Disclosure Representative shall have delivered copies of such opinion and amendment to the Dissemination Agent. The items provided in clause (2) shall be promptly filed by the Dissemination Agent on EMMA and sent to each Registered Owner.

(d) To the extent any amendment to this Agreement results in a change in the type of financial information or operating data provided pursuant to this Agreement, the first Annual Financial Information provided thereafter shall include a narrative explanation of the reasons for the amendment and its effect on the type of operating data or financial information being provided.

(e) If an amendment is made pursuant to Section 3.2(a) hereof to the accounting principles to be followed by the City in preparing its financial statements, the Annual Financial Information for the fiscal year in which the change is made shall present a comparison between the financial statements or information prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles. Such comparison shall include a qualitative and, to the extent reasonably feasible, quantitative discussion of the differences in the accounting principles and the impact of the change in the accounting principles on the presentation of the financial information.

Section 3.3. Benefit; Third-Party Beneficiaries; Enforcement. (a) The provisions of this Agreement shall constitute a contract with and inure solely to the benefit of the holders from time to time of the Bonds, except that beneficial owners of Bonds shall be third-party beneficiaries of this Agreement. The provisions of this Agreement shall create no rights in any person or entity except as provided in this subsection (a) and in subsection (b) of this Section.

(b) The obligations of the City to comply with the provisions of this Agreement shall be enforceable by any holder of Outstanding Bonds. The holders' rights to enforce the provisions of this Agreement shall be limited solely to a right, by action in mandamus or for specific performance, to compel performance of the City's obligations under this Agreement. In consideration of the third-party beneficiary status of beneficial owners of Bonds pursuant to subsection (a) of this Section, beneficial owners shall be deemed to be holders of Bonds for purposes of this subsection (b).

(c) Any failure by the City or the Dissemination Agent to perform in accordance with this Agreement shall not constitute a default or an Event of Default under the General Ordinance, and the rights and remedies provided by the General Ordinance upon the occurrence of a default or an Event of Default shall not apply to any such failure.

(d) This Agreement shall be construed and interpreted in accordance with the laws of the Commonwealth, and any suits and actions arising out of this Agreement shall be instituted in a court of competent jurisdiction in the Commonwealth; provided, however, that to the extent this Agreement addresses matters of federal securities laws, including the Rule, this Agreement shall be construed in accordance with such federal securities laws and official interpretations thereof.

ARTICLE IV

Definitions

Section 4.1. Definitions. The following terms used in this Agreement shall have the following respective meanings:

(1) "Act" means The First Class City Revenue Bond Act, P.L. 955, Act No. 234 of the General Assembly of the Commonwealth of Pennsylvania, approved October 18, 1972.

(2) "Annual Financial Information" means, collectively, (i) the Annual Financial Report-Philadelphia Water Department for the most recently ended fiscal year and, if not included or able to be derived from information presented therein, updates to the information presented in the Official Statement under the headings and in the Tables enumerated in the schedule annexed hereto as Exhibit A and made a part hereof, (ii) financial information or operating data with respect to the City, substantially similar to the type set forth in Appendices IV and V of the Official Statement, delivered at least annually pursuant to Section 1.2(a) hereof and in accordance with the Rule and (iii) the information regarding amendments to this Agreement required pursuant to Sections 3.2(d) and (e) of this Agreement. Annual Financial Information shall include Audited Financial Statements, if available, or Unaudited Financial Statements.

In connection with Section 4.1.(2)(ii), it is the City's intention to satisfy all or a portion of the obligations set forth therein by submitting to EMMA (A) its "Annual Report of Bonded Indebtedness and Other Long Term Obligations" in substantially the same format as such report for the fiscal year ended June 30, 2020, and (B) with respect to financial information or operating data regarding the Pension System, either (i) the annual audited financial statements of the Municipal Pension Fund, (ii) an Official Statement of the City that updates the financial information and operating data under the heading "Pension System," as included in the Official Statement, or (iii) updated financial information and operating data under the heading "Pension System," as included in the Official Statement.

The descriptions contained in Section 4.1(2)(i) hereof of financial information and operating data constituting Annual Financial Information are of general categories of financial information and operating data. When such descriptions include information that no longer can be generated because the operations to which it related have been materially changed or discontinued, a statement to that effect shall be provided in lieu of such information. Any Annual Financial

Information containing modified financial information or operating data shall explain, in narrative form, the reasons for the modification and the impact of the modification on the type of financial information or operating data being provided.

(3) "Audited Financial Statements" means the annual financial statements, if any, of the City, which includes the financial statements of the Water Fund, audited by such auditor as shall then be required or permitted by Commonwealth law. Audited Financial Statements shall be prepared in accordance with GAAP; provided, however, that pursuant to Sections 3.2(a) and (e) hereof, the City may from time to time, if required by federal or Commonwealth legal requirements, modify the accounting principles to be followed in preparing its financial statements. The notice of any such modification required by Section 3.2(a) hereof shall include a reference to the specific federal or Commonwealth law a regulation describing such accounting principles, or other description thereof.

(4) "Bond Committee Determination means the Bond Committee Determination for the Bonds adopted by the Bond Committee (consisting of the Mayor, the City Solicitor and the City Controller and acting by a majority thereof) on July 22, 2020.

(5) "Commonwealth" means the Commonwealth of Pennsylvania.

(6) "Counsel" means any nationally recognized bond counsel or counsel expert in federal securities laws.

(7) "Disclosure Representative" means the Director of Finance of the City, the City Treasurer or such other official or employee of the City as the Director of Finance or the City Treasurer shall designate in writing to the Dissemination Agent.

(8) "Financial Obligation" means a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (iii) guarantee of (i) or (ii). The term Financial Obligation shall not include municipal securities as to which a final official statement has been provided to the Municipal Securities Rulemaking Board consistent with the Rule.

(9) "Fiscal Agent" means U.S. Bank National Association, as fiscal agent and registrar for the Bonds.

(10) "GAAP" means generally accepted accounting principles as prescribed from time to time for governmental units by the Governmental Accounting Standards Board, the Financial Accounting Standards Board, or any successor to the duties and responsibilities of either of them.

(11) "General Ordinance" means the City's Restated General Water and Wastewater Revenue Bond Ordinance of 1989, approved June 24, 1993, as supplemented and amended by twenty-three (23) supplemental ordinances, as further supplemented or amended from time to time.

(12) "MSRB" means the Municipal Securities Rulemaking Board established pursuant to Section 15B(b)(1) of the Securities Exchange Act of 1934, or any successor thereto or to the functions of the MSRB contemplated by this Agreement.

(13) "Notice Event" means any of the following events with respect to the Bonds, whether relating to the City or otherwise:

(i) principal and interest payment delinquencies;

(ii) non-payment related defaults, if material;

(iii) unscheduled draws on debt service reserves reflecting financial difficulties;

(iv) unscheduled draws on credit enhancements reflecting financial difficulties;

(v) substitution of credit or liquidity providers, or their failure to perform;

(vi) adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determinations of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices of determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds;

(vii) modifications to rights of Bondholders, if material;

(viii) Bond calls, if material, and tender offers;

(ix) defeasances;

(x) release, substitution, or sale of property securing repayment of the Bonds, if material;

(xi) rating changes;

(xii) bankruptcy, insolvency, receivership or similar event of the City;

(xiii) the consummation of a merger, consolidation, or acquisition involving the City or the sale of all or substantially all of the assets of the City, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material;

(xiv) appointment of a successor or additional paying agent, or the change of name of a paying agent, if material;

(xv) the incurrence of a Financial Obligation of the obligated person, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a Financial Obligation of the obligated person, any of which affect securities holders, if material; and

(xvi) A default, event of acceleration, termination event, modification of terms, or other similar events under the terms of a Financial Obligation of the obligated person, any of which reflect financial difficulties.

(14) "Official Statement" means the Official Statement dated July 22, 2020, of the City relating to the Bonds.

(15) "Registered Owner" or "Registered Owners" means the person or persons in whose name a Bond is registered on the books of the City maintained by the Fiscal Agent in accordance with the General Ordinance. For so long as the Bonds shall be registered in the name of the Securities Depository or its nominee, the term "Registered Owner" or "Registered Owners" also means and includes, for the purposes of this Agreement, the owners of book-entry credits in the Bonds evidencing an interest in the Bonds; provided, however, that the Dissemination Agent shall have no obligation to provide notice hereunder to owners of book-entry credits in the Bonds except those who have filed their names and addresses with the Dissemination Agent for the purposes of receiving notices or giving direction under this Agreement.

(16) "Rule" means Rule 15c2-12 promulgated by the SEC under the Securities Exchange Act of 1934 (17 CFR Part 240, §240.15c2-12), as amended, as in effect on the date of this Agreement, including any official interpretations thereof issued either before or after the effective date of this Agreement which are applicable to this Agreement.

(17) "SEC" means the United States Securities and Exchange Commission.

(18) "Securities Depository" shall mean The Depository Trust Company, New York, New York, or its nominee, Cede & Co., or successor thereto appointed pursuant to the General Ordinance.

(19) "Unaudited Financial Statements" means the same as Audited Financial Statements, except that they shall not have been audited.

(20) "Underwriters" means the financial institutions named on the cover of the Official Statement.

ARTICLE V

Miscellaneous

Section 5.1. Duties, Immunities and Liabilities of the Dissemination Agent. The Dissemination Agent shall have only such duties under the Agreement as are specifically set forth in this Agreement, and the City agrees to indemnify and save the Dissemination Agent, its officers, directors, employees and agents, harmless against any loss, expense and liabilities which it may incur arising out of or in the exercise or performance of its powers and duties hereunder, including the costs and expenses (including attorneys' fees) of defending against any claim of liability, but excluding liabilities due to the Dissemination Agent's negligence or willful misconduct in the performance of its duties hereunder. The obligations of the City under this Section shall survive resignation or removal of the Dissemination Agent and payment of the Bonds.

Section 5.2. Counterparts. This Agreement may be executed in several counterparts, each of which shall be an original and all of which shall constitute but one and the same instrument.

IN WITNESS WHEREOF, THE CITY OF PHILADELPHIA, PENNSYLVANIA, has caused this Disclosure Agreement to be executed by the Director of Finance and DIGITAL ASSURANCE CERTIFICATION, L.L.C., as Dissemination Agent, has caused this Disclosure Agreement to be executed by one of its authorized officers, all as of the day and year first above written.

THE CITY OF PHILADELPHIA,
PENNSYLVANIA

By:____________________________
Name: Rob Dubow
Title: Director of Finance

DIGITAL ASSURANCE CERTIFICATION,
L.L.C.,
as Dissemination Agent

By:____________________________
Name:
Title:

EXHIBIT A

Table 1 – Debt Service Requirements

Table 2 – Outstanding Indebtedness

Table 5 – Capital Improvement Program and COA Budget

Table 8 – Condensed Statement of Net Position

Table 9 – Historical Operating Results

Table 10 – Rate Covenant Compliance

APPENDIX VIII

BOOK-ENTRY ONLY SYSTEM

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BOOK-ENTRY ONLY SYSTEM

DTC will act as securities depository for the Bonds. The Bonds will be initially issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered Bond certificate will be issued for each maturity of the Bonds, each in the aggregate principal amount thereof, and will be deposited with DTC.

DTC, the world's largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve System, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.6 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC's participants ("Direct Participants") deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants' accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation ("DTCC"). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). DTC has an S&P rating of "AA+." The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at www.dtcc.com and www.dtc.org.

Purchases of the Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Bonds on DTC's records. The ownership interest of each actual purchaser of each Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Bonds are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in the Bonds, except in the event that use of the book-entry system for the Bonds is discontinued.

To facilitate subsequent transfers, all Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to DTC. If less than all the Bonds of a series within a maturity are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to the Bonds unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the issuer as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on the Bonds will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the City or the Fiscal Agent, on payable dates in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC, the Fiscal Agent, or the City, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the City or the Fiscal Agent, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to the Bonds at any time by giving reasonable notice to the City or the Fiscal Agent. Under such circumstances, in the event that a successor depository is not obtained, bond certificates are required to be printed and delivered.

The City may decide to discontinue use of the system of book-entry-only transfers through DTC (or a successor securities depository). In that event, bond certificates will be printed and delivered.

THE CITY AND THE FISCAL AGENT WILL NOT HAVE ANY RESPONSIBILITY OR OBLIGATION TO DTC PARTICIPANTS OR THE PERSONS FOR WHOM THEY ACT AS NOMINEES WITH RESPECT TO THE ACCURACY OF THE RECORDS OF DTC, ITS NOMINEE OR ANY DTC PARTICIPANT WITH RESPECT TO ANY OWNERSHIP INTEREST IN THE BONDS, OR PAYMENTS TO, OR THE PROVIDING OF NOTICE FOR, DTC PARTICIPANTS OR THE INDIRECT PARTICIPANTS OR BENEFICIAL OWNERS.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the City believes to be reliable, but the City takes no responsibility for the completeness or accuracy thereof, or the absence of materially adverse changes in such information subsequent to the date hereof. For further information, Beneficial Owners should contact DTC in New York, New York.

CITY OF PHILADELPHIA, PENNSYLVANIA
Water and Wastewater Revenue and Revenue Refunding Bonds, Series 2020A and Water and Wastewater Revenue Refunding Bonds (Federally Taxable), Series 2020B

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